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ICHTHYOPLANKTON GEAR EVALUATION STUDIES

1984

Prepared Under Contract for

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

Financed Jointly by:

CENTRAL HUDSON GAS & ELECTRIC CORPORATION
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
NIAGARA MOHAWK POWER CORPORATION
ORANGE AND ROCKLAND UTILITIES, INC.
NEW YORK POWER AUTHORITY

March 1985

LAWLER, MATUSKY & SKELLY ENGINEERS
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River, New York 10965

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CHAPTER 1.0

INTRODUCTION

1.1 PURPOSE

The Hudson River Utilities, as part of the Hudson River Monitoring Program, contracted Lawler, Matusky & Skelly Engineers (LMS) to conduct an ichthyoplankton gear evaluation program during June and July 1984. The program consisted of three separate studies with simultaneous sampling conducted on all three during the annual period of peak ichthyoplankton abundance in the lower Hudson River estuary.

The studies were:

- Evaluation of a 1.0-m^2 Tucker trawl in assessing ichthyoplankton populations using two sampling techniques: oblique tows and discrete depth tows
- Influence of tow speed on ichthyoplankton abundance estimates based on a 1.0-m^2 Tucker trawl and a 1.0-m^2 net mounted on an epibenthic sled
- Evaluation of a Miller high speed sampler

1.2 BACKGROUND

The basic assumption of a biological sampling program is that the data from the sampling gear accurately estimate or represent population characteristics (abundance, developmental stage, species representation, distributional patterns), and that they do this with quantitative precision (UNESCO 1968; Barkley 1972; Thayer et al. 1983). In general, the accuracy of biological surveys is limited by the lack of information available on both the biological community under study and the efficiency of the sampling gear speed on the collection efficiency of the 1.0-m^2 epiberthic sled was conducted by TI (1980) on juvenile fish. The study determined that mean organism density did not increase with an increase in tow speed. The retention of fish larvae by a 1.0-m diameter Hensen net and a 0.5-m diameter plankton net was evaluated by McGroddy and Wyman (1977). They observed that the number of test larvae declined with an increase in water velocity through the net. They attributed this to extrusion through the net mesh at higher speeds. More larval mutilation was also observed at the higher tow velocities.

1.3 PROGRAM DESCRIPTION

The Hudson River estuary is one of the most heavily studied aquatic ecosystems in the United States. One major component of the biological evaluation of the Hudson River is to determine ichthyoplankton concentrations and spatiotemporal distribution patterns. Ichthyoplankton sampling, directed primarily toward the striped bass, was initiated in the mid-1960s (Carlson and McCann 1969) and has continued virtually without interruption to the present. Many kinds of sampling gear and deployment techniques have been employed by Hudson River investigators in these studies. The use of different gear and methods of deployment compounds problems of comparing data bases and indicates the need for gear comparison studies. These studies also serve to refine sampling techniques and result in information necessary to modify program design.

Three different gear evaluation studies were conducted under the current gear comparison program. Each of the studies, and the background for the study, is outlined below:

- The deployment of ichthyoplankton nets to sample discrete depth horizons or mounted on epibenthic tested was not appreciably different from the 0.9-1.0 m/sec normally used, they concluded that more larvae were collected at the higher tow speeds. A second study was undertaken in 1978 and 1979 (TI 1980) to evaluate tow speed effects on the 1.0-m^2 epibenthic sled for young-of-the-year fish. No detectable differences were found among tow speeds.

A more intensive study covering a longer time period and including a wider range of tow speeds compared to the TI studies was designed to evaluate the influence of tow speed on ichthyoplankton for both the 1.0-m^2 Tucker trawl and the 1.0-m^2 epibenthic sled. The study was designed to supplement the studies conducted by TI.

- Several studies on sampling gear selectivity indicate that nets towed at very high speeds are more efficient than those towed at slower speeds, especially for larger, well developed organisms. High speed sampling is achievable only with small nets. The Miller high speed sampler has been tested in several habitats as a means of evaluating ichthyoplankton abundance. A study was incorporated in the gear evaluation program to determine the feasibility of including this gear in the Hudson River ichthyoplankton program. The study was scheduled to be conducted during mid- to late July when larvae with better developed sensory and swimming capabilities were present in the study area. A direct comparison study of the 1.0-m^2 Tucker trawl with the Miller high speed sampler at tow velocities in excess of 10 times the 0.9-1.0 m/sec Tucker trawl tow speed was planned.

CHAPTER 2.0

EVALUATION OF A 1.0-m^2 TUCKER TRAWL IN ASSESSING ICHTHYOPLANKTON POPULATIONS USING TWO SAMPLING TECHNIQUES: OBLIQUE TOWS AND DISCRETE DEPTH TOWS

2.1 INTRODUCTION

Ichthyoplankton sampling programs designed to estimate abundance normally incorporate collection data from discrete depth tows. These tows yield information on depth distribution patterns and permit sampling in relationship to physical or chemical reference points (depth contours, chemopleths, and isotherms). Based on information that individual species or developmental stages for a species undergo similar distributional patterns, they also enable the selective sampling of individual populations or developmental stages (Tuberville 1979; Lewis and Siler 1980). The overall accuracy of a discrete depth tow program has been greatly increased by the use of nets that can be opened and closed. Nets with this capability are set and retrieved in the closed position; they are opened only at the designated depth strata during sampling. Set and retrieval of the closed net eliminates sample contamination from non-sampled water strata.

A sampling program that included both discrete and oblique tows was conducted in the littoral zone of Lake Erie by Cole and MacMillan (1984). They observed a continuous - both day and night - changing of larval density by depth. They also observed that density estimates obtained from oblique tows conducted from bottom to surface were similar and, accordingly, as accurate as estimates from discrete depth tows. Thus, one of the conclusions of the study was that the preferred sampling technique was the oblique tow, and that the effort involved in obtaining abundance information was less time consuming than integrating data from several discrete depth tows.

2.2 DESCRIPTION OF STUDY AREA

The lower Hudson River estuary is approximately 247 km (154 miles) long. Its mouth is at the southern tip of Manhattan Island (Battery) and it extends in a northerly direction to the Federal Dam at Troy, New York. The Troy Dam, constructed in 1832 as part of the New York State canal system (Schureman 1934), forms the boundary between the tidal estuarine lower Hudson River and the riverine upper Hudson River. The lower Hudson is defined as a drowned river valley or "coastal plain estuary" (Pritchard 1967), with saltwater intrusion generally restricted to the more southerly portion, although it is occasionally reported as far north as Poughkeepsie (km 122 [MP 76]). During extreme drought years the salt front has been reported as far north as Kingston (km 170 [MP 106]) (Buckley 1971). Mean freshwater flow measured at the Troy Dam is approximately 382 m^3/sec (13,500 cfs).

The net deployment comparison study was conducted between Croton Point (km 54) and Newburgh (km 97) (Figure 2.0-1). The study area encompasses two bays: the larger southern Haverstraw Bay and the northern Newburgh Bay. Both bays are characterized as having extensive littoral zones. The river between the two bays is generally narrow with a deep channel. The maximum Hudson River depth, 60 m, occurs near West Point (km 75).

The study area is divided into four regions (TI 1981). Information on the four regions is presented in Table 2.0-1. The Hudson River area between Croton and New Hamburg was selected for this study because historically it has been a center of high ichthyoplankton densities.

TABLE 2.0-1

PHYSICAL AND CHEMICAL INFORMATION ON RIVER REGIONS IN THE STUDY AREA

			River Segment Volume by Strata and Total (m^3)[a]				Physical and Chemical Characteristics[b]			
River Region Number	Name	River Kilometer (Mile)	Channel Stratum	Bottom Stratum	Shoal Stratum	Total Strata Volume	Estuarine Classification	Annual Salinity Range (mg Cl^-/l)	Temperature Range (°C)	Physical Characteristics
3	Croton-Haverstraw	54-61 (34-38)	61,309,016	32,517,633	53,910,105	147,736,754	Mesohaline	200-2000	1-25	Estuary very wide and shallow, shoals abundant
4	Indian Point	62-74 (39-46)	162,269,471	33,418,632	12,648,163	208,336,266	Oligohaline	50-200	0-28	Estuary narrow and deep, shoals rare
5	West Point	75-88 (47-55)	178,830,022	28,625,747	c	207,455,769	Oligohaline	50-200	0-28	Estuary narrow and very deep, shoals rare
6	Cornwall	89-98 (56-61)	94,882,267	36,768,629	8,140,123	139,791,019	Oligohaline	50-200	0-28	Estuary wide and moderately deep, shoals common

[a]Source: Battelle 1983.

[b]Source: Howells 1972.

[c]Small shoal stratum volume added to the bottom stratum.

TABLE 2.0-2

OBLIQUE VS DISCRETE 1.0 m^2 TUCKER TRAWL COMPARISON STUDY
SAMPLING DATES AND NUMBER OF SAMPLES COLLECTED

Ichthyoplankton Gear Comparison Study
June - July 1984

		No. OF SAMPLES COLLECTED	
WEEK No.	REGION No.	DISCRETE HORIZONTAL	OBLIQUE
1 (11-17 Jun)	6	32	32
	5	28	28
2 (18-20 Jun)	4	15	15
	3	15	15
3 (25-28 Jun)	3	30	30
	4	30	30
4 (2- 4 Jul)	3	15	15
	4	15	15
Total		180	180

A calibrated digital flowmeter (General Oceanics Model 2030) mounted in the center of the net mouth was used to calculate the volume of water filtered for each sample. The following formula was used to determine sample volume:

$$\text{Vol } (m^3) = \text{area of net mouth} \times \text{tow distance}$$

The area of the net mouth was adjusted for tow speed following the procedure described in Appendix 3-1. The following relationship was used to determine the tow distance from the net-mounted flow-meter.

$$\text{Distance (m)} = \frac{k \times \text{rotor constant}}{999{,}999}$$

where

k = flowmeter revolution count

Rotor constant = 26,873

The rotor constant is a factory-supplied value. Velocity meters were calibrated at the beginning and end of the sampling program. At the end of the program, calculated rotor constants were similar to the original factory-supplied value and it was therefore used for all distance calculations.

Two net deployment sampling techniques were employed: (1) discrete depth tows conducted at randomly selected depths, and (2) oblique tows from the surface to 3.0 m from the river bottom. The 3.0-m depth criterion was established to minimize the potential for the net frame to hit the uneven bottom or bottom structures. The discrete horizontal tow was conducted for 5 min at a randomly chosen depth from the surface to 3.0 m from the bottom. The net was lowered to the desired depth in the closed position, opened for the

Field crew performance was monitored periodically during the sampling period to ensure compliance with standard operating procedures (SOP). Maintenance and calibration of equipment assured compliance with specifications required for ichthyoplankton and water quality collections.

2.3.2 Laboratory Program

Preserved samples were transported to the Nyack laboratory, inventoried, organized by inventory number, and stained with Rose bengal to aid in sorting of fish eggs and larvae. All eggs and larvae were counted, removed from the sample, and identified to the lowest possible taxonomic level.

If more than 4000 fish eggs or bay anchovy larvae were estimated to be in a sample, a Folsom plankton splitter was used to divide the sample into eighths. The split portion was sorted and the fish eggs or larvae counted. If the count was greater than 500 in the one-eighth portion analyzed, sorting was complete. If the count was less than 500, additional one-eighth split portions were analyzed until one of the following relationships was realized:

SAMPLE SPLIT SIZE	No. OF EGGS OR LARVAE
1/8	> 500
1/4	>1000
3/8	>1500
1/2	>2000
5/8	>2500
3/4	>3000
7/8	>3500
Entire Sample	>4000

Alewife and blueback herring were grouped together as Alosa spp. because of the difficulty in distinguishing between their early

The mean density for each stratum (d_{jkl}) was taken as:

$$d_{jkl} = 1/n \sum_{i=1}^{n} d_{ijkl} \qquad (2)$$

where

n = number of samples in the jth region during the kth collection period for the lth gear

Standard errors of mean densities were calculated as:

$$SE_{d_{jkl}} = \left[\sum^{n} \frac{(d_{ijkl} - d_{jkl})^2}{n\ (n-1)} \right]^{0.5} \qquad (3)$$

Regional standing crops (N_r) and their associated standard errors (SE_{N_r}) were then obtained by multiplying each d_{jkl} and $SE_{d_{jkl}}$ by the volume of the strata. For the oblique-discrete net deployment study only channel strata volumes were used since sampling was restricted to the channel regions. For the Croton-Haverstraw, Indian Point, West Point, and Cornwall strata, these values are 61,309,016, 162,269,471, 178,830,022, and 94,882,267 m^3, respectively (Table 2.0-1). Total standing crop and standard errors for the four regions are calculated as:

$$N = \sum_{r} N_r \qquad (4)$$

and

$$SE_N = \sqrt{\sum_{r} (SE_{N_r})^2} \qquad (5)$$

The study was conducted during a period of historica' peak abundance of striped bass and white perch to ensure adequate catches of ichthyoplankton for comparative purposes. Sampling regions were a Log (X+1) transformation (Cassie 1962). Unfortunately, transformations have several disadvantages. It can be misleading to present means of the data on the transformed scale, and means converted back to the original scale result in a biased estimator of the true mean (Zar 1974). Additionally, for comparative purposes it is inappropriate to transform standard deviations or variances back to the original scale (Steel and Torrie 1960); such statistics are no longer symmetrical about the mean. Consequently, multiple comparison tests are invalid when converted back to the original scale and seldom make sense on the transformed scale (Scheffe 1959). Further complications arise in factorial ANOVA designs. McCaughran (1977) notes that, for example, the test of the 2 x 2 design interaction hypothesis (using $\log_e$ transform) H_0: $\mu_{11} - \mu_{21} = \mu_{12} - \mu_{22}$ does not imply H_0: $e^{\mu_{11}} - e^{\mu_{21}} = e^{\mu_{12}} - e^{\mu_{22}}$ in the untransformed scale. Therefore, transformations may remove or create statistical significance in factorial treatment designs.

Without transformations, many statistical tests are considered robust enough to withstand considerable violation of assumptions (Zar 1974; McCaughran 1977), especially when sample sizes are relatively large or when group sample numbers are equal (or nearly so). In fact, tests such as ANOVAs are often much more robust to violation of assumptions than tests designed to protect them from such problems. For example, Bartlett's test for homogeneity of variance is inefficient and badly affected by non-normality to the point that it is seldom worthwhile to use in conjunction with ANOVAs (Zar 1974).

Preliminary analyses, not surprisingly, suggested that sampling distributions were skewed right, and Bartlett's test detected significantly heterogeneous variances. The slope of the $\log_e$ variance on $\log_e$ density relationship, b, generally ranged from approximately 1.5 to 1.8.

Length-frequency distributions between tow types were examined using the Kolmogorov-Smirnov two-sample test (Siegel 1956) and by graphical inspection. The Kolmogorov-Smirnov tests whether two frequency distributions could have been drawn from the same population. It is sensitive to any difference between the distributions - median, dispersion, skewness, etc. Normalized cumulative distributions are calculated, and the maximum difference between the tow groups may be compared to tabulated critical values.

The assumptions necessary for applying the Kolmogorov-Smirnov procedure are minimal:

1. Samples from both populations are random and mutually independent.

2. Measurement scale is at least ordinal, i.e., capable of being ranked.

Since our applications involve continuous random variables (length) from independent samples, these assumptions are easily met.

A nonparametric procedure was used to compare the catch composition between the two gear types. The Spearman rank-order correlation (r_S) is an analog of the parametric correlation coefficient r. It is most useful when data from a bivariate population is far from normal. Since species compositions abundances are markedly non-normal (Pielou 1977), this procedure is more appropriate than the parametric counterpart. As with the parametric r, the strength of interdependence is measured with a value ranging from -1 to +1. Values of 0 indicate no correlation while positive or negative values indicate positive or negative associations. The test assumes only that both the X and Y variates are at least capable of being ranked.

TABLE 2.0-3

OBLIQUE VS DISCRETE 1.0 m^2 TUCKER TRAWL COMPARISON STUDY WATER QUALITY INFORMATION

Ichthyoplankton Gear Comparison Study - June - July 1984

DATE	TIME	LOCATION[a]	STATION DEPTH (m)	TEMP (°C) SURF	TEMP (°C) MID	TEMP (°C) BOTTOM	DO (mg/l) SURF	DO (mg/l) MID	DO (mg/l) BOTTOM	COND (µmhos/cm @ 25°C) SURF	COND MID	COND BOTTOM	SALINITY (ppt) SURF	SALINITY MID	SALINITY BOTTOM
12 Jun	0511	CW	13.7	17.6	17.7	17.6	7.9	7.9	8.2	176	175	173	0.0	0.0	0.0
13 Jun	0355	CW	9.8	18.3	18.2	18.2	8.0	8.2	8.1	173	172	170	0.0	0.0	0.0
14 Jun	0420	CW	12.5	18.8	18.8	18.7	7.8	7.6	8.0	181	180	179	0.0	0.0	0.0
14 Jun	2155	CW	17.7	19.2	19.1	19.1	8.1	8.1	8.2	161	161	158	0.0	0.0	0.0
15 Jun	0033	CW	16.5	19.1	18.9	19.0	7.8	7.8	7.7	161	161	161	0.0	0.0	0.0
16 Jun	0015	WP	21.3	19.0	19.1	19.1	7.6	7.5	7.5	162	163	162	0.0	0.0	0.0
16 Jun	0512	WP	20.7	18.6	18.7	18.6	7.3	7.4	7.3	160	160	159	0.0	0.0	0.0
17 Jun	0010	WP	30.5	18.9	19.0	19.0	7.6	7.6	7.8	161	161	164	0.0	0.0	0.0
18 Jun	2058	IP	34.4	19.4	19.3	19.3	7.4	7.4	7.3	162	161	160	0.0	0.0	0.0
18 Jun	2239	IP	20.7	19.5	19.4	19.4	7.4	7.4	7.4	160	161	160	0.0	0.0	0.0
19 Jun	0015	IP	16.8	21.0	19.5	19.4	7.4	7.4	7.4	163	162	161	0.0	0.0	0.0
18 Jun	0344	IP	30.2	20.2	20.1	20.1	7.6	7.6	7.6	168	166	162	0.0	0.0	0.0
19 Jun	2209	CH	8.8	21.5	20.5	20.5	7.6	8.4	8.0	191	191	200	0.0	0.0	0.0
19 Jun	2339	CH	10.1	21.6	20.3	20.2	7.1	7.1	7.2	187	188	188	0.0	0.0	0.0
20 Jun	0030	CH	12.2	20.8	20.4	20.3	7.2	7.2	6.8	191	192	170	0.0	0.0	0.0
20 Jun	0113	CH	10.1	20.8	20.8	20.1	7.3	7.3	5.2	200	340	5100	0.0	0.0	2.7
25 Jun	2300	CH	12.8	22.6	21.7	20.4	8.9	7.6	5.3	5160	8140	14420	2.7	4.5	8.4
25 Jun	2310	CH	9.1	22.7	22.3	21.1	9.1	8.8	6.8	5560	6070	10040	3.0	3.3	5.7
26 Jun	0347	CH	10.1	21.9	22.0	20.8	7.7	7.8	6.2	5570	5580	11180	3.0	3.0	6.4
27 Jun	0015	CH	12.2	22.3	20.8	20.4	9.9	6.2	5.3	6750	13550	16330	3.7	7.9	9.6
27 Jun	0341	IP	21.3	21.7	21.6	21.2	7.2	7.1	6.1	5630	5860	10030	3.0	3.2	5.7
27 Jun	2205	IP	15.9	22.1	22.3	21.4	7.2	7.5	6.2	4850	5520	9150	2.6	3.0	5.2
28 Jun	0042	IP	23.5	21.8	22.0	21.7	6.8	6.9	6.5	5050	5900	7600	2.7	3.2	4.2
28 Jun	0357	IP	36.9	21.4	21.4	21.5	6.7	6.6	6.4	3690	3910	4570	1.9	2.0	2.4
2 Jul	2257	CH	9.8	23.1	23.1	23.0	6.7	6.7	6.7	5030	5430	5570	2.7	2.9	3.0
3 Jul	0020	CH	11.6	23.3	23.1	22.9	6.5	6.5	6.4	4050	4480	4920	2.1	2.3	2.6
3 Jul	0035	CH	11.3	23.2	23.2	22.9	6.6	6.6	6.5	4240	4750	5680	2.2	2.5	3.1
3 Jul	0210	CH	9.1	23.2	23.0	22.9	6.7	7.0	8.6	5720	6510	6870	3.1	3.6	3.8
3 Jul	2321	IP	20.1	23.0	22.9	23.0	6.2	6.1	6.2	2820	3200	3310	1.4	1.6	1.6
3 Jul	2356	IP	15.9	23.4	22.6	22.7	6.2	6.1	6.1	2570	2620	2820	1.2	1.2	1.4
4 Jul	0055	IP	18.3	23.7	22.6	22.8	6.4	6.5	6.5	2380	2520	3240	1.1	1.2	1.6
4 Jul	0453	IP	10.4	23.4	23.4	23.1	6.5	6.4	6.4	4810	5180	6340	2.5	2.8	3.5

[a]CH = Croton-Haverstraw
IP = Indian Point
WP = West Point
CW = Cornwall

TABLE 2.0-4

SPECIES REPRESENTATION, ABUNDANCE[a], CONCENTRATION, AND PERCENT COMPOSITION IN OBLIQUE AND DISCRETE TRAWL PROGRAM

TAXON	OBLIQUE TOW PROGRAM			DISCRETE TOW PROGRAM		
	ABUNDANCE	DENSITY (No./1000 m^3)	% COMP.	ABUNDANCE	DENSITY (No./1000 m^3)	% COMP.
Acipenser sp.	1	0.01	<0.01	-	-	-
Alosa spp.	522	7.43	0.6	486	7.71	0.6
American shad	1	0.01	<0.01	2	0.03	<0.01
Atherinidae	77	1.10	0.1	98	1.56	0.1
Atlantic herring	1	0.01	<0.01	1	0.02	<0.01
Atlantic menhaden	2	0.03	<0.01	1	0.02	<0.01
Atlantic needlefish	1	0.01	<0.01	-	-	-
Atlantic tomcod	1,437	20.46	1.7	1,439	22.84	1.7
Bay anchovy	47,797	680.63	56.0	45,613	723.92	53.6
Bluefish	6	0.09	<0.01	4	0.06	<0.01
Centrarchidae	9	0.13	<0.01	11	0.17	<0.01
Clupeidae	2	0.03	<0.01	-	-	-
Cyprinidae	119	1.69	0.1	93	1.48	0.1
Hogchoker	-	-	-	1	0.02	<0.01
Morone spp.	2,515	35.81	2.9	3,076	48.82	3.6
Rainbow smelt	185	2.63	0.2	333	5.28	0.4
Striped bass	23,590	335.92	27.7	24,627	390.85	28.9
Tessellated darter	29	0.41	<0.01	24	0.38	<0.01
White perch	8,369	119.18	9.8	8,827	140.09	10.4
Unidentified	639	9.10	0.7	469	7.44	0.6
Total	85,302	1214.71		85,105	1350.69	
Total number of samples		180			180	
Total volume sampled (m^3)		70224.32			63008.59	
Average sample time (min)		5.6			5.0	
Range (min)		4.8-6.5			5.0-5.1	

[a]Yolk-sac, post-yolk-sac, juvenile, and unidentified life stage.

TABLE 2.0-5 (Page 1 of 2)

ESTIMATED STANDING CROP AND ONE STANDARD ERROR (SE)
FOR TOTAL ICHTHYOPLANKTON BY LIFE STAGE, DATE, AND REGION

(Standing Crop and SE Given in 1000s of Individuals)

		CH		IP		WP		CW		TOTAL	
LIFE STAGE	SAMPLE	STANDING CROP	SE	STANDING CROP	SE	STANDING CROP	SE	STANDING CROP	SE	STANDING CROP	SE
Egg	6/1-17/84										
	Discrete					13900	6926	5608	2464	19508	7351
	Oblique					8112	3103	3448	1261	11560	3349
	6/18-20/84										
	Discrete	0	0	198	198					198	198
	Oblique	0	0	176	110					176	110
	6/25-28/84										
	Discrete	459853	314364	93799	41013					553652	317029
	Oblique	230926	129897	135310	35103					366236	134556
	7/2-4/84										
	Discrete	362	174	1433	705					1795	727
	Oblique	1044	810	632	297					1676	863
Yolk-Sac Larvae	6/11-17/84										
	Discrete					48911	12353	13924	3552	62836	12853
	Oblique					28384	6537	7460	2773	35843	7101
	6/18-20/84										
	Discrete	578	243	3721	1445					4299	1171
	Oblique	609	117	6330	1772					6940	1776
	6/25-28/84										
	Discrete	69	24	652	395					720	396
	Oblique	78	28	283	116					361	120

TABLE 2.0-6 (Page 1 of 2)

SUMMARY ANOVA RESULTS FOR DISCRETE VS OBLIQUE TOW COMPARISONS

ALL SPECIES

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	77109636	4.06	0.0069**
Tow Type (T)	1	9095987	0.48	0.4889
Life Stage (L)	3	137676317	7.25	<0.0001**
WxT	3	876970	0.46	0.7088
WxL	9	118356834	6.24	<0.0001**
TxL	3	6593574	0.35	0.7911
WxTxL	9	9812726	0.52	0.8632
Error	1408	18980889		

STRIPED BASS

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	311174	4.74	0.0027**
Tow Type (T)	1	33468	0.51	0.4755
Life Stage (L)	2	10143857	154.45	<0.0001**
WxT	3	166694	2.54	0.0553
WxL	6	1078850	16.43	<0.0001**
TxL	2	4749	0.07	0.9302
WxTxL	6	92074	1.40	0.2106
Error	1056	65677		

WHITE PERCH

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	211249	17.41	<0.0001**
Tow Type (T)	1	4304	0.35	0.5516
Life Stage (L)	2	1794662	147.87	<0.0001**
WxT	3	22280	1.84	0.1389
WxL	6	273368	22.52	<0.0001**
TxL	2	2641	0.22	0.8044
WxTxL	6	20515	1.69	0.1200
Error	1056	12136		

* - $P \leq 0.05$
** - $p \leq 0.01$

TABLE 2.0-7

MEAN DENSITY AND STANDARD DEVIATION (SD) FOR STRIPED BASS, WHITE PERCH AND TOTAL ICHTHYOPLANKTON BY WEEK, REGION, TOW TYPE, AND LIFE STAGE

				GEAR COMPARISON - OBLIQUE VS DISCRETE							
					TOTAL		STRIPED BASS		WHITE PERCH		
WEEK	REGION[a]	GEAR[b]	STAGE[c]	VOLUME	DENSITY	SD	DENSITY	SD	DENSITY	SD	NUMBER
1	5	65	1	7977.285	77.725	204.937	66.696	184.952	11.029	25.905	28
1	5	65	2	7977.285	273.508	365.511	267.572	359.113	4.512	6.924	28
1	5	65	3	7977.285	531.731	424.957	409.315	375.908	36.552	41.497	28
1	5	67	1	9682.355	45.363	91.909	39.545	88.031	5.818	7.736	28
1	5	67	2	9682.355	158.719	193.440	155.148	193.108	2.125	3.527	28
1	5	67	3	9682.355	372.818	244.986	275.346	220.409	27.254	25.271	28
1	6	65	1	11015.676	59.105	146.928	40.777	117.829	18.240	51.228	32
1	6	65	2	11015.676	146.755	211.745	137.995	204.187	6.761	10.953	32
1	6	65	3	11015.676	101.976	140.040	41.635	77.140	18.367	19.237	32
1	6	67	1	11137.805	36.342	75.178	21.106	47.237	15.084	53.143	32
1	6	67	2	11137.805	78.621	165.306	73.770	156.646	2.111	5.512	32
1	6	67	3	11137.805	34.859	67.975	6.943	11.060	6.248	13.331	32
2	3	65	1	5609.678	0.000	0.000	0.000	0.000	0.000	0.000	15
2	3	65	2	5609.678	9.431	15.358	1.731	2.542	7.181	15.061	15
2	3	65	3	5609.678	529.099	413.907	428.437	392.297	91.308	51.287	15
2	3	67	1	6165.774	0.000	0.000	0.000	0.000	0.000	.000	15
2	3	67	2	6165.774	9.935	7.399	3.445	3.896	6.490	6.683	15
2	3	67	3	6165.774	653.509	467.669	466.481	381.920	162.267	145.865	15
2	4	65	1	4974.696	1.218	4.719	0.000	0.000	1.218	4.719	15
2	4	65	2	4974.696	22.932	27.328	21.157	27.797	1.406	2.450	15
2	4	65	3	4974.696	526.414	422.999	459.156	375.052	48.366	39.856	15
2	4	67	1	5959.906	1.086	2.620	0.313	1.210	0.773	2.433	15
2	4	67	2	5959.906	39.012	42.292	29.490	38.005	8.428	27.581	15
2	4	67	3	5959.906	953.447	749.669	802.683	668.234	130.682	242.441	15
3	3	65	1	10289.043	7500.583	28084.652	0.000	0.000	0.187	1.022	30
3	3	65	2	10289.043	1.120	2.144	0.087	0.478	0.000	.000	30
3	3	65	3	10289.043	106.510	71.121	73.627	73.332	6.155	6.366	30
3	3	67	1	12413.148	3766.593	11604.719	0.000	0.000	0.000	.000	30
3	3	67	2	12413.148	1.268	2.545	0.000	0.000	0.000	.000	30
3	3	67	3	12413.148	145.735	115.106	86.644	57.117	8.706	13.624	30
3	4	65	1	11643.504	578.043	1384.365	0.000	0.000	3.216	14.741	30
3	4	65	2	11643.504	4.016	13.328	0.695	3.807	2.901	10.931	30
3	4	65	3	11643.504	1250.866	1189.887	582.064	789.482	355.180	417.744	30
3	4	67	1	12334.105	833.857	1184.859	0.080	0.440	0.741	3.632	30
3	4	67	2	12334.105	1.745	3.979	0.344	1.105	0.723	1.998	30
3	4	67	3	12334.105	1126.667	826.799	435.474	404.851	266.548	252.149	30
4	3	65	1	5774.597	5.901	11.011	0.000	0.000	0.000	.000	15
4	3	65	2	5774.597	0.000	0.000	0.000	0.000	0.000	0.000	15
4	3	65	3	5774.597	5714.431	3293.693	518.289	632.498	234.289	202.221	15
4	3	67	1	6132.174	17.030	51.158	0.000	0.000	0.000	.000	15
4	3	67	2	6132.174	0.000	0.000	0.000	0.000	0.000	.000	15
4	3	67	3	6132.174	5221.294	3450.598	398.776	455.370	183.821	160.506	15
4	4	65	1	5724.106	8.833	16.834	0.000	0.000	0.344	.908	15
4	4	65	2	5724.106	0.523	1.083	0.000	0.000	0.340	.897	15
4	4	65	3	5724.106	2928.932	2329.594	216.622	207.674	317.292	168.810	15
4	4	67	1	6399.170	3.897	7.089	0.000	0.000	0.000	0.000	15
4	4	67	2	6399.170	0.468	0.969	0.000	0.000	0.155	0.602	15
4	4	67	3	6399.170	2536.226	2058.249	176.520	104.232	235.432	107.166	15

[a]3 = Croton-Haverstraw; 4 = Indian Point; 5 = West Point; 6 = Cornwall.

[b]65 = Discrete; 67 = Oblique.

[c]1 = Egg; 2 = Yolk-sac larvae; 3 = Post-yolk-sac larvae and early juvenile.

SD = Standard deviation.

FIGURE 2.0-4

DENSITY OF TOTAL EGGS FOR WEEK 2

(Mean and 95% Confidence Interval)

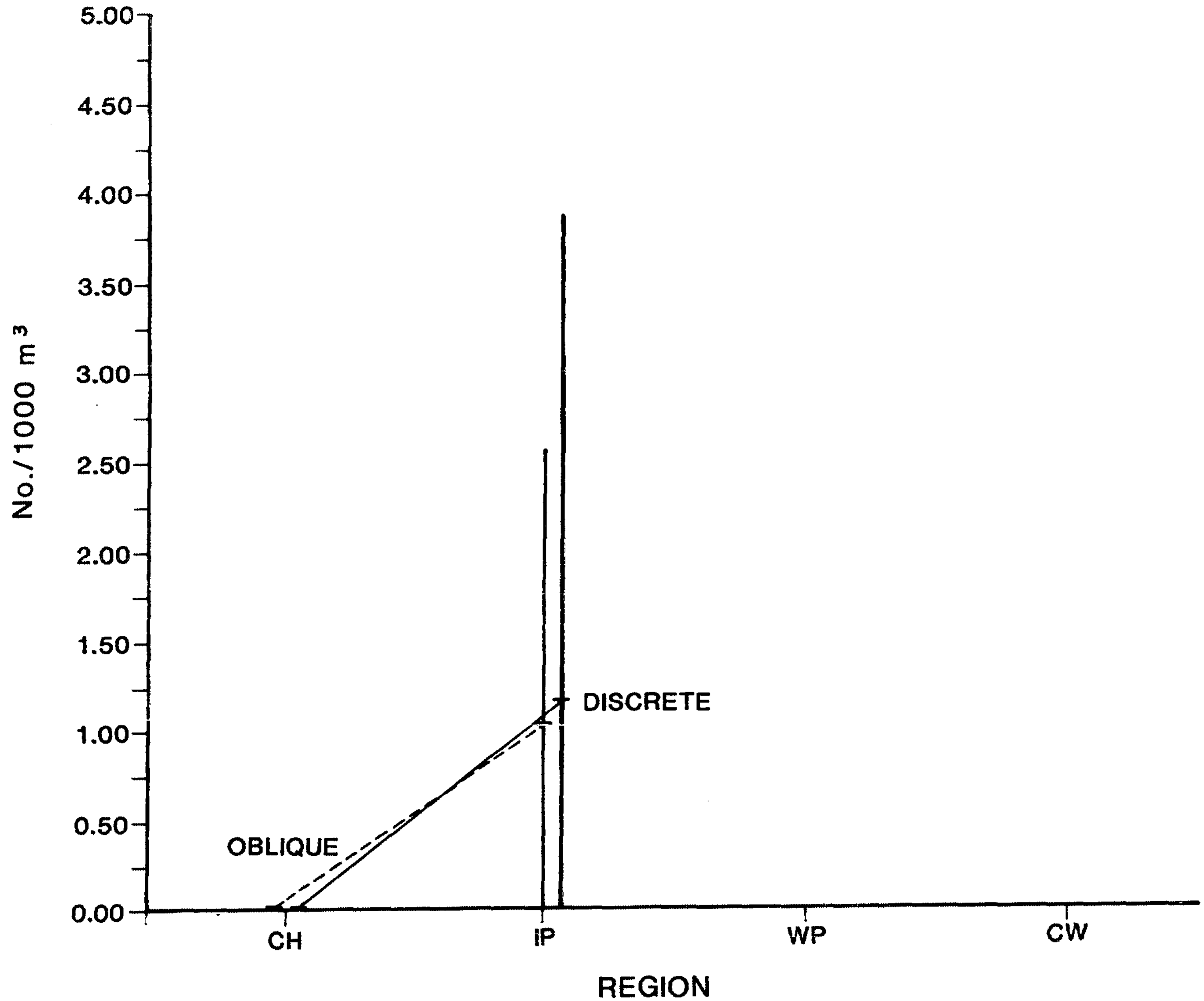


FIGURE 2.0-6

DENSITY OF TOTAL EGGS FOR WEEK 4
(Mean and 95% Confidence Interval)

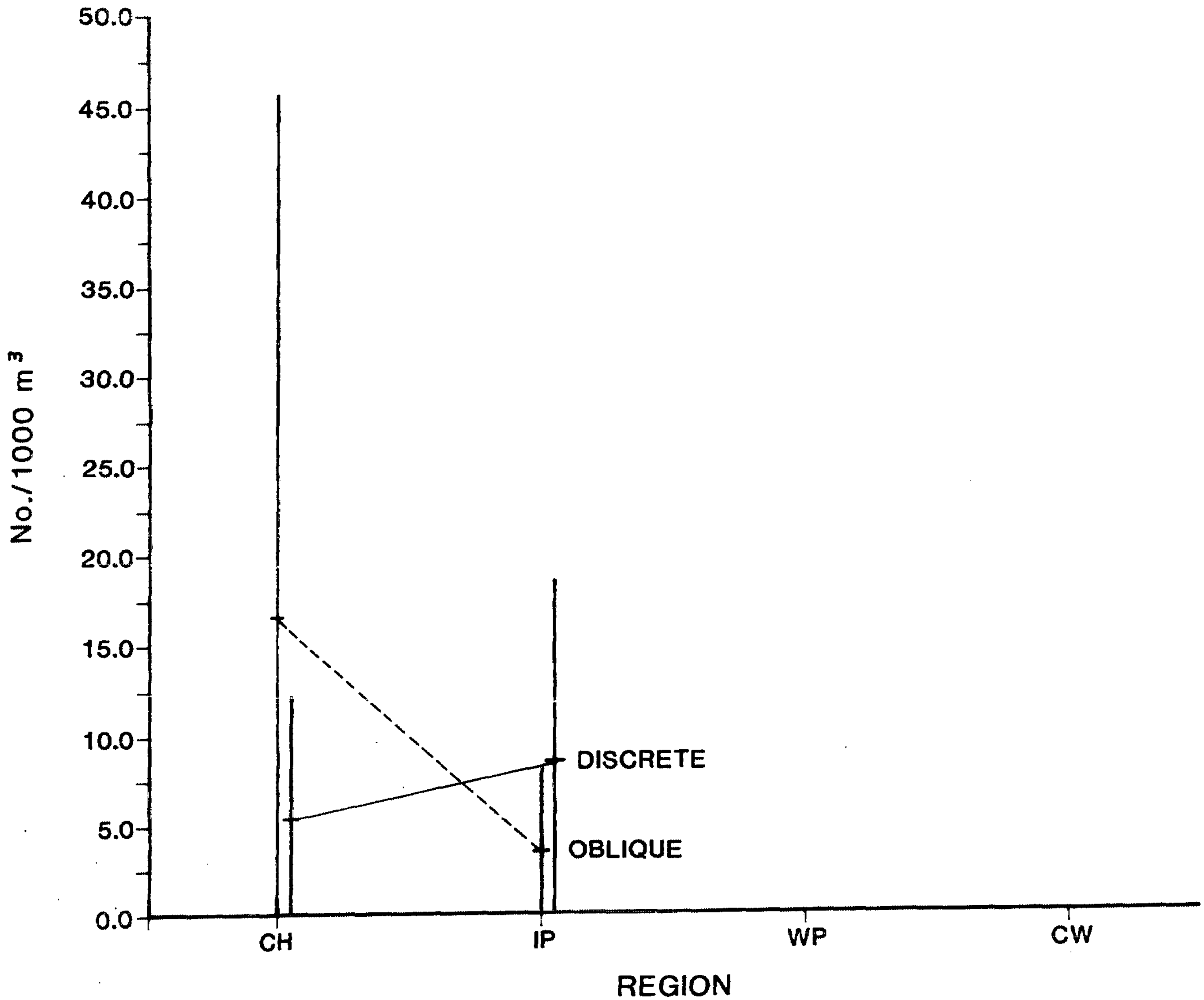


FIGURE 2.0-8

DENSITY OF TOTAL YOLK-SAC LARVAE FOR WEEK 2

(Mean and 95% Confidence Interval)

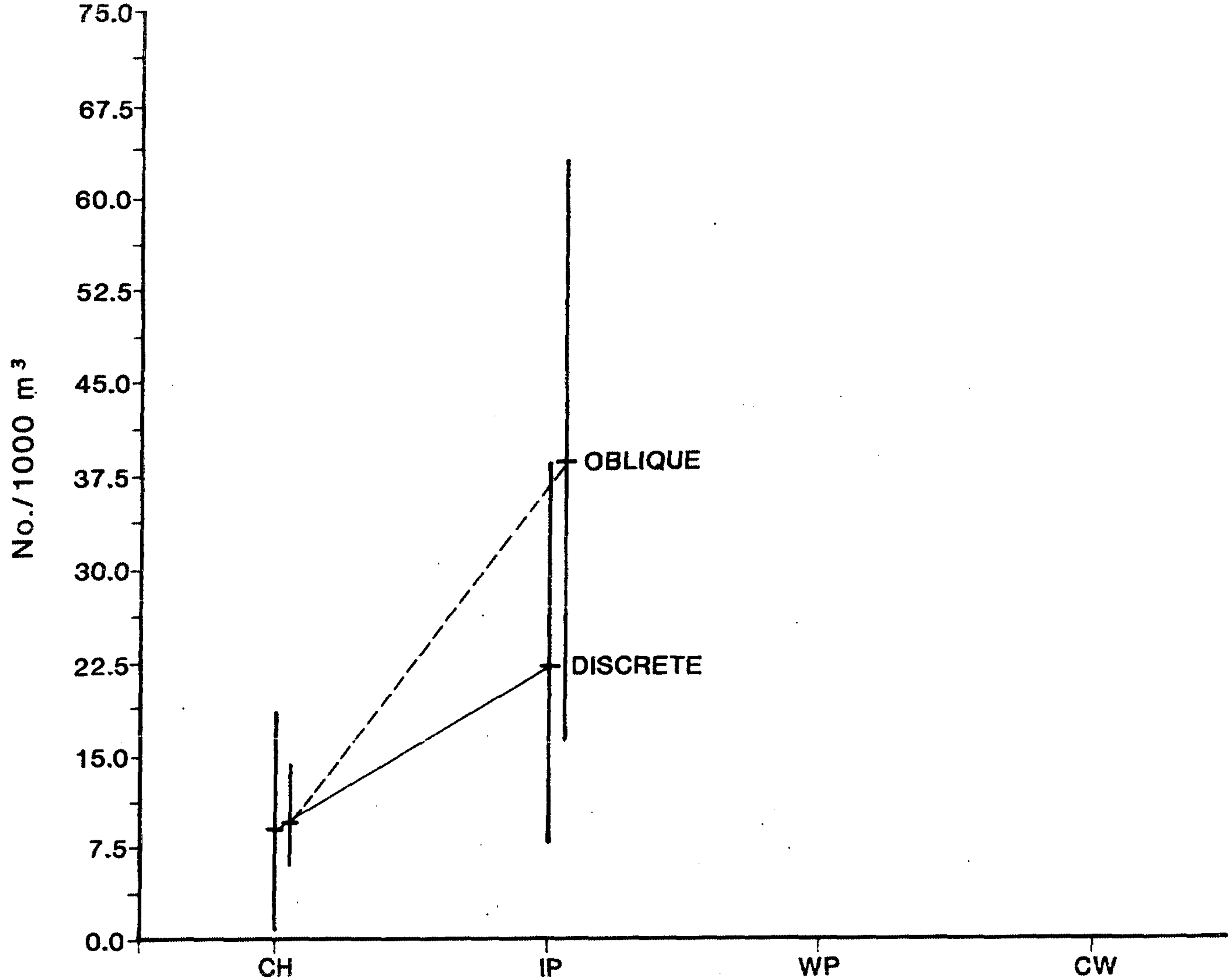


FIGURE 2.0-10

DENSITY OF TOTAL YOLK-SAC LARVAE FOR WEEK 4

(Mean and 95% Confidence Interval)

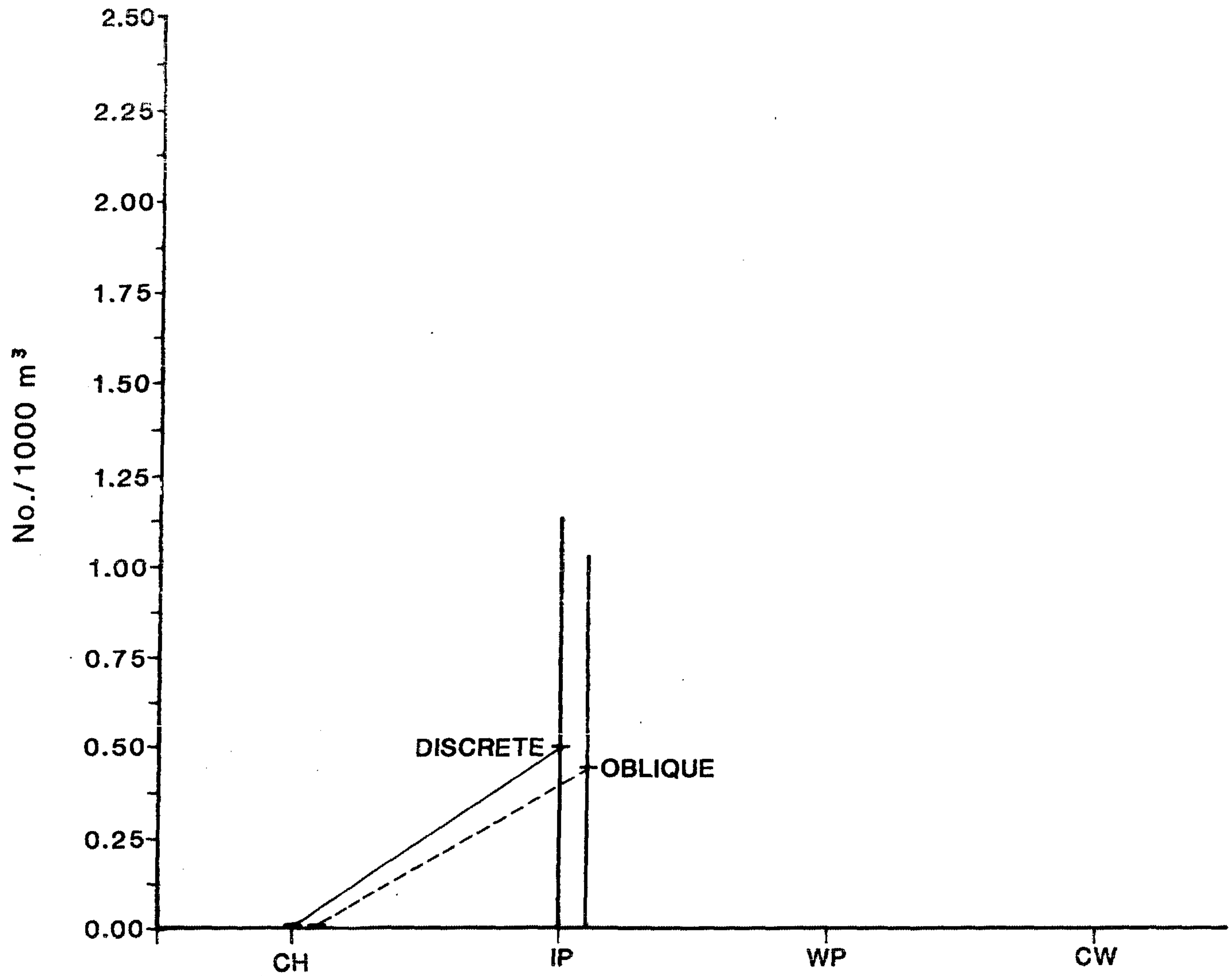


FIGURE 2.0-12

DENSITY OF TOTAL POST-YOLK-SAC LARVAE FOR WEEK 2

(Mean and 95% Confidence Interval)

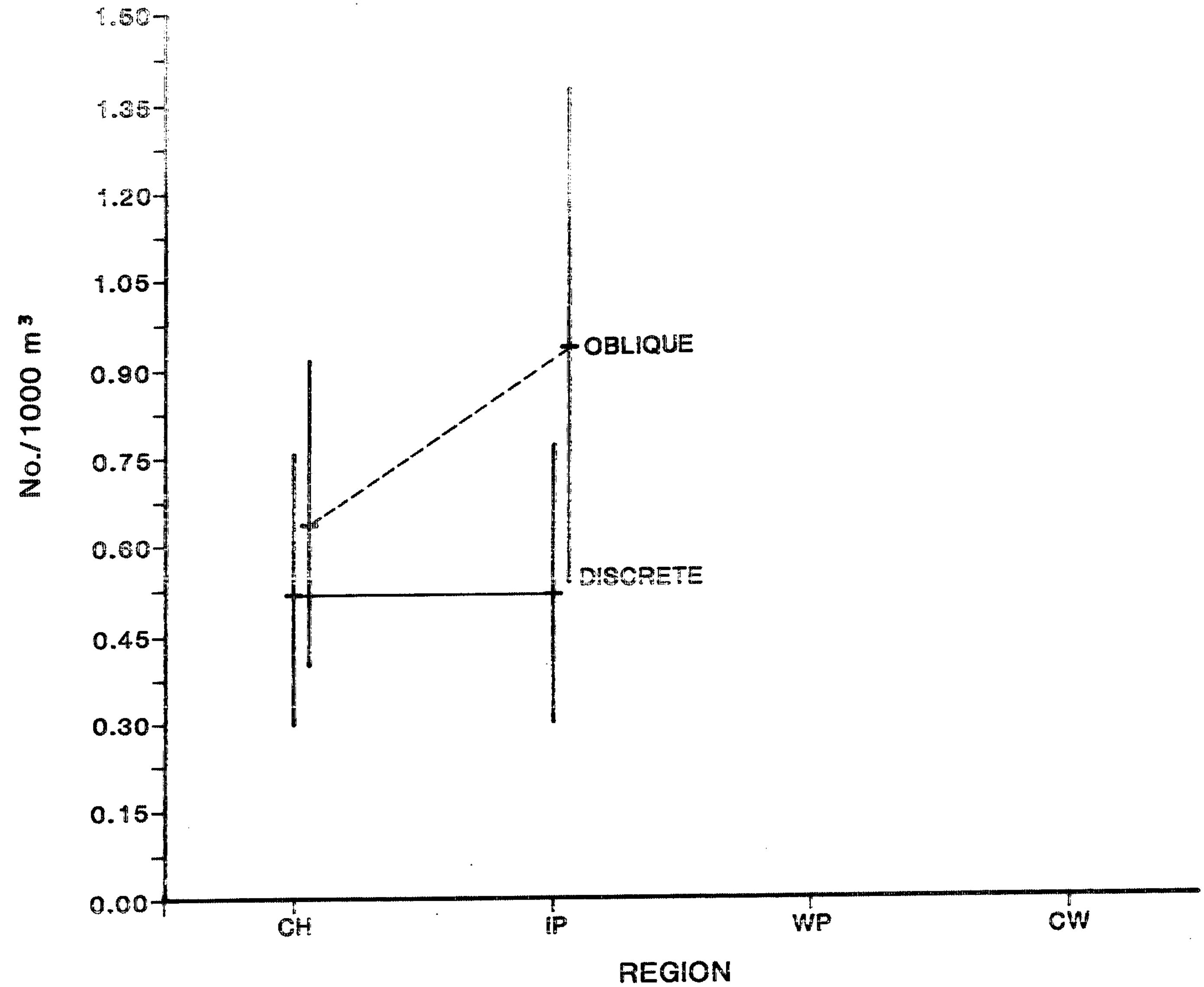
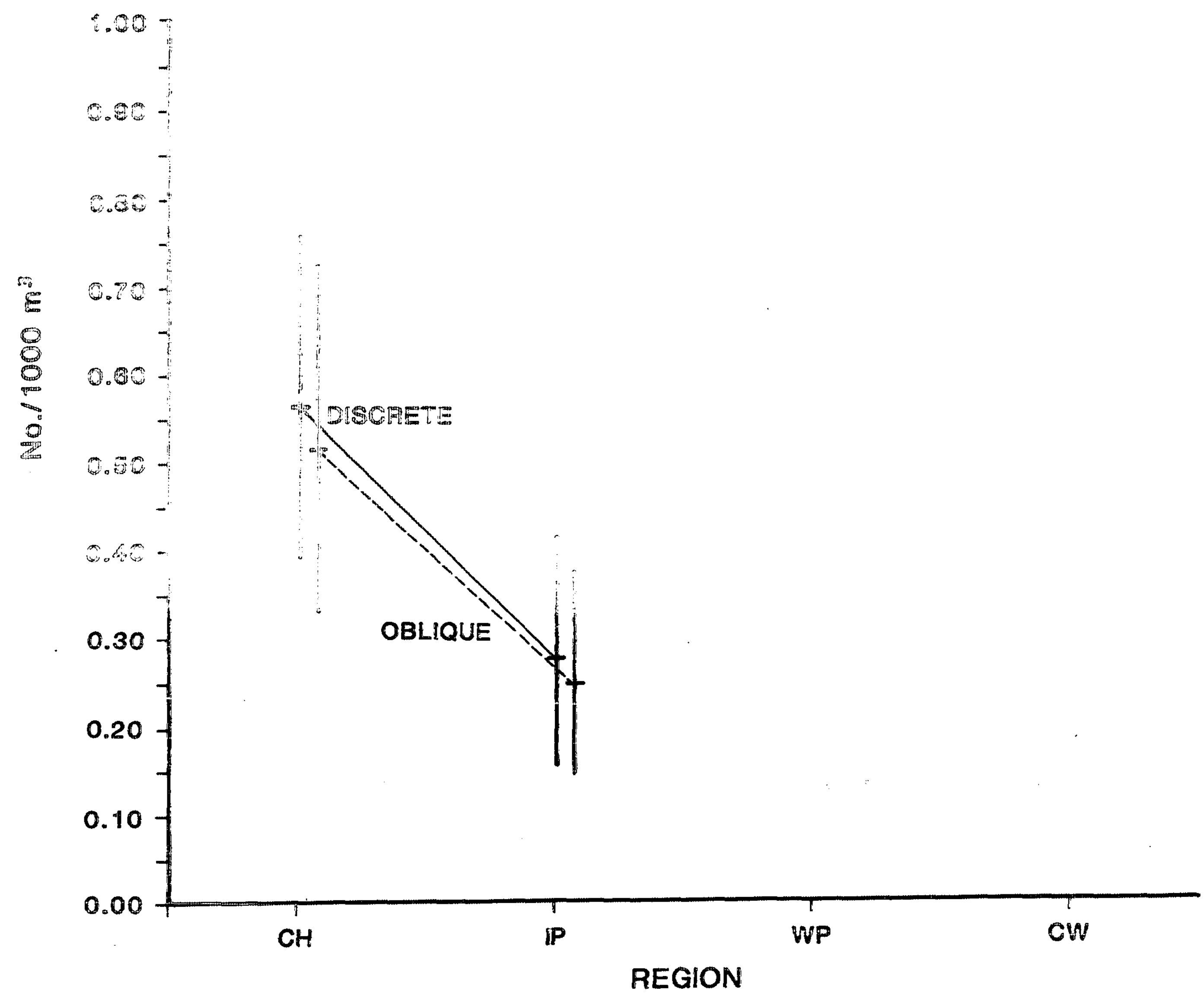


FIGURE 2.0-14

DENSITY OF TOTAL POST-YOLK-SAC LARVAE FOR WEEK 4
(Mean and 95% Confidence Interval)



To test whether the sampling variability around the mean concentration was the same for the two programs, ANCOVA was used. Mean density was used as a covariate because the effects of the relationship of variance to mean density must be removed prior to comparison. Volume filtered was also included as a covariate in an effort to remove differences in variance that might be introduced by the slightly longer tow duration for oblique tows.

Striped bass, white perch, and total ichthyoplankton were chosen for comparison because of the large number of samples with nonzero catch. ANCOVAs were conducted without respect to life stage; however, life-stage-specific estimates of mean density and variance were used as dependent and independent variables. Results indicated a highly significant effect on variance due to mean density and a significant (but of lesser importance on the basis of the t-value) effect attributable to the volume sampled (Table 2.0-8). Adjusted means for the three groups examined were similar between gear-type pairs. Only the striped bass data set indicated any significant difference in variance between methods (Table 2.0-9). The adjusted average variance of the oblique tow was significantly less ($P \leq 0.05$) than that of the discrete tow. It should be noted, however, that for all three groups the adjusted variance was lower for the oblique tow method.

The tendency toward lower variability suggests that the oblique tow method could be used advantageously to either increase the precision of standing crop estimates or lower the cost of the sampling program. However, it must be cautioned that the previously mentioned bias introduced by the stepping procedure could reduce the variance to some extent as well. Filtering water without catching ichthyoplankton introduces a consistency that reduces overall variance. It would seem likely that the slight, and in some case significant, difference in variance between the tow gears is the

TABLE 2.0-9

SUMMARY ANCOVA RESULTS FOR DISCRETE VS OBLIQUE TOW COMPARISONS

TOTAL ICHTHYOPLANKTON

Source of Variance	D.F.	MEAN SQ.	F-VALUE	PROB (TAIL)
Equality of Adj. Means	1	0.2353	1.5138	0.2257
Zero Slope	2	100.2525	644.8805	<0.0001**
Error	40	0.1555		
Equality of Slopes	2	0.0017	0.0104	0.9897
Error	38	0.1636		

STRIPED BASS

Source of Variance	D.F.	MEAN SQ.	F-VALUE	PROB (TAIL)
Equality of Adj. Means	1	0.3727	4.3603	0.0457*
Zero Slope	2	57.5461	673.2418	<0.0001**
Error	29	0.0855		
Equality of Slopes	2	0.0573	0.6541	0.5279
Error	27	0.0876		

WHITE PERCH

Source of Variance	D.F.	MEAN SQ.	F-VALUE	PROB (TAIL)
Equality of Adj. Means	1	0.0001	0.0010	0.9746
Zero Slope	2	41.0523	323.0651	<0.0001*
Error	34	0.1271		
Equality of Slopes	2	0.0868	0.6701	0.5187
Error	32	0.1296		

* = $P \leq 0.05$
** = $P \leq 0.01$

TABLE 2.0-10

LENGTH FREQUENCY INFORMATION (mm) FOR THE 15-TOW SAMPLE BLOCKS OF THE OBLIQUE VS DISCRETE TRAWL COMPARISON STUDY

TAXON	SAMPLE TOW TYPE		15 1.0-m^2 TUCKER TRAWLS PER BLOCK*											
			BLOCK 1	BLOCK 2	BLOCK 3	BLOCK 4	BLOCK 5	BLOCK 6	BLOCK 7	BLOCK 8	BLOCK 9	BLOCK 10	BLOCK 11	BLOCK 12
Striped Bass	Oblique	Number analyzed	128	74	278	450	450	450	379	283	389	450	410	439
		Length range	2.1-7.0	3.1-7.0	3.1-8.0	3.1-8.0	0.9-8.0	2.1-10.0	5.1-11.0	5.1-13.0	5.1-14.0	4.1-14.0	5.1-20.0	5.1-160
		Mean length	5.0	5.8	5.9	6.1	6.3	6.6	7.0	7.5	7.9	8.2	10.6	9.9
	Discrete	Number analyzed	206	232	394	382	390	445	237	275	404	450	405	428
		Length range	2.1-7.0	3.1-8.0	3.1-8.0	3.1-8.0	4.1-8.0	0.9-11.0	5.1-11.0	5.1-12.0	5.1-14.0	5.1-15.0	5.1-20.0	5.1-15.0
		Mean length	5.2	6.0	6.0	6.0	6.2	6.7	7.1	7.5	7.9	8.2	10.8	9.7
White perch	Oblique	Number analyzed	30	6	53	142	309	414	54	40	267	430	372	442
		Length range	2.1-80	2.1-6.0	3.1-7.0	0.9-9.0	3.1-9.0	3.1-11.0	3.1-8.0	4.1-10.0	3.1-12.0	3.1-10.0	4.1-13.0	3.1-130
		Mean length	4.0	4.0	4.2	4.6	4.8	4.8	5.6	5.8	5.4	5.8	7.5	7.8
	Discrete	Number analyzed	46	70	118	164	210	361	34	28	269	432	362	450
		Length range	2.1-6.0	3.1-5.0	2.1-7.0	3.1-8.0	2.1-10.0	3.1-12.0	3.1-8.0	3.1-9.0	3.1-12.0	1.1-13.0	0.9-13.0	3.1-13.0
		Mean length	3.7	3.9	4.1	4.6	4.9	5.0	5.5	5.8	5.6	6.0	7.4	7.8

*BLOCK No.	SAMPLE DATE	RIVER REGION
1	11-13 June	6
2	13-15 June	6
3	14-16 June	5
4	16-17 June	5
5	18-19 June	4
6	19-20 June	3
7	25-26 June	3
8	26-27 June	3
9	26-27 June	4
10	27-28 June	4
11	2- 3 July	3
12	3- 4 July	4

FIGURE 2.0-15

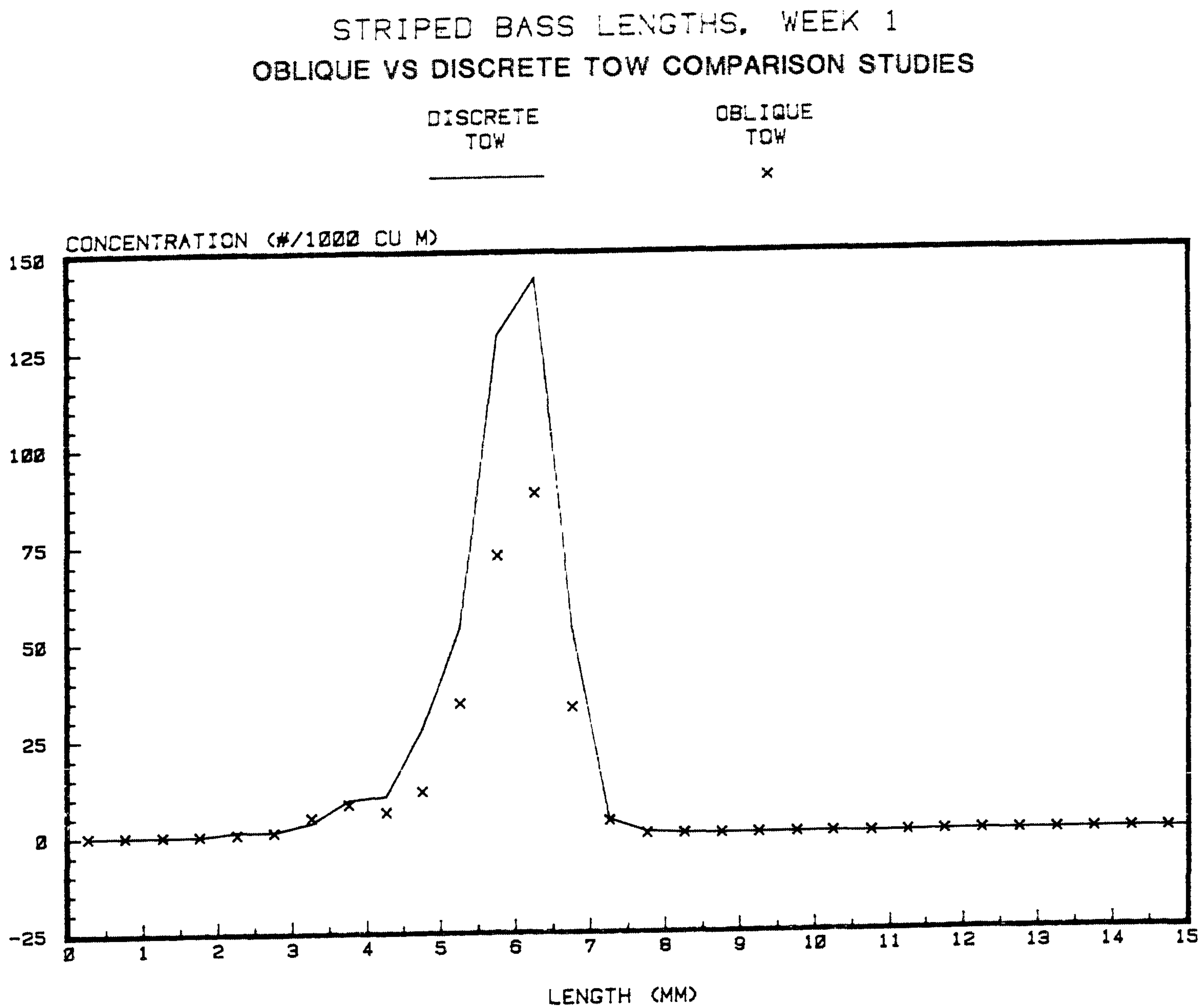

STRIPED BASS LENGTHS, WEEK 1
OBLIQUE VS DISCRETE TOW COMPARISON STUDIES
DISCRETE TOW
OBLIQUE TOW
CONCENTRATION (#/1000 CU M)
150
125
100
75
50
25
0
-25
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
LENGTH (MM)

FIGURE 2.0-17

STRIPED BASS LENGTHS, WEEK 3
OBLIQUE VS DISCRETE TOW COMPARISON STUDIES

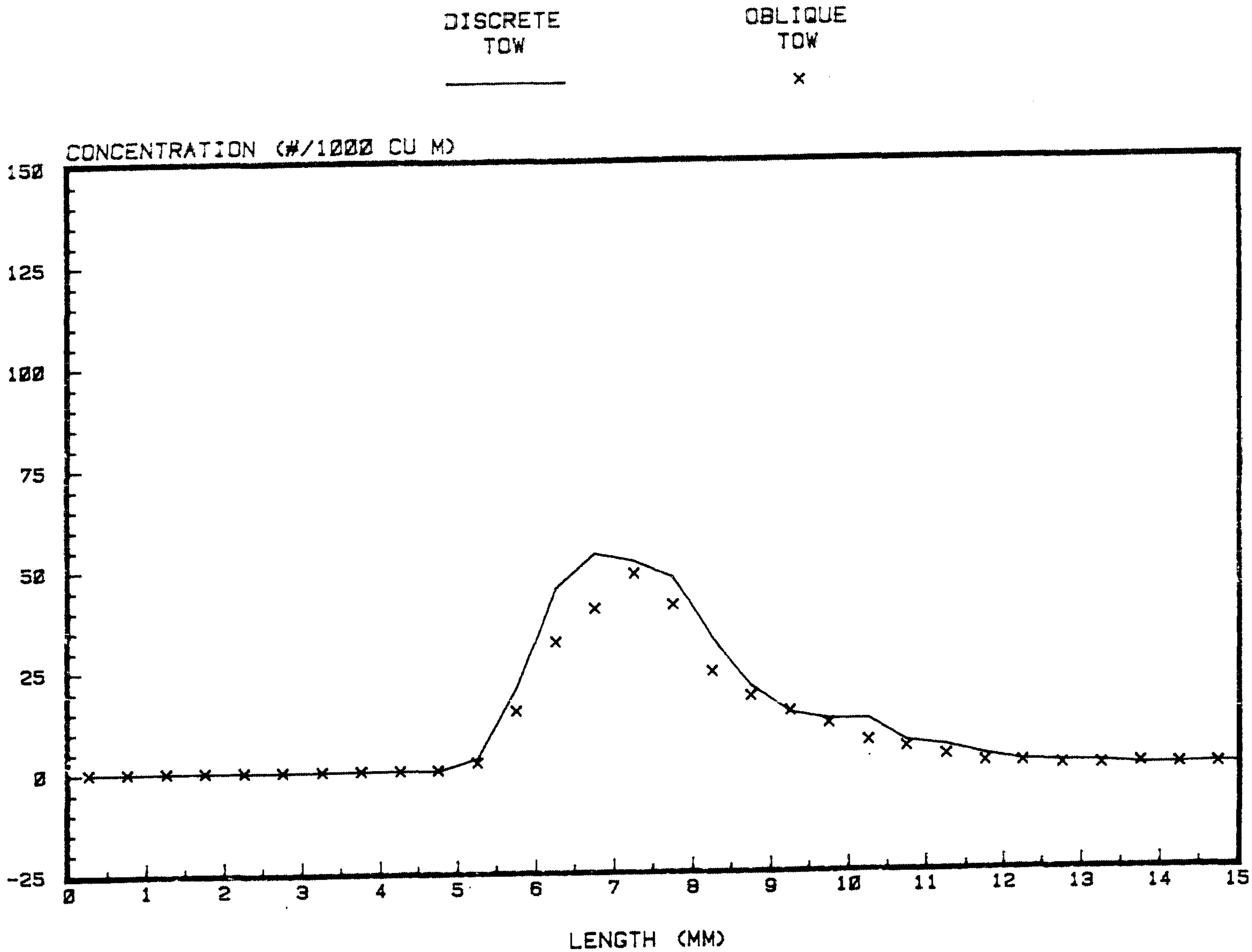


FIGURE 2.0-19

WHITE PERCH LENGTHS, WEEK 1

OBLIQUE VS DISCRETE TOW COMPARISON STUDIES

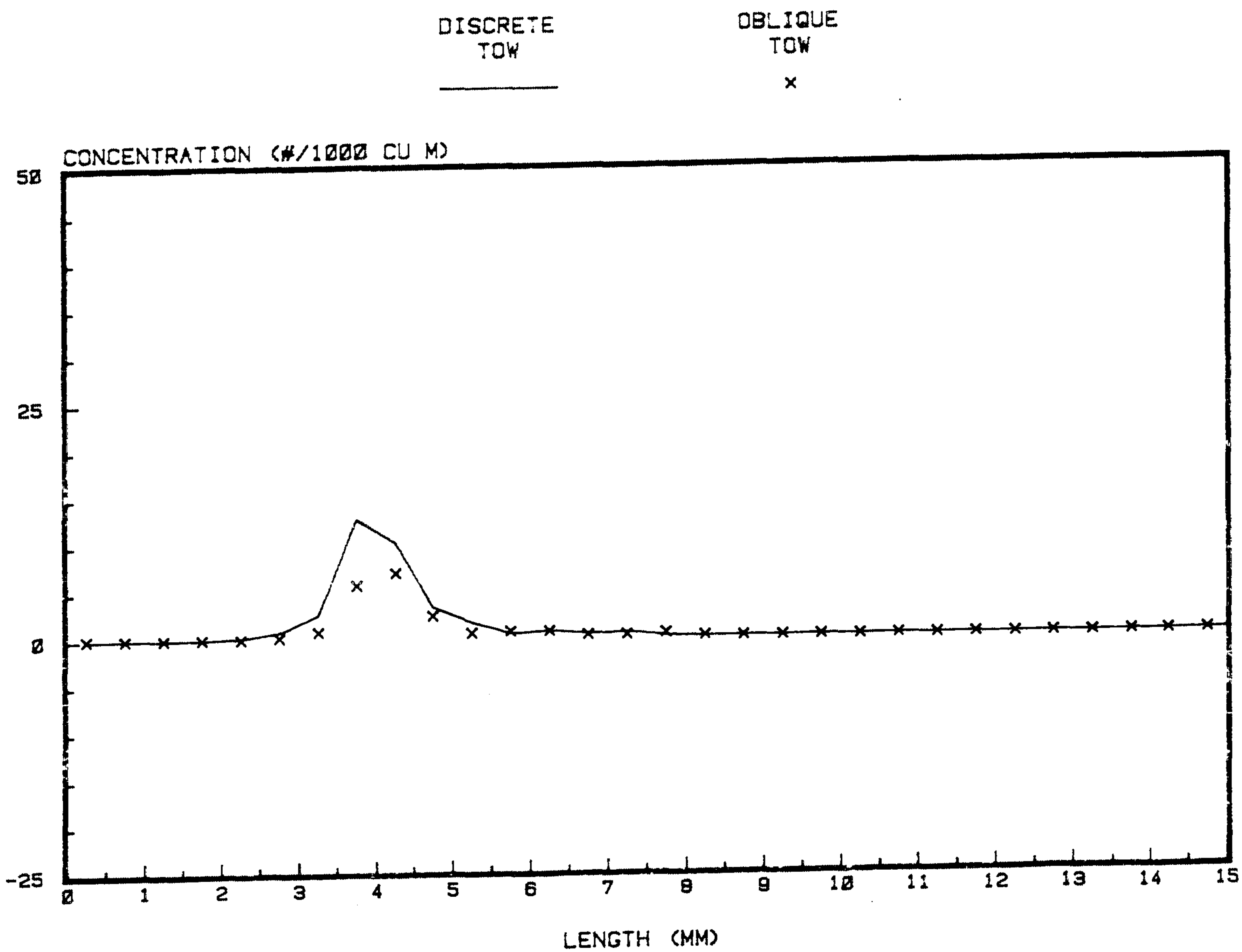
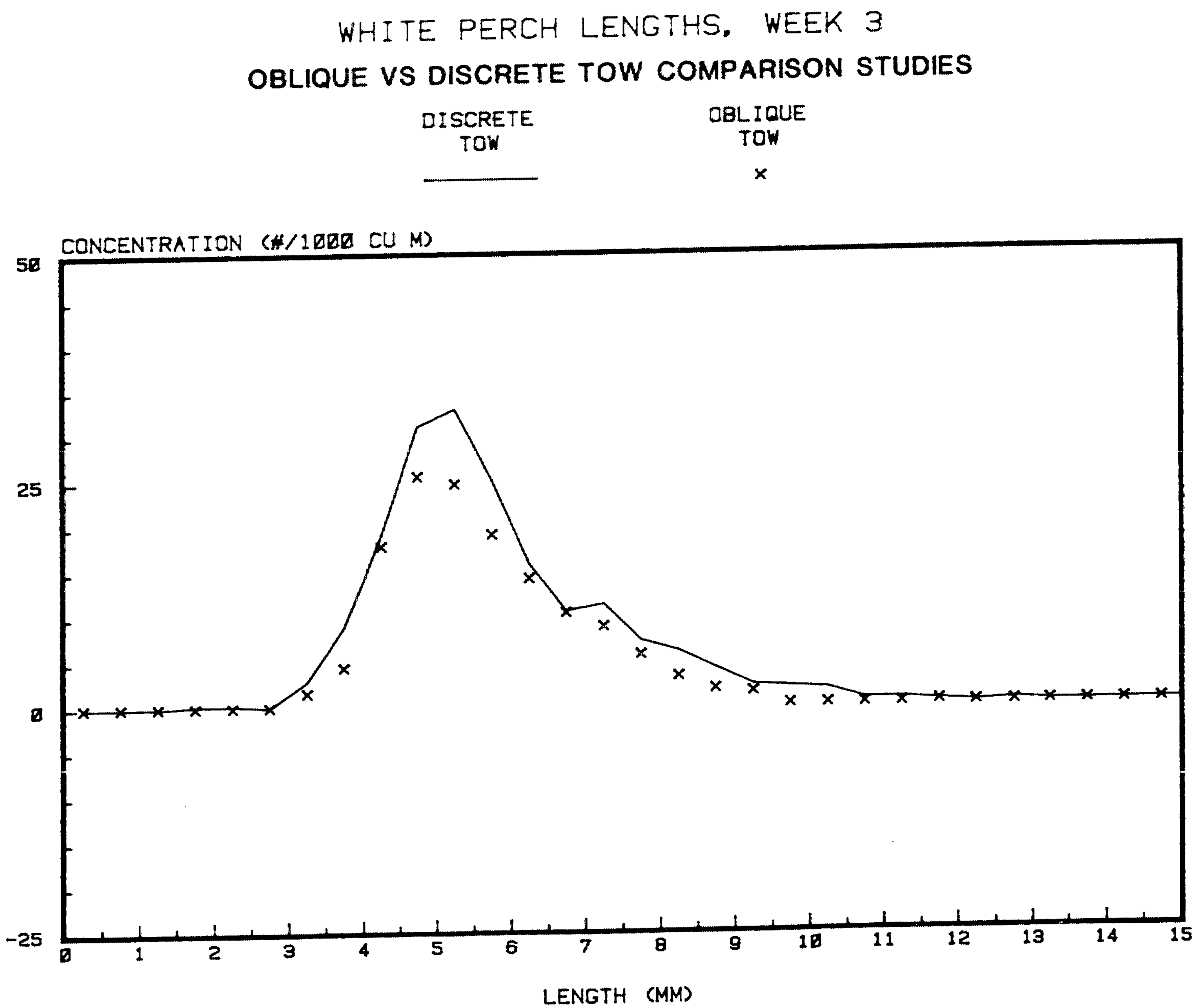


FIGURE 2.0-21


WHITE PERCH LENGTHS, WEEK 3
OBLIQUE VS DISCRETE TOW COMPARISON STUDIES
DISCRETE TOW
OBLIQUE TOW
CONCENTRATION (#/1000 CU M)
50
25
0
-25
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
LENGTH (MM)

Density by life stage for the major taxa collected during the oblique vs discrete study period (Atlantic tomcod, bay anchovy, striped bass, and white perch) is presented for each sample in Appendix 2-3. Generally, the same temporal and spatial pattern was observed from each of the two gear deployment techniques.

2.4.5 Comparative Sample Size

The primary goal of the net deployment comparison study is to determine the most efficient sampling method. Efficiency in this case can be defined as either (1) the smallest confidence limit around a mean standing crop estimate for a given sample size or (2) the least number of samples necessary to produce a specified confidence limit. To compare the sample size/precision relationship, and hence the relative cost-effectiveness, of the two deployment methods, the following procedure was used. The confidence limit (L) around a given mean concentration is based on the relationship:

$$L = X \pm t_{\alpha,\nu}\, SE \qquad (6)$$

where

X = mean concentration
t = student's t value
ν = degrees of freedom; n-1
SE = standard error of the mean
α = probability level

$$= SD/\sqrt{n} \qquad (7)$$

SD = standard deviation
n = sample size

By expressing the confidence limit and standard deviation as a percentage and by algebraic rearrangement, the sample size required to

FIGURE 2.0-23

VARIANCE vs DENSITY RELATIONSHIP FOR ALL LIFE STAGES OF STRIPED BASS

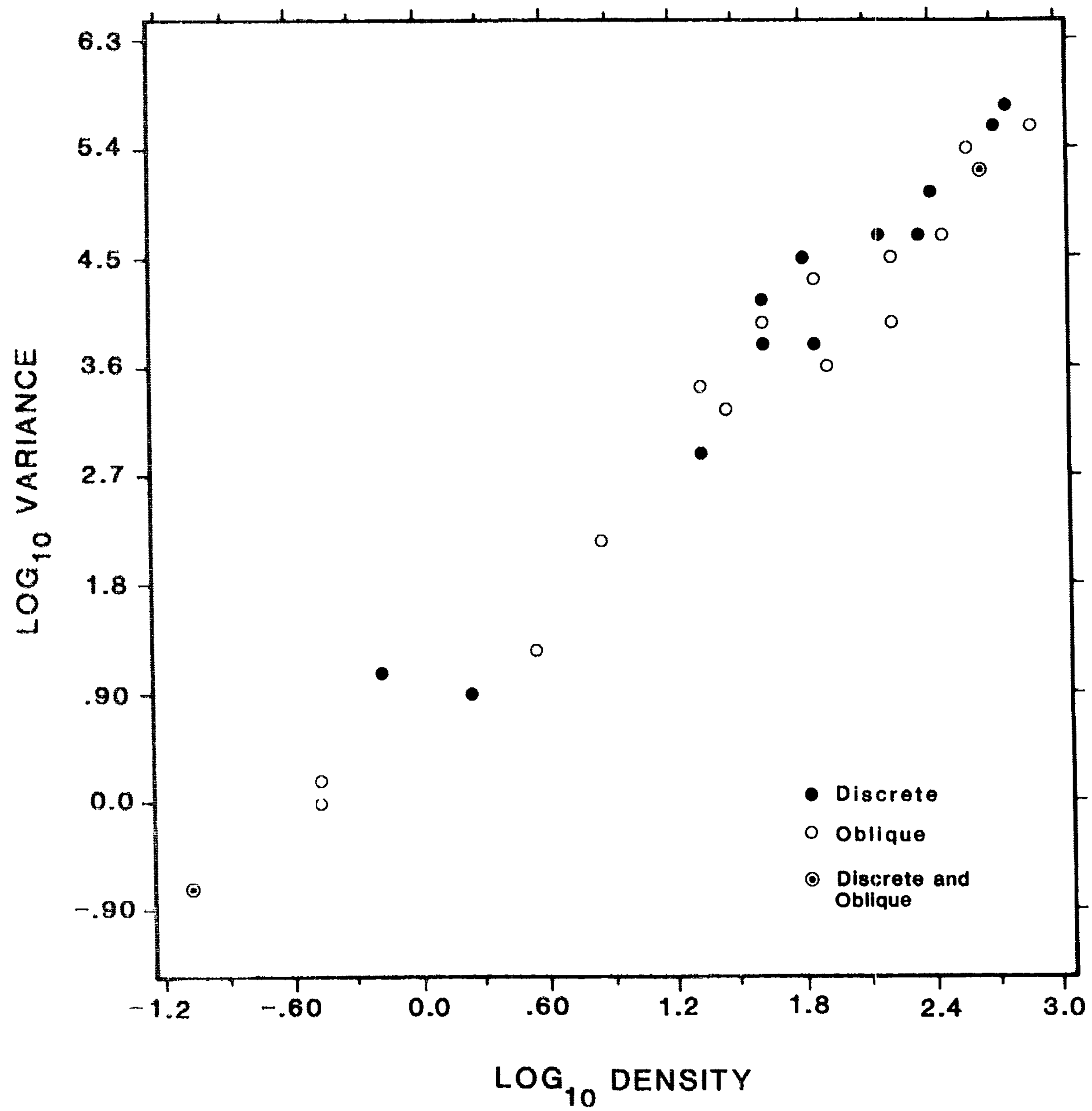
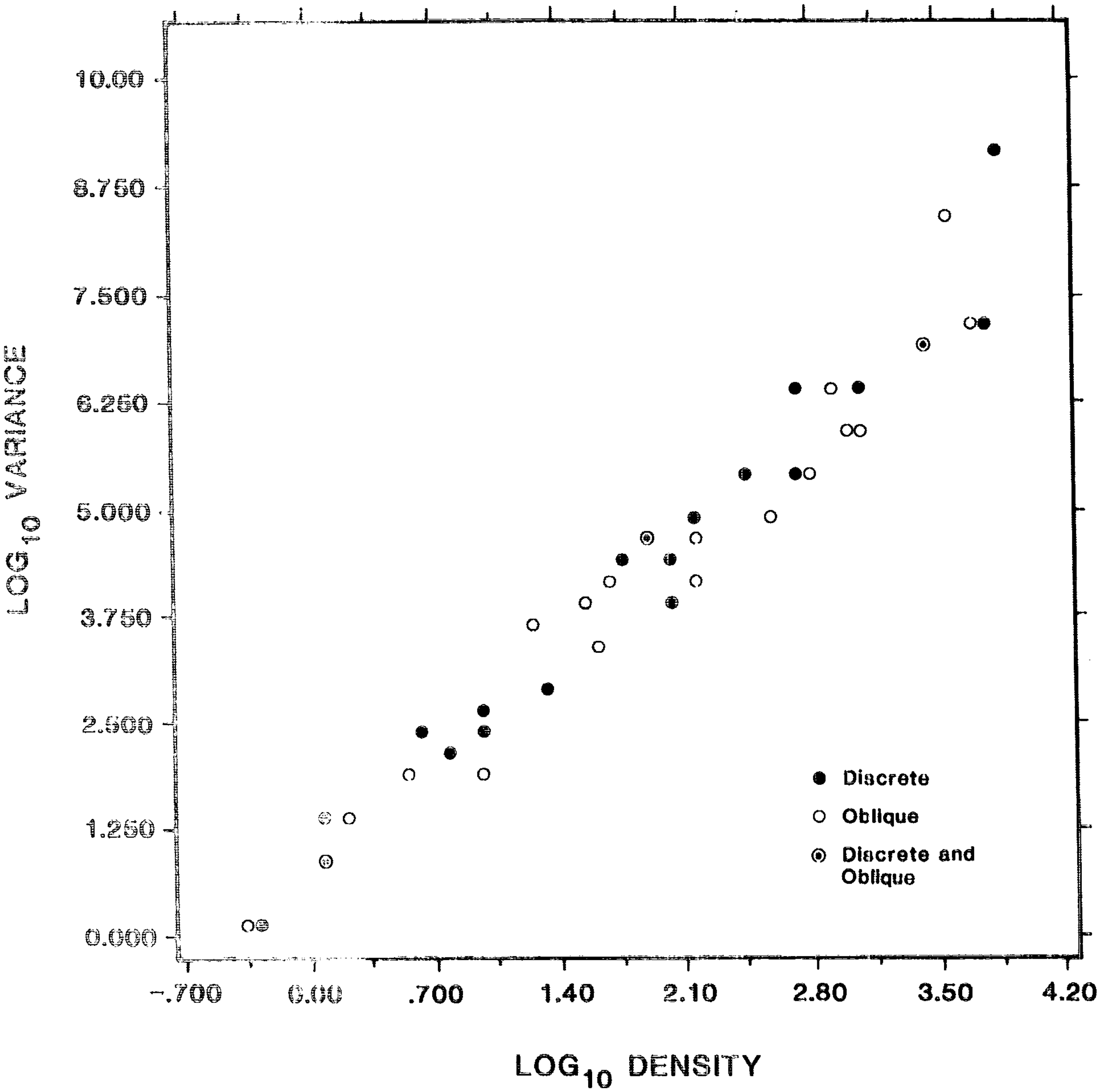


FIGURE 2.0-25

VARIANCE vs DENSITY RELATIONSHIP
FOR ALL LIFE STAGES OF TOTAL ICHTHYOPLANKTON



The number of samples required can then be obtained from Equation 8. Results for selected CV values ranging from 25-250 are summarized in Figure 2.0-26 for quick reference.

Using striped bass, white perch, and total ichthyoplankton as examples, the required sample size for various levels of precision and various mean densities is presented in Table 2.0-13. For simplicity, these results consider only the effect of mean density on variance; no effort was made to correct for tow duration or volume filtered. The number of samples required to obtain a ± 50% confidence limit around the mean of 100 striped bass/1000 m^3 would be 34 with discrete tows and 23 with oblique tows. For white perch under the same conditions, 16 discrete and 19 oblique tows would be required. The greatest differential between deployment methods occurs at very narrow (< ± 30%) confidence limits. With the currently used sample size of approximately 15 per region, differences in precision between gears would be very slight.

2.5 SUMMARY AND DISCUSSION

Comparison sampling was conducted using a 1.0-m^2 Tucker trawl to evaluate two deployment techniques: oblique tows and stratified random discrete depth tows. During a four-week period corresponding to peak seasonal ichthyoplankton densities in the study area, 180 samples representing each deployment method were collected. Each sample was analyzed for species identification, abundance, and selected species length frequency.

Sampling for both deployment techniques was accomplished by the same crew using the same sampling vessel. The original sampling schedule called for alternating deployment methods at each randomly selected station within a river region; however, this was modified to simultanous deployment during the first week of sampling.

TABLE 2.0-13

ESTIMATED NUMBER OF SAMPLES REQUIRED FOR A GIVEN SAMPLING PRECISION AROUND GIVEN MEAN CONCENTRATIONS OF TOTAL ICHTHYOPLANKTON, STRIPED BASS, AND WHITE PERCH

TAXON	PRECISON	NUMBER/1000 m³: 10 D	10 O	50 D	50 O	100 D	100 O	200 D	200 O	500 D	500 O
Total ichthyoplankton											
	10	1334	1084	964	777	838	673	728	583	605	483
	20	335	273	243	196	211	170	184	148	153	122
	30	150	123	109	88	95	77	83	67	69	56
	40	36	70	63	51	55	44	48	39	40	32
	50	56	46	41	33	36	29	31	26	27	22
	60	39	32	29	24	26	21	23	19	19	16
	70	30	24	22	18	19	16	17	14	15	12
	80	23	19	17	14	15	13	14	11	12	10
	90	19	16	14	12	13	10	11	10	10	9
	100	16	13	12	10	11	9	10	9	9	8
Striped bass											
	10	1818	1214	1007	658	6781	505	605	388	433	274
	20	456	305	253	166	1197	128	153	99	110	70
	30	204	137	114	75	89	58	69	45	50	33
	40	116	78	65	43	51	34	40	27	29	19
	50	75	51	43	29	34	23	27	18	20	13
	60	53	36	30	21	24	16	19	13	14	10
	70	39	27	23	16	18	13	15	10	11	8
	80	31	21	18	13	15	10	12	9	9	6
	90	25	17	15	10	12	9	10	8	8	7
	100	21	14	12	9	10	7	9	7	6	3
White perch											
	10	1061	1150	492	566	3353	418	308	279	165	206
	20	267	289	125	143	90	106	79	72	43	53
	30	120	130	57	65	41	49	36	33	20	25
	40	69	74	33	38	24	28	22	20	12	15
	50	45	48	22	25	16	19	15	13	9	10
	60	32	34	16	18	12	14	11	10	7	9
	70	24	26	12	14	10	11	9	9	7	6
	80	19	20	10	11	8	9	8	6	3	5
	90	15	17	9	9	6	7	7	7	3	3
	100	13	14	7	9	7	6	5	3	3	3

D - Discrete.
O - Oblique.

abandoning vertical integrated hauls in favor of short discrete horizontal tows of specified depths. One reason given by Banse (1964) is that measurements of the environment are usually recorded at discrete depths, thus making it difficult to correlate with integrated samples. Cassie (1968) points out that these environmental correlates may be useful in reducing sampling errors through such techniques as regression sampling.

CHAPTER 3.0

INFLUENCE OF TOW SPEED ON ICHTHYOPLANKTON ABUNDANCE ESTIMATES

3.1 INTRODUCTION

Inherent in the design of plankton nets are physical properties, e.g., filtration efficiency, filtration pressure, mesh velocity, and drag, that define the optimal towing range and deployment characteristics for the net (Barkley 1964; UNESCO 1968). Barkley (1972) identified four parameters related to net efficiency: detection distance, net mouth opening (radius), tow speed, and organism escape speed. Detection distance (the point in front of the net where the organism perceives the net) and the organism's swimming capabilities are species and developmental-stage specific. An increase in towing speed decreases the time the organism has to escape the net from the time it is detected (Clutter and Anraku 1968). Net towing velocity has been evaluated by several investigators and has been shown to directly affect the composition of the catch.

Aron and Collard (1969) evaluated an Isaacs-Kidd midwater trawl at nearshore ocean stations at depths of 60 and 100 m. Tow speeds ranging from 0.9 to 2.3 m/sec based on boat speed were tested. They concluded that relatively small changes in net speed resulted in noticeable changes in catch composition of fish, shrimp, and euphausiids. The tow speed results showed that larger or more developed organisms were better able to avoid the low speed net tows and that the catch of small fish at low speeds was greater than the catch of small fish at high speed.

Hopkins (1963) observed the same type of distribution pattern among varying net tow speeds in an estuarine system. Extrusion through and was towed in water ranging from 3 to 5 m in depth at night. Two boats were used, one always towing at 1.5 m/sec and the other at speeds ranging from 0.7 to 2.3 m/sec. No detectable difference in mean density was found with an increase in tow speed.

LMS conducted the current study in June and July 1984 to further evaluate the influence of tow speed on the 1.0-m^2 Tucker trawl and to obtain information on tow speed ichthyoplankton sampling with the epibenthic sled. A night sampling period was selected to minimize net avoidance through visual perception (Clutter and Anraku 1968) and to take advantage of the normal upward dispersion of larvae at night (LMS 1973; McFadden 1977). This study used three tow speeds as experimental treatments in a randomized block design.

3.2 DESCRIPTION OF STUDY AREA

The study was conducted in the Hudson River over a 12-km section between Croton Point and Verplanck Point. The study area (Figure 3.0-1) includes Haverstraw Bay, the widest section of the lower Hudson River estuary.

The area described above includes two river segments that have been used (Battelle 1983) in determining Hudson River ichthyoplankton standing stock and population characteristics. Historically, these regions yield high ichthyoplankton densities during the period associated with this study.

3.3 MATERIALS AND METHODS

3.3.1 Sample Methodology

Two types of gear were evaluated under the tow speed evaluation program: a 1.0-m^2 Tucker trawl (Figure 3.0-2) and a 1.0-m^2 net mounted on an epibenthic sled (Figure 3.0-3). The 1.0-m^2 Tucker trawl was modified for the medium (1.4 m/sec) and high (1.8 m/sec) speed tows by adding 46.8 kg to the bottom of the frame. The additional weight compensated for the increased net angle at higher tow speeds. A calibration survey was conducted to determine the angle of the net mouth at the various tow speeds tested during the survey (Appendix 3-1).

Sampling was conducted from 1 hr after sunset to 1 hr before sunrise between 20 June and 24 July (Table 3.0-1). Only one gear was sampled per night, resulting in four nightly sampling periods with the 1.0-m^2 Tucker trawl (114 samples) and four nightly periods of epibenthic sled sampling (102 samples). A series of tows, arranged in block fashion, were conducted on each date, with three tow velocities sampled randomly in each block. The tow velocities and acceptable range for each block, recorded as boat speed through the water, were 1.0 (1.0-1.3), 1.4 (1.4-1.7), and 1.8 (1.8-2.2) m/sec.

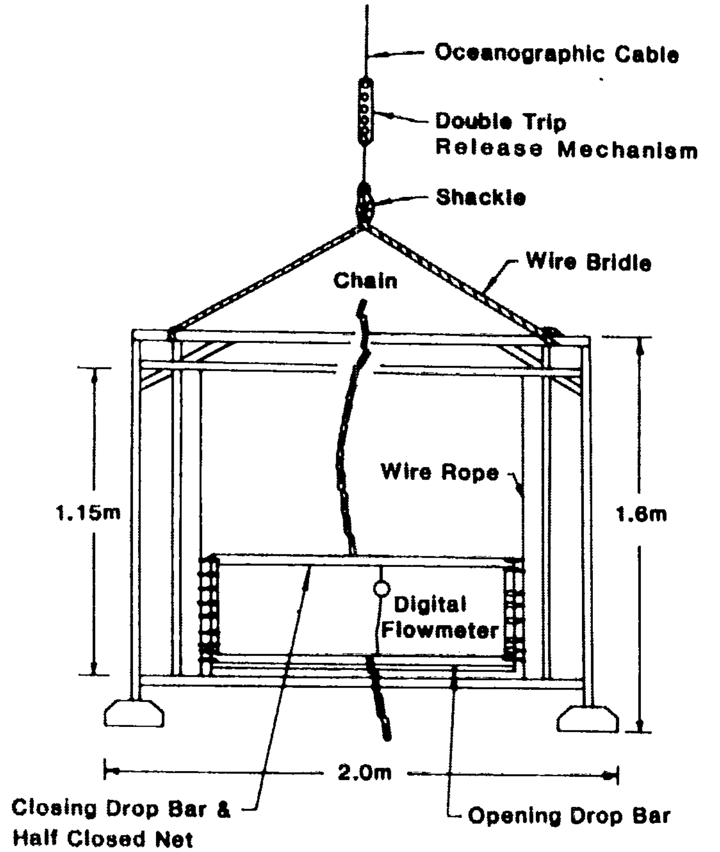
The survey was conducted in an area of the Hudson River encompassing river kilometers 55-74. Primary and alternate channel sampling locations were selected randomly and plotted on Hudson River charts prior to the survey. Region selection was based on ichthyoplankton abundance estimates from the Long River surveys (Normandeau Associates, pers commun.).

The volume of water filtered for each sample was calculated using a calibrated digital flowmeter (General Oceanics Model 2030) mounted

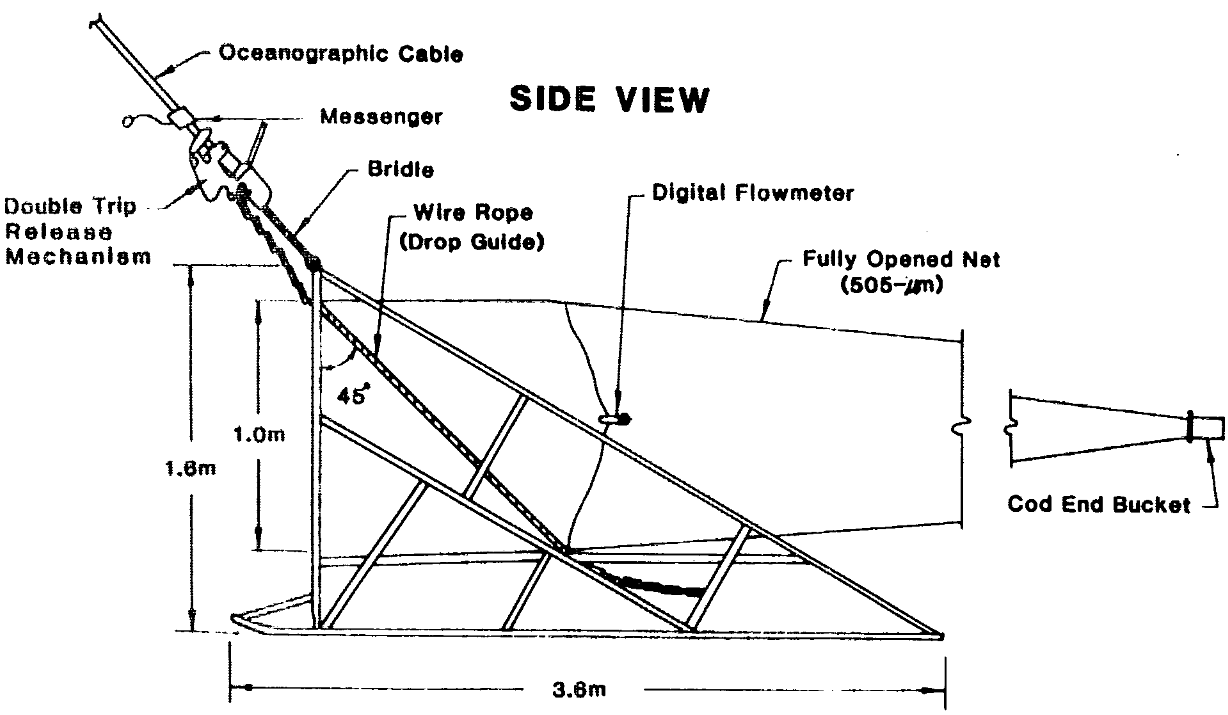
FIGURE 3.0-3

1.0 m² EPIBETHIC SLED DESIGN AND DIMENSIONS

FRONT VIEW



SIDE VIEW



in the center of the net mouth. The following formula was used to determine sample volume:

$$\text{Vol } (m^3) = \text{area of net mouth x tow distance}$$

The area of the net mouth was adjusted for tow speed following the procedure described in Appendix 3-1. The tow distance was determined from the net-mounted flowmeter, using the relationship;

$$\text{Distance (m)} = \frac{\text{k x rotor constant}}{999{,}999}$$

where

k = flowmeter revolution count

Rotor constant = 26,873

The rotor constant is a factory-supplied value. Velocity meters were calibrated at the beginning and end of the sampling program. At the end of the program, calculated rotor constants were similar to the original factory-supplied value and it was therefore used for all distance calculations.

A calibrated electronic flowmeter (G.O. Model 2031) with an on-deck read-out unit (G.O. Model 2035 MK III) was used to record tow velocity. The tow velocities for each block were increased proportionately, when possible, if tidal current conditions caused speeds greater than the desired minimum 1.0 m/sec. Wire angles for the 1.0-m^2 Tucker trawl tows were 45° for the 1.0 m/sec and 1.4 m/sec tows, and 50-55° for the 1.8 m/sec tow. The amount of tow cable necessary to achieve an approximate middepth tow was based on the wire angle observed. The net was lowered to middepth in the closed position, opened for the desired sample duration, closed, and retrieved. The sample duration for both gear types was altered according to the tow velocity to equalize the volume filtered:

A Hydrolab 4041 Water Quality Analyzer was used to measure water temperature, dissolved oxygen, and conductivity at surface, middle, and bottom depths. Water quality measurements were taken periodically within each river region during the nightly sampling periods.

3.3.2 Laboratory Program

Samples were transported to the Nyack laboratory, inventoried, organized by inventory number, and stained with Rose bengal to aid in separating fish eggs and larvae during the sort procedure. All eggs and larvae were counted, removed from the sample, and identified to the lowest possible taxonomic level. If more than 4000 fish eggs or bay anchovy larvae were estimated in a sample, a Folsom plankton splitter was used to divide the sample into eighths. The split portion was sorted and the fish eggs or larvae counted. If the count was >500, sorting was complete. If the count was ≤500, additional one-eighth split portions were sorted until one of the following relationships was realized:

SAMPLE SPLIT SIZE	No. OF EGGS OR LARVAE
1/8	>500
1/4	>1000
3/8	>1500
1/2	>2000
5/8	>2500
3/4	>3000
7/8	>3500
Entire Sample	

Alewife and blueback herring were grouped as Alosa spp. because it was difficult to distinguish among their early life stages. White perch and striped bass larvae that could not be distinguished were listed as Morone spp. Fish larvae were categorized by life stage, and a minimum of 30 striped bass, 30 white perch, and 30 American shad were measured for total length using a dissecting microscope variance among groups be met. In situations where these conditions are not satisfied, various transformations, such as logarithic, square root, Taylor's power law, and Box-Cox (Box and Cox 1964), may be useful (Elliot 1971; Green 1979). Ichthyoplankton catches typically are distributed as a negative binomial and are frequently normalized by a Log(X+1) transformation (Cassie 1962). Unfortunately, transformations have several disadvantages. It can be misleading to present means of the data on the transformed scale, and means converted back to the original scale result in a biased estimator of the true mean (Zar 1974). Additionally, for comparative purposes it is inappropriate to transform standard deviations or variances back to the original scale (Steel and Torrie 1960); such statistics are no longer symmetrical about the mean. Consequently, multiple comparison tests are invalid when converted back to the original scale and seldom make sense on the transformed scale (Scheffe 1959). Further complications arise in factorial ANOVA designs. McCaughran (1977) notes that, for example, the test of the 2x2 design interaction hypothesis (using $\log_e$ tranform) H_0: $\mu_{11} - \mu_{21} = \mu_{12} - \mu_{22}$ does not imply H_0: $e^{\mu_{11}} - e^{\mu_{21}} = e^{\mu_{12}} - e^{\mu_{22}}$ in the untransformed scale. Therefore, transformations may remove or create statistical significance in factorial treatment designs.

Many statistical tests are considered robust enough without transformations to withstand considerable violation of assumptions (Zar 1974; McCaughran 1977), especially when sample sizes are relatively large or when group sample numbers are equal (or nearly so). In fact, tests such as the ANOVAs are often much more robust to violation of assumptions than tests designed to protect them from such problems. For example, Bartlett's test for homogeneity of variance is inefficient and badly affected by non-normality to the point that it is seldom worthwhile to use in conjunction with ANOVAs (Zar 1974).

calculated, and the maximum difference between the tow groups may be compared to tabulated critical values.

The assumptions necessary for applying the Kolmogorov-Smirnov procedure are minimal:

1. Samples from both populations are random and mutually independent.
2. Measurement scale is at least ordinal, i.e., capable of being ranked.

Since our applications involve continuous random variables (length) from independent samples, these assumptions are easily met.

To compare the catch composition between the two gear types, a nonparametric procedure was used. The Spearman rank-order correlation (r_s) is an analog of the parametric correlation coefficient r. It is most useful when data from a bivariate population is far from normal. Since species compositions abundances are markedly nonnormal (Pielou 1977), this procedure is more appropriate than the parametric counterpart. As with the parametric r, the strength of interdependence is measured with a value ranging from -1 to +1. Values of 0 indicate no correlation;positive or negative values indicate positive or negative associations. The test assumes only that both the X and Y variates are at least capable of being ranked.

3.4 STUDY RESULTS

3.4.1 Water Quality Information

Water quality information collected during the nocturnal sampling periods corresponding to the speed tow evaluation study is presented in Table 3.0-2. Water temperatures gradually increased over the study period from 19.8 to 25.9°C. Generally, homothermic conditions were recorded at each sample location, with the bottom water strata equal to the surface temperature or slightly cooler. Dissolved oxygen exhibited the inverse trend: bottom water strata dissolved oxygen was substantially lower than the surface and mid-depth values during the third week of June and the last half of July; similar surface to bottom values were recorded during the last week of June and first half of July.

Specific conductance was generally higher in the bottom strata and lowest in the surface waters. Conductivity values indicate that the salt front was in the Croton-Haverstraw Bay area during the study, influencing samples collected during the second and fourth weeks. Salinity values presented in Table 3.0-2 were derived from conductivity measurements. The conductivity values were expressed as salinity via the following relationship (PSE&G 1983):

$$Y = -0.312996 + 5.83760\ \text{E-4}X + 1.550123\ \text{E-9}X^2$$

where

X = conductivity in mhos/cm at 25°C

Y = salinity in parts per thousand (ppt)

There is a potential bias in using conductivity values to calculate salinity that is related to the proportionality of the major chemical constituents. The bias is greatest at low salinities or at the dilute end of estuaries. Based on the imprecise conversion of conductivity to salinity, the information is presented for reference only.

3.4.3 Abundance, Concentration, and Percent Composition

Tucker trawl speed tow sampling at the three scheduled test velocities (1.0, 1.4, and 1.8 m/sec) was conducted during four separate weekly periods. Thirty-seven comparison samples were collected at each velocity. Epibenthic sled samples collected during the same four weekly periods resulted in the collection of 31 comparison samples per velocity.

Species abundance, density, and percent composition are presented for the Tucker trawl program in Table 3.0-3 and for the epibenthic sled program in Table 3.0-4. The dominant species in both studies was bay anchovy, which accounted for 89.9% from the Tucker trawl study and 60.7% from the epibenthic sled study. Striped bass and white perch ranked second and third, respectively, for the Tucker trawl. The second most abundant species in the epibenthic sled program was Atlantic tomcod. Striped bass and white perch were similar in overall abundance, ranking third and fourth. For both the Tucker trawl and epibenthic sled the species representation and percent composition were similar among tow velocities.

Tucker trawl collections at average velocities of 1.0, 1.4, and 1.8 m/sec collected a total of 48,022, 29,374, and 20,855 specimens, respectively. Based on mean densities, Spearman rank correlation coefficients indicate a highly significant correlation in species composition among pair-wise comparisons. Correlations of 0.9341, 0.8094, and 0.8612 were obtained for 1.0 vs 1.4, 1.0 vs 1.8, and 1.4 vs 1.8 m/sec comparisons, respectively. All are significant above $P \leq 0.01$. Similar findings were found for the epibenthic sled studies. A total of 18,007, 20,664, and 17,328 specimens were collected in the 1.0, 1.4, and 1.8 m/sec tows, respectively. Spearman rank correlations of 0.8185, 0.8532, and 0.8578 were

TABLE 3.0-4

ABUNDANCE, CONCENTRATION, AND PERCENT COMPOSITION BY TOW VELOCITY OF THE EPIBENTHIC SLED

Tow Speed Comparison Study

TAXON	1.0 m/sec VELOCITY TOWS			1.4 m/sec VELOCITY TOWS			1.8 m/sec VELOCITY TOWS		
	ABUNDANCE	CONCENTRATION (No./1000 m^3)	PERCENT COMPOSITION	ABUNDANCE	CONCENTRATION (No./1000 m^3)	PERCENT COMPOSITION	ABUNDANCE	CONCENTRATION (No./1000 m^3)	PERCENT COMPOSITION
Alosa spp.	3	0.28	0.02	11	0.94	0.05	18	1.57	0.10
American shad	2	0.19	0.01	-	-	-	1	0.09	0.01
Atherinidae	14	1.31	0.08	12	1.03	0.06	23	2.00	0.13
Atlantic tomcod	4,233	395.28	23.51	3,831	328.56	18.54	2,157	187.76	12.45
Bay anchovy	10,854	1,013.55	60.28	12,869	1,103.68	62.28	10,287	895.45	59.37
Bluefish	1	0.09	0.01	2	0.17	0.01	4	0.35	0.02
Bothidae	2	0.19	0.01	-	-	-	-	-	-
Centrarchidae	1	0.09	0.01	-	-	-	6	0.52	0.03
Cyprinidae	1	0.09	0.01	-	-	-	1	0.09	0.01
Hogchoker	3	0.28	0.02	-	-	-	2	0.17	0.01
Morone spp.	79	7.38	0.44	145	12.44	0.70	228	19.85	1.32
Northern pipefish	-	-	-	1	0.09	0.01	-	-	-
Rainbow smelt	73	6.82	0.41	77	6.60	0.37	49	4.27	0.28
Scianidae	-	-	-	1	0.09	0.01	-	-	-
Striped bass	548	51.17	3.04	606	51.97	2.93	778	67.72	4.49
Striped searobin	1	0.09	0.01	2	0.17	0.01	3	0.26	0.02
Tessellated darter	-	-	-	-	-	-	2	0.17	0.01
Weakfish	1,648	153.89	9.15	2,471	211.92	11.96	3,107	270.45	17.93
White perch	544	50.80	3.02	636	54.55	3.08	659	57.36	3.80
Windowpane flounder	-	-	-	-	-	-	1	0.09	0.01
UID	-	-	-	-	-	-	2	0.17	0.01
Total	18,007	1,681.50		20,664	1,772.21		17,328	1,508.34	
Number of tows		34			34			34	
Total volume sampled (m^3)		10,708.88			11,660.03			11,488.14	
Mean volume per tow (m^3)		314.97			342.94			337.89	

TABLE 3.0-5

MEAN CONCENTRATION[a] AND STANDARD ERROR[b] FOR TOTAL ICHTHYOPLANKTON

Tow Speed Comparison Study

TUCKER TRAWL

LIFE STAGE	SPEED 1.0 m/sec	1.4 m/sec	1.8 m/sec
Egg	194.64 (68.48)	412.32 (184.75)	201.42 (86.37)
Yolk-sac larvae	-	-	-
Post-yolk-sac larvae	3389.29 (805.88)	2088.73 (456.54)	1941.95 (294.04)
Juvenile	33.22 (6.26)	22.80 (3.45)	19.85 (4.12)

EPIBENTHIC SLED

LIFE STAGE	SPEED 1.0 m/sec	1.4 m/sec	1.8 m/sec
Egg	24408.62 (10077.72)	15606.9 (8199.62)	13776.89 (6834.34)
Yolk-sac larvae	-	-	-
Post-yolk-sac larvae	1300.86 (263.16)	1431.52 (283.90)	1303.08 (267.74)
Juvenile	384.40 (56.16)	325.47 (42.54)	198.80 (30.04)

[a]Number per 1000 m^3; all weeks combined.
[b]In parentheses.
- Indicates too few specimens taken.

TABLE 3.0-6a (Page 2 of 2)

SUMMARY ANOVA RESULTS FOR TUCKER TOW VELOCITIES

Tow Speed Comparison Study

WHITE PERCH PYSL

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	341774	9.07	<0.0001**
Velocity (V)	2	34146	0.91	0.4071
WxV	6	251656	0.67	0.6755
Error	102	37664		

RAINBOW SMELT JUVENILE

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	356	19.42	0.0001**
Velocity (V)	2	39	2.17	0.1194
WxV	6	22	1.21	0.3069
Error	102	18		

ATLANTIC TOMCOD JUVENILE

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	8660	13.09	<0.0001**
Velocity (V)	2	1464	2.21	0.1146
WxV	6	1041	1.57	0.1625
Error	102	661		

** = $P \leq 0.01$

TABLE 3.0-6b (Page 2 of 2)

SUMMARY ANOVA RESULTS FOR EPIBENTHIC SLED TOW VELOCITIES

Tow Speed Comparison Study

WHITE PERCH PYSL

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	126280	32.72	<0.0001**
Velocity (V)	2	238	.06	0.9401
WxV	6	919	2.03	0.9628
Error	90	3859		

RAINBOW SMELT JUVENILE

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	561	8.73	<0.0001**
Velocity (V)	2	41	.64	0.5280
WxV	6	130	2.03	0.0698
Error	90	64		

ATLANTIC TOMCOD JUVENILE

SOURCE	DEGREES OF FREEDOM	MEAN SQUARE	F	TAIL PROB
Week (W)	3	533005	10.41	<0.0001**
Velocity (V)	2	304126	5.94	0.0038**
WxV	6	64542	1.26	0.2838
Error	90	51218		

** = $P \leq 0.01$

and mean length. For the epibenthic sled tows, mean length and ranges were generally similar among the three test velocities. For bay anchovy, as tow speed increased, the mean length increased; for striped bass and white perch, the reverse was noted.

Mean length for bay anchovy from Tucker trawls also increased with an increase in tow speed. White perch and striped bass had the highest mean length at 1.4 m/sec; striped bass had the lowest at 1.0 m/sec; white perch had the lowest at 1.8 m/sec.

Length-interval information for striped bass, white perch, and bay anchovy was compared among tow velocities for each gear type using the Kolmogorov-Smirnov test. This procedure indicates that a number of the length-frequency distributions differ in shape from one another, especially those from the Tucker trawls (Table 3.0-8). For the Tucker trawl the greatest differences were between the 1.0 and 1.8 m/sec velocities, while for the epibenthic sled there was a tendency for the greatest differences to lie between the 1.4 m/sec and 1.8 m/sec tows.

Since the Kolmogorov-Smirnov procedure is sensitive only to shape differences, not absolute numbers, a graphical analysis of concentration by length was also conducted. Bay anchovy was chosen for this analysis as the Kolmogorov-Smirnov test indicated significant differences and a large number of specimens were available. Inspection of Figures 3.0-4 through 3.0-10 suggests results similar to those found in the comparisons of mean densities in that numbers captured tend to decrease with increasing tow speed. Figure 3.0-4, representing the largest sample size, is especially informative in demonstrating this effect. The Tucker trawl length-frequency distributions, Figures 3.0-4 through 3.0-7, indicate that larval extrusion is taking place since smaller size groups are underrepresented. Figure 3.0-10 indicates increasing gear

TABLE 3.0-8 (Page 2 of 2)

LENGTH-FREQUENCY DISTRIBUTION COMPARISON
BY SPECIES, WEEK, AND TOW SPEED[a]

Tow Speed Comparison Study

TAXON	KOLMOGOROV-SMIRNOV TEST STATISTIC (D_{max})	NORMAL DEVIATE (7)	PROBABLITY
EPIBENTHIC SLED			
Week 1			
Low vs Med	0.117	1.0772	0.1962
Low vs Hi	0.061	0.5953	0.8705
Med vs Hi	0.095	0.9355	0.3456
Week 2			
Low vs Med	0.107	0.4556	0.9856
Low vs Hi	0.087	0.4017	0.9970
Med vs Hi	0.118	0.5105	0.9568
WHITE PERCH			
Week 1			
Low vs Med	0.093	0.8051	0.5359
Low vs Hi	0.133	1.1616	0.1346
Med vs Hi	0.040	0.3920	0.9979
Week 2			
Low vs Med	0.018	0.1825	1.0000
Low vs Hi	0.081	0.8591	0.4516
Med vs Hi	0.080	0.8352	0.4881
ATLANTIC TOMCOD			
Week 1			
Low vs Med	0.036	0.4243	0.9938
Low vs Hi	0.055	0.6665	0.7660
Med vs Hi	0.052	0.6225	0.8331
Week 2			
Low vs Med	0.070	0.7627	0.6058
Low vs Hi	0.082	0.8537	0.4598
Med vs Hi	0.082	0.8450	0.4729
Week 3			
Low vs Med	0.058	0.6390	0.8088
Low vs Hi	0.083	0.9129	0.3752
Med vs Hi	0.087	0.9535	0.3171
BAY ANCHOVY			
Week 2			
Low vs Med	0.121	1.1731	0.1275
Low vs Hi	0.081	0.7901	0.5603
Med vs Hi	0.149	1.5048	0.0216*
Week 3			
Low vs Med	0.101	0.9442	0.3347
Low vs Hi	0.130	1.2671	0.0806
Med vs Hi	0.184	1.8251	0.0026**
Week 4			
Low vs Med	0.092	1.0042	0.2656
Low vs Hi	0.279	3.0581	0.0000**
Med vs Hi	0.188	2.0540	0.0004**

[a]Kolmogorov-Smirnov summary statistics.

* = $P < 0.05$
** = $P < 0.01$

Low = 1.0 m/sec.
Med = 1.4 m/sec.
High = 1.8 m/sec.

FIGURE 3.0-5

BAY ANCHOVY LENGTH FREQUENCY, WEEK 2

TOW SPEED COMPARISON STUDIES, TUCKER TRAWL

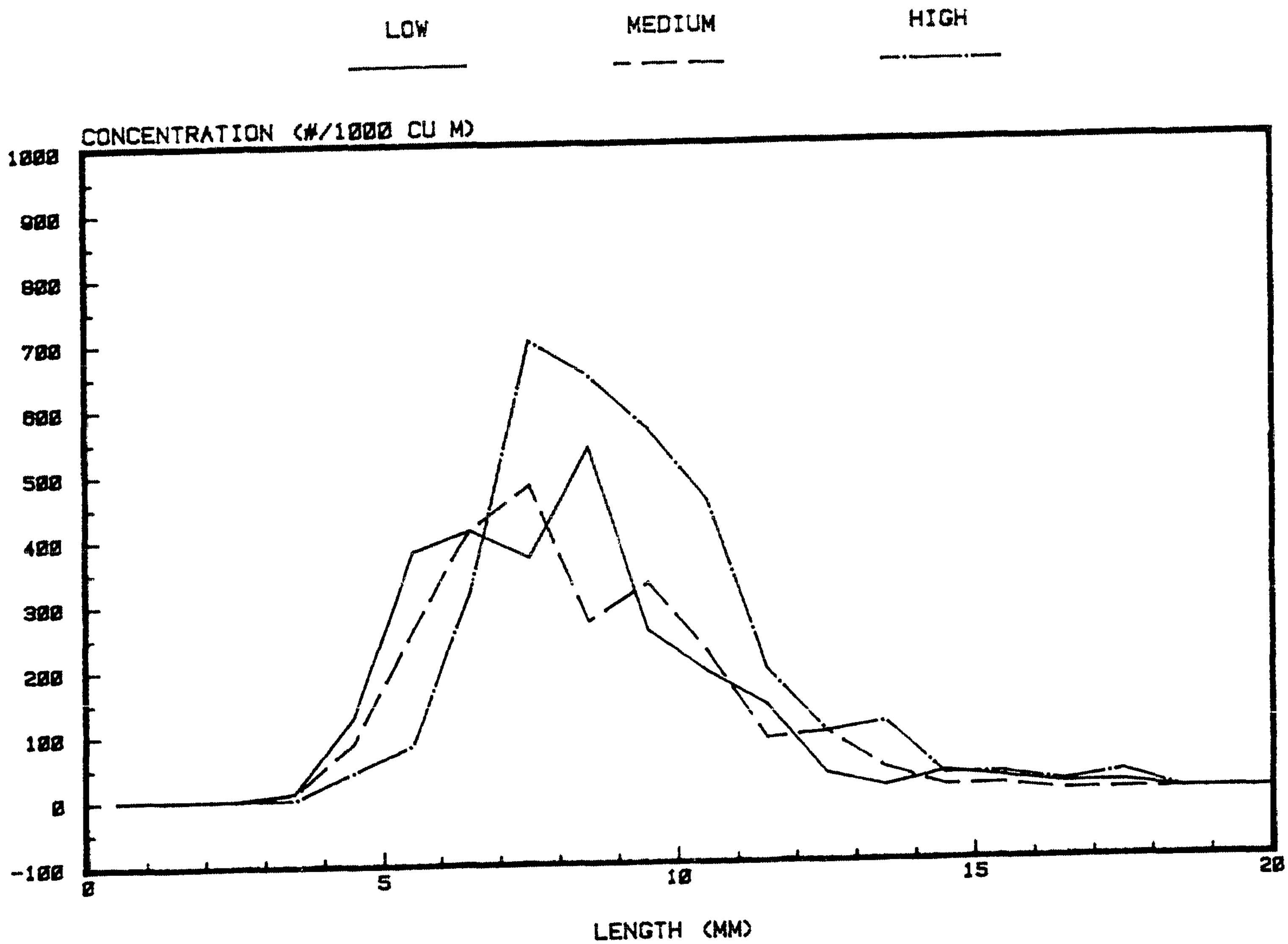


FIGURE 3.0-7

BAY ANCHOVY LENGTH FREQUENCY, WEEK 4

TOW SPEED COMPARISON STUDIES, TUCKER TRAWL

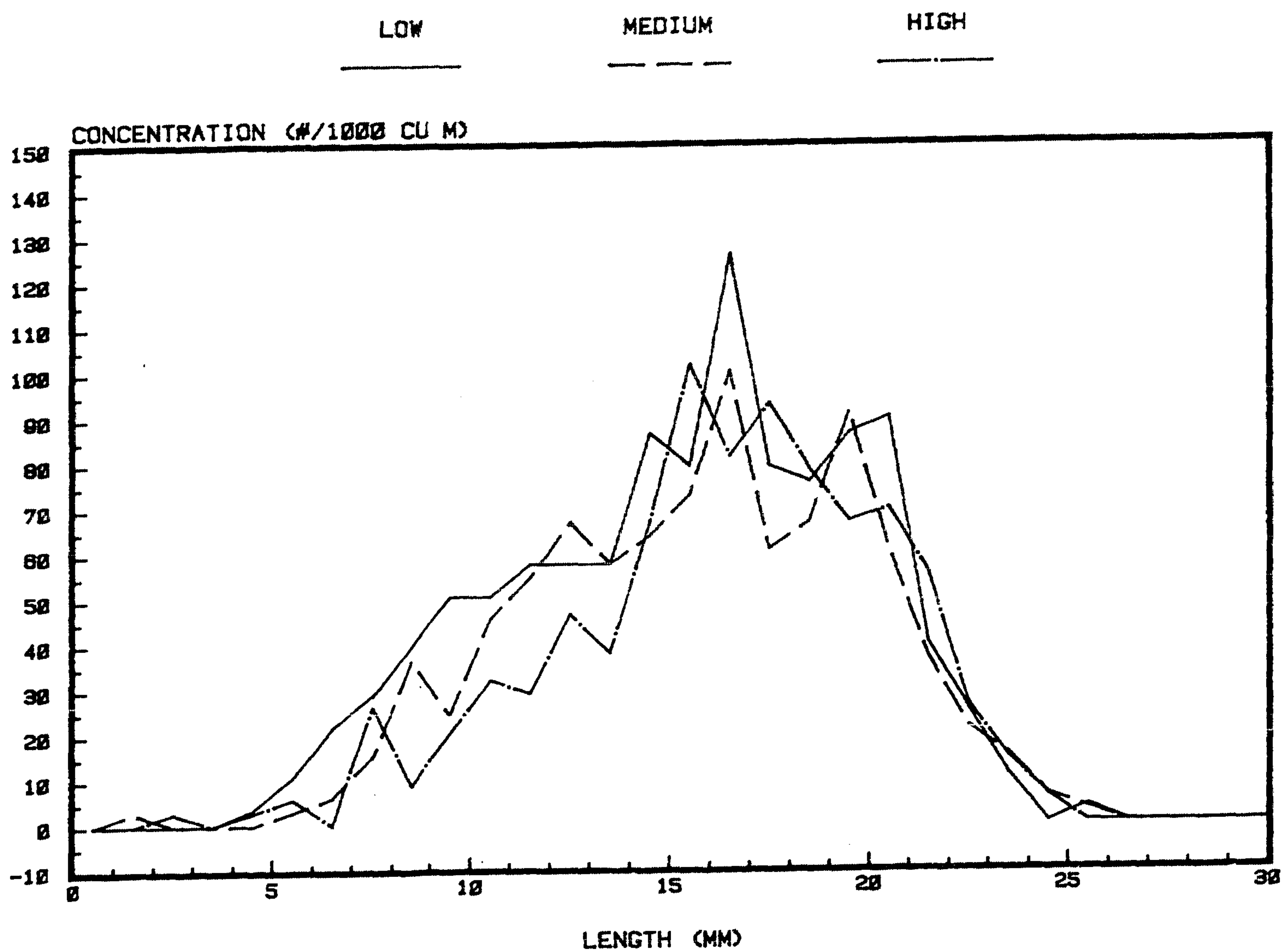
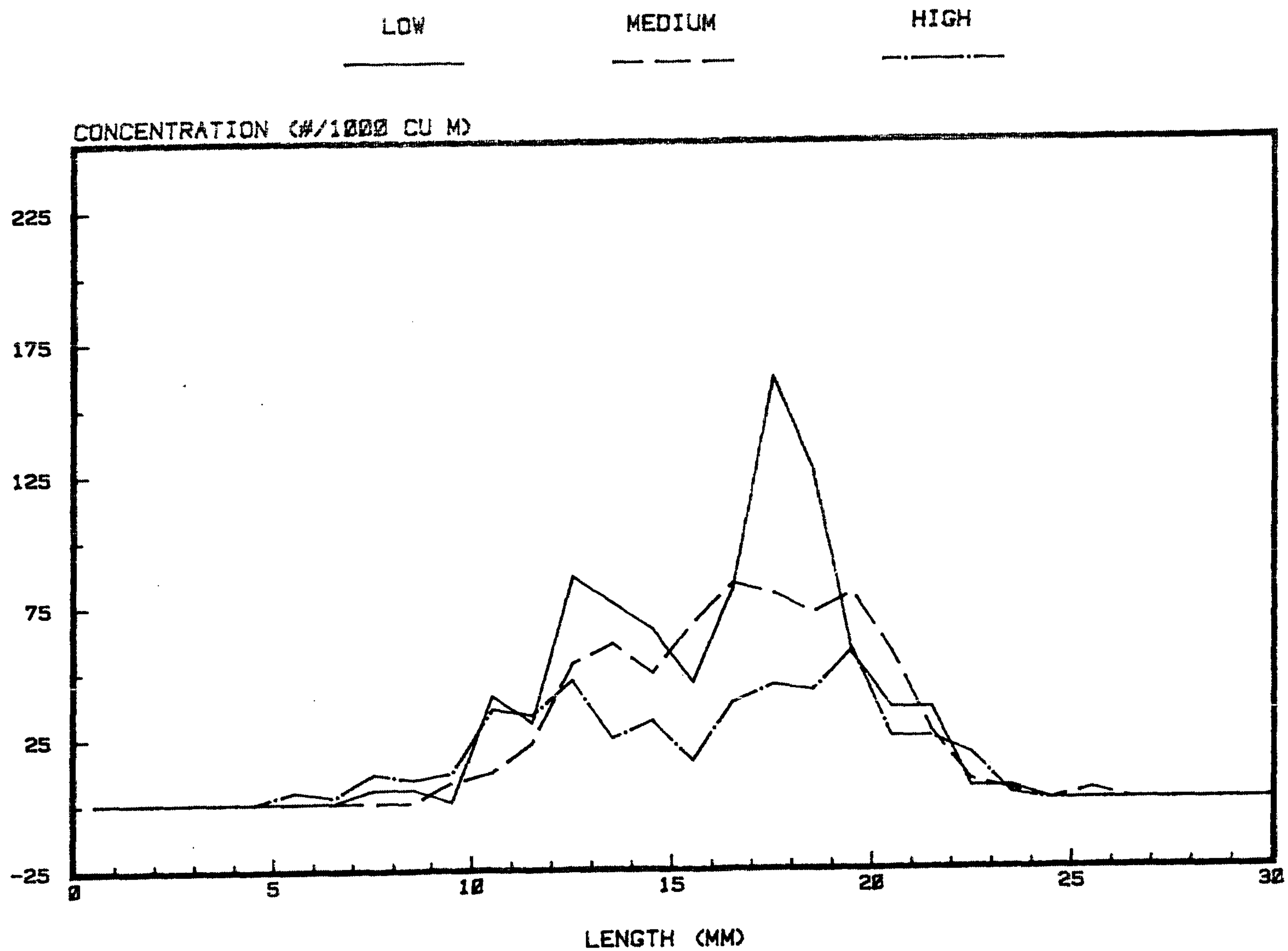


FIGURE 3.0-9

BAY ANCHOVY LENGTH FREQUENCY, WEEK 3

TOW SPEED COMPARISON STUDIES, EPIBENTHIC SLED



avoidance with decreasing tow speed at lengths at or greater than 15 mm. The apparent lack of avoidance in previous data sets is likely due to the paucity of large fish in the early part of the season.

Major taxa concentrations by life stage and the total for each sample are given in Appendix 3-3. No difference in life stage representation for the two gear types was apparent among the three tow velocities.

3.5 DISCUSSION

Seventeen taxa were identified from tows conducted with the Tucker trawl and 19 from epibenthic sled collections. A large percentage of the taxa identified were marine species, especially from the collections done in late July when marine waters were present in the study area. For both gear types there was no difference in species representation or percent composition among the three test velocities. Comparison of mean ichthyoplankton concentrations among the three test velocities points to a decreasing mean concentration with an increase in tow speed. This general trend is not statistically significant, and is counter to the results of other tow speed studies where concentration increases with an increase in tow speed.

Tow speed comparison studies have normally found that at the lower tow speeds most of the catch consists of smaller organisms; at the higher tow speeds a greater percentage of the catch consists of larger-size organisms. This trend is the result of avoidance of the larger organisms at the lower speeds and extrusion of the smaller organisms at the higer speeds. If extrusion is taking place, the mean length of captured organisms would increase. The dominant taxa collected by both types of gear during the June-July

CHAPTER 4.0

MILLER HIGH SPEED SAMPLER EVALUATION

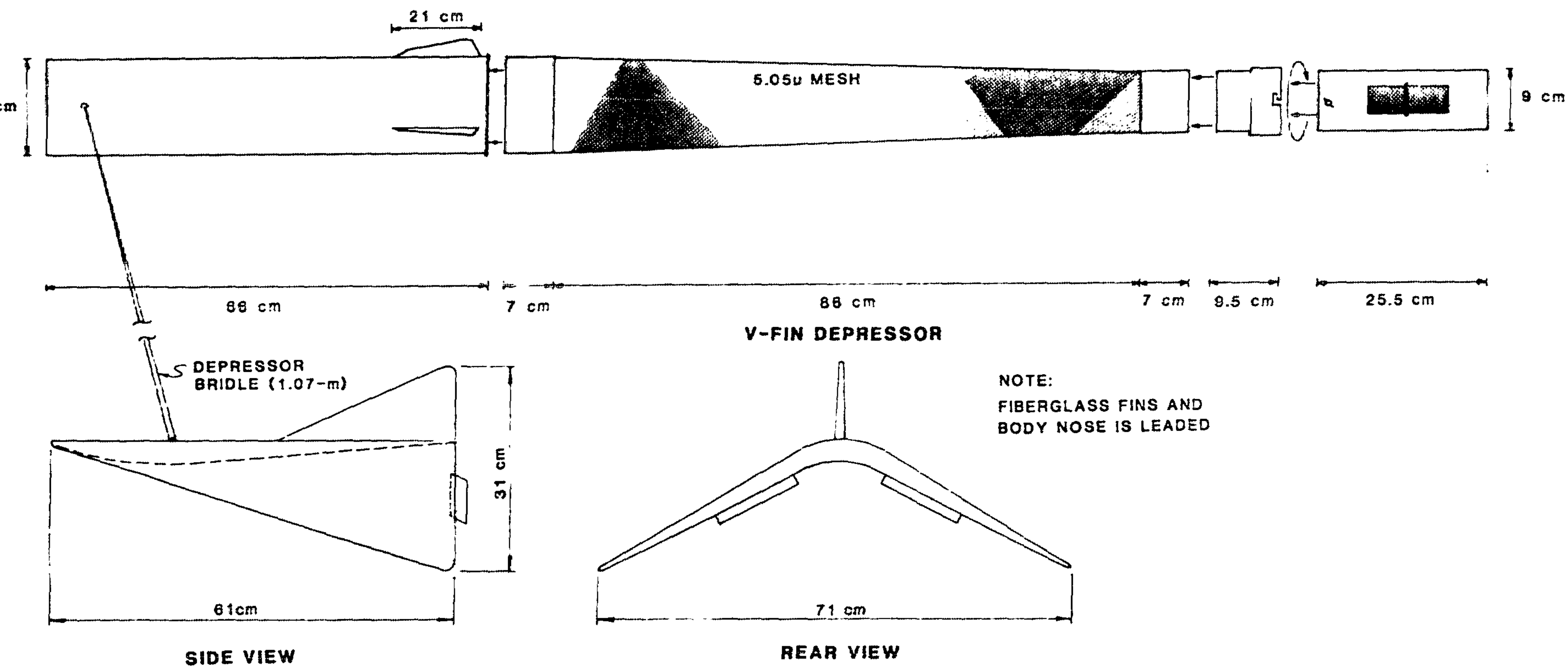
4.1 INTRODUCTION

Miller (1961) conducted a nearshore oceanic survey to determine the abundance and distributional pattern of haddock larvae. The sampling program incorporated simultaneous multi-depth net tows using a modified high speed Hardy continuous plankton recorder (UNESCO 1968). The Miller modifications included the incorporation of a plankton net and 10-cm mouth opening. In tests over tow speeds of 2.5-5.0 m/sec for a 30-min tow duration, he found the optimum speed was 3.8 m/sec. Miller (1961) observed minimal damage to larvae captured at the higher tow speeds and found no diel difference in catches. He attributed the lower diurnal avoidance to the faster tow speed.

Noble (1970) evaluated the Miller sampler at towing speeds ranging from 3.6 to 4.9 m/sec for yellow perch and walleye juveniles in Oneida Lake, New York. He found that progressively larger larvae were collected with increases in tow speed, but larval damage was greater at the higher tow speeds. Comparing abundance among tow speeds led to the observation that higher efficiencies were obtained at higher tow speeds, but this was highly variable. Noble concluded that plankton net avoidance increases as larvae grow, and increases in tow speed decrease avoidance, thus increasing net efficiency. Noble also compared the catches between 10- and 14-cm mouth diameter Miller samplers and found no significant differences. Thayer et al. (1983) studied the influence of tow speed (2-12 m/sec) on ichthyoplankton abundance estimates obtained from a Miller sampler. In clear water at tow velocities ranging from 2.0 to 7.0 m/sec, they found a significant increase in catch with increased tow speed; studies done in turbid water, ranging to

FIGURE 4.0-1

MILLER HIGH SPEED SAMPLER
DESIGN AND DIMENSIONS



appropriate (Elliott 1971). However, considering the above reservations, the robustness of the ANOVA, and the fact that the ultimate use of these statistics is to estimate population abundance (which requires an unbiased estimate of the mean density), we chose not to transform these data. As a precaution, many analyses were repeated using the log(X+1) transformation. Although individual probability values for various tests differed slightly, in nearly all cases the overall conclusions regarding significance levels were the same.

It should also be noted that transformations are especially useful when the data contain a large proportion of zero catches (Bannerot and Austin 1983; Pennington 1983). However, since this sampling program was conducted during the summer period of peak larval abundance, relatively few zero catches were encountered for either the Miller sampler or the Tucker trawl.

The ANOVA was run using a commercial statistical program for analysis of variance, BMDP2V (BMDP 1983). The Student-Newman-Kuels multiple comparison procedure followed Steel and Torrie (1960).

The Kolmogorov-Smirnov two-sample test (Siegel 1956) and graphical inspection were used to examine length-frequency distributions between tow types and velocities. The Kolmogorov-Smirnov tests whether two frequency distributions could have been drawn from the same population. It is sensitive to any difference between the distributions - median, dispersion, skewness, etc. Normalized cumulative distributions are calculated, and the maximum difference between the two groups may be compared to tabulated critical values.

TABLE 4.0-2

TUCKER TRAWL - MILLER HIGH SPEED SAMPLER COMPARISON STUDY
WATER QUALITY INFORMATION

Gear Comparison Study - June - July 1984

DATE	TIME	STATION DEPTH (m)	TEMP (°C)			DO (mg/l)			COND (mhos/cm @ 25°C)			SALINITY (ppt)		
			SURF	MID	BOTTOM	SURF	MID	BOTTOM	SURF	MID	BOTTOM	SURF	MID	BOTTOM
12 Jul	2349	9.1	24.8	24.6	24.4	6.9	6.7	6.5	430	450	480	0.0	0.0	0.0
13 Jul	0339	9.8	24.3	24.2	24.0	6.8	6.7	6.7	710	1080	1150	0.1	0.3	0.4
13 Jul	0444	8.5	24.4	24.3	24.2	6.8	6.7	6.8	440	580	730	0.0	0.0	0.1
26 Jul	0130	8.5	25.1	25.2	22.9	7.3	7.5	3.7	5610	5860	16690	3.0	3.2	9.9
26 Jul	0330	8.5	24.9	24.7	23.7	6.0	5.5	4.4	6370	8460	13780	3.5	4.7	8.0
26 Jul	0500	8.5	24.6	24.6	23.9	5.9	5.4	4.8	5750	8030	12380	3.1	4.5	7.2
26 Jul	2210	9.1	25.5	25.0	22.8	8.1	7.9	3.6	7070	8290	17720	3.9	4.6	10.5
27 Jul	0115	11.0	25.1	24.8	23.2	8.6	7.3	3.9	7740	8990	17240	4.3	5.1	10.2
27 Jul	0450	8.5	25.1	24.5	23.8	6.0	5.4	5.0	6770	9890	11490	3.7	5.6	6.6

taxa; Miller abundance ranged from 22 at 3.0 m/sec to 7 at 4.6 m/sec, with 3 taxa represented in each tow speed grouping (Table 4.0-3). [The mean volume of water filtered by the Miller sampler was consistent between tow velocities, averaging 33.8 m^3; the Tucker trawl mean volume filtered was 373.7 m^3.] Ichthyoplankton mean density for the three Miller tow velocities decreased with an increase in tow speed from 105.9/1000 m^3 at 3.0 m/sec to 35.1/1000 m^3 at 4.6 m/sec. The value calculated for the 4.0 m/sec tows (39.6/1000 m^3) was similar to the 4.6 m/sec value. The 3.0 m/sec Miller samples were more similar to the Tucker trawl samples than the 4.0 or 4.6 m/sec Miller samples. The highest mean density was calculated for the six Tucker trawls (151.6/1000 m^3). Bay anchovy was the only major taxon consistently collected by the Tucker and Miller sampler, representing 70.9% of the Tucker trawl samples and about 55% of the total combined Miller samples. Similar representation of life stage was observed among the gear types and velocities (Appendix 4-1).

Because the research vessel used during the 12-13 July sampling was unable to achieve higher tow velocities, a second, more intensive program was conducted during 25-27 July using the research vessel Woody I. Over a two-night period 11 blocks of samples were collected. Each block consisted of a Tucker trawl at 1.0 m/sec and four Miller samples at mean velocities of 5.8, 9.3, 11.6, and 11.9 m/sec. Tow durations for the Miller sampler were adjusted for each velocity such that approximately equal volumes of water were filtered. Abundance, density, and percent composition for the 25-27 July sampling effort are presented in Table 4.0-4. Marine species including the bay anchovy and weakfish were the dominant taxa in the study area during the July sampling period. The Tucker trawl captured the greatest diversity of taxonomic categories, 12, and greatest number of individuals, 8559 (Table 4.0-4). The Miller sampler collected 5, 6, 6, and 4 taxa and 577, 222, 94, and 58 specimens in the 5.8, 9.3, 11.6, and 12.0 m/sec tows, respectively.

TABLE 4.0-1

MILLER HIGH SPEED SAMPLER - 1.0 m^2 TUCKER TRAWL COMPARISON STUDY COLLECTION INFORMATION

Gear Comparison Study

June-July 1984

SAMPLING DATE	TUCKER TRAWL VELOCITY RANGE (m/sec)	No. OF SAMPLES COLLECTED MILLER SAMPLES VELOCITY RANGES (m/sec)						
	1.0-1.3	3.0	4.0-4.5	4.7-4.8	5.8-5.9	9.2-9.6	11.6-11.7	11.7-12.4
12-13 Jul	6	6	6	6[a]				
25-26 Jul	5				5	5	5[b]	5[c]
26-27 Jul	6				6	6	6[d]	6
Total	17	6	6	6	11	11	11	11

[a]One sample of the six was towed at 4.1 m/sec.
[b]One sample of the five was towed at 11.0 m/sec.
[c]One sample of the five was towed at 11.1 m/sec.
[d]One sample of the six was towed at 11.8 m/sec.

Ten organisms per life stage were chosen randomly for length measurement. If a life stage was absent or contained fewer than 10 specimens, the quota (30) was apportioned among the other life stages present. A continuous sampling plan (CSP-1, Hansen 1969) was used to achieve an Average Outgoing Quality Limit (AOQL) of $\leq$0.1.

4.2.4 Analytical Procedures

Tucker and Miller trawls were compared by analysis of variance (ANOVA). This procedure makes simultaneous comparisons among strata sample means in order to determine whether some predefined difference ($P \leq 0.05$) exists. A second-order factorial design was used to test for differences in mean strata density. Factors included in the analysis were collection period (week #) and tow type/speed. Since temporal changes in species/life stage composition are expected to vary significantly (and are not the subject of this investigation), only the tow type/speed main effect and its interactions are of interest. The second-order interaction terms should be examined first. A significant second-order interaction indicates that the tow type/speed functions differently at different times. If no significant interaction is found, the main effect term may be assessed. A significant difference in the main effect indicates an overall difference in gear performance by velocity with respect to the density of organisms collected.

The use of parametric statistical tests such as ANOVA requires that assumptions of normality, additivity, and equality of variance among groups be met. When these conditions are not satisfied, various transformations such as logarithmic, square root, Taylor's power law, and Box-Cox (Box and Cox 1964) may be useful (Elliott 1971; Green 1979). Ichthyoplankton catches typically are distributed as a negative binomial and are frequently normalized by

TABLE 4.0-4 (Page 1 of 2)

ABUNDANCE, CONCENTRATION, AND PERCENT COMPOSITION
OF THE MILLER HIGH SPEED SAMPLER

25-27 July 1984

	1.0 m² TUCKER TRAWL			5.8 m/sec MILLER SAMPLER			9.3 m/sec MILLER SAMPLER		
TAXON	No.	CONCENTRATION (No./1000 m³)	% COMP.	No.	CONCENTRATION (No./1000 m³)	% COMP.	No.	CONCENTRATION (No./1000 m³)	% COMP.
American shad	-						1	2.87	0.45
Atherinidae	28	6.82	0.33	2	5.46	0.35	1	2.87	0.45
Atlantic tomcod	20	4.87	0.23	-			-		
Bay anchovy	7,337	1,787.29	85.72	466	1,271.38	80.76	145	415.53	65.31
Bluefish	1	0.24	0.01	-			-		
Bothidae	-			-			-		
Butterflyfish	1	0.24	0.01	-			-		
Hogchoker	17	4.14	0.20	4	10.91	0.69	1	2.87	0.45
Northern pipefish	1	0.24	0.01	-			-		
Rainbow smelt	7	1.71	0.08	-			-		
Striped searobin	2	0.49	0.02	-			-		
Summer flounder	1	0.24	0.01	-			-		
Weakfish	1,141	277.95	13.33	65	177.34	11.27	47	134.69	21.17
UID	3	0.73	0.04	40	109.13	6.93	27	77.38	12.16
Total abundance	8,559	2,084.97		577	1,574.22		222	636.19	
Total species	11			4			5		

	1.0 m² TUCKER TRAWL	5.8 m/sec MILLER SAMPLER	9.3 m/sec MILLER SAMPLER
Number of samples	11	11	11
Total volume sampled (m³)	4,105.09	366.53	348.95
Mean volume per tow (m³)	373.19	33.32	31.92
Sample duration (min)	5.0	11.0	7.0
Sample tow velocity (m³/sec)			
Min	1.0	5.8	9.2
Mean	1.2	5.8	9.3
Max	1.4	5.9	9.5
No-catch tows	0	0	0

The two Miller collection periods, the first during 12-13 July and the second during 25-27 July, sampled two distinctly different velocity regimes. In addition, because the sampling periods were separated by approximately two weeks, two different ichthyoplankton assemblages with respect to species composition and life stage were present in the study area. Based on the difference between the data sets, only the more complete series of samples from 25-27 July were statistically evaluated.

4.3.3 Statistical Evaluation

Rank correlation analysis indicates that the Tucker trawl catch composition has only a moderate to poor correlation with most of the Miller tows (Table 4.0-5). The 11.9 m/sec Miller tow demonstrated no significant correlation to the Tucker catches. Within the Miller tows, the 5.8, 9.3, and (to a lesser degree) 11.6 m/sec tow were highly correlated, 0.8604-0.9502. The composition of the 11.9 m/sec tows was only moderately correlated to the other Miller catches, 0.6444-0.6974.

Examination of the means and associated standard errors for total ichthyoplankton taken by the Tucker trawl and various Miller tows during 25-27 July suggests that greater numbers of all life stages are caught with the Tucker trawl than with the Miller sampler (Table 4.0-6). ANOVA results on data sets with sufficient sample size and untransformed values indicated significant velocity effects ($P \leq 0.05$) in all cases (Table 4.0-7). Analysis performed using Log(X+1) transformations yielded identical conclusions. Further examination of untransformed total ichthyoplankton means using the Student-Newman-Kuels multiple range test procedure indicates that the 5.8 m/sec Miller tows most closely approached the catches obtained by the Tucker trawl (Table 4.0-8). Concentrations of organisms decreased with increasing Miller tow velocity.

TABLE 4.0-6

MEANS[a], ONE STANDARD ERROR[b], AND COEFFICIENT OF VARIATION[c] FOR TUCKER TRAWL AND MILLER HIGH SPEED SAMPLER WITH FOUR COMBINATIONS OF SPEED AND DURATION

LIFE STAGE	TUCKER TRAWL	MILLER SAMPLER 5.8 m/sec	MILLER SAMPLER 9.3 m/sec	MILLER SAMPLER 11.6 m/sec	MILLER SAMPLER 11.9 m/sec
Egg	36452.6 (20194.1) [228.4]	3322.2 (1763.8) [218.9]	289.2 (106.5) [151.8]	77.2 (41.3) [220.6]	820.4 (491.1) [246.8]
Yolk-sac larvae	- -	- -	- -	- -	- -
Post-yolk-sac larvae	1390.7 (312.4) [92.6]	978.9 (198.1) [83.4]	371.4 (68.2) [75.7]	156.6 (36.9) [97.2]	162.6 (35.1) [89.0]
Juvenile	16.6 (3.7) [91.9]	0 (0) [0]	5.7 (3.1) [224.2]	3.5 (2.4) [282.7]	9.1 (4.7) [213.0]
Total larvae	1407.8 (314.6) [92.1]	1061.3 (212.8) [82.7]	429.3 (85.5) [82.1]	180.3 (41.8) [95.6]	174.9 (35.3) [83.2]
Sample size	17	17	17	17	17

[a]Means and standard errors are for total ichthyoplankton in number/1000 m^3.
[b]In parentheses.
[c]In brackets.
- Indicates too few specimens taken.

[redacted]

TABLE 4.0-8

SUMMARY OF STUDENT-NEWMAN-KUELS MULTIPLE COMPARISON TEST OF ALL SPECIES IN TUCKER AND MILLER HIGH SPEED SAMPLES[a]

Egg

TYPE	TUCKER	TUCKER	5.8 m/sec	5.8 m/sec	11.9 m/sec	9.3 m/sec	9.3 m/sec	11.6 m/sec	11.6 m/sec	11.9 m/sec
Week[b]	2	3	3	2	2	3	2	3	2	3
Mean	86471	31222	5519	4673	1773	476	412	154	77	22
		______	______	______	______	______	______	______	______	______

Larvae

TYPE	TUCKER	TUCKER	5.8 m/sec	5.8 m/sec	9.3 m/sec	9.3 m/sec	11.6 m/sec	11.6 m/sec	11.9 m/sec	11.9 m/sec
Week[b]	2	3	2	3	2	3	2	3	3	2
Mean	2325	1897	1868	1334	714	577	293	231	188	159
	______	______	______							
		______	______	______						
			______	______						
				______	______	______				
					______	______	______	______	______	______

[a]Underscore indicates homogeneous subsets. Analysis based on untransformed data.
[b]2 = 25-26 July, 3 = 26-27 July.

TABLE 4.0-9

LENGTH-FREQUENCY INFORMATION

Tucker Trawl and Miller High Speed Sampler Evaluation Study

12-13 JULY

TAXON	1.0-m^2 TUCKER TRAWL			3.0 m/sec MILLER SAMPLER			4.0 m/sec MILLER SAMPLER			4.6 m/sec MILLER SAMPLER		
	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)
Atlantic tomcod	23	55.1-90.0	66.7	4	11.1-17.0	14.2	0			1	-	61.0
Bay anchovy	101	7.1-20.0	13.3	4	11.1-17.0	14.2	2	11.1-18.0	14.2	1	-	9.3
Striped bass	5	9.1-12.0	10.4	1	-	9.3	0			0		
White perch	61	4.1-13.0	8.3	6	5.1-10.0	8.0	1	-	8.6	0		

25-27 JULY

TAXON	1.0-m^2 TUCKER TRAWL		
	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)
Atlantic tomcod	0		
Bay anchovy	330	4.1-27.0	14.0
Striped bass	0		
White perch	0		

25-27 JULY (Continued)

TAXON	5.8 m/sec MILLER SAMPLER			9.3 m/sec MILLER SAMPLER			11.6 m/sec MILLER SAMPLER			11.9 m/sec MILLER SAMPLER		
	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)	NUMBER ANALYZED	LENGTH RANGE (mm)	MEAN LENGTH (mm)
Atlantic tomcod	0			0			0			0		
Bay anchovy	166	2.1-24.0	11.6	56	3.1-25.0	11.4	25	2.1-23.0	8.7	25	2.1-22.0	6.9
Striped bass	0			0			0			0		
White perch	0			0			0			0		

- Indicates too few specimens taken.

the Tucker trawl to be the more efficient gear at evaluating ichthyoplankton in the Hudson River during the period when more mature organisms of the major taxa were present. Miller samples did not demonstrate a parabolic catch efficiency, but a consistent decrease in catch with an increase in tow speed.

CHAPTER 5.0

PROGRAM SUMMARY AND CONCLUSION

An ichthyoplankton gear evaluation program consisting of three separate studies was conducted by Lawler, Matusky & Skelly Engineers (LMS) under contract to the Hudson River Utilities during June and July 1984. The overall objective of the program, which was conducted in the lower Hudson River estuary during the period of peak larval abundance, was to obtain information on ichthyoplankton sampling gear and sampling techniques that could be used to modify or improve current Hudson River ichthyoplankton programs.

The three gear evaluation studies were:

- Evaluate a 1.0-m^2 Tucker trawl in assessing ichthyoplankton populations using two sampling techniques: oblique tows and discrete depth tows
- Determine the influence of tow speed on ichthyoplankton abundance estimates from discrete depth tows of the 1.0-m^2 Tucker trawl and the 1.0-m^2 net mounted on an epibenthic sled
- Assess the collection parameters of a Miller high speed sampler at tow speeds ranging from 3.0 to 11.9 m/sec and compare the collection data to collection information from a 1.0-m^2 Tucker trawl

Each study is summarized and discussed separately in the following sections.

5.1 OBLIQUE VS DISCRETE SAMPLING DESIGN

The purpose of the oblique vs discrete study was to evaluate the use of the 1.0-m^2 Tucker trawl in an oblique sampling program and the use of the net in a random design discrete depth program. The

5.2 ASSESSMENT OF THE INFLUENCE OF TOW SPEED ON THE 1.0-m^2 TUCKER TRAWL AND 1.0-m^2 EPIBENTHIC SLED

The influence of tow speed on ichthyoplankton abundance estimates was evaluated based on a 1.0-m^2 Tucker trawl and a 1.0 m^2 net on an epibenthic sled. Each gear was tested at three tow speeds: 1.0, 1.4, and 1.8 m/sec. A block design, each block consisting of the three tow speeds conducted randomly, was incorporated in a nocturnal sampling schedule. Sampling was done during June and July, the period of peak larval concentration in the lower Hudson River estuary, at stations located between Croton Point and Peekskill Bay.

In general, for both the Tucker trawl study and the epibenthic sled study, the species representation, abundance, and percent composition were similar among the three tow velocities tested. Ichthyoplankton concentrations were tested among tow speeds with no significant differences detected for total larvae or major taxa. Overall, larval densities tended to decrease with an increase in tow speed. At the low velocities tested under this study phase, extrusion of larvae through the net mesh is not expected, but may be the primary reason for the reduced high-speed densities. Length-frequency information did not indicate any difference among tow speeds; in general, length frequency decreased with the tow speed, supporting the mesh loss theory.

The normal ichthyoplankton sampling program is conducted at two speeds of 0.9-1.0 m/sec for the 1.0-m^2 Tucker trawl and 1.0 m/sec for the epibenthic sled. The gear comparison study results do not indicate that the program should be modified to incorporate faster tow speeds.

cases greater species diversity, abundance, and larval densities were obtained from the 1.0-m^2 Tucker trawls. Bay anchovy, the dominant taxon collected, yielded large enough numbers for each velocity to examine the effect on size. For the Miller samples the length range collected was consistent among velocities, but the mean length increased with an increase in tow speed. The length range and mean length was higher for the Tucker trawls than for the Miller sampler.

Overall, very few organisms were collected by the Miller sampler. The lowest abundance was calculated for the tows at the higher velocities. Length-frequency data suggest that extrusion of small larvae occurred at the higher speeds. In every comparison the highest abundance, species representation, and length were obtained from the comparable 1.0-m^2 Tucker trawl.

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APPENDIX 2-1

DEPTH SENSOR DEVELOPMENT

APPENDIX 2-1

DEPTH SENSOR DEVELOPMENT

1.0 INTRODUCTION

For an oblique tow to be useful in determining the abundance of organisms, it is necessary that the net fish for an equal time and speed at all depths. The usual method for determining depth of a plankton net during tow is to measure the tow wire length and corresponding wire angle (UNESCO 1968*). The geometric relationship between the two results is a depth value. Since it was suspected that depth measurements obtained in this manner were too imprecise for use in the present study, a second method, using an electronic depth sensor, was developed.

Preliminary surveys conducted in May and June tested and calibrated the electronic depth sensor and on-deck clatter. Following depth sensor calibration, the tow wire length and angle relationship was checked against the depth sensor, which resulted in a verified table for the oblique tow study.

2.0 DESIGN

A schematic detailing the components of the depth sensor/recorder is contained in Figure 2-1-1. The sensor was a pressure transducer capable of measuring depths up to 70 m with an accuracy of ± 1%. The on-deck readout consisted of a strip chart recorder connected to the transducer by a voltage divider that determined the scale for the strip chart (0.5 m/cm). The recording from the strip chart gave a complete record of net depth in relation to time.

*United Nations Educational, Scientific and Cultural Organization (UNESCO). 1968. Zooplankton sampling. Monogr. Oceanog. Methodol. 2. 174p.

3.0 CALIBRATION

To calibrate the instrument, the transducer was lowered on a metered line and the actual depth measurement was compared with the recorder value. A second means of calibration included an oblique tow conducted in step fashion (described in Section 2.3.1) that compared depth values derived from the tow wire length vs angle relationship to values recorded from the depth sensor mounted on the Tucker trawl net frame. Several tows were conducted, yielding a favorable straight-line relationship between the two values.

4.0 FIELD APPLICATION

The depth sensor unit was used each night from 11 to 16 June to record net depth during oblique tows. The sensor mounted at the top of the Tucker trawl frame recorded the depth at each step of the tow. Figure 2-1-2 is a recording taken during a tow conducted on 15 June.

APPENDIX 2-2

LENGTH-FREQUENCY INFORMATION

OBLIQUE VS DISCRETE TOW PROGRAM

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 1

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - ASC

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540013 11 JUN	0540015 11 JUN	0540018 12 JUN	0540020 12 JUN	0540023 12 JUN	0540025 12 JUN	0540026 12 JUN	0540029 12 JUN	0540030 12 JUN	0540032 12 JUN	0540034 12 JUN	0540037 13 JUN	0540039 13 JUN	0540042 13 JUN	0540045 13 JUN
11.1-12.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	11.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	11.30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

L0SC4NCOLD

10 DEC 198?

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK I

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - BF

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540013 11 JUN	0540015 11 JUN	0540018 12 JUN	0540020 12 JUN	0540023 12 JUN	0540025 12 JUN	0540026 12 JUN	0540029 12 JUN	0540030 12 JUN	0540032 12 JUN	0540034 12 JUN	0540037 13 JUN	054003? 13 JUN	0540042 13 JUN	0540043 13 JUN
2.1- 3.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	6	1	-	-	1	-	1	-	-	7	2	-	-	-	-
4.1- 5.0	-	-	-	-	2	1	-	1	-	[illegible]	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
NO. LARVAE MEASURED	7	1	0	0	3	1	1	1	0	14	2	0	0	0	0
NO. LARVAE COLLECTED	8	3	0	1	3	1	1	6	1	21	6	0	1	2	0
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	3.5	3.4	.0	.0	4.0	4.4	3.9	4.6	.0	4.3	3.4	.0	.0	.0	.0
STD DEV	.33	3.40	NA	NA	.12	4.40	3.90	4.60	NA	1.07	.22	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 2

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - SF

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540046 13 JUN	0540044 13 JUN	0540052 13 JUN	0540053 13 JUN	0540055 13 JUN	0540057 13 JUN	0540059 14 JUN	0540062 14 JUN	0540063 14 JUN	0540065 14 JUN	0540068 14 JUN	0540061 14 JUN	0540072 14 JUN	0540074 14 JUN	0540076 14 JUN
2.1- 3.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-
4.1- 5.0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
NO.LARVAL MEASURED	0	1	0	0	2	0	0	1	0	2	0	0	0	0	0
NO.LARVAE COLLECTED	4	3	0	0	4	2	0	3	0	5	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	2.9	.0	.0	4.0	.0	.0	5.3	.0	3.6	.0	.0	.0	.0	.0
STD DEV	NA	2.90	NA	NA	.21	NA	NA	5.30	NA	.07	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 3

SAMPLE LOCATION - CELIGUE TRAWLS
SPECIES - WF

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540079 14 JUN	0540082 14 JUN	0540084 15 JUN	0540088 15 JUN	0540090 15 JUN	0540093 15 JUN	0540094 15 JUN	0540097 15 JUN
3.1- 4.0	-	6	6	6	-	-	-	-
4.1- 5.0	-	2	6	-	-	-	1	-
5.1- 6.0	-	1	-	1	-	-	-	1
6.1- 7.0	-	-	-	-	-	-	-	-
NO.LARVAL MEASURED	0	9	12	3	0	0	1	1
NO.LARVAL COLLECTED	0	13	28	7	0	0	3	2
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	4.1	4.1	4.2	.0	.0	4.2	5.5
STD DEV	NA	.50	.37	.90	NA	NA	4.20	5.50

LENGTH INTERVAL (MM)	0540099 15 JUN	0540101 15 JUN	0540105 15 JUN	0540110 15 JUN	0540111 15 JUN	0540113 16 JUN	0540116 16 JUN
3.1- 4.0	1	-	-	5	1	-	-
4.1- 5.0	1	3	2	7	1	2	-
5.1- 6.0	-	-	-	-	-	-	-
6.1- 7.0	-	1	-	-	-	-	-
NO.LARVAL MEASURED	2	4	3	12	2	2	0
NO.LARVAL COLLECTED	7	6	3	23	11	5	3
NO.SAMPLES	1	1	1	1	1	1	1
MEAN LENGTH	4.0	4.8	4.4	4.2	4.0	4.5	.0
STD DEV	.28	1.01	.25	.41	.57	.42	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 4

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - WP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540117 15 JUN	0540120 16 JUN	0540121 16 JUN	0540124 16 JUN	0540125 15 JUN	0540128 16 JUN	0540131 15 JUN	0540134 16 JUN	0540136 16 JUN	0540137 16 JUN	0540141 17 JUN	0540142 17 JUN	0540145 17 JUN	0540148 17 JUN	0540155 17 JUN
2.1- 3.0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
3.1- 4.0	1	6	1	4	-	-	1	4	1	11	4	2	-	1	1
4.1- 5.0	4	8	7	3	7	1	1	5	12	16	3	1	-	5	2
5.1- 6.0	-	-	1	1	2	-	-	2	1	-	1	-	-	-	2
6.1- 7.0	-	1	-	-	-	-	-	2	2	2	-	-	1	2	1
7.1- 8.0	-	-	-	-	-	-	-	-	1	-	-	-	-	4	1
8.1- 9.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	6	15	9	8	9	1	2	13	17	30	8	3	1	13	7
NO. LARVAE COLLECTED	9	19	15	10	13	3	4	13	20	31	8	6	1	20	11
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	4.8	4.2	4.5	4.4	4.7	4.6	4.4	4.9	5.3	4.1	4.2	4.0	7.0	5.7	5.5
STD DEV	1.62	.71	.59	.67	.50	0.00	.45	1.01	.99	.97	.22	.35	0.00	1.57	1.53

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 5

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - BP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540156 18 JUN	0540159 18 JUN	0540161 18 JUN	0540163 18 JUN	0540165 18 JUN	0540167 18 JUN	0540169 19 JUN	0540171 19 JUN	0540175 19 JUN	0540177 19 JUN	0540179 19 JUN	0540181 19 JUN	0540184 19 JUN	0540186 19 JUN	0540188 19 JUN
3.1- 4.0	1	1	1	5	1	3	5	-	6	5	15	16	7	1	1
4.1- 5.0	1	18	5	14	7	23	16	2	14	16	10	3	13	4	4
5.1- 6.0	-	4	1	5	3	2	8	2	6	8	3	4	3	1	3
6.1- 7.0	-	4	-	1	4	1	1	1	2	1	1	-	1	1	1
7.1- 8.0	-	2	-	4	-	1	-	-	-	-	-	1	-	1	-
8.1- 9.0	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	2	30	7	30	15	30	30	5	30	30	29	30	24	6	3
NO. LARVAE COLLECTED	2	47	9	56	24	41	47	12	55	50	35	484	24	9	13
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	4.1	5.3	4.5	5.1	5.2	4.7	4.8	5.2	4.7	4.9	4.2	4.5	4.5	5.2	5.0
STD DEV	.28	1.04	.26	1.25	.83	.65	.65	.82	.77	.69	.76	.84	.71	1.23	.77

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 6

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - WP　　　　LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	0540191 19 JUN	0540193 19 JUN	0540195 19 JUN	0540197 19 JUN	0540199 19 JUN	0540201 19 JUN	0540203 19 JUN	0540205 19 JUN	0540207 20 JUN	0540209 20 JUN	0540211 20 JUN	0540214 20 JUN	0540216 20 JUN	0540218 20 JUN	0540221 20 JUN
	NUMBER OF FISH PER SAMPLE														
3.1- 4.0	10	4	13	16	12	13	10	8	2	8	10	5	8	1	4
4.1- 5.0	7	14	11	10	12	13	13	16	-	17	11	9	11	4	11
5.1- 6.0	1	8	5	2	4	3	4	6	2	3	6	11	7	16	11
6.1- 7.0	-	3	-	-	1	-	2	-	-	1	1	5	4	3	1
7.1- 8.0	-	-	-	-	1	1	-	-	-	-	1	1	-	1	-
8.1- 9.0	-	1	1	-	-	-	1	-	-	1	1	-	-	3	-
9.1-10.0	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1
10.1-11.0	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
NO. LARVAE MEASURED	19	30	30	30	30	30	30	30	5	30	30	30	30	30	30
NO. LARVAE COLLECTED	20	79	98	37	45	58	41	50	12	47	72	254	52	136	141
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	4.4	5.0	4.5	4.1	4.4	4.4	4.7	4.5	5.6	4.6	4.9	5.3	4.6	6.2	5.0
STD DEV	1.51	.95	1.01	.64	.94	.63	1.01	.70	2.45	1.03	1.13	.95	.87	1.51	1.17

L03C(NCOL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 7

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - WF
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540223 25 JUN	0540225 25 JUN	0540227 25 JUN	0540229 25 JUN	0540231 25 JUN	0540233 25 JUN	0540235 25 JUN	0540237 25 JUN	0540239 25 JUN	0540241 25 JUN	0540243 26 JUN	0540245 26 JUN	0540247 26 JUN	0540249 26 JUN	0540251 26 JUN
3.1- 4.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	2	3	2	-	1	-	2	1	-	1	2	-	-	-	1
5.1- 6.0	6	7	3	4	-	-	-	-	-	-	-	-	-	1	-
6.1- 7.0	2	3	2	1	-	-	-	-	-	1	-	1	-	-	-
7.1- 8.0	2	1	-	1	1	1	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	14	14	7	6	2	1	2	1	0	2	2	1	0	1	1
NO.LARVAE COLLECTED	16	16	7	6	2	1	2	1	0	2	3	1	0	1	1
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.6	5.7	5.6	6.0	5.9	7.6	4.6	4.8	.0	5.5	4.6	6.1	.0	5.5	4.7
STD DEV	1.27	.77	.59	.71	1.89	7.63	.00	4.80	NA	1.20	.35	6.10	NA	5.30	4.70

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 8

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - AP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540254 26 JUN	0540256 26 JUN	0540258 26 JUN	0540260 26 JUN	0540262 26 JUN	0540264 26 JUN	0540266 26 JUN	0540268 26 JUN	0540270 26 JUN	0540272 26 JUN	0540274 26 JUN	0540276 26 JUN	0540278 26 JUN	0540283 26 JUN	054028J 26 JUN
4.1- 5.0	1	-	1	1	-	4	2	2	-	-	-	-	-	-	-
5.1- 6.0	1	-	1	5	-	3	2	2	-	-	-	-	-	-	-
6.1- 7.0	-	-	1	1	-	3	-	3	-	-	-	-	-	-	-
7.1- 8.0	2	-	2	-	-	-	-	-	-	-	-	-	1	-	-
8.1- 9.0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
9.1-10.0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
NO.LARVAE MEASURED	4	0	5	7	0	11	4	7	0	0	0	1	1	0	0
NO.LARVAE COLLECTED	4	0	5	7	1	11	4	7	0	0	0	1	1	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.3	.0	6.3	5.5	.0	5.6	5.1	5.6	.0	.0	.0	9.1	7.8	.0	.0
STD DEV	1.18	NA	1.33	.58	NA	1.18	.87	1.03	NA	NA	NA	9.10	7.80	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 9

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - GP
LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0540287 27 JUN	0540289 27 JUN	0540291 27 JUN	0540293 27 JUN	0540296 27 JUN	0540298 27 JUN	0540300 27 JUN	0540302 27 JUN	0540304 27 JUN	0540306 27 JUN	0540308 27 JUN	0540310 27 JUN	0540312 27 JUN	0540314 27 JUN	0540316 27 JUN
3.1- 4.0	-	-	-	-	1	-	-	1	1	[illegible]	9	3	2	-	-
4.1- 5.0	-	-	-	3	4	3	5	5	20	13	[illegible]	13	[illegible]	3	12
5.1- 6.0	-	-	-	1	4	4	8	1	5	7	3	[illegible]	15	10	9
6.1- 7.0	-	-	-	2	1	1	1	4	3	2	3	7	4	10	7
7.1- 8.0	-	-	-	-	2	3	1	1	1	1	4	1	2	5	[illegible]
8.1- 9.0	-	-	-	-	-	-	-	1	-	-	2	-	1	1	-
9.1-10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
10.1-11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.1-12.0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
NO. LARVAE MEASURED	0	0	0	6	12	11	15	13	30	30	30	30	30	30	30
NO. LARVAE COLLECTED	0	0	0	6	12	13	16	13	33	128	165	175	67	54	139
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	5.4	5.6	5.9	5.3	5.8	5.0	5.0	5.2	5.2	5.5	6.3	5.[illegible]
STD DEV	NA	NA	NA	1.29	1.27	1.25	.86	1.35	.80	1.59	1.61	1.07	1.12	1.08	.32

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK10

SAMPLE LOCATION - OBLIQUE TOWLS
SPECIES - WP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540318 27 JUN	0540320 27 JUN	0540322 27 JUN	0540324 27 JUN	0540326 28 JUN	0540328 28 JUN	0540330 28 JUN	0540332 28 JUN	0540334 28 JUN	0540336 28 JUN	0540338 28 JUN	0540340 28 JUN	0540343 28 JUN	0540345 28 JUN	054034[illegible] 28 JUN
3.1- 4.0	2	1	1	-	1	-	-	-	-	-	-	1	-	2	1
4.1- 5.0	13	5	15	11	4	12	1	8	5	5	5	14	7	7	10
5.1- 6.0	9	3	7	6	15	10	15	12	16	14	8	6	10	5	9
6.1- 7.0	3	-	2	7	4	7	7	6	1	9	8	3	7	7	5
7.1- 8.0	2	1	3	6	4	1	6	-	4	1	6	5	3	4	2
8.1- 9.0	1	-	1	-	1	-	1	4	3	-	2	1	2	4	2
9.1-10.0	-	-	1	-	1	-	-	-	1	1	-	-	1	1	-
NO.LARVAE MEASURED	30	10	30	30	30	30	30	30	30	30	30	30	30	30	30
NO.LARVAE COLLECTED	73	10	54	106	159	68	265	128	295	171	372	82	205	158	281
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.3	5.0	5.4	5.8	5.9	5.5	6.3	5.8	6.0	5.9	6.1	5.5	6.1	6.3	5.6
STD DEV	1.13	1.03	1.40	1.12	1.22	.83	.96	1.26	1.30	.97	1.22	1.22	1.31	1.53	1.23

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK11

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - WP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540349 2 JUL	0540351 2 JUL	0540353 2 JUL	0540355 2 JUL	0540357 2 JUL	0540359 2 JUL	0540361 2 JUL	0540363 2 JUL	0540365 2 JUL	0540369 3 JUL	0540371 3 JUL	0540374 3 JUL	0540376 3 JUL	0540378 3 JUL	0540380 3 JUL
4.1- 5.0	3	1	2	1	5	-	-	1	-	1	-	1	-	1	-
5.1- 6.0	3	1	1	-	-	2	3	4	4	6	6	3	1	-	3
6.1- 7.0	1	1	3	3	3	2	5	3	10	11	12	12	8	3	1
7.1- 8.0	9	8	4	2	6	14	7	8	7	9	8	11	10	9	11
8.1- 9.0	2	3	-	1	1	10	5	8	6	2	2	2	3	7	4
9.1-10.0	-	-	-	1	3	2	4	4	2	1	2	1	1	3	5
10.1-11.0	-	2	1	-	-	-	-	1	1	-	-	-	4	4	5
11.1-12.0	-	-	-	-	-	-	2	1	-	-	-	-	2	2	-
12.1-13.0	-	1	-	-	-	-	-	-	-	-	-	-	1	1	1
NO.LARVAE MEASURED	18	17	11	8	18	30	30	30	30	30	30	30	30	30	30
NO.LARVAE COLLECTED	18	17	11	8	18	145	189	187	74	159	62	10[illegible]	38	61	39
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.8	8.0	6.8	7.3	6.9	7.9	8.0	7.8	7.5	6.7	6.5	7.0	8.2	8.6	7.9
STD DEV	1.36	1.89	1.73	1.55	1.78	.97	1.49	1.55	1.20	1.32	1.10	.99	1.73	1.76	1.65

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK12

SAMPLE LOCATION - OBLIQUE TRAWLS
SPECIES - WP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540389 3 JUL	0540387 3 JUL	0540385 3 JUL	0540391 3 JUL	0540393 4 JUL	0540395 4 JUL	0540397 4 JUL	0540399 4 JUL	0540401 4 JUL	0540403 4 JUL	0540406 4 JUL	0540408 4 JUL	0540410 4 JUL	0540412 4 JUL	0540414 4 JUL
3.1- 4.0	-	2	-	3	3	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	-	2	3	1	2	-	4	1	1	-	-	4	[illegible]	-	2
5.1- 6.0	1	3	1	5	3	1	1	1	2	-	3	4	5	1	3
6.1- 7.0	6	1	2	7	3	5	6	4	10	4	4	3	5	4	5
7.1- 8.0	12	4	10	5	6	9	2	11	3	9	9	5	4	10	6
8.1- 9.0	6	1	9	5	8	6	3	3	5	9	11	8	3	6	9
9.1-10.0	2	4	4	-	4	8	4	4	3	3	2	3	1	8	1
10.1-11.0	3	9	-	3	1	1	2	5	5	5	-	3	3	-	3
11.1-12.0	-	4	1	1	-	-	-	1	-	-	1	-	-	1	-
12.1-13.0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
NO.LARVAE MEASURED	30	30	30	30	30	30	22	30	30	30	30	30	30	30	30
NO.LARVAE COLLECTED	102	198	111	62	69	122	39	109	172	122	143	56	35	105	66
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.8	8.6	7.9	7.1	7.4	8.2	7.4	8.2	7.9	8.3	7.5	7.6	6.3	8.2	7.8
STD DEV	1.22	2.52	1.59	2.12	2.01	1.27	1.96	1.67	1.85	1.30	1.25	1.92	1.79	1.15	1.77

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 1

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540012 11 JUN	0540016 12 JUN	0540017 12 JUN	0540021 12 JUN	0540022 12 JUN	0540024 12 JUN	0540027 12 JUN	0540028 12 JUN	0540031 12 JUN	0540033 12 JUN	0540035 13 JUN	0540036 13 JUN	0540038 13 JUN	0540041 13 JUN	0540044 13 JUN
2.1- 3.0	-	1	-	-	5	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	11	-	1	4	1	2	-	2	-	-	1	-	-	-
4.1- 5.0	6	10	-	2	2	-	7	-	4	1	-	6	1	-	2
5.1- 6.0	13	7	-	19	-	2	10	-	17	11	2	14	3	2	12
6.1- 7.0	-	1	-	-	-	1	1	-	7	3	2	1	3	1	3
NO.LARVAE MEASURED	19	30	0	22	11	4	20	0	30	15	4	22	7	3	17
NO.LARVAE COLLECTED	45	44	1	52	20	7	37	18	133	137	11	81	25	15	22
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.4	4.4	.0	5.4	3.2	5.2	5.2	.0	5.5	5.8	6.2	5.4	5.7	5.9	5.6
STD DEV	.35	.90	NA	.44	.70	.32	.74	NA	.74	.47	.52	.63	.82	.21	.47

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ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 2

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB   LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540045 13 JUN	0540047 13 JUN	0540051 13 JUN	0540054 13 JUN	0540056 13 JUN	0540058 13 JUN	0540060 14 JUN	0540061 14 JUN	0540064 14 JUN	0540066 14 JUN	0540067 14 JUN	0540070 14 JUN	0540071 14 JUN	0540073 14 JUN	0540075 14 JUN
3.1- 4.0	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-
4.1- 5.0	-	-	3	1	-	-	-	-	-	1	2	-	1	-	1
5.1- 6.0	2	-	10	4	-	17	11	11	4	6	17	[illegible]	4	7	[illegible]
6.1- 7.0	1	-	1	6	-	12	18	18	2	22	6	2	2	4	20
7.1- 8.0	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
NO.LARVAE MEASURED	3	0	14	11	0	30	30	30	0	30	26	4	7	11	30
NO.LARVAE COLLECTED	26	0	24	38	4	219	525	138	24	115	96	47	47	16	223
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.9	.0	5.4	6.1	.0	5.7	6.2	6.2	6.0	6.1	5.8	6.5	5.7	6.0	6.1
STD DEV	.60	NA	.50	.51	NA	.68	.46	.43	.33	.62	.55	.39	.47	.25	.54

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ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 3

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540081 14 JUN	0540083 14 JUN	0540085 15 JUN	0540087 15 JUN	0540089 15 JUN	0540091 15 JUN	0540095 15 JUN	0540098 15 JUN	0540100 15 JUN	0540104 15 JUN	0540105 15 JUN	0540107 15 JUN	0540112 16 JUN	0540114 16 JUN	054011[illegible] 16 JUN
3.1- 4.0	-	-	1	1	-	-	-	-	-	2	-	-	-	-	-
4.1- 5.0	5	3	-	4	2	4	-	-	-	1	-	2	-	2	2
5.1- 6.0	11	11	3	18	22	10	7	14	7	8	5	13	8	10	12
6.1- 7.0	14	16	-	7	6	16	9	16	7	18	23	15	22	18	16
7.1- 8.0	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-
NO.LARVAE MEASURED	30	30	4	30	30	30	16	30	14	30	30	30	30	30	30
NO.LARVAE COLLECTED	179	81	5	810	408	348	35	133	31	44	254	127	175	58	71
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.8	5.9	5.2	5.7	5.6	6.0	6.2	6.1	6.1	6.1	6.4	6.0	6.3	6.1	6.0
STD DEV	.63	.49	.82	.66	.39	.64	.40	.44	.35	.90	.44	.49	.46	.49	.57

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 4

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540118 16 JUN	0540119 16 JUN	0540122 16 JUN	0540123 16 JUN	0540126 16 JUN	0540127 16 JUN	0540130 16 JUN	0540132 16 JUN	0540135 16 JUN	0540138 16 JUN	0540139 17 JUN	0540143 17 JUN	0540145 17 JUN	0540150 17 JUN	0540154 17 JUN
3.1- 4.0	1	-	-	-	-	-	-	-	-	4	-	-	-	-	-
4.1- 5.0	-	-	-	9	4	1	-	-	5	4	4	-	-	2	-
5.1- 6.0	8	1	7	4	19	5	17	4	11	11	20	1	3	15	8
6.1- 7.0	20	4	22	2	6	19	13	26	12	11	6	6	27	13	22
7.1- 8.0	1	-	1	-	1	-	-	-	2	-	-	-	-	-	-
NO.LARVAE MEASURED	30	5	30	15	30	25	30	30	30	30	30	7	30	30	30
NO.LARVAE COLLECTED	81	14	72	20	242	46	472	67	491	360	254	13	115	244	419
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.3	6.4	6.3	5.0	5.7	6.3	6.2	6.4	5.9	5.5	5.6	6.3	6.4	5.9	6.3
STD DEV	.57	.27	.43	.61	.69	.47	.47	.29	.80	.84	.46	.37	.33	.48	.39

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ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 3

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540157 18 JUN	0540158 18 JUN	0540160 18 JUN	0540162 18 JUN	0540166 18 JUN	0540168 18 JUN	0540170 19 JUN	0540172 19 JUN	0540174 19 JUN	0540176 19 JUN	0540180 19 JUN	0540183 19 JUN	0540185 19 JUN	0540187 19 JUN	0540189 19 JUN
4.1- 5.0	-	1	1	1	3	-	-	-	-	-	-	-	-	-	1
5.1- 6.0	16	16	20	14	15	8	1	3	2	3	5	4	6	8	5
6.1- 7.0	13	13	9	15	12	22	4	2	24	25	15	25	22	21	13
7.1- 8.0	1	-	-	-	-	-	1	-	4	2	2	1	2	1	-
NO.LARVAE MEASURED	30	30	30	30	30	30	6	5	30	30	30	30	30	30	19
NO.LARVAE COLLECTED	170	584	184	389	253	120	18	17	153	261	241	74	75	43	37
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.1	6.0	5.8	6.1	6.0	6.3	5.9	6.3	6.5	6.5	6.2	6.5	6.4	6.3	6.2
STD DEV	.53	.57	.52	.63	.64	.40	.46	.46	.42	.36	.46	.33	.42	.43	.52

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 5

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540190 19 JUN	0540192 19 JUN	0540194 19 JUN	0540196 19 JUN	0540198 19 JUN	0540200 19 JUN	0540202 19 JUN	0540204 19 JUN	0540206 20 JUN	0540208 20 JUN	0540210 20 JUN	0540212 20 JUN	0540214 20 JUN	0540217 20 JUN	0540219 20 JUN
3.1- 4.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-
5.1- 6.0	6	3	6	1	3	6	6	4	4	-	-	-	4	-	1
6.1- 7.0	23	26	20	25	23	21	24	23	15	12	10	17	23	20	10
7.1- 8.0	-	-	4	3	9	3	-	3	10	12	16	13	3	7	8
8.1- 9.0	-	1	-	-	-	-	-	-	-	5	4	-	-	1	1
9.1-10.0	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-
10.1-11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
NO. LARVAE MEASURED	30	30	30	30	30	30	30	30	30	30	30	30	30	30	20
NO. LARVAE COLLECTED	169	567	148	93	54	88	75	61	72	141	173	450	269	89	24
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.2	6.4	6.6	6.5	6.5	6.4	6.4	6.4	6.8	7.3	7.3	7.0	6.5	7.0	7.0
STD DEV	1.08	.51	.51	.61	.36	.38	.33	.52	.69	.82	.56	.48	.42	.90	.49

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 7

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SE

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540222 25 JUN	0540224 25 JUN	0540226 25 JUN	0540228 25 JUN	0540230 25 JUN	0540232 25 JUN	0540234 25 JUN	0540236 25 JUN	0540238 25 JUN	0540240 25 JUN	0540242 26 JUN	0540244 26 JUN	0540246 26 JUN	0540248 26 JUN	0540252 26 JUN
5.1- 6.0	-	9	-	1	5	1	1	-	1	-	-	1	-	1	1
6.1- 7.0	3	14	3	13	18	4	3	17	10	1	2	8	-	3	3
7.1- 8.0	1	3	-	16	5	6	-	11	9	2	6	7	-	-	10
8.1- 9.0	-	1	-	-	-	4	-	2	1	-	2	3	1	1	7
9.1-10.0	-	-	-	-	-	1	-	-	-	-	-	3	1	-	1
10.1-11.0	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-
NO.LARVAE MEASURED	4	27	3	30	28	17	4	30	22	3	10	22	2	5	30
NO.LARVAE COLLECTED	5	27	3	52	28	18	4	30	22	3	10	25	2	5	51
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.7	6.5	6.5	7.1	6.6	7.6	6.4	7.0	7.2	7.3	7.7	7.4	8.7	6.6	7.6
STD DEV	.76	.64	.32	.53	.62	1.19	.37	.66	.88	.35	.55	1.14	.71	.87	.74

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ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 8

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - 3L

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540253 26 JUN	0540255 26 JUN	0540257 26 JUN	0540259 26 JUN	0540261 26 JUN	0540263 26 JUN	0540265 26 JUN	0540267 26 JUN	0540269 26 JUN	0540271 26 JUN	0540273 26 JUN	0540276 26 JUN	0540279 26 JUN	0540282 26 JUN	0540284 26 JUN
5.1- 6.0	-	1	1	5	1	2	4	3	-	-	-	-	-	-	-
6.1- 7.0	8	4	7	15	16	11	12	16	5	1	1	-	-	-	-
7.1- 8.0	11	19	6	10	8	12	10	9	6	-	-	1	-	2	-
8.1- 9.0	7	2	3	-	4	4	4	1	8	4	-	1	1	1	1
9.1-10.0	3	4	-	-	1	-	-	1	7	-	-	-	-	1	-
10.1-11.0	1	-	1	-	-	1	-	-	4	-	-	1	-	1	-
11.1-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
NO.LARVAE MEASURED	30	30	18	30	30	30	30	30	30	5	1	3	1	6	1
NO.LARVAE COLLECTED	62	39	18	47	39	49	66	74	45	5	1	3	1	6	1
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.8	7.7	7.4	6.7	7.2	7.3	7.0	6.9	8.6	8.0	7.0	8.8	8.2	9.2	8.5
STD DEV	1.10	.83	1.12	.65	.75	1.02	.80	.79	1.12	.76	7.00	1.40	8.20	1.51	8.50

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK 9

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540266 27 JUN	0540268 27 JUN	0540290 27 JUN	0540294 27 JUN	0540295 27 JUN	0540297 27 JUN	0540299 27 JUN	0540301 27 JUN	0540303 27 JUN	0540305 27 JUN	0540307 27 JUN	0540309 27 JUN	0540311 27 JUN	0540314 27 JUN	0540315 27 JUN
5.1- 6.0	3	-	1	-	1	2	1	4	2	-	-	1	1	-	4
6.1- 7.0	6	10	2	5	4	10	11	10	1	5	15	3	2	5	10
7.1- 8.0	6	12	3	6	1	9	10	3	4	7	11	6	4	5	1
8.1- 9.0	6	5	-	4	3	4	1	3	5	7	3	7	3	4	[illegible]
9.1-10.0	1	1	-	2	1	4	2	1	4	2	1	5	5	3	4
10.1-11.0	-	1	-	1	1	2	1	1	2	1	-	3	5	4	5
11.1-12.0	-	-	-	-	-	-	-	-	-	1	-	-	5	1	1
12.1-13.0	-	-	-	-	-	1	-	-	-	2	-	-	1	1	-
13.1-14.0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	24	30	7	30	15	27	30	30	30	30	30	30	30	50	30
NO.LARVAE COLLECTED	24	42	[illegible]	40	15	27	90	48	33	134	157	2[illegible]	65	215	144
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.2	7.3	6.5	7.3	7.6	7.5	7.5	7.2	7.9	8.6	[illegible]	6.2	9.1	8.2	7.1
STD DEV	1.10	.97	.42	1.46	1.33	1.75	1.02	1.11	1.34	1.65	.76	1.52	1.07	1.55	1.63

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ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCKID

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	[illegible] 21 JUN	[illegible] 27 JUN	[illegible] 27 JUN	[illegible] 27 JUN	[illegible] 28 JUN	[illegible] 28 JUN	[illegible] 28 JUN	[illegible] 28 JUN	[illegible] 28 JUN	[illegible] 24 JUN	[illegible] 24 JUL	[illegible]	[illegible] 28 JUL	[illegible]	[illegible]
5.1- 6.0	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]	-	-	-	[illegible]	[illegible]
6.1- 7.0	[illegible]	8	[illegible]	5	[illegible]	[illegible]	8	2	5	[illegible]	[illegible]	[illegible]	[illegible]	5	[illegible]
7.1- 8.0	[illegible]	9	5	12	[illegible]	[illegible]	5	15	8	[illegible]	13	[illegible]	14	12	[illegible]
8.1- 9.0	4	5	5	[illegible]	[illegible]	6	6	6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9.1-10.0	2	[illegible]	4	3	[illegible]	[illegible]	5	[illegible]	2	[illegible]	2	[illegible]	2	3	[illegible]
10.1-11.0	-	2	5	[illegible]	2	3	5	5	-	[illegible]	2	[illegible]	2	2	[illegible]
11.1-12.0	2	-	4	[illegible]	[illegible]	[illegible]	2	1	-	2	[illegible]	[illegible]	[illegible]	-	-
12.1-13.0	1	-	1	-	-	-	1	-	-	-	-	[illegible]	-	-	-
13.1-14.0	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-
14.1-15.0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
NO. LARVAE COLLECTED	110	55	80	135	275	73	22[illegible]	339	61	1570	622	322	437	550	497
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.7	7.3	9.2	7.7	8.0	8.0	8.7	8.3	7.0	8.8	7.5	9.3	8.1	7.8	7.7
STD DEV	1.75	1.33	1.96	1.43	1.86	1.62	2.11	1.15	1.13	1.55	1.15	1.81	1.20	1.30	1.69

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK11

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0540348 2 JUL	0540350 2 JUL	0540352 2 JUL	0540354 2 JUL	0540356 2 JUL	0540358 2 JUL	0540360 2 JUL	0540362 2 JUL	0540364 3 JUL	0540366 2 JUL	0540370 3 JUL	0540372 3 JUL	0540376 3 JUL	0540377 3 JUL	054037? 3 JUL
5.1- 6.0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
6.1- 7.0	-	1	-	-	-	-	2	-	1	-	-	1	1	-	-
7.1- 8.0	1	2	1	1	-	1	4	1	3	2	3	1	3	2	1
8.1- 9.0	6	-	3	1	2	6	2	6	2	4	3	3	2	4	-
9.1-10.0	4	-	2	1	2	5	3	2	5	3	7	2	5	3	14
10.1-11.0	6	2	4	3	1	7	11	8	6	3	11	15	8	1	5
11.1-12.0	4	2	2	-	3	6	1	7	4	5	5	4	8	9	5
12.1-13.0	3	3	5	4	3	1	5	2	3	6	1	4	2	4	>
13.1-14.0	4	2	5	3	5	2	1	2	-	1	-	-	1	3	1
14.1-15.0	2	4	3	1	-	2	-	2	1	-	-	-	-	-	.
15.1-16.0	-	1	-	-	-	-	1	-	-	-	-	-	-	1	
16.1-17.0	-	2	-	-	1	-	-	-	-	-	-	-	-	2	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	.	-	-	.
19.1-20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
NO.LARVAE MEASURED	30	19	25	14	17	30	30	30	30	30	30	30	30	30	30
NO.LARVAE COLLECTED	40	19	25	14	17	81	861	575	106	462	172	108	249	149	134
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	11.0	12.6	11.6	11.6	11.9	10.6	10.3	10.7	10.1	10.6	10.0	10.4	10.4	11.6	10.5
STD DEV	1.96	2.81	2.11	2.17	2.20	1.85	2.07	1.78	1.87	1.69	1.25	1.41	1.65	2.73	1.14

[illegible]

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
BLOCK12

SAMPLE LOCATION - DISCRETE TRAWLS
SPECIES - SB
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	[illegible] 3 JUL	[illegible] 3 JUL	[illegible] 3 JUL	[illegible] 3 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] 4 JUL	[illegible] [illegible] JUL
5.1- 6.0	-	[illegible]	[illegible]	[illegible]	-	[illegible]	1	3	-	2	-	-	-	-	-
6.1- 7.0	2	2	2	4	2	3	-	2	[illegible]	4	[illegible]	-	-	-	-
7.1- 8.0	9	[illegible]	2	1	1	5	4	6	4	4	6	2	-	[illegible]	[illegible]
8.1- 9.0	5	3	[illegible]	[illegible]	5	[illegible]	-	[illegible]	[illegible]	1	3	[illegible]	2	[illegible]	[illegible]
9.1-10.0	10	9	6	8	10	5	3	[illegible]	7	9	[illegible]	5	3	5	[illegible]
10.1-11.0	2	6	[illegible]	4	7	8	4	6	5	5	6	[illegible]	8	10	[illegible]
11.1-12.0	1	5	3	6	3	[illegible]	2	2	2	2	[illegible]	[illegible]	5	8	5
12.1-13.0	-	[illegible]	1	2	-	-	-	-	-	2	3	3	[illegible]	3	4
13.1-14.0	-	1	1	-	-	-	-	-	-	-	-	4	3	-	2
14.1-15.0	1	-	-	-	-	-	-	-	-	-	2	-	2	1	-
NO.LARVAE MEASURED	30	30	30	30	30	30	14	30	30	30	30	24	30	30	30
NO.LARVAE COLLECTED	130	106	37	70	60	33	31	58	47	50	113	24	[illegible]	90	276
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	8.5	10.1	9.6	9.2	9.5	8.5	9.3	8.8	8.9	9.0	10.3	10.7	11.4	10.8	10.9
STD DEV	1.60	1.60	1.65	1.73	1.49	1.86	1.88	1.66	1.42	1.92	1.96	1.33	1.58	1.35	1.48

APPENDIX 2-3

OBLIQUE VS DISCRETE TUCKER TRAWL EVALUATION PROGRAM

COLLECTION INFORMATION BY LIFE STAGE FOR:

Striped bass	American shad
White perch	Atlantic tomcod
Alosa spp.	Bay anchovy

Gear Code: Oblique Tucker Trawls = 67
Discrete Tucker Trawls = 65

CON EDISON GEAR COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES STRIPED BASS

TASK & SAMPLE	GEAR	SET	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0540216	67	3	34	84/06/20	0203	5.8	14383	424.9873	.00	1637.70	9.41	1623.58	-	4.71
0540218	67	3	34	84/06/20	0222	5.5	16062	453.3763	.00	564.65	2.21	558.04	-	4.41
0540221	67	3	34	84/06/20	0303	5.2	15223	411.8533	.00	526.89	12.14	514.75	-	-
0540272	67	3	34	84/06/26	2103	5.6	16336	447.5733	.00	13.41	-	13.41	-	-
0540274	67	3	34	84/06/26	2139	5.8	16507	453.4543	.00	10.98	-	10.98	-	-
0540276	67	3	34	84/06/26	2212	5.6	12404	383.0236	.00	2.61	-	2.61	-	-
0540278	67	3	34	84/06/26	2234	5.0	11075	342.0055	.00	2.02	-	2.02	-	-
0540283	67	3	34	84/06/26	2338	5.7	15458	436.9637	.00	.00	-	-	-	-
0540285	67	3	34	84/06/26	2352	5.7	13535	407.2031	.00	.00	-	-	-	-
0540249	67	3	34	84/07/02	2036	5.5	13673	403.5695	.00	79.23	-	79.23	-	-
0540251	67	3	34	84/07/02	2053	5.6	14053	412.9456	.00	38.75	-	38.75	-	-
0540253	67	3	34	84/07/02	2103	5.5	13580	401.9306	.00	42.30	-	42.30	-	-
0540255	67	3	34	84/07/02	2127	5.6	13466	403.4069	.00	44.62	-	44.62	-	-
0540257	67	3	34	84/07/02	2147	5.5	12927	330.4936	.00	81.75	-	81.75	-	-
0540259	67	3	34	84/07/02	2205	5.5	13505	402.3468	.00	489.63	-	489.63	-	-
0540261	67	3	34	84/07/02	2226	5.2	13574	333.5376	.00	1575.14	-	1575.14	-	-
0540263	67	3	34	84/07/02	2244	5.5	13653	403.1415	.00	1205.53	-	1205.53	-	-
0540209	67	3	35	84/06/20	0048	5.8	13888	416.4107	.00	348.21	-	348.21	-	-
0540211	67	3	35	84/06/20	0105	5.8	14371	434.1847	.00	543.55	-	541.24	-	2.30
0540214	67	3	35	84/06/20	0149	5.8	15464	441.3166	.00	947.17	4.53	540.37	-	2.27
0540246	67	3	35	84/06/26	0425	5.5	14059	409.7801	.00	141.54	-	141.54	-	-
0540248	67	3	35	84/06/26	0444	5.6	15523	444.7321	.00	166.39	-	166.39	-	-
0540270	67	3	35	84/06/26	2036	5.6	14633	421.4205	.00	102.04	-	102.04	-	-
0540205	67	3	36	84/06/19	2357	5.7	13393	408.2432	.00	222.01	2.45	218.11	-	2.45
0540207	67	3	36	84/06/20	0016	5.8	13563	410.3278	.00	277.63	2.44	275.20	-	-
0540251	67	3	36	84/06/26	0138	5.6	14959	425.4887	.00	128.76	-	128.76	-	-
0540254	67	3	36	84/06/26	0213	5.6	13698	407.3673	.00	127.74	-	127.74	-	-
0540256	67	3	36	84/06/26	0234	5.6	9744	321.6590	.00	108.41	-	108.41	-	-
0540258	67	3	36	84/06/26	0251	5.7	15232	434.4600	.00	121.99	-	121.99	-	-
0540260	67	3	36	84/06/26	0317	5.7	14772	427.5861	.00	154.35	-	154.35	-	-
0540262	67	3	36	84/06/26	0334	5.5	13055	392.4424	.00	150.13	-	150.13	-	-
0540264	67	3	36	84/06/26	0402	5.5	14605	417.6665	.00	181.96	-	181.96	-	-
0540371	67	3	36	84/07/03	0038	5.5	15402	443.5601	.00	308.86	-	306.61	-	2.25
0540374	67	3	36	84/07/03	0109	5.4	17458	439.9262	.00	356.88	-	356.88	-	-
0540376	67	3	36	84/07/03	0123	5.2	14412	402.8171	.00	208.53	-	208.53	-	-
0540378	67	3	36	84/07/03	0141	5.4	13692	400.4419	.00	382.38	-	382.38	-	-
0540380	67	3	36	84/07/03	0156	5.5	13255	395.3752	.00	262.38	-	262.38	-	-
0540191	67	3	37	84/06/19	2108	5.8	9674	294.6367	.00	393.71	6.79	383.52	-	3.59
0540193	67	3	37	84/06/19	2131	5.8	10155	334.7718	.00	531.71	-	531.71	-	-
0540195	67	3	37	84/06/19	2152	5.8	15162	437.0203	.00	265.43	-	263.15	-	2.25
0540227	67	3	37	84/06/25	2121	5.0	16276	407.8713	.00	100.52	-	100.52	-	-
0540229	67	3	37	84/06/25	2140	6.0	11552	434.0099	.00	115.20	-	115.20	-	-
0540231	67	3	37	84/06/25	2205	6.0	16434	462.5452	.00	114.53	-	114.53	-	-
0540233	67	3	37	84/06/25	2225	6.0	14573	434.3725	.00	43.74	-	43.74	-	-
0540235	67	3	37	84/06/25	2243	6.0	15968	456.1265	.00	35.03	-	35.03	-	-
0540237	67	3	37	84/06/25	2315	5.5	12913	390.2428	.00	76.88	-	76.88	-	-
0540239	67	3	37	84/06/25	2331	5.6	13307	410.5664	.00	68.20	-	65.76	-	2.44

CON EDISON GEAR COMPARISON STUDY
CHELSEA TRAWLS

SPECIES STRIPED BASS

TOW & SAMPLE	GEAR	LOC	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. METER REVS.	VOLUME (CU. M.)	(IN NO./1000 CU. M.) TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNID LIFE STAGE
0540319	67	4	42	84/06/27	2137	5.8	14276	451.7369	.00	179.31	-	179.31	-	-
0540316	67	4	42	84/06/27	2204	5.7	14583	424.7152	.00	266.41	-	266.41	-	-
[illegible]	67	4	42	84/06/27	2228	5.7	14713	423.6656	.00	155.13	-	155.13	-	-
[illegible]	67	4	42	84/07/03	[illegible]	5.6	13943	411.2550	.00	179.48	-	179.48	-	-
[illegible]	67	4	42	84/07/04	0112	5.5	15565	427.5537	.00	53.10	-	53.10	-	-
[illegible]	67	4	43	[illegible]	2250	5.8	[illegible]	411.9905	.00	1213.00	21.27	[illegible]	-	[illegible]
[illegible]	67	4	43	[illegible]	2257	[illegible]	[illegible]	[illegible]	.00	[illegible]	[illegible]	[illegible]	-	[illegible]
[illegible]	67	4	43	[illegible]	2251	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]	-	-
[illegible]	67	4	43	84/06/27	[illegible]	5.6	[illegible]	[illegible]	.00	458.25	-	458.25	-	-
[illegible]	67	4	43	84/06/27	2336	5.7	[illegible]	[illegible]	.00	[illegible]	-	[illegible]	-	-
[illegible]	67	4	43	84/06/28	0017	[illegible]	[illegible]	[illegible]	.00	[illegible]	-	[illegible]	-	-
[illegible]	67	4	43	84/06/28	0051	5.6	[illegible]	[illegible]	.00	208.13	-	[illegible]	-	-
0540330	67	4	43	84/06/28	0115	5.8	15167	[illegible]	.00	[illegible]	-	[illegible]	-	-
[illegible]	67	4	43	[illegible]	0223	5.5	15937	[illegible]	.00	223.73	-	223.73	-	-
[illegible]	67	4	43	[illegible]	0248	5.7	14475	424.1255	.00	[illegible]	-	[illegible]	-	-
[illegible]	67	4	44	84/06/18	2119	5.8	[illegible]	432.6123	.00	2438.35	[illegible]	2340.30	-	[illegible]
[illegible]	67	4	44	84/06/18	2151	5.6	[illegible]	382.0255	.00	395.15	[illegible]	[illegible]	-	[illegible]
0540332	67	4	44	84/05/28	0133	5.5	15400	414.8429	.00	749.38	-	749.38	-	-
0540334	67	4	44	84/05/28	0211	6.2	15286	415.1579	[illegible]	1322.68	-	1322.68	-	-
0540336	67	4	45	84/06/28	0225	6.1	11215	365.5861	[illegible]	729.34	2.79	726.55	-	-
0540156	67	4	46	84/06/18	2039	5.5	8746	301.8476	.00	496.94	39.76	393.53	-	[illegible]
0540339	67	4	46	84/06/28	0248	6.0	13105	406.4225	.00	1426.33	-	1426.33	-	-
0540340	67	4	46	84/06/28	0309	5.6	13483	405.3593	.00	396.07	4.96	[illegible]	-	-
0540343	67	4	46	84/06/25	0340	6.0	[illegible]	359.0945	.00	1047.37	-	1047.37	-	-
0540345	67	4	46	84/06/28	0412	6.0	10575	461.5521	.00	1300.43	-	1300.43	-	-
0540346	67	4	46	84/06/28	0436	6.0	11923	380.5877	.00	611.73	2.63	609.10	-	-
0540101	67	5	47	84/06/17	0056	5.9	16634	448.4166	24.55	590.97	80.29	510.68	-	-
0540142	67	5	47	84/06/17	0119	5.0	[illegible]	[illegible]	[illegible]	414.76	166.85	216.01	-	31.90
0540145	67	5	47	84/06/17	0147	[illegible]	12558	393.0965	27.84	394.44	197.42	197.02	-	-
0540148	67	5	47	84/06/17	0235	[illegible]	12373	373.3019	.00	667.02	180.52	476.33	-	10.17
[illegible]	67	5	47	84/06/17	0418	6.0	11714	370.0384	.00	731.31	103.71	627.60	-	-
0540137	67	5	49	84/06/16	2355	5.9	12552	392.4305	30.58	1337.42	451.04	886.38	-	-
0540134	67	5	50	84/06/16	2300	5.7	16170	445.9331	47.09	446.26	78.49	367.77	-	-
0540136	67	5	50	84/06/16	2321	5.9	6061	215.2935	315.83	659.56	311.20	250.82	-	97.54
0540117	67	5	51	84/06/16	0155	5.0	10531	332.7952	45.07	814.31	372.60	414.67	-	27.04
0540120	67	5	51	84/06/16	0237	5.0	11021	332.5797	2.84	544.56	246.75	289.30	-	8.51
0540121	67	5	51	84/06/16	0253	5.0	10208	323.5739	.00	182.34	64.90	117.44	-	-
0540124	67	5	51	84/06/16	0330	5.1	11641	355.6049	2.81	402.13	126.54	264.34	-	11.25
0540125	67	5	51	84/06/16	0351	5.0	11682	353.7139	.00	409.74	70.68	327.55	-	11.51
0540128	67	5	51	84/06/16	0442	5.5	12683	385.9560	2.59	207.28	25.91	181.37	-	-
0540131	67	5	51	84/06/16	2209	5.7	15346	435.7365	45.93	706.75	96.39	601.21	-	9.15
0540113	67	5	52	84/06/16	0046	5.0	8941	293.3619	6.82	221.57	129.55	81.61	-	10.41
0540116	67	5	52	84/06/16	0143	5.0	9111	297.6333	.00	238.55	70.56	164.63	-	3.36
0540101	67	5	53	84/06/15	2047	5.0	10342	339.2858	26.53	277.05	139.53	120.04	-	17.48
0540105	67	5	53	84/06/15	2150	5.0	10194	323.2611	.00	207.20	9.22	170.14	-	27.84
0540110	67	5	53	84/06/15	2331	4.8	3143	293.4715	84.61	629.50	175.99	332.44	-	71.07
0540111	67	5	53	84/06/15	2350	5.0	10437	328.6217	12.17	343.46	57.82	273.47	-	12.17

CON EDISON GEAR COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES WHITE PERCH

TRACK & SAMPLE	GEAR	SEQ	RIVER MILE	SAMPLE DATE	TIME	DUR (MINS)	NO. METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0540210	67	3	34	84/06/20	0220	5.8	14383	424.4823	.00	122.56	-	122.00	-	2.36
0540216	67	3	34	84/06/20	0222	5.5	16052	455.3753	.00	299.17	-	299.17	-	-
0540221	67	3	34	84/06/20	0304	5.2	15228	411.8533	.00	342.35	-	342.35	-	-
0540272	67	3	34	84/06/26	2103	5.5	16356	447.5733	.00	.00	-	-	-	-
0540274	67	3	34	84/06/26	2139	5.8	16607	455.4549	.00	.00	-	-	-	-
0540276	67	3	34	84/06/26	2212	5.6	12404	383.0256	.00	2.11	-	2.11	-	-
0540277	67	3	34	84/06/26	2234	5.0	11075	342.0055	.00	2.32	-	2.32	-	-
0540283	67	3	34	84/06/26	2335	5.7	13458	413.9537	.00	.00	-	-	-	-
0540285	67	3	34	84/06/26	2352	5.7	13355	407.2038	.00	.00	-	-	-	-
0540349	67	3	34	84/07/02	2036	5.5	13675	403.5635	.00	44.60	-	44.60	-	-
0540351	67	3	34	84/07/02	2053	5.6	14233	412.5456	.00	41.17	-	41.17	-	-
0540353	67	3	34	84/07/02	2109	5.5	13280	401.9306	.00	27.37	-	27.37	-	-
0540355	67	3	34	84/07/02	2127	5.6	13466	403.4065	.00	15.33	-	15.33	-	-
0540357	67	3	34	84/07/02	2147	5.5	12127	391.4996	.00	46.03	-	46.03	-	-
0540359	67	3	34	84/07/02	2205	5.3	13305	402.3435	.00	335.41	-	335.41	-	-
0540361	67	3	34	84/07/02	2223	5.2	13374	388.5375	.00	496.94	-	486.94	-	-
0540363	67	3	34	84/07/02	2244	5.5	13532	403.1915	.00	463.86	-	463.86	-	-
0540209	67	3	35	84/06/20	0048	5.8	13866	416.4127	.00	112.87	4.80	108.07	-	-
0540211	67	3	35	84/06/20	0105	5.8	14971	434.1847	.00	163.52	5.21	152.01	-	2.30
0540214	67	3	35	84/06/20	0143	5.8	15464	441.5166	.00	586.35	-	592.35	-	4.33
0540216	67	3	35	84/06/26	0425	5.5	14069	423.7801	.00	9.76	-	9.76	-	-
0540266	67	3	35	84/06/26	0449	5.6	16523	449.7321	.00	15.74	-	15.74	-	-
0540270	67	3	35	84/06/26	2059	5.6	14603	421.4205	.00	.00	-	-	-	-
0540205	67	3	36	84/06/19	2357	5.7	13393	408.2432	.00	122.48	9.80	107.78	-	4.10
0540207	67	3	36	84/06/20	0016	5.3	13563	410.5278	.00	29.23	-	29.13	-	-
0540251	67	3	36	84/06/26	0138	5.6	14353	426.4847	.00	2.34	-	2.34	-	-
0540254	67	3	36	84/06/26	0213	5.6	13638	407.8873	.00	9.43	-	9.43	-	-
0540256	67	3	36	84/06/26	0234	5.6	9744	321.6533	.00	.00	-	-	-	-
0540258	67	3	36	84/06/26	0251	5.7	15252	434.4600	.00	11.11	-	11.11	-	-
0540260	67	3	36	84/06/26	0317	5.7	14772	427.5861	.00	16.37	-	16.37	-	-
0540262	67	3	36	84/06/26	0334	5.5	13056	392.8424	.00	2.53	-	2.53	-	-
0540264	67	3	36	84/06/26	0402	5.5	14635	417.6665	.00	26.34	-	26.34	-	-
0540271	67	3	36	84/07/03	0038	5.6	16492	443.5601	.00	139.74	-	139.74	-	-
0540274	67	3	36	84/07/03	0109	5.4	17458	433.9262	.00	245.10	-	245.10	-	-
0540376	67	3	36	84/07/03	0123	5.2	14412	402.8171	.00	94.34	-	94.34	-	-
0540378	67	3	36	84/07/03	0141	5.4	13692	400.4414	.00	152.33	-	152.33	-	-
0540380	67	3	36	84/07/03	0156	5.5	13255	336.3752	.00	98.33	-	98.33	-	-
0540151	67	3	37	84/06/19	2108	5.8	8674	274.6367	.00	67.88	6.79	61.09	-	2.77
0540153	67	3	37	84/06/19	2131	5.6	10135	334.7718	.00	221.03	5.57	212.38	-	2.29
0540155	67	3	37	84/06/19	2152	5.8	15162	437.0203	.00	109.83	3.15	98.59	-	-
0540227	67	3	37	84/06/25	2121	5.0	16276	407.8713	.00	17.16	-	17.16	-	-
0540229	67	3	37	84/06/25	2140	5.0	14552	434.0099	.00	13.32	-	13.32	-	-
0540231	67	3	37	84/06/25	2206	6.0	16434	462.3452	.00	4.33	-	4.33	-	-
0540233	67	3	37	84/06/25	2225	6.0	14573	434.3725	.00	2.30	-	2.30	-	-
0540235	67	3	37	84/06/25	2243	6.0	13368	456.1285	.00	4.38	-	4.38	-	-
0540237	67	3	37	84/06/25	2315	5.5	12313	390.2428	.00	2.06	-	2.06	-	-
0540239	67	3	37	84/06/25	2331	5.5	13907	410.5664	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
OTTER TRAWLS

SPECIES WHITE PERCH

TAGS & SAMPLE	GEAR	SET	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNK LIFE STAGE
									(IN NO./1000 CU. M.)					
0540314	67	4	42	84/06/27	2137	5.8	13278	451.7343	.00	119.59	-	119.59	-	-
0540316	67	4	42	84/06/27	2208	5.7	14585	424.7182	.00	327.24	-	327.24	-	-
0540318	67	4	42	84/06/27	2226	5.7	14313	429.6666	.00	169.90	-	169.90	-	-
0540391	67	4	42	84/07/03	2339	5.6	13343	411.1580	.00	150.79	-	150.79	-	-
0540397	67	4	42	84/07/04	0112	5.5	13566	427.5397	.00	31.22	-	31.22	-	-
0540163	67	4	43	84/06/18	2230	5.8	13643	411.9389	.00	87.38	4.85	82.52	-	-
0540166	67	4	43	84/06/18	2257	5.6	14628	421.7872	.00	56.90	2.37	54.53	-	-
0540320	67	4	43	84/06/27	2251	5.2	13737	394.7254	.00	25.33	-	25.33	-	-
0540322	67	4	43	84/06/27	2313	5.8	14736	431.5069	.00	125.14	-	125.14	-	-
0540324	67	4	43	84/06/27	2356	5.7	14047	416.0980	.00	254.75	-	254.75	-	-
0540326	67	4	43	84/06/28	0017	5.9	15053	439.0691	.00	362.13	-	362.13	-	-
0540328	67	4	43	84/06/28	0051	5.6	14930	425.9145	.00	159.28	-	159.28	-	-
0540330	67	4	43	84/06/28	0115	5.8	13187	403.4144	19.83	656.89	-	656.89	-	-
0540355	67	4	43	84/07/04	0003	5.5	15497	429.0734	.00	160.81	2.33	158.48	-	-
0540395	67	4	43	84/07/04	0048	5.7	14876	423.1255	.00	284.30	-	284.30	-	-
0540154	67	4	44	84/06/18	2119	5.8	14739	430.6183	.00	109.15	-	106.82	-	2.32
0540161	67	4	44	84/06/18	2150	5.8	4550	168.0255	.00	53.56	-	53.56	-	-
0540332	67	4	44	84/06/28	0139	5.8	13300	414.8424	.00	308.55	-	308.55	-	-
0540334	67	4	44	84/06/28	0201	6.2	13296	415.0679	2.41	710.73	-	710.73	-	-
0540336	67	4	45	84/06/28	0225	6.1	11215	365.5861	.00	467.74	-	467.74	-	-
0540156	67	4	46	84/06/18	2033	6.5	8748	301.8476	.00	6.63	-	6.63	-	-
0540338	67	4	46	84/06/28	0246	6.2	13105	406.6223	.00	914.85	-	914.85	-	-
0540340	67	4	46	84/06/28	0303	5.6	13483	403.3543	.00	203.30	-	203.30	-	-
0540343	67	4	46	84/06/28	0340	6.0	12745	399.0946	.00	523.69	-	523.69	-	-
0540345	67	4	46	84/06/28	0412	6.0	16373	461.5621	.00	428.58	-	428.58	-	-
0540346	67	4	46	84/06/28	0436	6.0	11923	383.8877	.00	737.75	2.63	735.12	-	-
0540141	67	5	47	84/06/17	0058	5.9	15694	448.4168	.00	17.84	-	17.84	-	-
0540142	67	5	47	84/06/17	0119	5.0	16190	407.4632	27.00	14.75	4.91	9.82	-	-
0540145	67	5	47	84/06/17	0147	5.9	12658	395.0966	7.59	2.53	-	2.53	-	-
0540148	67	5	47	84/06/17	0235	5.9	12573	333.3019	7.63	50.45	-	48.31	-	2.14
0540155	67	5	47	84/06/17	0418	6.0	11714	376.0384	5.32	34.57	-	34.57	-	-
0540137	67	5	49	84/06/16	2355	5.9	12532	392.4306	28.03	78.39	5.19	73.20	-	-
0540134	67	5	50	84/06/16	2301	5.7	16170	445.9331	11.21	29.15	-	29.15	-	-
0540136	67	5	50	84/06/16	2321	5.9	6061	215.2335	18.58	111.48	4.64	106.83	-	-
0540117	67	5	51	84/06/16	0155	5.0	10631	332.7952	3.00	24.04	3.00	21.03	-	-
0540120	67	5	51	84/06/16	0237	5.0	11521	352.5797	2.84	53.89	8.51	45.38	-	-
0540121	67	5	51	84/06/16	0253	5.0	11208	323.5739	6.18	40.18	-	40.18	-	-
0540124	67	5	51	84/06/16	0330	5.1	11641	355.6049	.00	28.12	5.62	22.50	-	-
0540125	67	5	51	84/06/16	0351	5.0	11682	353.7139	.00	36.75	2.83	33.93	-	-
0540128	67	5	51	84/06/16	0442	5.5	12683	385.9560	.00	7.77	-	7.77	-	-
0540131	67	5	51	84/06/16	2209	5.7	15346	435.7365	4.59	9.18	-	9.18	-	-
0540113	67	5	52	84/06/16	0046	5.0	8741	293.3619	6.82	17.04	-	17.04	-	-
0540116	67	5	52	84/06/16	0143	5.0	9111	297.6333	3.36	10.08	-	10.08	-	-
0540101	67	5	53	84/06/15	2047	5.0	10342	339.2858	2.95	17.64	2.95	14.74	-	-
0540105	67	5	53	84/06/15	2150	5.0	10194	323.2611	.00	9.28	-	9.28	-	-
0540110	67	5	53	84/06/15	2331	4.8	9145	295.4715	.00	77.54	3.39	71.07	-	3.08
0540111	67	5	53	84/06/15	2350	5.0	10437	328.6217	6.09	33.47	3.04	24.34	-	6.09

LMSC C-NC.

CON EDISON GEAR COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES ALOSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	FLOWMETER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
									(IN NO./1000 CU. M.)					
0540216	67	3	34	84/06/20	0205	5.8	14339	424.3873	.00	2.36	-	2.36	-	-
0540218	67	3	34	84/06/20	0222	5.9	16062	453.3753	.00	2.21	-	2.21	-	-
0540221	67	3	34	84/06/20	0308	5.2	15228	411.8533	.00	.00	-	-	-	-
0540272	67	3	34	84/06/26	2105	5.6	16636	447.5733	.00	.00	-	-	-	-
0540274	67	3	34	84/06/26	2134	5.8	16607	453.4546	.00	.00	-	-	-	-
0540276	67	3	34	84/06/26	2212	5.6	12434	383.0236	.00	.00	-	-	-	-
0540278	67	3	34	84/06/26	2234	5.0	11076	342.0055	.00	.00	-	-	-	-
0540283	67	3	34	84/06/26	2338	5.7	13438	436.9637	.00	.00	-	-	-	-
0540285	67	3	34	84/06/26	2352	5.7	13333	407.2038	.00	.00	-	-	-	-
0540349	67	3	34	84/07/02	2036	5.5	13673	403.5695	.00	.00	-	-	-	-
0540351	67	3	34	84/07/02	2053	5.6	14053	412.3456	.00	.00	-	-	-	-
0540353	67	3	34	84/07/02	2104	5.5	13580	401.3306	.00	.00	-	-	-	-
0540355	67	3	34	84/07/02	2127	5.6	13986	403.4069	.00	.00	-	-	-	-
0540357	67	3	34	84/07/02	2147	5.5	12927	390.4996	.00	.00	-	-	-	-
0540359	67	3	34	84/07/02	2205	5.5	13505	402.3468	.00	.00	-	-	-	-
0540361	67	3	34	84/07/02	2226	5.2	13374	388.5376	.00	.00	-	-	-	-
0540363	67	3	34	84/07/02	2244	5.5	13653	403.1415	.00	.00	-	-	-	-
0540209	67	3	35	84/06/20	0049	5.8	13888	416.4107	.00	4.80	-	4.80	-	-
0540211	67	3	35	84/06/20	0105	5.8	14371	434.1847	.00	2.30	-	2.30	-	-
0540214	67	3	35	84/06/20	0143	5.8	15464	441.3166	.00	4.53	-	4.53	-	-
0540266	67	3	35	84/06/26	0425	5.5	14069	409.7801	.00	.00	-	-	-	-
0540268	67	3	35	84/06/26	0444	5.6	16523	444.7321	.00	2.25	-	2.25	-	-
0540270	67	3	35	84/06/26	2038	5.6	14603	421.4203	.00	.00	-	-	-	-
0540205	67	3	36	84/06/19	2357	5.7	13593	409.2432	.00	.00	-	-	-	-
0540207	67	3	36	84/06/20	0016	5.8	13563	410.5278	.00	2.44	-	2.44	-	-
0540251	67	3	36	84/06/26	0138	5.6	14951	426.4897	.00	.00	-	-	-	-
0540254	67	3	36	84/06/26	0213	5.6	13698	407.0673	.00	.00	-	-	-	-
0540256	67	3	36	84/06/26	0234	5.6	9744	321.6530	.00	6.22	-	6.22	-	-
0540258	67	3	36	84/06/26	0251	5.7	15252	434.4600	.00	.00	-	-	-	-
0540260	67	3	36	84/06/26	0317	5.7	14772	427.5861	.00	.00	-	-	-	-
0540262	67	3	36	84/06/26	0334	5.5	13056	392.8424	.00	.00	-	-	-	-
0540264	67	3	36	84/06/26	0402	5.5	14605	417.6665	.00	.00	-	-	-	-
0540371	67	3	36	84/07/03	0038	5.6	16402	443.5601	.00	.00	-	-	-	-
0540374	67	3	36	84/07/03	0104	5.4	17456	433.9262	.00	.00	-	-	-	-
0540376	67	3	36	84/07/03	0123	5.2	14412	402.8171	.00	.00	-	-	-	-
0540378	67	3	36	84/07/03	0141	5.4	13692	400.4414	.00	.00	-	-	-	-
0540380	67	3	36	84/07/03	0156	5.5	13255	396.3752	.00	.00	-	-	-	-
0540191	67	3	37	84/06/19	2108	5.8	8674	294.6367	.00	10.18	-	10.18	-	-
0540193	67	3	37	84/06/19	2131	5.8	10155	334.7718	.00	8.96	-	8.96	-	-
0540195	67	3	37	84/06/19	2152	5.8	15162	437.0203	.00	2.29	-	2.29	-	-
0540227	67	3	37	84/06/25	2121	5.0	15276	407.8713	.00	.00	-	-	-	-
0540229	67	3	37	84/06/25	2140	6.0	14352	434.0099	.00	.00	-	-	-	-
0540231	67	3	37	84/06/25	2206	6.0	16434	462.3452	.00	.00	-	-	-	-
0540233	67	3	37	84/06/25	2225	6.0	14373	434.3725	.00	.00	-	-	-	-
0540235	67	3	37	84/06/25	2243	6.0	15368	456.1285	.00	.00	-	-	-	-
0540237	67	3	37	84/06/25	2315	5.5	12913	330.2428	.00	.00	-	-	-	-
0540239	67	3	37	84/06/25	2331	5.6	13307	410.5664	.00	.00	-	-	-	-

LOW [illegible] GEAR COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES [illegible] SP

TRAN & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. METER REVS.	VOLUME (CU. M.)	(NO./1000 CU. M.) TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	JIC LIFE STAGE
0540314	67	4	42	84/06/21	2137	5.8	15278	451.7543	.00	.00	-	-	-	-
0540316	67	4	42	84/06/21	2204	[illegible]	14582	424.7182	.00	.00	-	-	-	-
0540318	67	4	42	84/06/21	2228	5.7	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	42	84/07/03	2335	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	42	84/07/04	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	42	[illegible]	2232	5.6	15613	[illegible]	.00	14.42	-	14.42	-	-
[illegible]	67	4	42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	[illegible]	-	[illegible]	-	-
[illegible]	67	4	43	[illegible]	2251	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	43	84/06/21	[illegible]	[illegible]	[illegible]	[illegible]	.00	2.32	-	2.32	-	-
[illegible]	67	4	43	84/06/21	2356	[illegible]	[illegible]	[illegible]	.00	2.40	-	2.40	-	-
0540326	67	4	43	84/06/22	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
0540328	67	4	43	84/06/22	[illegible]	5.6	14930	[illegible]	.00	.00	-	-	-	-
0540330	67	4	43	84/06/22	[illegible]	[illegible]	15127	[illegible]	.00	.00	-	-	-	-
0540333	67	4	43	84/07/01	0003	5.5	[illegible]	429.0794	.00	2.33	-	2.33	-	-
0540345	67	4	43	84/07/04	[illegible]	[illegible]	14078	[illegible]	.00	.00	-	-	-	-
0540155	67	4	44	84/06/15	2119	5.8	14739	430.5185	.00	4.54	-	-	-	[illegible]
0540151	67	4	44	84/06/15	2150	5.8	4650	150.2256	.00	.00	-	-	-	-
0540332	67	4	44	84/06/22	0139	5.8	15402	[illegible]	.00	2.01	-	2.01	-	-
0540334	67	4	44	84/06/22	0201	6.2	13256	415.2579	.00	.00	-	-	-	-
[illegible]	67	4	45	84/06/22	0225	6.1	11215	[illegible]	.00	.00	-	-	-	-
0540156	67	4	46	84/06/18	0035	5.5	2742	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	46	84/05/22	[illegible]	6.0	13115	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	-	-	-	-
[illegible]	67	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	-	-	-	-
[illegible]	67	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		-	-	-
[illegible]	67	4	46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-
[illegible]	67	[illegible]	47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	-	-	-	-
[illegible]	67	5	47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]		-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]	-	-
[illegible]	67	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]		[illegible]
[illegible]	67	5	47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]	-	[illegible]
[illegible]	67	5	49	[illegible]	[illegible]	[illegible]	12032	[illegible]	[illegible]	[illegible]	-	[illegible]	-	-
[illegible]	67	5	50	[illegible]	2300	[illegible]	16170	[illegible]	.00	47.09	-	[illegible]	-	-
[illegible]	67	5	50	84/06/15	2321	[illegible]	6001	[illegible]	.00	[illegible]	-	102.15	-	-
0540117	67	5	51	84/06/16	0155	5.0	[illegible]	332.7952	.00	12.02	-	12.02	-	-
0540120	67	5	51	84/06/16	0237	5.0	11521	352.5797	.00	28.36	-	25.53	-	2.84
0540122	67	5	51	84/06/16	0255	5.0	12208	325.0739	.00	52.14	-	52.14	-	-
0540124	67	5	51	84/06/16	0330	5.1	11641	355.6049	.00	42.18	-	42.18	-	-
0540125	67	5	51	84/06/16	0351	5.0	11632	355.7137	.00	16.35	-	16.35	-	-
0540126	67	5	51	84/06/16	0442	5.5	12683	385.5560	.00	5.15	-	[illegible]	-	-
0540131	67	5	51	84/06/16	2209	5.7	15345	435.7365	.00	6.88	-	6.88	-	-
0540113	67	5	52	84/06/16	0045	5.0	8341	293.3619	.00	3.41	-	3.41	-	-
0540115	67	5	52	84/06/16	0145	5.0	9111	237.6333	.00	13.44	-	6.72	-	6.72
0540101	67	5	53	84/06/15	2047	5.0	10942	339.2858	.00	8.34	-	8.34	-	-
0540105	67	5	53	84/06/15	2150	5.0	10194	323.2611	.00	.00	-	-	-	-
0540110	67	5	53	84/06/15	2331	4.8	9145	293.4715	.00	37.23	-	16.92	-	20.31
0540111	67	5	53	84/06/15	2350	5.0	11437	328.6217	.00	27.39	-	24.34	-	3.04

CON EDISON GEAR COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES: AMERICAN SHAD

TAPE & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DEP (M)	FLOWMETER REVS.	VOLUME (CU. M.)	NO./1000 CU. M. TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	[illegible] LIFE STAGE
054021[illegible]	67	3	34	84/06/20	1200	5.6	14383	421.9813	.00	.00	-	-	-	-
0540218	67	3	34	84/06/21	2222	5.3	16162	436.2753	.00	.00	-	-	-	-
0540221	67	3	34	84/06/21	1304	5.2	15220	421.8033	.00	.00	-	-	-	-
0540272	67	3	34	84/06/21	2100	5.4	15515	447.8700	.00	.00	-	-	-	-
0540274	67	3	34	84/06/25	2133	5.2	15507	355.1540	.00	.00	-	-	-	-
054027[illegible]	67	3	34	84/06/26	2210	[illegible]	13[illegible]	283.0234	.00	.00	-	-	-	-
054022[illegible]	67	3	[illegible]	84/06/23	2228	[illegible]	[illegible]	342.[illegible]	.00	.00	-	-	-	-
054027[illegible]	67	3	34	84/06/2[illegible]	2233	5.7	[illegible]	422.[illegible]	.00	.00	-	-	-	-
0540282	67	3	34	84/06/28	2352	5.4	13[illegible]	407.9034	.00	.00	-	-	-	-
054028[illegible]	67	3	34	84/07/0[illegible]	[illegible]	[illegible]	13[illegible]	408.[illegible]	.00	.00	-	-	-	-
0540351	67	3	34	84/07/02	2052	5.3	13050	412.5135	.00	.00	-	-	-	-
054035[illegible]	67	3	34	84/07/02	2109	5.5	13221	401.5305	.00	.00	-	-	-	-
0540355	67	3	34	84/07/02	2127	5.6	13986	403.1069	.00	.00	-	-	-	-
0540357	67	3	34	84/07/02	21[illegible]	5.5	12127	380.4545	.00	.00	-	-	-	-
0540359	67	3	34	84/07/02	2201	5.2	13603	402.3465	.00	.00	-	-	-	-
0540361	67	3	34	84/07/02	2226	5.2	13374	388.6275	.00	.00	-	-	-	-
0540363	67	3	34	84/07/02	2249	5.5	13053	408.1110	.00	.00	-	-	-	-
0540209	67	3	35	84/06/21	0048	5.5	13855	416.4107	.00	.00	-	-	-	-
0540211	67	3	35	84/06/21	0105	5.5	14171	430.1647	.00	.00	-	-	-	-
054021[illegible]	67	3	35	84/06/21	0109	5.8	15404	441.3163	.00	.00	-	-	-	-
0540265	67	3	35	84/06/28	0425	5.5	14065	405.7801	.00	.00	-	-	-	-
0540268	67	3	35	84/06/28	0444	5.5	16523	444.7321	.00	.00	-	-	-	-
0540270	67	3	35	84/06/28	2035	5.6	14603	421.4205	.00	.00	-	-	-	-
0540205	67	3	36	84/06/19	2151	5.7	11583	408.2402	.00	.00	-	-	-	-
0540207	67	3	36	84/06/20	0015	5.1	13552	410.5215	.00	.00	-	-	-	-
0540251	67	3	36	84/06/23	0150	5.6	14357	424.4087	.00	.00	-	-	-	-
054025[illegible]	67	3	[illegible]	84/06/2[illegible]	0215	5.5	13455	407.0575	.00	.00	-	-	-	-
0540255	67	3	35	84/06/23	0234	5.6	[illegible]	321.[illegible]	.00	.00	-	-	-	-
0540257	67	3	35	84/06/23	0251	5.7	13382	[illegible]	.00	.00	-	-	-	-
0540260	67	3	36	84/06/28	0317	5.7	14[illegible]72	427.[illegible]	.00	.00	-	-	-	-
0540262	67	3	36	84/06/2[illegible]	0334	[illegible]	13058	392.[illegible]	.00	.00	-	-	-	-
0540264	67	3	36	84/06/28	0402	5.5	14505	417.5560	.00	.00	-	-	-	-
0540371	67	3	36	84/07/03	0034	[illegible]	14402	443.5601	.00	.00	-	-	-	-
0540374	67	3	36	84/07/03	0102	5.4	17438	430.0262	.00	.00	-	-	-	-
0540376	67	3	36	84/07/03	0123	5.2	13412	402.9171	.00	.00	-	-	-	-
0540378	67	3	36	84/07/03	0141	5.4	13692	400.4414	.00	.00	-	-	-	-
0540380	67	3	36	84/07/03	0156	5.5	13255	356.3752	.00	.00	-	-	-	-
0540191	67	3	37	84/06/19	2108	5.6	8675	294.6357	.00	.00	-	-	-	-
0540193	67	3	37	84/06/19	2131	5.8	10155	334.7718	.00	.00	-	-	-	-
0540195	67	3	37	84/06/19	2152	5.6	15162	437.0205	.00	.00	-	-	-	-
0540227	67	3	37	84/06/25	2121	5.0	16276	407.8713	.00	.00	-	-	-	-
0540229	67	3	37	84/06/25	2140	6.0	14532	439.0095	.00	.00	-	-	-	-
0540231	67	3	37	84/06/25	2206	6.0	16439	462.3452	.00	.00	-	-	-	-
0540233	67	3	37	84/06/25	2225	5.0	14573	434.3725	.00	.00	-	-	-	-
0540235	67	3	37	84/06/25	2243	5.0	13968	456.1285	.00	.00	-	-	-	-
0540237	67	3	37	84/06/25	2315	5.5	12913	390.2428	.00	.00	-	-	-	-
0540239	67	3	37	84/06/25	2331	5.6	13907	410.5664	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
UNIQUE TRAWLS

SPECIES AMERICAN SHAD

TASK & SAMPLE	YEAR	GEAR	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAL	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNID LIFE STAGE
									(IN NO./1000 CU. M.)					
0540314	67	4	42	84/06/21	[illegible]	[illegible]	16278	451.7345	.00	.00	-	-	-	-
0540316	67	4	42	84/06/21	2304	[illegible]	14893	424.7382	.00	.00	-	-	-	-
0540319	67	4	42	84/06/21	2329	5.7	14913	429.6665	.00	.00	-	-	-	-
[illegible]	67	4	42	84/07/03	[illegible]	[illegible]	15343	411.1580	.00	.00	-	-	-	-
0540337	67	4	42	84/07/0[illegible]	[illegible]	5.5	[illegible]	417.5357	.00	.00	-	-	-	-
[illegible]	67	4	42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	[illegible]	42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	[illegible]	43	84/06/[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	[illegible]	43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	[illegible]	43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	4	43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	[illegible]	[illegible]	43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	44	[illegible]	[illegible]	[illegible]	11763	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	44	84/06/18	2150	5.8	9652	[illegible]	.00	.00	-	-	-	-
0540332	67	4	44	84/06/25	0139	5.8	13810	414.9324	.00	.00	-	-	-	-
0540334	67	4	44	84/06/25	0201	6.2	13296	415.0679	.00	.00	-	-	-	-
0540335	67	4	46	84/06/28	0225	5.1	11213	265.5861	.00	.00	-	-	-	-
0540155	67	4	46	84/06/18	2339	5.5	8748	301.8476	.00	.00	-	-	-	-
0540338	67	4	46	84/06/28	0246	5.0	13135	406.5225	.00	.00	-	-	-	-
0540340	67	4	46	84/06/28	0309	5.6	13453	403.5543	.00	.00	-	-	-	-
0540343	67	4	46	84/06/28	0340	6.0	12745	339.0946	.00	.00	-	-	-	-
0540345	67	4	46	84/06/28	0412	5.0	16373	461.5521	.00	.00	-	-	-	-
0540346	67	4	46	84/06/28	0436	6.0	11723	380.8877	.00	.00	-	-	-	-
0540141	67	5	47	84/06/17	0058	5.3	15394	448.4163	.00	.00	-	-	-	-
0540142	67	5	47	84/06/17	0119	5.0	16190	407.4632	.00	.00	-	-	-	-
0540145	67	5	47	84/06/17	0147	5.9	12598	395.0966	.00	.00	-	-	-	-
0540148	67	5	47	84/06/17	0235	5.9	12573	333.3019	.00	.00	-	-	-	-
0540135	67	5	47	84/06/17	0418	6.0	11714	375.0384	.00	.00	-	-	-	-
0540137	67	5	49	84/06/16	2355	5.9	12532	392.4306	.00	.00	-	-	-	-
0540134	67	5	50	84/06/16	2300	5.7	16170	445.9331	.00	.00	-	-	-	-
0540136	67	5	50	84/06/16	2321	5.9	6061	215.2935	.00	.00	-	-	-	-
0540117	67	5	51	84/06/16	0155	5.0	10631	332.7952	.00	.00	-	-	-	-
0540120	67	5	51	84/06/16	0237	5.0	11621	352.5797	.00	.00	-	-	-	-
0540121	67	5	51	84/06/16	0253	5.0	10208	323.5739	.00	.00	-	-	-	-
0540124	67	5	51	84/06/16	0330	5.1	11541	355.6049	.00	.00	-	-	-	-
0540125	67	5	51	84/06/16	0351	5.0	11682	353.7139	.00	.00	-	-	-	-
0540128	67	5	51	84/06/16	0442	5.5	12683	385.9560	.00	.00	-	-	-	-
0540131	67	5	51	84/06/16	2209	5.7	15346	435.7365	.00	.00	-	-	-	-
0540113	67	5	52	84/06/16	0046	5.0	8941	293.3619	.00	.00	-	-	-	-
0540116	67	5	52	84/06/16	0143	5.0	9111	217.6333	.00	.00	-	-	-	-
0540101	67	5	53	84/06/15	2047	5.0	10342	339.2658	.00	.00	-	-	-	-
0540105	67	5	53	84/06/15	2150	5.0	10134	323.2611	.00	.00	-	-	-	-
0540110	67	5	53	84/06/15	2331	4.8	9145	295.4715	.00	.00	-	-	-	-
0540111	67	5	53	84/06/15	2350	5.0	10437	328.6217	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
[illegible]

SPECIES ATLANTIC TOMCOD

TAG & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. FILTER REVS.	VOLUME (CU. M.)	(IN NO./1000 CU. M.) TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	LIFE STAGE UNK
[illegible]	67	3	[illegible]	[illegible]	0250	[illegible]	[illegible]	[illegible]	.00	[illegible]	-	-	[illegible]	-
[illegible]	67	3	34	84/06/21	0222	[illegible]	15032	[illegible]	.00	[illegible]	-	-	[illegible]	-
[illegible]	67	3	34	84/06/21	[illegible]	[illegible]	15229	[illegible]	.00	[illegible]	-	-	[illegible]	-
[illegible]	67	3	34	[illegible]	[illegible]	[illegible]	12836	[illegible]	.00	4.17	-	-	[illegible]	-
[illegible]	67	3	34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	[illegible]	-	-	-	-
[illegible]	67	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	10.84	-	-	[illegible]	-
[illegible]	67	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	[illegible]	-	-	[illegible]	-
[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-
[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-
[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	5.7	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-
[illegible]	[illegible]	3	34	84/07/02	2056	[illegible]	13678	[illegible]	[illegible]	[illegible]	-	-	-	-
[illegible]	67	3	34	84/07/02	[illegible]	5.6	14037	412.2455	.00	[illegible]	-	-	[illegible]	-
[illegible]	67	3	34	84/07/02	[illegible]	5.5	13520	401.3506	.00	[illegible]	-	-	[illegible]	-
[illegible]	67	3	34	84/07/02	2127	[illegible]	[illegible]	403.4059	.00	32.23	-	-	32.23	-
[illegible]	67	3	34	84/07/02	2169	[illegible]	12927	390.4576	.00	38.41	-	-	38.41	-
[illegible]	67	3	34	84/07/02	2205	5.5	13635	402.3468	.00	139.14	-	-	139.14	-
[illegible]	67	3	34	84/07/02	2226	5.2	13374	388.5376	.00	43.75	-	-	43.75	-
[illegible]	67	3	34	84/07/02	2244	5.5	13553	403.1915	.00	275.34	-	-	275.34	-
0540205	67	3	35	84/06/20	0049	5.8	13888	416.4107	.00	60.04	-	-	60.04	-
0540211	67	3	35	84/06/20	0105	5.2	14571	454.1947	.00	221.10	-	-	221.10	-
0540214	67	3	35	84/06/20	0141	5.8	15464	441.3166	.00	63.45	-	-	63.45	-
[illegible]	67	3	35	84/06/26	0425	5.5	14069	409.7801	.00	.00	-	-	-	-
[illegible]	67	3	35	84/06/26	0444	5.6	15523	444.7321	.00	.00	-	-	-	-
0540270	67	3	35	84/06/26	2038	5.6	14603	421.4205	.00	.00	-	-	-	-
0540205	67	3	36	84/06/19	2357	5.7	13593	408.2432	.00	[illegible]	-	-	[illegible]	-
0540207	67	3	35	84/06/20	0016	5.6	13563	410.5278	.00	14.62	-	-	14.62	-
0540251	67	3	35	84/06/26	0138	5.6	14959	426.4987	.00	4.69	-	-	4.69	-
0540254	67	3	36	84/06/26	[illegible]	5.6	13698	407.0673	.00	.00	-	-	-	-
[illegible]	67	3	35	84/06/26	0234	5.6	3744	321.6592	.00	3.11	-	-	3.11	-
0540258	67	3	36	84/06/26	0251	5.7	15252	454.4600	.00	.00	-	-	-	-
0540260	67	3	36	84/06/26	0317	5.7	14772	427.5961	.00	2.34	-	-	2.34	-
0540262	67	3	36	84/06/26	0334	5.5	13056	391.8424	.00	.00	-	-	-	-
0540264	67	3	36	84/06/26	0402	5.5	14605	417.6665	.00	16.76	-	-	16.76	-
0540371	67	3	35	84/07/03	0038	5.6	16432	443.5601	.00	6.76	-	-	6.76	-
0540374	67	3	36	84/07/03	0109	5.4	17458	439.9262	.00	13.64	-	-	13.64	-
0540376	67	3	36	84/07/03	0123	5.2	14412	402.8171	.00	4.97	-	-	4.97	-
0540378	67	3	36	84/07/03	0141	5.4	13692	400.4414	.00	.00	-	-	-	-
0540380	67	3	36	84/07/03	0156	5.5	13255	396.3752	.00	.00	-	-	-	-
0540191	67	3	37	84/06/19	2108	5.8	8674	294.6367	.00	64.85	-	-	64.85	-
0540193	67	3	37	84/06/19	2131	5.8	10155	354.7718	.00	564.56	-	-	564.56	-
0540195	67	3	37	84/06/19	2152	5.8	15162	437.0203	.00	48.05	-	-	48.05	-
0540227	67	3	37	84/06/25	2121	6.0	16270	407.8713	.00	.00	-	-	-	-
0540229	67	3	37	84/06/25	2140	6.0	14552	434.0099	.00	4.61	-	-	4.61	-
0540231	67	3	37	84/06/25	2206	6.0	16434	462.3452	.00	4.33	-	-	4.33	-
0540233	67	3	37	84/06/25	2225	6.0	14573	434.3725	.00	.00	-	-	-	-
0540235	67	3	37	84/06/25	2243	6.0	15968	436.1285	.00	2.17	-	-	2.17	-
0540237	67	3	37	84/06/25	2315	5.5	12913	390.2428	.00	.00	-	-	-	-
0540239	67	3	37	84/06/25	2331	5.6	13907	410.5664	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES ATLANTIC TOMCOD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. METER REVS.	VOLUME (CU. M.)	(IN NO./1000 CU. M.) TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	OTHER LIFE STAGE
0540314	67	4	42	84/06/27	2137	5.8	16278	451.7343	.00	.00	-	-	-	-
0540316	67	4	42	84/06/27	2208	5.7	14583	424.7182	.00	4.71	-	-	4.71	-
0540318	67	4	42	84/06/27	2228	5.7	14913	429.6666	.00	2.33	-	-	2.33	-
0540391	67	4	42	84/07/03	2333	5.6	13943	411.1580	.00	19.46	-	-	19.46	-
0540397	67	4	42	84/07/04	0112	5.5	15366	427.5397	.00	7.02	-	-	7.02	-
0540153	67	4	43	84/06/18	2230	5.8	13643	411.9989	.00	2.43	-	-	2.43	-
0540165	67	4	43	84/06/18	2257	5.6	14628	421.7672	.00	7.11	-	-	7.11	-
0540320	67	4	43	84/06/27	2251	5.2	13737	394.7254	.00	.00	-	-	-	-
0540322	67	4	43	84/06/27	2319	5.8	14735	431.5069	.00	4.63	-	-	4.63	-
0540324	67	4	43	84/06/27	2356	5.7	14047	416.0980	.00	2.40	-	-	2.40	-
0540326	67	4	43	84/06/28	0017	5.9	15059	439.0691	.00	30.11	-	-	30.11	-
0540328	67	4	43	84/06/28	0051	5.6	14930	426.9143	.00	.00	-	-	-	-
0540330	67	4	43	84/06/28	0115	5.8	13187	403.4144	.00	57.01	-	-	57.01	-
0540393	67	4	43	84/07/04	0003	5.5	13437	429.0794	.00	11.65	-	-	11.65	-
0540395	67	4	43	84/07/04	0048	5.7	14376	423.1255	.00	13.98	-	-	13.98	-
0540159	67	4	44	84/06/18	2119	5.8	14739	430.6183	.00	2.32	-	-	2.32	-
0540161	67	4	44	84/06/18	2150	5.8	4650	168.0255	.00	.00	-	-	-	-
0540332	67	4	44	84/06/28	0139	5.8	13800	414.6424	.00	9.64	-	-	9.64	-
0540334	67	4	44	84/06/28	0201	6.2	13296	415.0679	.00	12.05	-	-	12.05	-
0540336	67	4	45	84/06/28	0225	6.1	11215	365.5861	.00	27.35	-	-	27.35	-
0540156	67	4	46	84/06/18	2039	6.5	3748	301.8476	.00	3.31	-	-	3.31	-
0540338	67	4	46	84/06/28	0245	6.0	13105	406.6223	.00	27.03	-	-	27.03	-
0540340	67	4	46	84/06/28	0309	5.6	13493	403.3543	.00	59.50	-	-	59.50	-
0540343	67	4	46	84/06/28	0340	6.0	12745	399.0946	.00	82.69	-	-	82.69	-
0540345	67	4	46	84/06/28	0412	6.0	13373	461.5621	.00	93.16	-	-	93.16	-
0540346	67	4	46	84/06/28	0436	5.0	11923	380.8877	.00	120.77	-	-	120.77	-
0540141	67	5	47	84/06/17	0058	5.9	15694	448.4168	.00	2.23	-	-	2.23	-
0540142	67	5	47	84/06/17	0117	5.0	16190	407.4632	.00	9.82	-	-	9.82	-
0540145	67	5	47	84/06/17	0147	5.5	12658	395.0366	.00	15.19	-	-	15.19	-
0540148	67	5	47	84/06/17	0233	5.9	12573	393.3019	.00	7.63	-	-	7.63	-
0540155	67	5	47	84/06/17	0418	6.0	11714	376.0384	.00	5.32	-	-	5.32	-
0540137	67	5	49	84/06/16	2355	5.9	12532	392.4306	.00	17.84	-	-	17.84	-
0540134	67	5	50	84/06/16	2300	5.7	16170	445.9331	.00	17.94	-	-	17.94	-
0540136	67	5	50	84/06/16	2321	5.3	6061	215.2935	.00	4.64	-	-	4.64	-
0540117	67	5	51	84/06/16	0155	5.0	10631	332.7952	.00	.00	-	-	-	-
0540120	67	5	51	84/06/16	0237	5.0	11521	352.5797	.00	2.84	-	-	2.84	-
0540121	67	5	51	84/06/16	0253	5.0	10208	323.5739	.00	40.18	-	-	40.18	-
0540124	67	5	51	84/06/16	0330	5.1	11541	355.6049	.00	2.41	-	-	2.41	-
0540125	67	5	51	84/06/16	0351	5.0	11532	353.7139	.00	.00	-	-	-	-
0540128	67	5	51	84/06/16	0442	5.5	12683	385.9560	.00	.00	-	-	-	-
0540131	67	5	51	84/06/16	2209	5.7	15346	435.7365	.00	2.29	-	-	2.29	-
0540113	67	5	52	84/06/16	0046	5.0	8941	233.3613	.00	.00	-	-	-	-
0540116	67	5	52	84/06/16	0143	5.0	9111	237.6333	.00	.00	-	-	-	-
0540101	67	5	53	84/06/15	2047	5.0	10342	319.2858	.00	.00	-	-	-	-
0540105	67	5	53	84/06/15	2150	5.0	10134	323.2611	.00	24.75	-	-	24.75	-
0540110	67	5	53	84/06/15	2331	4.8	9145	293.4715	.00	.00	-	-	-	-
0540111	67	5	53	84/06/15	2350	5.0	10437	328.6217	.00	3.04	-	-	3.04	-

CON EDISON GEAR COMPARISON STUDY
OBLIQUE FRAMES

SPECIES BAY ANCHOVY

TOW & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO. METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UIC LIFE STAGE
									(IN NO./1000 CU. M.)					
0540216	67	3	34	84/06/20	0205	5.6	14389	424.9873	.00	.00	-	-	-	-
0540218	67	3	34	84/06/20	0222	5.9	13062	413.3755	.00	.00	-	-	-	-
0540222	67	3	34	84/06/20	0324	4.2	15223	411.1533	.00	.00	-	-	-	-
0540272	67	3	34	84/06/26	2123	5.6	16036	447.5733	404.40	23.11	-	20.11	-	-
0540274	67	3	34	84/06/26	2139	5.5	16607	453.4540	9537.72	50.30	-	50.30	-	-
0540276	67	3	34	84/06/26	2213	5.6	12404	383.0235	47911.44	131.43	-	35.17	-	[illegible]
0540278	67	3	34	84/06/26	2254	5.0	11076	342.0055	[illegible]	73.13	[illegible]	[illegible]	-	[illegible]
0540283	67	3	34	84/06/26	2338	5.7	13438	436.9637	517.70	77.31	-	77.32	-	-
0540285	67	3	34	84/06/26	2357	5.7	13335	407.2038	23.47	31.73	-	31.73	-	-
0540349	67	3	34	84/07/02	2036	5.5	13379	403.5695	14.87	6482.15	-	6415.23	-	66.10
0540351	67	3	34	84/07/02	2053	5.6	14053	412.9456	200.93	7749.21	-	7749.21	-	-
0540353	67	3	34	84/07/02	2109	5.5	13580	401.5306	14.93	2607.42	-	2607.42	-	-
0540355	67	3	34	84/07/02	2127	5.6	13436	403.4069	.00	2706.74	-	2706.74	-	-
0540357	67	3	34	84/07/02	2147	5.5	12327	390.4936	.00	7334.20	-	7334.20	-	-
0540359	67	3	34	84/07/02	2205	5.3	13605	402.3466	.00	1757.19	-	1757.19	-	-
0540361	67	3	34	84/07/02	2226	5.2	13374	388.5376	2.57	1050.03	-	1050.03	-	-
0540363	67	3	34	84/07/02	2244	5.5	13353	403.1415	[illegible]	1855.43	-	1798.38	-	57.05
0540209	67	3	35	84/06/20	0046	5.8	13888	416.4107	.00	.00	-	-	-	-
0540211	67	3	35	84/06/20	0105	5.8	14371	434.1847	.00	.00	-	-	-	-
0540214	67	3	35	84/06/20	0149	5.8	15464	441.3166	.00	.00	-	-	-	-
0540263	67	3	35	84/06/26	0425	5.5	14069	409.7801	.00	7.32	-	7.32	-	-
0540266	67	3	35	84/06/26	0444	5.6	16523	444.7321	37.69	8.99	-	6.99	-	-
0540270	67	3	35	84/06/26	2033	5.6	14503	421.4205	9275.77	536.21	-	529.15	-	[illegible]
0540205	67	3	36	84/06/19	2357	5.7	13543	408.2432	.00	.00	-	-	-	-
0540207	67	3	36	84/06/20	0016	5.8	13563	410.5278	.00	.00	-	-	-	-
0540251	67	3	36	84/06/26	0136	5.6	14959	426.4837	.00	25.73	-	23.43	-	2.34
0540254	67	3	36	84/06/26	0213	5.6	13638	407.0673	27.02	2.43	-	2.43	-	-
0540256	67	3	36	84/06/26	0234	5.6	9744	321.6590	.00	15.54	-	12.44	-	3.11
0540258	67	3	36	84/06/26	0251	5.7	15252	434.4600	2.30	2.30	-	2.30	-	-
0540260	67	3	36	84/06/26	0317	5.7	14772	427.5861	.00	37.42	-	35.08	-	2.34
0540262	67	3	36	84/06/26	0334	5.5	13955	392.8424	5.09	63.64	-	63.64	-	-
0540264	67	3	36	84/06/26	0402	5.5	14605	417.6665	11.97	186.75	-	146.05	-	40.70
0540371	67	3	36	84/07/03	0038	5.6	16402	443.5601	.00	2026.75	-	2026.75	-	-
0540374	67	3	36	84/07/03	0109	5.4	17438	439.9262	4.55	1995.73	-	1995.73	-	-
0540376	67	3	36	84/07/03	0123	5.2	14412	402.8171	.00	2745.66	-	2745.66	-	-
0540378	67	3	36	84/07/03	0141	5.4	13692	400.4414	7.49	12376.34	-	12376.34	-	-
0540380	67	3	36	84/07/03	0156	5.5	13255	396.3752	7.57	10979.50	-	10825.60	-	153.89
0540191	67	3	37	84/06/19	2108	5.8	8674	294.6367	.00	.00	-	-	-	-
0540193	67	3	37	84/06/19	2131	5.8	10155	354.7718	.00	.00	-	-	-	-
0540195	67	3	37	84/06/19	2152	5.8	15162	437.0203	.00	.00	-	-	-	-
0540227	67	3	37	84/06/25	2121	5.0	16276	407.8713	.00	56.39	-	49.04	-	7.36
0540229	67	3	37	84/06/25	2140	6.0	14552	434.0099	.00	20.74	-	20.74	-	-
0540231	67	3	37	84/06/25	2206	6.0	16434	462.3402	[illegible]	19.47	-	19.47	-	-
0540233	67	3	37	84/06/25	2225	6.0	14373	434.3725	195.68	32.23	-	32.23	-	-
0540235	67	3	37	84/06/25	2243	6.0	15968	453.1285	[illegible]	19.73	-	19.73	-	-
0540237	67	3	37	84/06/25	2315	5.5	12713	390.2428	.00	61.50	-	48.69	-	12.81
0540239	67	3	37	84/06/25	2331	5.6	13907	410.5664	.00	14.61	-	14.61	-	-

CON EDISON BEAM COMPARISON STUDY
OBLIQUE TRAWLS

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEQ	RIVER MILE	SAMPLE DATE	TIME	SUB STRING	NO. METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNK LIFE STAGE
0540119	67	4	42	84/06/27	2137	3.6	10278	451.7543	125.39	119.54	-	119.59	-	-
0540116	67	4	42	84/06/27	2204	5.7	10548	429.7162	253.70	1581.31	-	1550.29	-	31.02
0540114	67	4	42	84/06/27	2228	5.7	10914	429.6566	6.38	302.34	-	302.34	-	-
[illegible]	67	4	42	84/07/03	1339	5.6	13993	611.1580	.00	277.27	-	277.27	-	-
0540037	67	4	42	[illegible]	0112	5.5	10366	427.5317	.00	143.02	-	143.02	-	-
0540363	67	4	43	[illegible]	2230	5.8	15643	[illegible]	.00	.00	-	-	-	-
[illegible]	67	4	43	[illegible]	2257	5.6	14620	421.7872	[illegible]	.00	-	-	-	-
[illegible]	67	4	43	84/06/27	2251	[illegible]	13727	[illegible]	311.81	[illegible]	-	[illegible]	-	-
[illegible]	67	4	43	84/06/27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	550.73	-	[illegible]	-	[illegible]
[illegible]	67	4	43	84/06/27	2356	[illegible]	14041	[illegible]	2819.60	278.31	-	203.31	-	[illegible]
0540324	67	4	43	84/06/28	0017	5.9	15059	459.0595	1279.05	180.76	-	125.42	-	55.34
0540326	67	4	43	84/06/28	0051	5.5	14930	426.3148	[illegible]	208.47	-	208.47	-	-
0540330	67	4	43	84/06/29	0115	5.8	15187	403.4146	561.51	193.53	-	193.53	-	-
0540333	67	4	43	84/07/04	0003	5.9	15457	425.0744	.00	252.72	-	252.72	-	-
0540341	67	4	43	84/07/04	0049	5.7	14275	422.1255	.00	181.77	-	181.77	-	-
0540155	67	4	44	84/06/12	2119	5.8	14735	430.5142	.00	.00	-	-	-	-
0540161	67	4	44	84/06/12	2151	5.7	4650	162.0255	.00	.00	-	-	-	-
0540332	67	4	44	84/06/28	1139	5.6	15800	[illegible]	235.11	337.44	-	315.75	-	21.69
0540334	67	4	44	84/06/28	0201	6.2	13245	425.0675	1159.02	457.37	-	457.37	-	-
0540336	67	4	45	84/06/28	0225	5.1	11215	365.3865	752.81	1403.23	-	1345.74	-	[illegible]
0540156	67	4	46	84/06/12	2333	5.5	8749	301.8475	.00	.00	-	-	-	-
0540338	67	4	46	84/06/28	0246	6.0	13105	405.6225	24.59	127.89	-	113.13	-	14.76
0540340	67	4	46	84/06/28	0319	5.6	13493	433.3543	556.64	615.66	-	579.99	-	35.67
0540343	67	4	46	84/06/28	0340	6.0	12745	399.3946	160.41	273.12	-	260.19	-	12.93
0540345	67	4	46	84/06/28	0412	6.0	13373	461.5521	75.63	.00	-	-	-	-
0540346	67	4	46	84/06/28	0435	6.0	11323	380.6877	553.97	512.45	-	312.43	-	-
0540141	67	5	47	84/06/17	0059	5.9	15634	448.4156	.00	.00	-	-	-	-
0540142	67	5	47	84/06/17	0113	5.0	16247	407.4532	.00	.00	-	-	-	-
0540145	67	5	47	84/06/17	0147	5.9	12658	395.0966	.00	.00	-	-	-	-
0540148	67	5	47	84/06/17	0235	5.9	12573	393.3019	.00	.00	-	-	-	-
0540155	67	5	47	84/06/17	0418	6.0	11714	376.0384	.00	.00	-	-	-	-
0540137	67	5	49	84/06/16	2333	5.3	12352	392.4306	.00	.00	-	-	-	-
0540134	67	5	50	84/06/16	2300	5.7	16170	445.9331	.00	.00	-	-	-	-
0540135	67	5	50	84/06/16	2321	5.9	6051	213.2935	.00	.00	-	-	-	-
0540117	67	5	51	84/06/16	0155	5.0	10631	332.7952	.00	.00	-	-	-	-
0540120	67	5	51	84/06/16	0237	5.0	11621	352.5737	.00	.00	-	-	-	-
0540121	67	5	51	84/06/16	0253	5.0	10208	323.5739	.00	.00	-	-	-	-
0540124	67	5	51	84/06/16	0333	5.1	11641	355.6049	.00	.00	-	-	-	-
0540125	67	5	51	84/06/16	0351	5.0	11682	333.7139	.00	.00	-	-	-	-
0540128	67	5	51	84/06/16	0442	5.5	12683	385.9560	.00	.00	-	-	-	-
0540131	67	5	51	84/06/16	2209	5.7	15346	435.7365	.00	.00	-	-	-	-
0540113	67	5	52	84/06/16	0046	5.0	8941	293.5619	.00	.00	-	-	-	-
0540116	67	5	52	84/06/16	0143	5.0	9111	297.6333	.00	.00	-	-	-	-
0540101	67	5	53	84/06/15	2047	5.0	10342	339.2858	.00	.00	-	-	-	-
0540105	67	5	53	84/06/15	2150	5.0	13134	323.2611	.00	.00	-	-	-	-
0540110	67	5	53	84/06/15	2331	4.8	9143	295.4715	.00	.00	-	-	-	-
0540111	67	5	53	84/06/15	2350	5.0	10437	328.6217	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES STRIPED BASS

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAL	YOLK-SAC	POST YOLK-SAC	JUVENILE	DIE LIFE STAGE
0540215	65	3	34	84/06/20	0204	5.0	13414	381.5837	.00	734.96	5.24	699.72	-	-
0540217	65	3	34	84/06/20	0221	5.0	14366	393.1690	.00	226.37	2.59	223.82	-	-
0540219	65	3	34	84/06/20	0249	5.0	6042	211.2560	.00	132.54	-	132.54	-	-
0540271	65	3	34	84/06/26	2104	5.0	9026	295.5058	.00	16.92	-	16.92	-	-
0540273	65	3	34	84/06/26	2138	5.0	5950	317.7319	.00	3.15	-	3.15	-	-
0540275	65	3	34	84/06/26	2211	5.0	16139	407.2396	.00	7.37	-	7.37	-	-
0540275	65	3	34	84/06/26	2252	5.0	12894	374.1154	.00	2.67	-	2.67	-	-
0540282	65	3	34	84/06/26	2326	5.0	14375	393.2654	.00	15.26	-	15.26	-	-
0540284	65	3	34	84/06/26	2351	5.0	14470	394.2672	.00	2.54	-	2.54	-	-
0540348	65	3	34	84/07/02	2035	5.0	13742	385.8841	.00	103.66	-	103.66	-	-
0540350	65	3	34	84/07/02	2052	5.0	13830	386.9831	.00	49.10	-	49.10	-	-
0540352	65	3	34	84/07/02	2108	5.0	12410	366.4623	.00	68.22	-	68.22	-	-
0540354	65	3	34	84/07/02	2126	5.0	13340	380.5693	.00	36.79	-	36.79	-	-
0540356	65	3	34	84/07/02	2146	5.0	13167	378.1349	.00	44.96	-	44.96	-	-
0540358	65	3	34	84/07/02	2204	5.0	13627	384.4129	.00	210.71	-	210.71	-	-
0540360	65	3	34	84/07/02	2225	5.0	13566	388.6355	.00	2215.44	-	2215.44	-	-
0540362	65	3	34	84/07/02	2243	5.0	13207	378.7056	.00	1518.33	-	1518.33	-	-
0540208	65	3	35	84/06/20	0047	5.0	13128	377.5735	.00	373.44	-	373.44	-	-
0540210	65	3	35	84/06/20	0104	5.0	13986	388.8738	.00	444.87	-	444.87	-	-
0540212	65	3	35	84/06/20	0132	5.0	14358	389.7215	.00	1170.07	-	1167.50	-	2.57
0540265	65	3	35	84/06/26	0424	5.0	13855	387.2910	.00	170.41	-	170.41	-	-
0540267	65	3	35	84/06/26	0443	5.0	7698	260.2119	.00	284.38	-	284.38	-	-
0540269	65	3	35	84/06/26	2037	5.0	14138	390.6449	.00	115.19	-	115.19	-	-
0540204	65	3	36	84/06/19	2356	5.0	13244	379.2253	.00	160.85	-	160.85	-	-
0540206	65	3	36	84/06/20	0015	5.0	13610	384.1921	.00	187.41	-	187.41	-	-
0540252	65	3	36	84/06/26	0158	5.0	13449	382.0579	.00	232.18	-	232.18	-	-
0540253	65	3	36	84/06/26	0211	5.0	10596	332.2627	.00	186.60	-	186.60	-	-
0540255	65	3	36	84/06/26	0233	5.0	12959	375.0920	.00	103.97	-	103.97	-	-
0540257	65	3	36	84/06/26	0250	5.0	10932	339.0810	.00	53.08	-	53.08	-	-
0540259	65	3	36	84/06/26	0310	5.0	13813	386.7726	.00	121.52	-	121.52	-	-
0540261	65	3	36	84/06/26	0333	5.0	13112	377.3425	.00	103.35	-	103.35	-	-
0540263	65	3	36	84/06/26	0407	5.0	12185	362.6789	.00	135.11	-	135.11	-	-
0540370	65	3	36	84/07/03	0037	5.0	15038	399.6695	.00	430.36	-	430.36	-	-
0540372	65	3	36	84/07/03	0055	5.0	13761	386.1234	.00	279.70	-	279.70	-	-
0540375	65	3	36	84/07/03	0122	5.0	14009	389.1463	.00	639.86	-	639.86	-	-
0540377	65	3	36	84/07/03	0140	5.0	13297	379.9724	.00	392.13	-	392.13	-	-
0540379	65	3	36	84/07/03	0155	5.0	13097	377.1249	.00	365.93	-	365.93	-	-
0540190	65	3	37	84/06/19	2107	5.0	14843	397.9290	.00	412.13	2.51	409.62	-	-
0540192	65	3	37	84/06/19	2130	5.0	13622	384.3481	.00	1475.23	7.81	1451.81	-	15.61
0540194	65	3	37	84/06/19	2151	5.0	13125	377.5306	.00	392.02	-	392.02	-	-
0540226	65	3	37	84/06/25	2120	5.0	5702	200.5973	.00	14.96	-	14.96	-	-
0540228	65	3	37	84/06/25	2139	5.0	15043	399.7126	.00	130.09	-	130.09	-	-
0540230	65	3	37	84/06/25	2205	5.0	11171	343.9052	.00	81.42	-	81.42	-	-
0540232	65	3	37	84/06/25	2224	5.0	13979	388.7905	.00	46.30	-	46.30	-	-
0540234	65	3	37	84/06/25	2242	5.0	5018	178.5892	.00	22.40	-	22.40	-	-
0540236	65	3	37	84/06/25	2314	5.0	13555	383.4717	.00	78.23	-	78.23	-	-
0540238	65	3	37	84/06/25	2330	5.0	14575	395.3419	.00	55.65	-	55.65	-	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES STRIPED BASS

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	(IN NO./1000 CU. M.) TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0540313	65	4	42	84/06/27	2136	5.0	15056	399.8241	.00	537.74	-	535.24	-	2.50
0540315	65	4	42	84/06/27	2207	5.0	13673	385.0062	.00	374.02	-	371.42	-	2.60
0540317	65	4	42	84/06/27	2227	5.0	13464	382.2600	.00	287.76	-	287.76	-	-
0540390	65	4	42	84/07/03	2339	5.0	13416	381.6109	.00	183.43	-	183.43	-	-
0540396	65	4	42	84/07/04	0111	5.0	15819	425.4234	.00	76.46	-	76.46	-	-
0540162	65	4	43	84/06/18	2226	5.0	12507	368.0495	.00	1056.12	51.62	594.43	-	10.47
0540166	65	4	43	84/06/18	2320	5.0	13168	378.1492	.00	669.07	55.55	608.23	-	5.29
0540319	65	4	43	84/06/27	2250	5.0	14734	396.9339	.00	138.57	-	138.57	-	-
0540321	65	4	43	84/06/27	2318	5.0	12964	375.1667	.00	213.24	-	213.24	-	-
0540323	65	4	43	84/06/27	2355	5.0	15319	401.9654	.00	333.85	-	333.85	-	-
0540325	65	4	43	84/06/28	0016	5.0	14163	390.9295	.00	703.45	-	703.45	-	-
0540327	65	4	43	84/06/28	0050	5.0	13752	386.0102	.00	189.11	-	189.11	-	-
0540329	65	4	43	84/06/28	0114	5.0	12736	371.6906	.00	608.03	-	608.03	-	-
0540392	65	4	43	84/07/04	0002	5.0	13250	379.3138	.00	158.18	-	158.18	-	-
0540394	65	4	43	84/07/04	0047	5.0	15077	400.0032	.00	82.50	-	82.50	-	-
0540158	65	4	44	84/06/18	2117	5.0	14306	392.5421	.00	1487.74	68.78	1396.03	-	22.93
0540160	65	4	44	84/06/18	2148	5.0	12850	373.9034	.00	492.11	72.21	419.89	-	-
0540331	65	4	44	84/06/28	0138	5.0	13003	375.7462	.00	902.20	-	902.20	-	-
0540333	65	4	44	84/06/28	0203	5.0	14986	359.2171	.00	152.80	-	152.80	-	-
0540335	65	4	45	84/06/28	0224	5.0	14451	393.8593	.00	3986.19	-	3986.19	-	-
0540157	65	4	46	84/06/18	2038	5.0	14841	397.9105	.00	427.23	35.18	382.00	-	10.05
0540337	65	4	46	84/06/28	0245	5.0	13039	375.8350	.00	1654.98	-	1654.98	-	-
0540341	65	4	46	84/06/28	0323	5.0	13583	383.8396	.00	838.89	-	838.89	-	-
0540342	65	4	46	84/06/28	0339	5.0	12195	362.8500	.00	1204.35	-	1204.35	-	-
0540344	65	4	46	84/06/28	0411	5.0	11047	341.4209	.00	1610.91	-	1610.91	-	-
0540347	65	4	46	84/06/28	0446	5.0	13569	383.6559	.00	1300.64	20.85	1279.79	-	-
0540139	65	5	47	84/06/17	0030	5.0	9135	298.2310	10.06	985.81	352.08	633.74	-	-
0540143	65	5	47	84/06/17	0117	5.0	4178	150.6390	6.64	86.32	13.28	66.40	-	6.64
0540146	65	5	47	84/06/17	0206	5.0	10423	328.3168	42.64	350.27	42.64	292.40	-	15.23
0540150	65	5	47	84/06/17	0300	5.0	15038	399.6695	.00	610.50	117.60	492.91	-	-
0540154	65	5	47	84/06/17	0402	5.0	18647	409.2566	.00	1023.21	107.51	916.30	-	-
0540138	65	5	49	84/06/16	2354	5.0	10658	333.3685	95.99	1079.89	278.97	800.92	-	-
0540132	65	5	50	84/06/16	2236	5.0	11939	358.3812	.00	186.35	2.19	184.16	-	-
0540135	65	5	50	84/06/16	2320	5.0	10059	320.2199	87.44	1533.32	1217.91	277.93	-	37.47
0540118	65	5	51	84/06/16	0210	5.0	12005	359.5506	13.91	225.28	44.50	169.66	-	11.12
0540119	65	5	51	84/06/16	0223	5.0	4592	164.5238	.00	85.09	-	85.09	-	-
0540122	65	5	51	84/06/16	0303	5.0	3674	133.3636	7.50	539.88	172.46	359.92	-	7.50
0540123	65	5	51	84/06/16	0320	5.0	4003	144.6578	27.65	138.26	34.56	103.69	-	-
0540126	65	5	51	84/06/16	0406	5.0	4880	174.0619	.00	1390.31	528.55	861.76	-	-
0540127	65	5	51	84/06/16	0417	5.0	5660	159.2673	.00	230.85	95.35	135.50	-	-
0540130	65	5	51	84/06/16	2146	5.0	13942	388.3480	2.58	1215.40	43.78	1171.62	-	-
0540114	65	5	52	84/06/16	0101	5.0	9582	309.1205	16.17	187.63	80.87	106.75	-	-
0540115	65	5	52	84/06/16	0117	5.0	3743	135.7435	117.87	523.05	221.01	302.04	-	-
0540104	65	5	53	84/06/15	2131	5.1	8912	293.9203	265.38	149.70	88.46	54.44	-	6.80
0540106	65	5	53	84/06/15	2207	5.0	3811	138.0832	.00	1839.47	333.13	1477.37	-	28.97
0540107	65	5	53	84/06/15	2241	5.0	4838	172.6784	23.16	735.47	173.73	509.62	-	52.12
0540112	65	5	53	84/06/16	0004	5.0	3655	132.7073	964.53	1318.69	723.40	580.22	-	15.07

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES WHITE PERCH

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
									(IN NO./1000 CU. M.)					
0540215	65	3	34	84/06/20	0204	5.0	13414	381.5837	.00	65.52	2.62	62.90	-	-
0540217	65	3	34	84/06/20	0221	5.0	14566	393.1690	.00	139.89	2.54	137.35	-	-
0540219	65	3	34	84/06/20	0249	5.0	6042	211.2560	.00	56.80	-	56.80	-	-
0540271	65	3	34	84/06/26	2104	5.0	9026	295.5058	.00	3.38	-	3.38	-	-
0540273	65	3	34	84/06/26	2138	5.0	9950	317.7319	.00	3.15	-	3.15	-	-
0540275	65	3	34	84/06/26	2211	5.0	16139	407.2096	.00	.00	-	-	-	-
0540279	65	3	34	84/06/26	2252	5.0	12894	374.1154	.00	.00	-	-	-	-
0540282	65	3	34	84/06/26	2326	5.0	14375	393.2654	.00	.00	-	-	-	-
0540284	65	3	34	84/06/26	2351	5.0	14470	394.2672	.00	.00	-	-	-	-
0540348	65	3	34	84/07/02	2035	5.0	13742	385.8841	.00	28.51	-	28.51	-	-
0540350	65	3	34	84/07/02	2052	5.0	13830	386.9831	.00	18.09	-	18.09	-	-
0540352	65	3	34	84/07/02	2108	5.0	12410	366.4623	.00	73.68	-	73.68	-	-
0540354	65	3	34	84/07/02	2126	5.0	13340	380.5693	.00	13.14	-	13.14	-	-
0540356	65	3	34	84/07/02	2146	5.0	13167	378.1349	.00	31.73	-	31.73	-	-
0540358	65	3	34	84/07/02	2204	5.0	13627	384.4129	.00	286.15	-	286.15	-	-
0540360	65	3	34	84/07/02	2225	5.0	13966	388.6355	.00	738.48	-	738.48	-	-
0540362	65	3	34	84/07/02	2243	5.0	13207	378.7056	.00	311.59	-	311.59	-	-
0540208	65	3	35	84/06/20	0047	5.0	13128	377.5739	.00	140.37	-	137.72	-	2.65
0540210	65	3	35	84/06/20	0104	5.0	13986	388.8738	.00	118.29	-	118.29	-	-
0540212	65	3	35	84/06/20	0132	5.0	14058	389.7215	.00	105.20	-	105.20	-	-
0540265	65	3	35	84/06/26	0424	5.0	13855	387.2910	.00	7.75	-	7.75	-	-
0540267	65	3	35	84/06/26	0443	5.0	7698	260.2119	.00	11.53	-	11.53	-	-
0540269	65	3	35	84/06/26	2037	5.0	14138	390.6449	.00	2.56	-	2.56	-	-
0540204	65	3	36	84/06/19	2356	5.0	13244	379.2293	.00	52.74	5.27	47.46	-	-
0540206	65	3	36	84/06/20	0015	5.0	13610	384.1921	.00	39.04	2.60	36.44	-	-
0540252	65	3	36	84/06/26	0158	5.0	13449	382.0579	.00	15.70	-	15.70	-	-
0540253	65	3	36	84/06/26	0211	5.0	10606	332.2627	.00	6.02	-	6.02	-	-
0540255	65	3	36	84/06/26	0233	5.0	12959	375.0920	.00	8.00	-	8.00	-	-
0540257	65	3	36	84/06/26	0250	5.0	10932	339.0810	.00	14.75	-	14.75	-	-
0540259	65	3	36	84/06/26	0310	5.0	13813	386.7726	.00	7.76	-	7.76	-	-
0540261	65	3	36	84/06/26	0333	5.0	13112	377.3425	.00	5.30	-	5.30	-	-
0540263	65	3	36	84/06/26	0407	5.0	12185	362.6789	.00	13.79	-	13.79	-	-
0540370	65	3	36	84/07/03	0037	5.0	15038	399.6695	.00	357.80	-	357.80	-	-
0540372	65	3	36	84/07/03	0055	5.0	13761	386.1234	.00	251.22	-	251.22	-	-
0540375	65	3	36	84/07/03	0122	5.0	14009	389.1463	.00	269.82	-	269.82	-	-
0540377	65	3	36	84/07/03	0140	5.0	13297	379.9724	.00	197.38	-	197.38	-	-
0540379	65	3	36	84/07/03	0155	5.0	13097	377.1249	.00	116.67	-	116.67	-	-
0540190	65	3	37	84/06/19	2107	5.0	14843	397.9290	.00	10.05	-	10.05	-	-
0540192	65	3	37	84/06/19	2130	5.0	13622	384.3481	.00	163.91	-	150.90	-	13.01
0540194	65	3	37	84/06/19	2151	5.0	13125	377.5306	.00	259.58	50.33	203.96	-	5.30
0540226	65	3	37	84/06/25	2120	5.0	5702	200.5973	.00	4.99	-	4.99	-	-
0540228	65	3	37	84/06/25	2139	5.0	15043	399.7126	.00	22.52	-	22.52	-	-
0540230	65	3	37	84/06/25	2205	5.0	11171	343.9052	.00	2.91	-	2.91	-	-
0540232	65	3	37	84/06/25	2224	5.0	13979	388.7905	.00	5.14	-	5.14	-	-
0540234	65	3	37	84/06/25	2242	5.0	5018	178.5892	5.60	.00	-	-	-	-
0540236	65	3	37	84/06/25	2314	5.0	13555	383.4717	.00	.00	-	-	-	-
0540238	65	3	37	84/06/25	2330	5.0	14575	395.3419	.00	5.06	-	5.06	-	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES WHITE PERCH

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
									(IN NO./1000 CU. M.)					
0540313	65	4	42	84/06/27	2136	5.0	15056	399.8241	.00	262.62	-	262.62	-	-
0540315	65	4	42	84/06/27	2207	5.0	13673	385.0062	.00	667.52	-	667.52	-	-
0540317	65	4	42	84/06/27	2227	5.0	13464	382.2600	.00	497.04	-	497.04	-	-
0540350	65	4	42	84/07/03	2338	5.0	13416	381.6109	.00	183.43	-	183.43	-	-
0540396	65	4	42	84/07/04	0111	5.0	15819	405.4234	.00	234.32	-	234.32	-	-
0540162	65	4	43	84/06/18	2228	5.0	12507	368.0495	.00	95.10	-	95.10	-	-
0540166	65	4	43	84/06/18	2320	5.0	13168	378.1492	.00	89.91	5.29	84.62	-	-
0540319	65	4	43	84/06/27	2250	5.0	14734	396.9039	.00	37.79	-	37.79	-	-
0540321	65	4	43	84/06/27	2318	5.0	12964	375.1667	.00	130.61	-	130.61	-	-
0540323	65	4	43	84/06/27	2355	5.0	15319	401.9654	.00	181.61	-	181.61	-	-
0540325	65	4	43	84/06/28	0016	5.0	14163	390.9255	5.12	365.79	-	365.79	-	-
0540327	65	4	43	84/06/28	0050	5.0	13752	386.0102	.00	165.80	-	165.80	-	-
0540329	65	4	43	84/06/28	0114	5.0	12736	371.6906	80.71	699.51	-	699.51	-	-
0540392	65	4	43	84/07/04	0002	5.0	13250	379.3138	.00	192.45	-	192.45	-	-
0540394	65	4	43	84/07/04	0047	5.0	15077	400.0032	.00	385.00	-	385.00	-	-
0540158	65	4	44	84/06/18	2117	5.0	14308	392.5421	.00	109.54	-	109.54	-	-
0540160	65	4	44	84/06/18	2148	5.0	12880	373.9034	.00	34.77	-	34.77	-	-
0540331	65	4	44	84/06/28	0138	5.0	13003	375.7462	2.66	369.93	-	369.93	-	-
0540333	65	4	44	84/06/28	0200	5.0	14986	399.2171	.00	137.77	-	137.77	-	-
0540335	65	4	45	84/06/28	0224	5.0	14431	393.8593	.00	1767.13	-	1767.13	-	-
0540157	65	4	46	84/06/18	2038	5.0	14841	397.9105	.00	22.62	-	22.62	-	-
0540337	65	4	46	84/06/28	0245	5.0	13009	375.8350	7.98	1319.73	-	1319.73	-	-
0540341	65	4	46	84/06/28	0323	5.0	13583	383.8356	.00	200.60	-	200.60	-	-
0540342	65	4	46	84/06/28	0339	5.0	12195	362.8500	.00	931.51	-	931.51	-	-
0540344	65	4	46	84/06/28	0411	5.0	11047	341.4209	.00	474.49	-	474.49	-	-
0540347	65	4	46	84/06/28	0446	5.0	13569	383.6559	.00	761.10	33.88	727.21	-	-
0540139	65	5	47	84/06/17	0030	5.0	9135	298.2310	3.35	53.65	6.71	46.94	-	-
0540143	65	5	47	84/06/17	0117	5.0	4178	150.6090	.00	6.64	-	6.64	-	-
0540146	65	5	47	84/06/17	0206	5.0	10423	328.3168	24.37	9.14	-	9.14	-	-
0540150	65	5	47	84/06/17	0300	5.0	15038	399.6695	2.50	80.07	2.50	77.56	-	-
0540154	65	5	47	84/06/17	0402	5.0	18647	409.2566	.00	100.18	-	100.18	-	-
0540138	65	5	49	84/06/16	2354	5.0	10658	333.3685	12.00	68.99	-	68.99	-	-
0540132	65	5	50	84/06/16	2236	5.0	11339	358.3812	.00	22.32	2.79	19.53	-	-
0540135	65	5	50	84/06/16	2320	5.0	10059	320.2159	3.12	137.41	18.74	118.67	-	-
0540118	65	5	51	84/06/16	0210	5.0	12005	359.5506	.00	19.47	-	13.91	-	5.56
0540119	65	5	51	84/06/16	0223	5.0	4592	164.5238	.00	6.08	-	6.08	-	-
0540122	65	5	51	84/06/16	0303	5.0	3674	133.3636	7.50	29.99	-	29.99	-	-
0540123	65	5	51	84/06/16	0320	5.0	4003	144.6578	.00	34.56	-	34.56	-	-
0540126	65	5	51	84/06/16	0406	5.0	4880	174.0619	5.75	22.98	5.75	17.24	-	-
0540127	65	5	51	84/06/16	0417	5.0	5660	199.2673	.00	30.11	5.02	25.09	-	-
0540130	65	5	51	84/06/16	2146	5.0	13942	388.3480	.00	36.05	-	36.05	-	-
0540114	65	5	52	84/06/16	0101	5.0	9582	309.1205	6.47	19.41	9.70	9.70	-	-
0540115	65	5	52	84/06/16	0117	5.0	3743	135.7435	7.37	14.73	7.37	7.37	-	-
0540104	65	5	53	84/06/15	2131	5.1	8912	293.9203	3.40	23.82	6.80	17.01	-	-
0540106	65	5	53	84/06/15	2207	5.0	3811	138.0832	.00	188.29	-	181.05	-	7.24
0540107	65	5	53	84/06/15	2241	5.0	4838	172.6784	.00	69.49	-	69.49	-	-
0540112	65	5	53	84/06/16	0004	5.0	3655	132.7073	105.50	22.61	15.07	7.54	-	-

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CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES ALOSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0540215	65	3	34	84/06/20	0204	5.0	13414	381.5837	.00	.00	-	-	-	-
0540217	65	3	34	84/06/20	0221	5.0	14366	393.1690	.00	.00	-	-	-	-
0540219	65	3	34	84/06/20	0249	5.0	6042	211.2560	.00	.00	-	-	-	-
0540271	65	3	34	84/06/26	2104	5.0	9026	293.5058	.00	.00	-	-	-	-
0540273	65	3	34	84/06/26	2138	5.0	9950	317.7319	.00	.00	-	-	-	-
0540275	65	3	34	84/06/26	2211	5.0	16139	407.2096	.00	.00	-	-	-	-
0540279	65	3	34	84/06/26	2252	5.0	12894	374.1154	.00	.00	-	-	-	-
0540282	65	3	34	84/06/26	2326	5.0	14375	393.2654	.00	.00	-	-	-	-
0540284	65	3	34	84/06/26	2351	5.0	14470	394.2672	.00	.00	-	-	-	-
0540349	65	3	34	84/07/02	2035	5.0	13742	385.8641	.00	.00	-	-	-	-
0540350	65	3	34	84/07/02	2052	5.0	13830	386.9831	.00	.00	-	-	-	-
0540352	65	3	34	84/07/02	2108	5.0	12410	366.4623	.00	.00	-	-	-	-
0540354	65	3	34	84/07/02	2126	5.0	13340	380.5693	.00	.00	-	-	-	-
0540356	65	3	34	84/07/02	2146	5.0	13167	378.1349	.00	.00	-	-	-	-
0540358	65	3	34	84/07/02	2204	5.0	13627	384.4129	.00	.00	-	-	-	-
0540360	65	3	34	84/07/02	2225	5.0	13966	388.6355	.00	.00	-	-	-	-
0540362	65	3	34	84/07/02	2243	5.0	13207	378.7056	.00	2.65	-	2.65	-	-
0540208	65	3	35	84/06/20	0047	5.0	13128	377.5739	.00	.00	-	-	-	-
0540210	65	3	35	84/06/20	0104	5.0	13986	388.8738	.00	.00	-	-	-	-
0540212	65	3	35	84/06/20	0132	5.0	14058	389.7215	.00	.00	-	-	-	-
0540265	65	3	35	84/06/26	0424	5.0	13855	387.2910	.00	.00	-	-	-	-
0540267	65	3	35	84/06/26	0443	5.0	7698	260.2119	.00	.00	-	-	-	-
0540269	65	3	35	84/06/26	2037	5.0	14138	390.6449	.00	13.18	-	13.18	-	-
0540204	65	3	36	84/06/19	2356	5.0	13244	379.2293	.00	.00	-	-	-	-
0540206	65	3	36	84/06/20	0015	5.0	13610	384.1521	.00	.00	-	-	-	-
0540252	65	3	36	84/06/26	0155	5.0	13449	382.0519	.00	.00	-	-	-	-
0540253	65	3	36	84/06/26	0211	5.0	10606	332.2627	.00	.00	-	-	-	-
0540255	65	3	36	84/06/26	0233	5.0	12959	375.0920	.00	.00	-	-	-	-
0540257	65	3	36	84/06/26	0250	5.0	10932	339.0810	.00	.00	-	-	-	-
0540259	65	3	36	84/06/26	0310	5.0	13813	386.7726	.00	2.65	-	2.65	-	-
0540261	65	3	36	84/06/26	0333	5.0	13112	377.3425	.00	.00	-	-	-	-
0540263	65	3	36	84/06/26	0407	5.0	12185	362.6789	.00	.00	-	-	-	-
0540370	65	3	36	84/07/03	0037	5.0	15038	399.6695	.00	.00	-	-	-	-
0540372	65	3	36	84/07/03	0055	5.0	13761	386.1234	.00	.00	-	-	-	-
0540375	65	3	36	84/07/03	0122	5.0	14309	389.1463	.00	.00	-	-	-	-
0540377	65	3	36	84/07/03	0140	5.0	13297	379.9724	.00	.00	-	-	-	-
0540379	65	3	36	84/07/03	0155	5.0	13097	377.1249	.00	7.54	-	7.54	-	-
0540190	65	3	37	84/06/19	2107	5.0	14843	397.9250	.00	7.81	-	2.60	-	5.20
0540192	65	3	37	84/06/19	2130	5.0	13622	384.3481	.00	7.95	-	7.95	-	-
0540194	65	3	37	84/06/19	2151	5.0	13125	377.5306	.00	.00	-	-	-	-
0540226	65	3	37	84/06/25	2120	5.0	5702	200.5973	.00	.00	-	-	-	-
0540228	65	3	37	84/06/25	2139	5.0	15043	399.7126	.00	.00	-	-	-	-
0540230	65	3	37	84/06/25	2205	5.0	11171	343.9052	.00	.00	-	-	-	-
0540232	65	3	37	84/06/25	2224	5.0	13979	388.7905	.00	.00	-	-	-	-
0540234	65	3	37	84/06/25	2242	5.0	5018	178.5892	.00	.00	-	-	-	-
0540236	65	3	37	84/06/25	2314	5.0	13555	383.4717	.00	.00	-	-	-	-
0540238	65	3	37	84/06/25	2330	5.0	14575	395.3419	.00	.00	-	-	-	-

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CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES ALOSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNID LIFE STAGE
									(IN NO./1000 CU. M.)					
0540313	65	4	42	84/06/27	2136	5.0	15056	399.8241	.00	2.50	-	2.50	-	-
0540315	65	4	42	84/06/27	2207	5.0	13673	385.0062	.00	.00	-	-	-	-
0540317	65	4	42	84/06/27	2227	5.0	13464	382.2600	.00	.00	-	-	-	-
0540390	65	4	42	84/07/03	2338	5.0	13416	381.6109	.00	.00	-	-	-	-
0540396	65	4	42	84/07/04	0111	5.0	15819	405.4234	.00	.00	-	-	-	-
0540162	65	4	43	84/06/18	2226	5.0	12507	365.0495	.00	10.87	-	10.87	-	-
0540166	65	4	43	84/06/18	2320	5.0	15158	379.1492	.00	5.29	-	5.29	-	-
0540319	65	4	43	84/06/27	2250	5.0	14734	396.9039	.00	2.52	-	2.52	-	-
0540321	65	4	43	84/06/27	2310	5.0	12964	375.1667	.00	.00	-	-	-	-
0540323	65	4	43	84/06/27	2355	5.0	15319	401.9654	.00	.00	-	-	-	-
0540325	65	4	43	84/06/28	0016	5.0	14163	390.9255	.00	5.12	-	5.12	-	-
0540327	65	4	43	84/06/28	0050	5.0	13752	386.0102	.00	.00	-	-	-	-
0540329	65	4	43	84/06/28	0114	5.0	12736	371.6906	.00	.00	-	-	-	-
0540392	65	4	43	84/07/04	0002	5.0	13250	379.3138	.00	.00	-	-	-	-
0540394	65	4	43	84/07/04	0047	5.0	15077	400.0032	.00	.00	-	-	-	-
0540158	65	4	44	84/06/18	2117	5.0	14338	392.5421	.00	22.93	-	17.83	-	5.09
0540160	65	4	44	84/06/18	2146	5.0	12880	373.9034	.00	13.37	-	13.37	-	-
0540331	65	4	44	84/06/28	0138	5.0	13303	375.7462	.00	.00	-	-	-	-
0540333	65	4	44	84/06/28	0200	5.0	14986	399.2171	.00	2.50	-	2.50	-	-
0540335	65	4	45	84/06/28	0224	5.0	14431	393.8593	.00	7.62	-	7.62	-	-
0540157	65	4	46	84/06/18	2038	5.0	14841	397.9105	.00	.00	-	-	-	-
0540337	65	4	46	84/06/28	0245	5.0	13009	375.8350	.00	.00	-	-	-	-
0540341	65	4	46	84/06/28	0323	5.0	13583	383.8396	.00	.00	-	-	-	-
0540342	65	4	46	84/06/28	0339	5.0	12195	362.8500	.00	.00	-	-	-	-
0540344	65	4	46	84/06/28	0411	5.0	11047	341.4209	.00	.00	-	-	-	-
0540347	65	4	46	84/06/28	0446	5.0	13569	383.6559	.00	.00	-	-	-	-
0540139	65	5	47	84/06/17	0030	5.0	9135	298.2310	.00	40.24	-	40.24	-	-
0540143	65	5	47	84/06/17	0117	5.0	4178	150.6090	.00	6.64	-	6.64	-	-
0540146	65	5	47	84/06/17	0206	5.0	10423	328.3168	.00	.00	-	-	-	-
0540150	65	5	47	84/06/17	0300	5.0	15038	399.6695	.00	27.52	-	27.52	-	-
0540154	65	5	47	84/06/17	0402	5.0	18647	409.2566	.00	4.89	-	4.89	-	-
0540138	65	5	49	84/06/16	2354	5.0	10658	333.3685	.00	36.00	-	36.00	-	-
0540132	65	5	50	84/06/16	2236	5.0	11939	358.3812	.00	2.79	-	2.79	-	-
0540135	65	5	50	84/06/16	2320	5.0	10059	320.2199	.00	109.30	-	109.30	-	-
0540118	65	5	51	84/06/16	0210	5.0	12035	359.5506	.00	11.12	-	2.78	-	8.34
0540119	65	5	51	84/06/16	0223	5.0	4592	164.5238	.00	.00	-	-	-	-
0540122	65	5	51	84/06/16	0303	5.0	3674	133.3636	.00	22.49	-	22.49	-	-
0540123	65	5	51	84/06/16	0320	5.0	4003	144.6578	.00	27.65	-	13.83	-	13.83
0540126	65	5	51	84/06/16	0406	5.0	4880	174.0619	.00	.00	-	-	-	-
0540127	65	5	51	84/06/16	0417	5.0	5660	199.2673	.00	5.02	-	5.02	-	-
0540130	65	5	51	84/06/16	2146	5.0	13942	388.3480	.00	7.73	-	7.73	-	-
0540114	65	5	52	84/06/16	0101	5.0	9582	309.1205	.00	29.11	-	29.11	-	-
0540115	65	5	52	84/06/16	0117	5.0	3743	135.7435	.00	22.10	-	14.73	-	7.37
0540104	65	5	53	84/06/15	2131	5.1	8912	293.9203	.00	27.22	-	20.41	-	6.80
0540106	65	5	53	84/06/15	2207	5.0	3811	138.0832	.00	14.48	-	14.48	-	-
0540107	65	5	53	84/06/15	2241	5.0	4838	172.6784	.00	34.75	-	34.75	-	-
0540112	65	5	53	84/06/16	0004	5.0	3655	132.7073	.00	45.21	-	45.21	-	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES AMERICAN SHAD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE (IN NO./1000 CU. M.)	YOLK-SAC (IN NO./1000 CU. M.)	POST YOLK-SAC (IN NO./1000 CU. M.)	JUVENILE (IN NO./1000 CU. M.)	UID LIFE STAGE (IN NO./1000 CU. M.)
0540215	65	3	34	84/06/20	0204	5.0	13414	381.5837	.00	.00	-	-	-	-
0540217	65	3	34	84/06/20	0221	5.0	14366	393.1690	.00	.00	-	-	-	-
0540219	65	3	34	84/06/20	0249	5.0	6042	211.2560	.00	.00	-	-	-	-
0540271	65	3	34	84/06/26	2134	5.0	9026	255.5058	.00	.00	-	-	-	-
0540273	65	3	34	84/06/26	2138	5.0	9950	317.7319	.00	.00	-	-	-	-
0540275	65	3	34	84/06/26	2211	5.0	16139	407.2056	.00	.00	-	-	-	-
0540279	65	3	34	84/06/26	2252	5.0	12894	374.1154	.00	.00	-	-	-	-
0540282	65	3	34	84/06/26	2326	5.0	14375	393.2654	.00	.00	-	-	-	-
0540284	65	3	34	84/06/26	2351	5.0	14470	394.2672	.00	.00	-	-	-	-
0540348	65	3	34	84/07/02	2035	5.0	13742	385.8841	.00	.00	-	-	-	-
0540350	65	3	34	84/07/02	2052	5.0	13830	386.9831	.00	.00	-	-	-	-
0540352	65	3	34	84/07/02	2108	5.0	12410	366.4623	.00	.00	-	-	-	-
0540354	65	3	34	84/07/02	2126	5.0	13340	380.5693	.00	.00	-	-	-	-
0540356	65	3	34	84/07/02	2146	5.0	13167	378.1349	.00	.00	-	-	-	-
0540358	65	3	34	84/07/02	2204	5.0	13627	384.4129	.00	.00	-	-	-	-
0540360	65	3	34	84/07/02	2225	5.0	13966	388.6355	.00	.00	-	-	-	-
0540362	65	3	34	84/07/02	2243	5.0	13207	378.7056	.00	.00	-	-	-	-
0540208	65	3	35	84/06/20	0047	5.0	13128	377.5739	.00	.00	-	-	-	-
0540210	65	3	35	84/06/20	0104	5.0	13986	388.8738	.00	.00	-	-	-	-
0540212	65	3	35	84/06/20	0132	5.0	14058	389.7215	.00	.00	-	-	-	-
0540265	65	3	35	84/06/26	0424	5.0	13855	387.2910	.00	.00	-	-	-	-
0540267	65	3	35	84/06/26	0443	5.0	7698	260.2119	.00	.00	-	-	-	-
0540269	65	3	35	84/06/26	2037	5.0	14138	390.6449	.00	.00	-	-	-	-
0540204	65	3	36	84/06/19	2356	5.0	13244	379.2293	.00	.00	-	-	-	-
0540206	65	3	36	84/06/20	0015	5.0	13610	384.1921	.00	.00	-	-	-	-
0540252	65	3	36	84/06/26	0158	5.0	13449	382.0579	.00	.00	-	-	-	-
0540253	65	3	36	84/06/26	0211	5.0	10606	332.2627	.00	.00	-	-	-	-
0540255	65	3	36	84/06/26	0233	5.0	12959	375.0920	.00	.00	-	-	-	-
0540257	65	3	36	84/06/26	0250	5.0	10932	339.0810	.00	.00	-	-	-	-
0540259	65	3	36	84/06/26	0310	5.0	13813	386.7726	.00	.00	-	-	-	-
0540261	65	3	36	84/06/26	0333	5.0	13112	377.3425	.00	.00	-	-	-	-
0540263	65	3	36	84/06/26	0407	5.0	12185	362.6789	.00	.00	-	-	-	-
0540370	65	3	36	84/07/03	0037	5.0	15038	399.6695	.00	.00	-	-	-	-
0540372	65	3	36	84/07/03	0055	5.0	13761	386.1234	.00	.00	-	-	-	-
0540375	65	3	36	84/07/03	0122	5.0	14009	389.1463	.00	.00	-	-	-	-
0540377	65	3	36	84/07/03	0140	5.0	13297	379.9724	.00	.00	-	-	-	-
0540379	65	3	36	84/07/03	0155	5.0	13097	377.1249	.00	.00	-	-	-	-
0540190	65	3	37	84/06/19	2107	5.0	14843	397.9250	.00	.00	-	-	-	-
0540192	65	3	37	84/06/19	2130	5.0	13622	384.3481	.00	.00	-	-	-	-
0540194	65	3	37	84/06/19	2151	5.0	13125	377.5306	.00	.00	-	-	-	-
0540226	65	3	37	84/06/25	2120	5.0	5702	200.5973	.00	.00	-	-	-	-
0540228	65	3	37	84/06/25	2139	5.0	15043	399.7126	.00	.00	-	-	-	-
0540230	65	3	37	84/06/25	2205	5.0	11171	343.9052	.00	.00	-	-	-	-
0540232	65	3	37	84/06/25	2224	5.0	13979	388.7905	.00	.00	-	-	-	-
0540234	65	3	37	84/06/25	2242	5.0	5018	178.5852	.00	.00	-	-	-	-
0540236	65	3	37	84/06/25	2314	5.0	13555	383.4717	.00	.00	-	-	-	-
0540238	65	3	37	84/06/25	2330	5.0	14575	395.3419	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES ATLANTIC TOMCOD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0540215	65	3	34	84/06/20	0204	5.0	13414	381.5837	.00	.00	-	-	-	-
0540217	65	3	34	84/06/20	0221	5.0	14366	393.1690	.00	2.54	-	-	2.54	-
0540219	65	3	34	84/06/20	0249	5.0	6042	211.2560	.00	.00	-	-	-	-
0540271	65	3	34	84/06/26	2104	5.0	9026	295.5058	.00	16.92	-	-	16.92	-
0540273	65	3	34	84/06/26	2138	5.0	9950	317.7319	.00	116.45	-	-	116.45	-
0540275	65	3	34	84/06/26	2211	5.0	16139	407.2096	.00	.00	-	-	-	-
0540279	65	3	34	84/06/26	2252	5.0	12894	374.1154	.00	.00	-	-	-	-
0540282	65	3	34	84/06/26	2326	5.0	14375	393.2654	.00	.00	-	-	-	-
0540284	65	3	34	84/06/26	2351	5.0	14470	394.2672	.00	.00	-	-	-	-
0540348	65	3	34	84/07/02	2035	5.0	13742	385.8841	.00	.00	-	-	-	-
0540350	65	3	34	84/07/02	2052	5.0	13830	386.9831	.00	95.61	-	-	95.61	-
0540352	65	3	34	84/07/02	2108	5.0	12410	366.4623	.00	278.34	-	-	278.34	-
0540354	65	3	34	84/07/02	2126	5.0	13340	380.5693	.00	5.26	-	-	5.26	-
0540356	65	3	34	84/07/02	2146	5.0	13167	378.1349	.00	31.73	-	-	31.73	-
0540358	65	3	34	84/07/02	2204	5.0	13627	384.4129	.00	293.16	-	-	293.16	-
0540360	65	3	34	84/07/02	2225	5.0	13966	388.6355	.00	2.57	-	-	2.57	-
0540362	65	3	34	84/07/02	2243	5.0	13207	378.7056	.00	.00	-	-	-	-
0540208	65	3	35	84/06/20	0047	5.0	13128	377.5739	.00	90.05	-	-	90.05	-
0540210	65	3	35	84/06/20	0104	5.0	13986	388.8738	.00	169.72	-	-	169.72	-
0540212	65	3	35	84/06/20	0132	5.0	14058	389.7215	.00	2.57	-	-	2.57	-
0540265	65	3	35	84/06/26	0424	5.0	13855	387.2910	.00	.00	-	-	-	-
0540267	65	3	35	84/06/26	0443	5.0	7698	260.2119	.00	.00	-	-	-	-
0540269	65	3	35	84/06/26	2037	5.0	14138	390.6449	.00	.00	-	-	-	-
0540204	65	3	36	84/06/19	2356	5.0	13244	379.2253	.00	44.83	-	-	44.83	-
0540206	65	3	36	84/06/20	0015	5.0	13610	384.1921	.00	20.82	-	-	20.82	-
0540252	65	3	36	84/06/26	0158	5.0	13449	382.0575	.00	.00	-	-	-	-
0540253	65	3	36	84/06/26	0211	5.0	10606	332.2627	.00	.00	-	-	-	-
0540255	65	3	36	84/06/26	0233	5.0	12959	375.0920	.00	2.67	-	-	2.67	-
0540257	65	3	36	84/06/26	0250	5.0	10332	339.0810	.00	120.92	-	-	120.92	-
0540259	65	3	36	84/06/26	0310	5.0	13813	386.7726	.00	.00	-	-	-	-
0540261	65	3	36	84/06/26	0333	5.0	13112	377.3425	.00	.00	-	-	-	-
0540263	65	3	36	84/06/26	0407	5.0	12185	362.6789	.00	2.76	-	-	2.76	-
0540370	65	3	36	84/07/03	0037	5.0	15038	399.6695	.00	2.50	-	-	2.50	-
0540372	65	3	36	84/07/03	0055	5.0	13761	386.1234	.00	.00	-	-	-	-
0540375	65	3	36	84/07/03	0122	5.0	14009	389.1463	.00	.00	-	-	-	-
0540377	65	3	36	84/07/03	0140	5.0	13297	379.9724	.00	.00	-	-	-	-
0540379	65	3	36	84/07/03	0155	5.0	13097	377.1249	.00	.00	-	-	-	-
0540190	65	3	37	84/06/19	2107	5.0	14843	397.9290	.00	.00	-	-	-	-
0540192	65	3	37	84/06/19	2130	5.0	13622	384.3481	.00	.00	-	-	-	-
0540194	65	3	37	84/06/19	2151	5.0	13125	377.5306	.00	52.38	-	-	52.38	-
0540226	65	3	37	84/06/25	2120	5.0	5702	200.5973	.00	.00	-	-	-	-
0540228	65	3	37	84/06/25	2139	5.0	15043	399.7126	.00	.00	-	-	-	-
0540230	65	3	37	84/06/25	2205	5.0	11171	343.9052	.00	.00	-	-	-	-
0540232	65	3	37	84/06/25	2224	5.0	13979	388.7905	.00	.00	-	-	-	-
0540234	65	3	37	84/06/25	2242	5.0	5018	178.5892	.00	.00	-	-	-	-
0540236	65	3	37	84/06/25	2314	5.0	13555	383.4717	.00	.00	-	-	-	-
0540238	65	3	37	84/06/25	2330	5.0	14575	395.3419	.00	5.06	-	-	5.06	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES ATLANTIC TOMCOD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	DIE LIFE STAGE
0540085	65	5	54	84/06/15	0143	5.0	12330	365.1333	.00	2.74	-	-	2.74	-
0540091	65	5	54	84/06/15	0222	5.1	12981	378.9729	.00	.00	-	-	-	-
0540095	65	5	54	84/06/15	0330	5.0	14525	394.8344	.00	.00	-	-	-	-
0540098	65	5	54	84/06/15	0421	5.0	12489	367.7569	.00	.00	-	-	-	-
0540100	65	5	54	84/06/15	0450	5.0	12637	373.1348	.00	.00	-	-	-	-
0540085	65	5	55	84/06/15	0022	5.1	13563	387.5727	.00	.00	-	-	-	-
0540087	65	5	55	84/06/15	0103	5.1	12363	368.8012	.00	.00	-	-	-	-
0540012	65	6	56	84/06/11	2155	5.0	12989	375.5387	.00	2.66	-	-	2.6	-
0540013	65	6	56	84/06/12	0004	5.0	8403	279.4202	.00	3.58	-	-	3.58	-
0540017	65	6	56	84/06/12	0130	5.0	13494	382.6622	.00	.00	-	-	-	-
0540021	65	6	56	84/06/12	0248	5.0	14020	389.2761	.00	.00	-	-	-	-
0540075	65	6	56	84/06/14	2103	5.0	14620	395.7920	.00	.00	-	-	-	-
0540081	65	6	56	84/06/14	2319	5.0	13028	376.1154	.00	10.64	-	-	10.64	-
0540083	65	6	56	84/06/14	2350	5.0	15031	339.6091	.00	17.52	-	-	17.52	-
0540022	65	6	57	84/06/12	0319	5.0	7544	255.8800	.00	.00	-	-	-	-
0540024	65	6	57	84/06/12	0355	5.0	14271	392.1367	.00	.00	-	-	-	-
0540027	65	6	58	84/06/12	0446	5.0	12751	371.9239	.00	.00	-	-	-	-
0540051	65	6	58	84/06/13	2139	5.0	4702	168.1809	.00	.00	-	-	-	-
0540054	65	6	58	84/06/13	2245	5.0	13800	386.6111	.00	5.17	-	-	5.17	-
0540056	65	6	58	84/06/13	2325	5.0	4378	157.3604	.00	.00	-	-	-	-
0540058	65	6	59	84/06/13	2359	5.0	12083	360.9172	.00	.00	-	-	-	-
0540060	65	6	59	84/06/14	0027	5.0	11817	356.1650	.00	.00	-	-	-	-
0540061	65	6	59	84/06/14	0045	5.0	12725	371.5191	.00	5.38	-	-	5.38	-
0540064	65	6	59	84/06/14	0128	5.0	4086	147.4854	.00	.00	-	-	-	-
0540066	65	6	59	84/06/14	0207	5.0	12542	368.6156	.00	37.98	-	-	37.98	-
0540067	65	6	59	84/06/14	0220	5.0	12943	374.8528	.00	.00	-	-	-	-
0540070	65	6	59	84/06/14	0305	5.0	14337	394.9569	.00	.00	-	-	-	-
0540071	65	6	59	84/06/14	0318	5.0	14212	391.4816	.00	.00	-	-	-	-
0540073	65	6	59	84/06/14	0430	5.0	13692	385.2493	.00	2.60	-	-	2.60	-
0540047	65	6	60	84/06/13	0413	5.0	7042	241.4343	.00	.00	-	-	-	-
0540028	65	6	61	84/06/12	2140	5.0	12951	374.9725	.00	2.67	-	-	2.67	-
0540031	65	6	61	84/06/12	2233	5.0	12156	362.1809	.00	2.76	-	-	2.76	-
0540033	65	6	61	84/06/12	2335	5.0	10396	327.7275	.00	.00	-	-	-	-
0540035	65	6	61	84/06/13	0007	5.0	11851	356.8033	.00	.00	-	-	-	-
0540036	65	6	61	84/06/13	0030	5.0	14086	390.0469	.00	5.13	-	-	5.13	-
0540038	65	6	61	84/06/13	0112	5.0	12508	368.0657	.00	.00	-	-	-	-
0540041	65	6	61	84/06/13	0204	5.0	13929	388.1915	.00	.00	-	-	-	-
0540044	65	6	61	84/06/13	0303	5.0	13726	385.6818	.00	2.59	-	-	2.59	-
0540045	65	6	61	84/06/13	0321	5.0	10918	338.7938	.00	.00	-	-	-	-

NO.SAMPLES = 180

LOBC CONC.

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
									(IN NO./1000 CU. M.)					
0540313	65	4	42	84/06/27	2136	5.0	15056	339.6241	.00	77.53	-	77.53	-	-
0540315	65	4	42	84/06/27	2207	5.0	13673	385.0062	162.83	654.53	-	415.58	-	238.96
0540317	65	4	42	84/06/27	2227	5.0	13464	382.2600	.00	164.81	-	164.81	-	-
0540390	65	4	42	84/07/03	2338	5.0	13416	381.6109	.00	676.08	-	676.08	-	-
0540396	65	4	42	84/07/04	0111	5.0	15819	405.4234	.00	735.03	-	735.03	-	-
0540162	65	4	43	84/06/18	2228	5.0	12507	368.0495	.00	.00	-	-	-	-
0540166	65	4	43	84/06/18	2320	5.0	13168	378.1492	.00	.00	-	-	-	-
0540319	65	4	43	84/06/27	2250	5.0	14734	396.9039	382.96	728.14	-	728.14	-	-
0540321	65	4	43	84/06/27	2318	5.0	12964	375.1667	1402.04	279.88	-	279.88	-	-
0540323	65	4	43	84/06/27	2355	5.0	15319	401.3654	353.07	218.32	-	194.05	-	24.28
0540325	65	4	43	84/06/28	0016	5.0	14163	390.9295	1813.63	48.60	-	48.60	-	-
0540327	65	4	43	84/06/28	0050	5.0	13752	386.0102	2.59	326.42	-	279.79	-	46.63
0540329	65	4	43	84/06/28	0114	5.0	12736	371.6506	858.60	454.68	-	454.68	-	-
0540392	65	4	43	84/07/04	0002	5.0	13250	379.3138	.00	348.00	-	348.00	-	-
0540394	65	4	43	84/07/04	0047	5.0	15077	400.0032	.00	422.50	-	422.50	-	-
0540158	65	4	44	84/06/18	2117	5.0	14308	392.5421	.00	.00	-	-	-	-
0540160	65	4	44	84/06/18	2148	5.0	12880	373.9034	.00	.00	-	-	-	-
0540331	65	4	44	84/06/28	0138	5.0	13003	375.7462	106.45	162.34	-	162.34	-	-
0540333	65	4	44	84/06/28	0200	5.0	14386	399.2171	826.62	2011.44	-	2011.44	-	-
0540335	65	4	45	84/06/28	0224	5.0	14431	393.8593	25.39	25.39	-	25.39	-	-
0540157	65	4	46	84/06/18	2338	5.0	14841	397.9105	.00	.00	-	-	-	-
0540337	65	4	46	84/06/28	0245	5.0	13009	375.8350	191.57	58.54	-	58.54	-	-
0540341	65	4	46	84/06/28	0323	5.0	13583	383.8356	10.42	15.63	-	15.63	-	-
0540342	65	4	46	84/06/28	0339	5.0	12195	362.8500	82.68	27.55	-	27.55	-	-
0540344	65	4	46	84/06/28	0411	5.0	11047	341.4209	108.37	8.79	-	8.79	-	-
0540347	65	4	46	84/06/28	0446	5.0	13569	383.6559	453.53	605.51	-	605.51	-	-
0540139	65	5	47	84/06/17	0030	5.0	9135	298.2310	.00	.00	-	-	-	-
0540143	65	5	47	84/06/17	0117	5.0	4178	150.6090	.00	.00	-	-	-	-
0540146	65	5	47	84/06/17	0206	5.0	10423	328.3168	.00	.00	-	-	-	-
0540150	65	5	47	84/06/17	0300	5.0	15038	399.6655	.00	.00	-	-	-	-
0540154	65	5	47	84/06/17	0402	5.0	18647	409.2566	.00	.00	-	-	-	-
0540138	65	5	45	84/06/16	2354	5.0	10658	333.3685	.00	.00	-	-	-	-
0540132	65	5	50	84/06/16	2236	5.0	11333	358.3812	.00	.00	-	-	-	-
0540135	65	5	50	84/06/16	2320	5.0	10053	320.2199	.00	.00	-	-	-	-
0540118	65	5	51	84/06/16	0210	5.0	12005	359.5506	.00	.00	-	-	-	-
0540119	65	5	51	84/06/16	0223	5.0	4592	164.5238	.00	.00	-	-	-	-
0540122	65	5	51	84/06/16	0303	5.0	3674	133.3636	.00	.00	-	-	-	-
0540123	65	5	51	84/06/16	0320	5.0	4003	144.6578	.00	.00	-	-	-	-
0540126	65	5	51	84/06/16	0406	5.0	4880	174.0619	.00	.00	-	-	-	-
0540127	65	5	51	84/06/16	0417	5.0	5660	199.2673	.00	.00	-	-	-	-
0540130	65	5	51	84/06/16	2146	5.0	13342	388.3480	.00	.00	-	-	-	-
0540114	65	5	52	84/06/16	0101	5.0	9582	309.1205	.00	.00	-	-	-	-
0540115	65	5	52	84/06/16	0117	5.0	3743	135.7435	.00	.00	-	-	-	-
0540104	65	5	53	84/06/15	2131	5.1	8912	293.9203	.00	.00	-	-	-	-
0540106	65	5	53	84/06/15	2207	5.0	3811	138.0832	.00	.00	-	-	-	-
0540107	65	5	53	84/06/15	2241	5.0	4838	172.6784	.00	.00	-	-	-	-
0540112	65	5	53	84/06/16	0004	5.0	3655	132.7073	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES AMERICAN SHAD

TASK & SAMPLE	YEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0540089	65	5	54	84/06/15	0143	5.0	12330	365.1333	.00	.00	-	-	-	-
0540091	65	5	54	84/06/15	0222	5.1	12981	378.9729	.00	.00	-	-	-	-
0540095	65	5	54	84/06/15	0332	5.0	14325	394.8344	.00	.00	-	-	-	-
0540098	65	5	54	84/06/15	0421	5.0	12489	367.7569	.00	.00	-	-	-	-
0540100	65	5	54	84/06/15	0453	5.0	12637	373.1348	.00	.00	-	-	-	-
0540085	65	5	55	84/06/15	0022	5.1	13563	387.5727	.00	.00	-	-	-	-
0540087	65	5	55	84/06/15	0103	5.1	12363	368.6012	.00	.00	-	-	-	-
0540012	65	6	56	84/06/11	2155	5.0	12989	375.5387	.00	5.33	-	-	-	5.33
0540016	65	6	56	84/06/12	0004	5.0	8403	279.4202	.00	.00	-	-	-	-
0540017	65	6	56	84/06/12	0130	5.0	13494	382.6622	.00	.00	-	-	-	-
0540021	65	6	56	84/06/12	0248	5.0	14020	389.2761	.00	.00	-	-	-	-
0540075	65	6	56	84/06/14	2103	5.0	14620	395.7920	.00	.00	-	-	-	-
0540081	65	6	56	84/06/14	2319	5.0	13028	376.1154	.00	.00	-	-	-	-
0540083	65	6	56	84/06/14	2350	5.0	15031	399.6091	.00	.00	-	-	-	-
0540022	65	6	57	84/06/12	0319	5.0	7544	255.8803	.00	.00	-	-	-	-
0540024	65	6	57	84/06/12	0355	5.0	14271	392.1367	.00	.00	-	-	-	-
0540027	65	6	58	84/06/12	0446	5.0	12751	371.9239	.00	.00	-	-	-	-
0540051	65	6	58	84/06/13	2139	5.0	4702	168.1809	.00	.00	-	-	-	-
0540054	65	6	58	84/06/13	2246	5.0	13800	386.6111	.00	.00	-	-	-	-
0540056	65	6	58	84/06/13	2325	5.0	4378	157.3604	.00	.00	-	-	-	-
0540058	65	6	59	84/06/13	2358	5.0	12083	360.9172	.00	.00	-	-	-	-
0540060	65	6	59	84/06/14	0027	5.0	11817	356.1880	.00	.00	-	-	-	-
0540061	65	6	59	84/06/14	0045	5.0	12725	371.5151	.00	.00	-	-	-	-
0540064	65	6	59	84/06/14	0129	5.0	4086	147.4854	.00	.00	-	-	-	-
0540066	65	6	59	84/06/14	0207	5.0	12542	368.6156	.00	.00	-	-	-	-
0540067	65	6	59	84/06/14	0220	5.0	12943	374.8528	.00	.00	-	-	-	-
0540070	65	6	59	84/06/14	0305	5.0	14537	394.9569	.00	.00	-	-	-	-
0540071	65	6	59	84/06/14	0318	5.0	14212	391.4816	.00	.00	-	-	-	-
0540073	65	6	59	84/06/14	0430	5.0	13692	385.2493	.00	.00	-	-	-	-
0540047	65	6	60	84/06/13	0413	5.0	7042	241.4343	.00	.00	-	-	-	-
0540028	65	6	61	84/06/12	2140	5.0	12951	374.9725	.00	.00	-	-	-	-
0540031	65	6	61	84/06/12	2233	5.0	12156	362.1809	.00	.00	-	-	-	-
0540033	65	6	61	84/06/12	2335	5.0	10396	327.7275	.00	.00	-	-	-	-
0540035	65	6	61	84/06/13	0007	5.0	11851	356.8033	.00	.00	-	-	-	-
0540036	65	6	61	84/06/13	0030	5.0	14086	390.0469	.00	.00	-	-	-	-
0540038	65	6	61	84/06/13	0112	5.0	12508	368.0657	.00	.00	-	-	-	-
0540041	65	6	61	84/06/13	0204	5.0	13929	388.1915	.00	.00	-	-	-	-
0540044	65	6	61	84/06/13	0300	5.0	13726	385.6818	.00	.00	-	-	-	-
0540045	65	6	61	84/06/13	0321	5.0	10918	338.7938	.00	.00	-	-	-	-

NO.SAMPLES = 180

LOBC CONC

CON EDISON GEAR COMPARISON STUDY
DISCRETE TRAWLS

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	LIFE STAGE
0540240	65	3	37	84/06/25	2359	5.0	6699	231.2274	25.94	47.54	-	43.24	-	4.52
0540242	65	3	37	84/06/25	0019	5.0	12897	374.1607	362.19	5.34	-	2.67	-	2.67
0540244	65	3	37	84/06/26	0040	5.0	14377	393.2868	.00	2.54	-	2.54	-	-
0540246	65	3	37	84/06/26	0101	5.0	12816	372.9273	1075.28	16.09	-	16.09	-	-
0540248	65	3	37	84/06/26	0120	5.0	4249	153.0119	84.95	58.82	6.54	52.28	-	-
0540366	65	3	37	84/07/02	2359	5.0	15437	402.6325	.00	1202.09	-	1202.09	-	-
0540196	65	3	38	84/06/19	2222	5.0	13543	383.3133	.00	.00	-	-	-	-
0540198	65	3	38	84/06/19	2240	5.0	13120	377.4583	.00	.00	-	-	-	-
0540200	65	3	38	84/06/19	2300	5.0	14704	396.6153	.00	.00	-	-	-	-
0540202	65	3	38	84/06/19	2325	5.0	13822	386.8841	.00	.00	-	-	-	-
0540222	65	3	38	84/06/25	2039	5.0	9884	316.2114	.00	107.52	-	107.52	-	-
0540224	65	3	38	84/06/25	2100	5.0	13461	382.2196	.00	75.87	-	65.41	-	10.47
0540364	65	3	38	84/07/02	2319	5.0	14094	390.1395	.00	10260.43	-	10260.43	-	-
0540187	65	4	39	84/06/19	0403	5.0	12561	368.9215	.00	.00	-	-	-	-
0540189	65	4	39	84/06/19	0424	5.0	13976	388.7548	.00	.00	-	-	-	-
0540286	65	4	39	84/06/27	0101	5.0	14676	396.3433	78.22	32.80	-	32.80	-	-
0540288	65	4	39	84/06/27	0114	5.0	13898	387.8163	18.05	56.73	-	56.73	-	-
0540290	65	4	39	84/06/27	0131	5.0	13866	387.4259	151.00	38.72	-	38.72	-	-
0540407	65	4	39	84/07/04	0350	5.0	13351	380.7211	.00	582.35	-	582.35	-	-
0540409	65	4	39	84/07/04	0408	5.0	14343	392.9217	.00	7194.82	-	6991.21	-	203.60
0540411	65	4	39	84/07/04	0426	5.0	14461	394.1735	60.89	4820.21	-	4820.21	-	-
0540413	65	4	39	84/07/04	0443	5.0	9379	304.2327	16.43	3162.05	-	2994.42	-	167.63
0540176	65	4	40	84/06/19	0142	5.0	12906	374.2965	.00	.00	-	-	-	-
0540180	65	4	40	84/06/19	0228	5.0	15306	401.8648	.00	.00	-	-	-	-
0540183	65	4	40	84/06/19	0305	5.0	15025	399.5572	.00	.00	-	-	-	-
0540185	65	4	40	84/06/19	0322	5.0	10422	328.2951	.00	.00	-	-	-	-
0540294	65	4	40	84/06/27	0210	5.0	14906	398.5045	85.32	323.71	-	323.71	-	-
0540295	65	4	40	84/06/27	0223	5.0	14570	395.3721	404.68	311.10	-	311.10	-	-
0540297	65	4	40	84/06/27	0241	5.0	14220	391.5711	20.43	15.32	-	15.32	-	-
0540299	65	4	40	84/06/27	0302	5.0	13544	383.3265	7.83	18.26	-	18.26	-	-
0540385	65	4	40	84/07/03	2216	5.0	13724	385.6565	.00	1721.74	-	1721.74	-	-
0540386	65	4	40	84/07/03	2231	5.0	14024	389.3232	2.57	1155.85	-	1155.85	-	-
0540405	65	4	40	84/07/04	0251	5.0	14581	395.4023	22.76	5010.09	-	5010.09	-	-
0540172	65	4	41	84/06/19	0028	5.0	4504	161.5859	.00	.00	-	-	-	-
0540174	65	4	41	84/06/19	0051	5.0	7853	264.5235	.00	.00	-	-	-	-
0540301	65	4	41	84/06/27	0319	5.0	13707	385.4406	59.67	62.27	-	62.27	-	-
0540303	65	4	41	84/06/27	0351	5.0	16182	407.4240	586.61	39.27	-	39.27	-	-
0540305	65	4	41	84/06/27	0407	5.0	14974	399.1115	383.35	67.65	-	67.65	-	-
0540307	65	4	41	84/06/27	0428	5.0	14963	399.0143	829.54	596.47	-	596.47	-	-
0540309	65	4	41	84/06/27	0448	5.0	14545	395.0383	7525.85	551.85	-	551.85	-	-
0540311	65	4	41	84/06/27	2115	5.0	17402	410.9312	184.95	1189.98	-	1158.34	-	31.64
0540388	65	4	41	84/07/03	2254	5.0	13810	386.7354	.00	530.08	-	530.08	-	-
0540398	65	4	41	84/07/04	0133	5.0	13718	385.5804	.00	555.01	-	555.01	-	-
0540400	65	4	41	84/07/04	0154	5.0	13184	378.3780	.00	1406.00	-	1406.00	-	-
0540404	65	4	41	84/07/04	0232	5.0	12300	364.6303	24.68	5775.71	-	5775.71	-	-
0540168	65	4	42	84/06/18	2336	5.0	6044	211.3181	.00	.00	-	-	-	-
0540170	65	4	42	84/06/19	0003	5.0	4607	165.0236	.00	.00	-	-	-	-

APPENDIX 3-1

INCLINOMETER DEVELOPMENT

APPENDIX 3-1

INCLINOMETER DEVELOPMENT

1.0 INTRODUCTION

A means of measuring the inclination of the net mouth of a Tucker trawl in tow was developed to determine the effective net mouth area. An electronic inclinometer was adapted to measure net angle under various tow velocities.

2.0 DESIGN

The device (Siler 1983*) consisted of a pendulum fixed to a precision potentiometer enclosed in a PVC casing (Figure 3-1-1). The casing was filled with silicone oil to protect the potentiometer from moisture and to dampen pendulum movement. On-deck readings were obtained using a digital ohmmeter wired to the potentiometer. A rotation of 90° corresponded to a change of 2500 ohms on the potentiometer.

3.0 CALIBRATION

A bench calibration of the instrument was conducted to determine whether a linear relationship existed between the observed angle and a corresponding inclinometer resistance value recorded by the ohmmeter. The unit was mounted in a frame with angle graduations in 10° increments and rotated through a series of angles yielding a corresponding set of resistance values. A linear correlation between the two values was determined ($r^2 = 1.00$), establishing a means of measuring net mouth angle during a sample tow.

*Siler, J.R. 1983. Description of a trawl handling structure for a bow-fished Tucker Trawl. Prog.-Fish Cult. 45(4):217-220.

Preliminary surveys conducted on 22 and 26 June included mounting the unit on the net frame and conducting a series of tows at a depth* of 10 m at tow velocities** ranging from 1.0 to 2.5 m/sec. Net angle, wire angle***, and boat speed were recorded. Linearity was evident between net angle and corresponding wire angle and between net angle and boat speed. Use of the linear relationships made possible the measurement of net mouth angle based on boat speed or wire angle.

A third calibration survey was conducted on 26 October to refine the net mouth angle measurement technique. The inclinometer was mounted securely to the Tucker trawl frame and rotated through a series of angles in the same manner described for the bench test. A series of nine angles with corresponding resistance values was measured four times. This resulted in a favorable linear correlation with a coefficient of determination (r^2) value of 0.997 (Figure 3-1-2). As in the previous two surveys, a series of tows was conducted at a depth of 10 m at tow velocities ranging from 1.0 to 2.1 m/sec. An additional 46.8 kg was added to the Tucker trawl frame during two of the four trials to correlate with the procedure used during the actual speed tow survey. Net speed was recorded in addition to net angle, wire angle, and boat speed (Table 3-1-1). Linearity between net angle and wire angle and between ret angle and boat speed still yielded a strong correlation (Tables 3-1-1 and 3-1-2). However, the linearity between net angle and net speed was most favorable, with an r^2 value $\geq$ 0.98. Determination of net mouth angle was accomplished using the net angle vs the net speed

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*Net depth monitored using the wire length vs angle relation ship.

**Tow velocity measured at the surface with a GO Model 2031 flow meter with a GO Model 2035 MKIII on-deck readout unit.

***Angles measured with a Wildco (No. 65) line/cable inclinometer.

TABLE 3-1-1

REGRESSION ANALYSIS OF
NET ANGLE VS WIRE ANGLE, NET SPEED, OR BOAT SPEED
FOR STANDARD TUCKER TRAWL

TRIAL No.	RESISTANCE (K)	=	NET ANGLE (°)	VS	WIRE ANGLE (°)	VS	NET SPEED (m/sec)	VS	BOAT SPEED (m/sec)
1	8.73		30.0		44		0.9		1.0
	8.59		35.0		50		1.0		1.1
	8.44		40.0		57		1.2		1.3
	8.27		46.5		65		1.4		1.5
	8.14		51.5		72		1.6		1.8
	7.97		57.5		73		1.8		2.1
	7.97		57.5		74		1.8		2.1
	8.10		52.5		69		1.6		1.8
	8.25		47.5		65		1.4		1.5
	8.39		42.0		60		1.2		1.3
	8.57		35.5		50		1.0		1.1
	8.65		32.5		46		0.9		1.0
2	8.65		32.5		48		0.9		1.0
	8.54		37.0		51		1.0		1.1
	8.42		41.0		59		1.2		1.4
	8.26		47.0		64		1.4		1.5
	8.07		54.0		70		1.6		1.8
	7.96		58.5		73		1.8		2.1
	7.95		58.5		73		1.8		2.1
	8.09		53.0		70		1.6		1.8
	8.25		47.5		64		1.4		1.6
	8.38		42.5		60		1.2		1.4
	8.58		35.0		50		1.0		1.1
	8.61		34.0		47		0.95		1.0

Regression Analysis:

Comparison Samples	$(n) =$	24	24	24
y intercept	$(a_0) =$	9.823	9.357	9.271
slope	$(a_1) =$	-0.025	-0.782	-0.638
Coefficient of Determination	$(r^2) =$	0.974	0.990	0.977

linear relationship illustrated in Figure 3-1-3 for tows conducted at 1.0 m/sec with the standard net and Figure 3-1-4 for tows conducted at $\geq$ 1.4 m/sec using the Tucker trawl with 46.8 kg of added weight.

4.0 APPLICATION

The development of the inclinometer was necessary to obtain the net mouth angle of the 1.0 x 1.4 m Tucker trawl. From the above relationships (Section 3.0), the following formulas were developed to determine net mouth area:

$Area_S$ =

$$h \cdot \cos(345.809 - 36.171(9.357 - 0.782(0.026873 \cdot G.O.\ revs/time)))w$$

where:

$Area_S$ = effective net mouth area during a standard tow

h = vertical measurement of net mouth = 1.41 m

(0.026873 · G.O. revs/time)

= net velocity

9.357 - 0.782

= net angle vs net velocity (Figure 3-1-3)

345.809 - 36.171

= net angle vs resistance relationship (Figure 3-1-2)

cos = geometric function of the net mouth angle

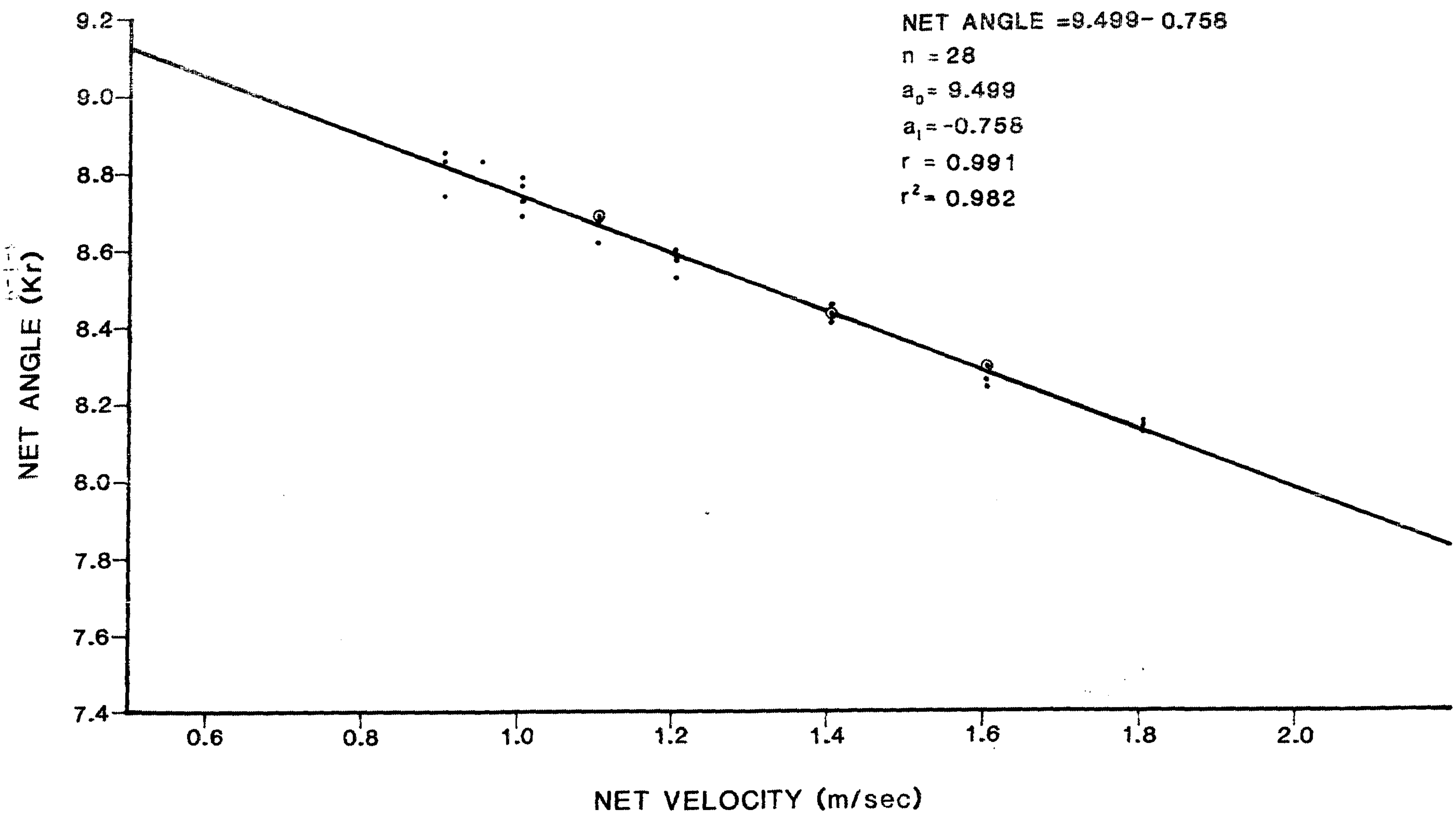
w = width measurement of net mouth

FIGURE 3-1-4

LINEAR REGRESSION

NET ANGLE (Kr) vs NET VELOCITY

TUCKER TRAWL WITH ADDITIONAL 46.8 kg WEIGHT



APPENDIX 3-2

TOW SPEED COMPARISON STUDY

LENGTH-FREQUENCY INFORMATION BY SAMPLE

1.0-m^2 EPIBENTHIC SLED AND 1.0-m^2 TUCKER TRAWL

LUSCENCUCI

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VTL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - ASO

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	0550001 20 JUN	0550005 20 JUN	0550009 20 JUN	0550013 21 JUN	0550017 21 JUN	0550022 21 JUN	0550023 21 JUN	0550028 21 JUN	0550031 21 JUN	0550032 21 JUN	0550124 7 JUL	0550127 7 JUL	0550131 8 JUL	0550134 8 JUL	0550141 8 JUL
	NUMBER OF FISH PER SAMPLE														
54.1-55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55.1-56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - ASD   LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550255 25 JUL	0550261 25 JUL	0550262 25 JUL	0550266 25 JUL
54.1-55.0	-	-	-	-
55.1-56.0	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0
NO.SAMPLES	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VER 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - SB
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550193 7 JUL	0550195 6 JUL	0550195 8 JUL	0550185 19 JUL	0550189 19 JUL	0550191 20 JUL	0550196 20 JUL	0550198 20 JUL	0550201 20 JUL	0550203 20 JUL	0550207 20 JUL	0550241 24 JUL	0550248 24 JUL	0550249 24 JUL	0550252 25 JUL
5.1- 6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-
9.1-10.0	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
10.1-11.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.1-12.0	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
12.1-13.0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16.1-17.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.1-20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.1-21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.1-22.0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	4	2	5	1	1	0	1	0	0	0	0	0	0	0	0
NO. LARVAE COLLECTED	4	2	5	1	1	0	1	0	0	0	0	0	0	0	0
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	9.0	10.6	10.3	21.4	12.5	.0	8.8	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	1.15	1.84	2.63	21.40	12.50	NA	8.80	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - GP
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550001 20 JUN	0550006 20 JUN	0550009 20 JUN	0550010 21 JUN	0550017 21 JUN	0550022 21 JUN	0550023 21 JUN	0550028 21 JUN	0550031 21 JUN	0550032 21 JUN	0550126 7 JUL	0550127 7 JUL	0550135 8 JUL	0550136 8 JUL	0550140 8 JUL
3.1- 4.0	-	-	-	7	2	-	4	-	-	1	-	1	3	-	1
4.1- 5.0	-	16	1	16	3	-	5	-	9	4	3	4	4	-	2
5.1- 6.0	-	2	1	3	6	-	1	-	-	4	1	5	1	2	5
6.1- 7.0	-	4	5	2	4	-	-	-	2	-	1	5	7	2	7
7.1- 8.0	-	-	7	2	2	-	1	-	1	1	3	7	8	6	5
8.1- 9.0	-	-	3	-	2	1	-	-	-	-	14	5	5	5	7
9.1-10.0	-	-	3	-	-	-	-	-	-	-	6	2	1	3	2
10.1-11.0	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
11.1-12.0	-	-	-	-	-	-	-	-	-	-	1	-	1	2	-
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
NO.LARVAE MEASURED	0	22	20	30	19	1	11	0	12	11	30	30	30	20	30
NO.LARVAE COLLECTED	0	24	20	79	19	1	11	0	12	12	33	77	43	23	43
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	5.0	7.5	4.8	5.8	8.1	4.5	.0	5.0	5.6	8.3	7.0	6.7	8.2	7.1
STD DEV	NA	.79	1.24	1.06	1.40	8.10	1.07	NA	1.02	2.02	1.56	1.59	1.83	1.70	1.66

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - WP

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550255 25 JUL	0550261 25 JUL	0550262 25 JUL	0550266 25 JUL
3.1- 4.0	-	-	-	-
4.1- 5.0	-	-	-	-
5.1- 6.0	-	-	-	-
6.1- 7.0	-	-	-	-
7.1- 8.0	-	-	-	-
8.1- 9.0	-	-	-	-
9.1-10.0	-	-	-	-
10.1-11.0	-	-	-	-
11.1-12.0	-	-	-	-
12.1-13.0	-	-	-	-
13.1-14.0	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0
NO.SAMPLES	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA

LUSC(NCCL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - ATC

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550143 5 JUL	0550145 6 JUL	0550149 8 JUL	0550186 19 JUL	0550189 19 JUL	0550191 20 JUL	0550196 20 JUL	0550198 20 JUL	0550201 20 JUL	0550203 20 JUL	0550207 20 JUL	0550244 24 JUL	0550246 24 JUL	0550249 24 JUL	0550252 25 JUL
43.1-44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44.1-45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45.1-46.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46.1-47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47.1-48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48.1-49.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
49.1-50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50.1-51.0	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
51.1-52.0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
52.1-53.0	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-
53.1-54.0	-	-	-	1	-	1	-	2	-	2	-	-	-	-	-
54.1-55.0	1	-	-	-	1	-	1	-	-	1	-	-	-	-	-
55.1-56.0	-	1	3	-	1	1	-	-	-	1	-	-	-	-	-
56.1-57.0	3	-	1	2	1	-	2	-	2	1	-	-	-	-	-
57.1-58.0	-	2	5	1	-	3	2	1	2	3	2	-	-	-	-
58.1-59.0	3	2	1	2	-	1	1	2	2	2	2	-	-	-	-
59.1-60.0	-	2	3	5	2	2	3	-	1	-	3	-	-	-	-
60.1-61.0	-	1	1	-	1	1	-	3	5	1	2	-	-	-	-
61.1-62.0	1	2	2	4	5	3	2	1	3	3	-	-	-	-	-
62.1-63.0	1	1	1	1	-	2	3	2	-	1	2	-	-	-	-
63.1-64.0	1	2	3	4	2	3	2	1	1	2	1	-	-	-	-
64.1-65.0	3	-	3	1	5	3	3	2	2	2	-	-	-	-	-
65.1-66.0	1	2	-	-	-	-	2	-	1	2	-	-	-	-	-
66.1-67.0	1	3	2	3	-	1	2	2	-	2	2	-	-	-	-
67.1-68.0	1	1	1	1	1	-	2	-	-	1	-	-	-	-	-
68.1-69.0	-	-	-	-	2	1	-	1	-	2	-	-	-	-	-
69.1-70.0	-	1	1	-	1	-	1	1	-	-	-	-	-	-	-
70.1-71.0	2	1	2	-	-	-	-	1	1	-	2	-	-	-	-
71.1-72.0	1	2	-	-	2	2	-	-	2	-	1	-	-	-	-
72.1-73.0	-	1	-	-	1	-	-	1	1	1	1	-	-	-	-
73.1-74.0	2	-	-	2	-	-	-	1	1	-	-	-	-	-	-
74.1-75.0	3	-	-	-	-	-	-	2	-	-	1	-	-	-	-
75.1-76.0	-	1	-	-	-	-	-	3	-	-	-	-	-	-	-
76.1-####	6	5	-	3	4	6	3	3	5	2	10	-	-	-	-
NO.LARVAE MEASURED	30	30	30	30	30	30	30	30	30	30	30	0	0	0	0
NO.LARVAE COLLECTED	98	99	183	127	111	179	361	378	387	153	110	17	21	3	17
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	69.2	67.8	61.7	64.3	66.4	66.0	64.2	66.9	65.7	63.0	70.8	.0	.0	.0	.0
STD DEV	10.21	8.57	5.10	6.63	8.88	8.11	7.14	8.17	8.19	6.44	11.74	NA	NA	NA	NA

L03C(NCCL).

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - BA

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550001 20 JUN	0550006 20 JUN	0550009 20 JUN	0550010 21 JUN	0550017 21 JUN	0550022 21 JUN	0550023 21 JUN	0550028 21 JUN	0550031 21 JUN	0550032 21 JUN	0550124 7 JUL	0550129 7 JUL	0550135 8 JUL	0550138 8 JUL	0550140 8 JUL
3.1- 4.0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-	-	-	3	3	7	-	3
6.1- 7.0	-	-	-	-	-	-	-	-	-	-	7	3	9	-	4
7.1- 8.0	-	-	-	-	-	-	-	-	-	-	9	7	2	-	[illegible]
8.1- 9.0	-	-	-	-	-	-	-	-	-	-	4	7	3	2	2
9.1-10.0	-	-	-	-	-	-	-	-	-	-	1	2	2	1	2
10.1-11.0	-	-	-	-	-	-	-	-	-	-	3	2	4	1	1
11.1-12.0	-	-	-	-	-	-	-	-	-	-	1	-	1	2	2
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-
14.1-15.0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
16.1-17.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.1-20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.1-21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.1-22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.1-23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0	0	0	30	30	30	7	20
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0	0	0	217	1473	365	12	20
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	7.8	9.1	8.0	11.0	7.9
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.20	2.73	2.65	3.20	1.75

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - EA

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550255 25 JUL	0550261 25 JUL	0550262 25 JUL	0550266 25 JUL
3.1- 4.0	-	1	-	-
4.1- 5.0	-	1	-	-
5.1- 6.0	-	-	-	-
6.1- 7.0	-	1	-	1
7.1- 8.0	1	2	-	1
8.1- 9.0	2	3	1	3
9.1-10.0	4	8	3	1
10.1-11.0	2	2	6	6
11.1-12.0	4	5	4	2
12.1-13.0	3	1	3	5
13.1-14.0	5	-	3	2
14.1-15.0	7	2	7	1
15.1-16.0	-	2	1	1
16.1-17.0	1	-	2	2
17.1-18.0	-	1	-	2
18.1-19.0	-	-	-	-
19.1-20.0	-	-	-	2
20.1-21.0	-	-	-	-
21.1-22.0	1	1	-	-
22.1-23.0	-	-	-	-
23.1-24.0	-	-	-	-
24.1-25.0	-	-	-	1
NO.LARVAE MEASURED	30	30	30	30
NO.LARVAE COLLECTED	956	873	918	1614
NO.SAMPLES	1	1	1	1
MEAN LENGTH	12.6	10.7	12.5	12.3
STD DEV	2.87	3.69	2.22	4.03

L03C(NCCL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.4

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550142 8 JUL	0550146 8 JUL	0550150 8 JUL	0550187 19 JUL	0550190 19 JUL	0550192 20 JUL	0550194 20 JUL	0550199 20 JUL	0550200 20 JUL	0550204 20 JUL	0550206 20 JUL	0550245 24 JUL	0550246 24 JUL	0550251 24 JUL	0550253 25 JUL
4.1- 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-
9.1-10.0	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-
10.1-11.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
11.1-12.0	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.1-17.0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.1-20.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
20.1-21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.1-22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.1-23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.1-27.0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
27.1-28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.1-29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.1-30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.1-31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.1-32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.1-33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.1-34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.1-35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.1-36.0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
NO. LARVAE MEASURED	1	8	7	0	0	0	0	4	0	1	0	1	0	0	0
NO. LARVAE COLLECTED	1	8	7	0	0	0	0	4	0	1	0	1	0	0	0
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.9	10.0	10.5	.0	.0	.0	.0	17.4	.0	9.9	.0	36.0	.0	.0	.0
STD DEV	7.90	4.23	2.52	NA	NA	NA	NA	6.52	NA	9.90	NA	36.00	NA	NA	NA

L03C(NCOL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.4

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - SM

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550257 25 JUL	0550259 25 JUL	0550263 25 JUL	0550267 25 JUL
4.1- 5.0	-	-	-	-
5.1- 6.0	-	-	-	-
6.1- 7.0	-	-	-	-
7.1- 8.0	-	-	-	-
8.1- 9.0	-	-	-	-
9.1-10.0	-	-	-	-
10.1-11.0	-	-	-	-
11.1-12.0	-	-	-	-
12.1-13.0	-	-	-	-
13.1-14.0	-	-	-	-
14.1-15.0	-	-	-	-
15.1-16.0	-	-	-	-
16.1-17.0	-	-	-	-
17.1-18.0	-	-	-	-
18.1-19.0	-	-	-	-
19.1-20.0	-	-	-	-
20.1-21.0	-	-	-	-
21.1-22.0	-	-	-	-
22.1-23.0	-	-	-	-
23.1-24.0	-	-	-	-
24.1-25.0	-	-	-	-
25.1-26.0	-	-	-	-
26.1-27.0	-	-	-	-
27.1-28.0	-	-	-	-
28.1-29.0	-	-	-	-
29.1-30.0	-	-	-	-
30.1-31.0	-	-	-	-
31.1-32.0	-	-	-	-
32.1-33.0	-	-	-	-
33.1-34.0	-	-	-	-
34.1-35.0	-	-	-	-
35.1-36.0	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0
NO.SAMPLES	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA

L03C(NCOL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.4

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - WF

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550257 25 JUL	0550259 25 JUL	0550263 25 JUL	0550267 25 JUL
3.1- 4.0	-	-	-	-
4.1- 5.0	-	-	-	-
5.1- 6.0	-	-	-	-
6.1- 7.0	-	-	-	-
7.1- 8.0	-	-	-	-
8.1- 9.0	-	-	-	-
9.1-10.0	-	-	-	-
10.1-11.0	-	-	-	-
11.1-12.0	-	-	-	-
12.1-13.0	-	-	-	-
13.1-14.0	-	-	-	-
14.1-15.0	-	-	-	-
15.1-16.0	-	-	-	-
16.1-17.0	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0
NO.SAMPLES	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA

L03C(NCOL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.4

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - ATC

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550142 8 JUL	0550146 8 JUL	0550150 8 JUL	0550187 13 JUL	0550193 19 JUL	0550192 20 JUL	0550194 20 JUL	0550199 20 JUL	0550200 20 JUL	0550204 20 JUL	0550206 20 JUL	0550245 24 JUL	0550246 24 JUL	0550251 24 JUL	0550253 25 JUL
46.1-47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47.1-48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48.1-49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49.1-50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50.1-51.0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
51.1-52.0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
52.1-53.0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
53.1-54.0	-	-	1	1	-	-	1	-	-	-	1	-	-	-	-
54.1-55.0	1	-	-	1	-	1	1	-	1	-	1	-	-	-	-
55.1-56.0	2	1	3	-	1	1	1	1	-	1	-	-	-	-	-
56.1-57.0	-	3	3	3	1	-	1	-	1	1	-	-	-	-	-
57.1-58.0	1	4	4	4	2	2	7	-	3	3	1	-	-	-	-
58.1-59.0	2	2	3	2	2	-	-	1	2	1	3	-	-	-	-
59.1-60.0	1	2	2	3	1	4	1	3	1	-	-	-	-	-	-
60.1-61.0	3	1	1	1	1	5	3	3	5	2	2	-	-	-	-
61.1-62.0	5	2	2	3	1	-	1	1	3	4	1	-	-	-	-
62.1-63.0	3	-	5	1	2	1	-	2	5	2	2	-	-	-	-
63.1-64.0	2	1	1	-	-	2	2	1	-	1	2	-	-	-	-
64.1-65.0	-	-	-	1	1	1	4	3	-	2	2	-	-	-	-
65.1-66.0	-	1	-	1	1	5	-	-	1	1	1	-	-	-	-
66.1-67.0	-	2	-	-	4	1	1	3	-	2	2	-	-	-	-
67.1-68.0	-	-	1	2	1	2	-	1	1	-	1	-	-	-	-
68.1-69.0	1	-	-	2	2	-	-	1	-	1	-	-	-	-	-
69.1-70.0	-	-	2	-	1	1	1	-	-	-	2	-	-	-	-
70.1-71.0	2	-	-	-	-	1	1	2	1	-	2	-	-	-	-
71.1-72.0	-	2	-	1	2	-	-	1	2	1	1	-	-	-	-
72.1-73.0	1	-	-	-	-	-	-	1	2	-	-	-	-	-	-
73.1-74.0	2	-	-	1	-	1	-	-	1	2	-	-	-	-	-
74.1-75.0	-	1	2	1	2	1	-	-	1	2	-	-	-	-	-
75.1-76.0	-	-	-	-	1	-	1	-	-	1	1	-	-	-	-
76.1-####	4	8	-	1	3	1	4	6	-	3	4				
NO.LARVAE MEASURED	30	30	30	30	30	30	30	30	30	30	30	0	0	0	0
NO.LARVAE COLLECTED	90	205	184	211	158	144	133	272	404	85	107	30	32	20	31
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	67.0	67.7	61.5	63.2	66.1	64.5	64.5	68.5	63.3	66.2	66.3	.0	.0	.0	.0
STD DEV	11.24	11.56	5.41	8.80	7.17	6.12	7.64	9.34	5.71	7.02	8.12	NA	NA	NA	NA

LOSC...

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.4

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - FA

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550002 20 JUN	0550003 20 JUN	0550008 20 JUN	0550011 21 JUN	0550018 21 JUN	0550020 21 JUN	0550024 21 JUN	0550027 21 JUN	0550030 21 JUN	0550035 21 JUN	0550126 7 JUL	0550127 7 JUL	0550133 8 JUL	0550137 8 JUL	0550139 8 JUL
2.1- 3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-	-	-	-	3	1	6	-
6.1- 7.0	-	-	-	-	-	-	-	-	-	-	2	3	4	7	-
7.1- 8.0	-	-	-	-	-	-	-	-	-	-	5	3	9	3	3
8.1- 9.0	-	-	-	-	-	-	-	-	-	-	7	4	7	5	4
9.1-10.0	-	-	-	-	-	-	-	-	-	-	5	[illegible]	3	2	1
10.1-11.0	-	-	-	-	-	-	-	-	-	-	1	2	3	4	1
11.1-12.0	-	-	-	-	-	-	-	-	-	-	2	2	1	1	1
12.1-13.0	-	-	-	-	-	-	-	-	-	-	2	1	2	1	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-
14.1-15.0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.1-17.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.1-20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.1-21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.1-22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.1-23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0	0	0	30	30	30	30	11
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0	0	0	565	1215	311	179	13
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.1	7.9	8.5	8.2	5.3
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.02	1.39	1.68	2.19	2.12

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.4

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - EA

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550257 25 JUL	0550259 25 JUL	0550263 25 JUL	0550267 25 JUL
2.1- 3.0	1	-	-	-
3.1- 4.0	-	-	-	-
4.1- 5.0	-	-	-	-
5.1- 6.0	-	-	-	-
6.1- 7.0	-	2	-	-
7.1- 8.0	3	2	-	-
8.1- 9.0	2	6	-	-
9.1-10.0	7	6	-	1
10.1-11.0	3	5	2	1
11.1-12.0	4	4	1	-
12.1-13.0	1	4	3	-
13.1-14.0	1	-	5	-
14.1-15.0	2	1	4	4
15.1-16.0	-	-	5	2
16.1-17.0	3	-	2	2
17.1-18.0	1	-	2	5
18.1-19.0	1	-	2	5
19.1-20.0	-	-	-	6
20.1-21.0	1	-	3	3
21.1-22.0	-	-	-	1
22.1-23.0	-	-	1	-
23.1-24.0	-	-	-	-
24.1-25.0	-	-	-	-
25.1-26.0	-	-	-	-
NO.LARVAE MEASURED	30	30	30	30
NO.LARVAE COLLECTED	1940	1341	1033	711
NO.SAMPLES	1	1	1	1
MEAN LENGTH	11.6	10.0	15.4	17.4
STD DEV	3.94	1.91	3.04	2.85

LOSCORCLLA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VBL 1.6

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - ASO

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550147 8 JUL	0550148 8 JUL	0550151 8 JUL	0550185 19 JUL	0550188 19 JUL	0550193 20 JUL	0550195 20 JUL	0550197 20 JUL	0550202 20 JUL	0550203 20 JUL	0550206 20 JUL	0550243 24 JUL	0550247 24 JUL	0550250 24 JUL	0550254 25 JUL
54.1-55.0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	55.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV.	NA	NA	NA	NA	NA	55.00	NA	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.8

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550003 20 JUN	0550004 20 JUN	0550007 20 JUN	0550013 21 JUN	0550019 21 JUN	0550021 21 JUN	0550025 21 JUN	0550026 21 JUN	0550029 21 JUN	0550034 22 JUN	0550132 8 JUL	0550134 8 JUL	0550136 8 JUL	0550141 8 JUL	0550144 8 JUL
4.1- 5.0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
5.1- 6.0	1	2	1	4	1	7	2	-	3	3	-	-	-	-	-
6.1- 7.0	5	12	5	18	15	18	3	4	14	12	-	-	-	1	-
7.1- 8.0	3	6	10	8	8	5	3	8	13	14	1	-	1	1	1
8.1- 9.0	2	1	1	-	3	-	1	-	-	1	-	2	1	2	-
9.1-10.0	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1
10.1-11.0	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-
11.1-12.0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
14.1-15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
16.1-17.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	11	21	17	30	30	30	10	12	30	30	2	2	4	6	3
NO.LARVAE COLLECTED	11	22	19	240	266	84	11	12	32	31	2	2	4	6	3
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.1	7.0	7.1	6.7	7.2	6.4	6.7	7.2	6.9	6.9	9.4	8.5	10.9	8.7	11.0
STD DEV	.81	.67	.56	.54	1.02	.57	1.16	.43	.55	.71	2.62	.14	3.21	1.28	4.25

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.8

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - .F

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550147 8 JUL	0550149 8 JUL	0550151 8 JUL	0550185 19 JUL	0550188 19 JUL	0550193 20 JUL	0550195 20 JUL	0550197 20 JUL	0550202 20 JUL	0550205 20 JUL	0550208 20 JUL	0550245 24 JUL	0550247 24 JUL	0550250 24 JUL	0550254 25 JUL
3.1- 4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	2	1	5	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	2	4	3	1	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	7	7	8	-	-	1	-	-	-	-	-	-	-	-	-
7.1- 8.0	5	3	2	-	1	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	8	2	4	-	-	2	-	-	-	-	-	-	-	-	-
9.1-10.0	2	1	5	-	-	1	-	-	-	-	-	-	-	-	-
10.1-11.0	1	1	1	1	-	-	-	1	1	-	-	-	-	-	-
11.1-12.0	1	-	1	-	-	-	-	1	1	-	-	-	-	-	-
12.1-13.0	-	-	-	1	-	-	1	1	-	-	-	-	-	-	-
13.1-14.0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	28	20	30	4	1	4	1	3	2	0	0	0	0	0	0
NO.LARVAE COLLECTED	31	21	37	4	1	4	1	3	2	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	7.6	7.3	7.8	10.7	7.6	8.4	12.1	11.5	10.7	.0	.0	.0	.0	.0	.0
STD DEV	1.66	2.37	1.77	3.64	7.60	1.49	12.10	1.21	.49	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - STC   LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550003 20 JUN	0550004 20 JUN	0550007 20 JUN	0550015 21 JUN	0550019 21 JUN	0550021 21 JUN	0550025 21 JUN	0550026 21 JUN	0550029 21 JUN	0550039 22 JUN	0550132 6 JUL	0550134 6 JUL	0550136 6 JUL	0550141 6 JUL	0550146 6 JUL
40.1-41.0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
41.1-42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42.1-43.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
43.1-44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44.1-45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45.1-46.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46.1-47.0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
47.1-48.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48.1-49.0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
49.1-50.0	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-
50.1-51.0	1	-	-	-	-	1	1	-	-	2	-	-	-	-	-
51.1-52.0	3	-	-	1	1	1	-	1	-	-	-	-	-	-	-
52.1-53.0	2	1	1	1	-	3	4	1	1	2	3	-	-	-	-
53.1-54.0	2	1	2	1	1	3	1	4	2	-	-	1	-	1	-
54.1-55.0	2	2	2	3	1	2	1	1	1	-	3	1	-	1	1
55.1-56.0	4	4	4	1	3	3	2	-	1	4	1	2	-	2	-
56.1-57.0	1	4	1	3	-	3	1	4	3	3	2	2	1	3	-
57.1-58.0	3	4	2	1	3	1	2	2	4	2	2	2	3	1	-
58.1-59.0	2	3	4	-	2	4	4	3	-	3	2	3	2	1	2
59.1-60.0	3	6	2	1	1	1	1	1	2	2	2	2	1	1	1
60.1-61.0	2	-	2	3	1	3	2	-	-	1	2	2	5	-	-
61.1-62.0	-	1	4	1	1	-	2	2	1	-	2	1	2	-	1
62.1-63.0	1	1	2	2	1	2	-	1	1	-	2	3	1	-	-
63.1-64.0	1	-	-	2	1	-	3	-	1	-	1	3	2	-	-
64.1-65.0	-	-	-	1	-	1	-	1	1	3	-	2	3	-	-
65.1-66.0	-	-	1	-	1	-	-	1	-	-	1	-	1	-	-
66.1-67.0	-	-	-	1	2	-	-	1	1	-	1	-	1	-	-
67.1-68.0	1	-	-	-	1	1	1	-	2	1	1	2	-	-	1
68.1-69.0	1	1	-	1	2	-	-	1	1	-	1	-	1	-	-
69.1-70.0	-	-	1	-	-	1	1	-	-	-	1	-	-	-	-
70.1-71.0	-	-	1	3	2	-	-	-	-	2	-	1	1	1	-
71.1-72.0	-	-	-	1	-	-	1	1	1	-	-	-	-	2	-
72.1-73.0	-	-	-	1	-	-	-	-	2	-	-	1	1	-	-
73.1-74.0	-	1	-	-	2	-	-	1	1	1	-	-	-	-	1
74.1-75.0	-	-	-	1	-	-	1	-	1	-	1	-	1	-	-
75.1-76.0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
76.1-99.0	-	-	1	1	4	-	-	1	2	3	2	2	4	-	-
NO. LARVAE MEASURED	30	30	30	30	30	30	30	30	30	30	30	30	30	13	7
NO. LARVAE COLLECTED	114	37	106	54	77	347	56	37	64	60	44	78	92	13	7
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	57.3	58.3	60.3	62.8	64.8	58.0	59.2	59.2	63.6	62.6	64.4	62.3	66.2	60.3	62.4

LOSCERCCLD

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.8

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - ATC

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550256 25 JUL	0550258 25 JUL	0550264 25 JUL	0550265 25 JUL
40.1-41.0	-	-	-	-
41.1-42.0	-	-	-	-
42.1-43.0	-	-	-	-
43.1-44.0	-	-	-	-
44.1-45.0	-	-	-	-
45.1-46.0	-	-	-	-
46.1-47.0	-	-	-	-
47.1-48.0	-	-	-	-
48.1-49.0	-	-	-	-
49.1-50.0	-	-	-	-
50.1-51.0	-	-	-	-
51.1-52.0	-	-	-	-
52.1-53.0	-	-	-	-
53.1-54.0	-	-	-	-
54.1-55.0	-	-	-	-
55.1-56.0	-	-	-	-
56.1-57.0	-	-	-	-
57.1-58.0	-	-	-	-
58.1-59.0	-	-	-	-
59.1-60.0	-	-	-	-
60.1-61.0	-	-	-	-
61.1-62.0	-	-	-	-
62.1-63.0	-	-	-	-
63.1-64.0	-	-	-	-
64.1-65.0	-	-	-	-
65.1-66.0	-	-	-	-
66.1-67.0	-	-	-	-
67.1-68.0	-	-	-	-
68.1-69.0	-	-	-	-
69.1-70.0	-	-	-	-
70.1-71.0	-	-	-	-
71.1-72.0	-	-	-	-
72.1-73.0	-	-	-	-
73.1-74.0	-	-	-	-
74.1-75.0	-	-	-	-
75.1-76.0	-	-	-	-
76.1-99.0	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0
NO.LARVAE COLLECTED	33	41	66	2
NO.SAMPLES	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.8

SAMPLE LOCATION - EPIBENTHIC SLED
SPECIES - CA
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550147 JUL	0550141 6 JUL	0550151 8 JUL	0550185 19 JUL	0550188 19 JUL	0550193 20 JUL	0550195 20 JUL	0550197 20 JUL	0550202 20 JUL	0550205 20 JUL	0550208 20 JUL	0550243 24 JUL	0550247 24 JUL	0550250 24 JUL	0550254 25 JUL
1.1- 2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.1- 3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-
6.1- 7.0	-	2	-	-	-	-	-	-	-	-	1	2	-	-	-
7.1- 8.0	3	3	5	-	-	-	-	-	-	1	4	3	2	2	5
8.1- 9.0	2	7	7	-	-	1	-	-	-	-	3	3	4	2	7
9.1-10.0	-	5	2	-	-	1	1	-	3	-	-	4	1	2	5
10.1-11.0	1	2	4	-	-	7	1	-	5	1	2	2	6	2	4
11.1-12.0	1	5	-	3	-	1	-	1	5	1	4	3	4	2	1
12.1-13.0	-	3	2	2	-	1	6	2	4	2	4	1	2	4	1
13.1-14.0	-	2	-	2	-	-	2	4	-	1	2	3	-	1	3
14.1-15.0	-	1	1	7	-	-	1	4	2	-	-	[illegible]	3	3	1
15.1-16.0	-	-	-	1	-	2	-	2	1	-	1	1	1	6	1
16.1-17.0	-	-	-	1	1	4	4	4	-	2	1	-	1	2	1
17.1-18.0	-	-	-	3	6	2	4	3	2	-	-	-	2	1	-
18.1-19.0	-	-	-	3	3	1	3	2	6	1	-	-	2	3	-
19.1-20.0	-	-	-	4	9	-	6	5	2	-	-	-	-	-	-
20.1-21.0	-	-	-	1	3	2	2	2	-	-	1	-	1	-	1
21.1-22.0	-	-	-	1	7	2	-	1	-	-	-	-	1	-	-
22.1-23.0	-	-	-	1	1	6	-	-	-	-	-	-	-	-	-
23.1-24.0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	7	30	22	30	30	30	30	30	30	9	25	30	30	30	30
NO.LARVAE COLLECTED	29	38	29	134	218	245	323	323	147	36	51	213	373	1672	1015
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	8.9	10.0	9.2	16.4	19.6	16.2	16.4	16.6	13.9	13.2	11.0	10.0	12.7	13.4	10.7
STD DEV	1.50	2.13	2.09	3.3[illegible]	1.59	4.80	3.23	2.79	3.62	3.43	3.53	2.41	3.35	3.20	3.12

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - STANDARD TICKER
SPECIES - ASJ

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550063 29 JUN	0550066 25 JUN	0550070 29 JUN	0550073 30 JUN	0550076 30 JUN	0550078 30 JUN	0550086 30 JUN	0550088 30 JUN	0550092 30 JUN	0550094 30 JUN	0550097 5 JUL	0550099 5 JUL	0550104 6 JUL	0550107 6 JUL	0550105 6 JUL
53.1-54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.1-55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55.1-56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56.1-57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57.1-58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58.1-59.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59.1-60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60.1-61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
61.1-62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62.1-63.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63.1-64.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64.1-65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65.1-66.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.0

SAMPLE LOCATION - STANDARD TICKER
SPECIES - ASC
LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550217 23 JUL	0550219 24 JUL	0550222 24 JUL	0550225 24 JUL	0550230 24 JUL	0550234 24 JUL	0550238 24 JUL	0550241 24 JUL
53.1-54.0	-	-	-	-	-	-	-	-
54.1-55.0	-	-	-	-	-	-	-	-
55.1-56.0	-	-	-	-	-	-	-	-
56.1-57.0	-	-	-	-	-	-	-	-
57.1-58.0	-	-	-	-	-	-	-	-
58.1-59.0	-	-	-	-	-	-	-	-
59.1-60.0	-	1	-	-	1	-	-	-
60.1-61.0	-	-	1	-	-	-	-	-
61.1-62.0	1	-	-	-	-	-	1	-
62.1-63.0	1	-	-	-	1	-	-	1
63.1-64.0	-	-	-	-	1	-	-	-
64.1-65.0	-	-	1	-	-	-	-	-
65.1-66.0	-	-	1	-	-	-	-	-
NO.LARVAE MEASURED	2	1	3	0	3	0	1	1
NO.LARVAE COLLECTED	2	1	3	0	3	0	1	1
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	62.5	60.0	64.0	.0	62.3	.0	62.0	63.0
STD DEV	.71	60.00	2.65	NA	2.08	NA	62.00	63.00

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VER 1.0

SAMPLE LOCATION - STANDARD TACKER
SPECIES - SB
LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550113 6 JUL	0550115 6 JUL	0550118 6 JUL	0550154 18 JUL	0550157 18 JUL	0550160 18 JUL	0550163 19 JUL	0550167 19 JUL	0550170 19 JUL	0550173 19 JUL	0550177 19 JUL	0550179 19 JUL	0550182 19 JUL	0550209 23 JUL	0550210 23 JUL
5.1- 6.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	2	5	1	-	-	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
9.1-10.0	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
10.1-11.0	3	-	5	-	-	-	-	-	-	-	-	-	-	-	-
11.1-12.0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
12.1-13.0	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	-	-	-										
NO.LARVAE MEASURED	16	10	14	0	0	0	0	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	16	10	14	0	0	0	0	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	10.1	8.1	10.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	2.03	1.20	1.77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LUSC(NCOL)

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - STANDARD TICKER
SPECIES - BP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550063 29 JUN	0550066 29 JUN	0550070 29 JUN	0550073 30 JUN	0550076 30 JUN	0550078 30 JUN	0550086 30 JUN	0550088 30 JUN	0550092 30 JUN	0550094 30 JUN	0550097 5 JUL	0550081 5 JUL	0550104 6 JUL	0550107 6 JUL	0550104 6 JUL
3.1- 4.0	-	4	-	2	4	2	-	-	-	-	-	3	-	-	-
4.1- 5.0	12	1	2	5	6	6	6	3	4	6	-	1	-	5	-
5.1- 6.0	7	9	7	6	4	2	5	5	13	11	2	5	2	4	-
6.1- 7.0	5	6	11	3	4	4	10	6	8	9	4	4	3	5	5
7.1- 8.0	2	5	4	1	2	-	4	2	2	1	5	8	8	6	1
8.1- 9.0	3	3	4	3	-	1	-	3	-	1	8	3	11	10	6
9.1-10.0	1	2	2	2	-	-	5	1	-	-	3	1	4	2	2
10.1-11.0	-	-	-	-	-	-	-	-	-	-	3	-	2	-	2
11.1-12.0	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	30	30	30	22	20	15	30	20	27	30	30	30	30	30	21
NO.LARVAE COLLECTED	102	668	121	22	20	15	39	22	27	42	58	35	58	44	21
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.4	6.3	6.8	6.1	5.1	5.3	5.6	6.6	5.9	5.8	8.5	7.0	8.1	7.3	8.1
STD DEV	1.37	1.70	1.32	1.96	1.22	1.43	1.58	1.42	.69	.91	1.75	1.64	1.19	1.54	1.04

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.0

SAMPLE LOCATION - STANDARD TICKER
SPECIES - EA

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550063 24 JUN	0550066 25 JUN	0550030 29 JUN	0550075 30 JUN	0550076 30 JUN	0550078 30 JUN	0550086 30 JUN	0550088 30 JUN	0550092 30 JUN	0550094 30 JUN	0550097 5 JUL	0550099 5 JUL	0550104 6 JUL	0550107 6 JUL	0550105 5 JUL
2.1- 3.0	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	3	-	-	5	-	-	1	-	-	-	-	-	1	-
4.1- 5.0	8	3	8	6	1	2	1	6	-	-	-	1	1	6	-
5.1- 6.0	13	9	9	12	9	8	4	10	-	3	6	1	4	5	-
6.1- 7.0	6	7	8	6	11	8	12	9	8	15	6	9	5	7	3
7.1- 8.0	2	5	2	1	2	6	7	2	13	5	7	4	4	3	5
8.1- 9.0	-	1	2	1	-	3	2	2	2	2	7	11	5	4	[illegible]
9.1-10.0	1	-	1	3	2	-	1	-	2	4	4	1	3	-	7
10.1-11.0	-	-	-	-	-	1	-	-	-	1	-	4	2	5	[illegible]
11.1-12.0	-	-	-	-	-	-	2	-	-	-	-	3	4	1	3
12.1-13.0	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
14.1-15.0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
16.1-17.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.1-20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.1-21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.1-22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.1-23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	30	33	30	30	30	33	30	30	33	30	30	30	30	30	30
NO. LARVAE COLLECTED	423	2298	812	1813	2444	2142	3452	3406	6240	8024	168	520	541	1315	263
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.7	5.6	6.1	6.0	5.9	6.7	7.3	6.0	7.4	7.3	7.4	8.7	8.6	6.8	5.6
STD DEV	1.00	1.37	1.35	1.58	1.51	1.31	1.78	1.16	.70	1.27	1.33	2.11	2.45	2.09	2.17

LOSCONCCLD

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.0

SAMPLE LOCATION - STANDARD TUCKER
SPECIES - EA
LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550217 23 JUL	0550219 24 JUL	0550222 24 JUL	0550225 24 JUL	0550230 24 JUL	0550234 24 JUL	055023? 24 JUL	0550241 24 JUL
2.1- 3.0	-	-	-	-	-	-	-	-
3.1- 4.0	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	1	-	-	-	-
5.1- 6.0	1	-	-	-	-	-	1	-
6.1- 7.0	1	-	-	1	-	-	2	-
7.1- 8.0	2	-	-	1	-	-	3	1
8.1- 9.0	3	-	-	1	-	1	1	-
9.1-10.0	-	-	-	1	1	3	-	2
10.1-11.0	2	-	-	5	1	1	-	1
11.1-12.0	1	3	1	-	2	1	1	-
12.1-13.0	3	-	1	2	4	1	2	1
13.1-14.0	1	3	1	2	2	-	4	-
14.1-15.0	1	6	4	2	3	1	2	-
15.1-16.0	4	5	1	1	4	1	2	2
16.1-17.0	3	3	7	3	4	1	2	3
17.1-18.0	3	3	2	2	3	3	1	1
18.1-19.0	1	1	1	3	3	2	3	4
19.1-20.0	1	1	5	1	2	7	2	3
20.1-21.0	-	3	6	3	-	3	2	5
21.1-22.0	2	-	1	1	-	3	1	3
22.1-23.0	1	2	-	-	-	1	1	2
23.1-24.0	-	-	-	-	1	-	-	2
24.1-25.0	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	1	-	-
NO.LARVAE MEASURED	30	30	30	30	30	30	30	30
NO.LARVAE COLLECTED	316	284	466	233	329	499	681	622
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	14.0	16.3	17.4	14.3	15.4	17.3	14.4	18.0
STD DEV	4.69	3.02	2.64	4.66	3.02	4.53	4.99	4.33

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.0

SAMPLE LOCATION - STANDARD TICKER
SPECIES - SP

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550216 23 JUL	0550219 24 JUL	0550222 24 JUL	0550225 24 JUL	0550230 24 JUL	0550234 24 JUL	0550238 24 JUL	0550241 24 JUL
3.1- 4.0	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-
7.1- 8.0	-	-	-	-	-	-	-	-
8.1- 9.0	-	-	-	-	-	-	-	-
9.1-10.0	-	-	-	-	-	-	-	-
10.1-11.0	-	-	-	-	-	-	-	-
11.1-12.0	-	-	-	-	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-
14.1-15.0	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA

COSCINCOLD

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VER 1.0

SAMPLE LOCATION - WEIGHTED TICKER
SPECIES - ASD

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	0550216 23 JUL	0550218 23 JUL	0550221 24 JUL	0550226 24 JUL	0550231 24 JUL	0550235 24 JUL	0550236 24 JUL	0550239 24 JUL
	NUMBER OF FISH PER SAMPLE							
55.1-56.0	-	-	-	-	-	-	-	-
56.1-57.0	-	-	-	-	-	-	-	-
57.1-58.0	-	-	-	-	-	-	-	-
58.1-59.0	-	-	-	-	-	-	-	-
59.1-60.0	-	-	-	-	-	-	-	-
60.1-61.0	-	-	-	1	-	1	-	-
61.1-62.0	-	-	-	-	-	-	-	-
62.1-63.0	-	-	-	1	-	-	-	-
63.1-64.0	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	0	0	0	2	0	1	0	0
NO. LARVAE COLLECTED	0	0	0	2	0	2	0	0
NO. SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	62.0	.0	61.0	.0	.0
STD DEV	NA	NA	NA	1.41	NA	61.00	NA	NA

LOSCANCFLD

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
DEL 1.4

SAMPLE LOCATION - WEIGHTED TICKER
SPECIES - 56

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550111 6 JUL	0550116 6 JUL	0550113 6 JUL	0550152 18 JUL	0550156 18 JUL	0550159 18 JUL	0550164 19 JUL	0550166 19 JUL	0550173 19 JUL	0550174 19 JUL	0550175 19 JUL	0550181 19 JUL	0550183 19 JUL	0550211 23 JUL	0550212 23 JUL
.1- 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	2	3	1	-	-	-	-	-	-	-	-	-	-	-	-
9.1-10.0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.1-11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.1-12.0	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
15.1-16.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.1-17.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.1-18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.1-19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.1-20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.1-21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.1-22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.1-23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.1-27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.1-28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.1-29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.1-30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.1-31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.1-32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.1-33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.1-34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.1-35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.1-36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	12	9	3	0	0	0	0	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	12	9	3	0	0	0	0	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	10.6	9.3	10.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	2.07	2.22	4.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.

SAMPLE LOCATION - WEIGHTED TUCKER
SPECIES - WF

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550065 27 JUN	0550068 29 JUN	0550071 29 JUN	0550072 29 JUN	0550075 30 JUN	0550082 30 JUN	0550085 30 JUN	0550089 30 JUN	0550093 30 JUN	0550095 30 JUN	0550098 6 JUL	0550100 6 JUL	0550103 6 JUL	0550106 6 JUL	0550107 6 JUL
3.1- 4.0	1	-	2	1	2	3	-	-	-	1	-	1	-	-	-
4.1- 5.0	1	2	3	3	2	-	2	2	3	10	3	2	5	3	1
5.1- 6.0	6	7	10	8	5	5	5	5	3	4	5	2	1	4	2
6.1- 7.0	9	14	11	4	4	5	5	13	2	6	4	2	3	4	4
7.1- 8.0	7	3	-	1	3	3	1	8	3	2	4	6	4	2	9
8.1- 9.0	3	2	-	-	1	1	7	2	1	-	5	10	2	8	8
9.1-10.0	3	1	2	1	-	-	-	-	1	-	4	2	6	3	6
10.1-11.0	-	-	-	-	-	-	1	-	-	-	1	2	1	4	-
11.1-12.0	-	-	-	-	-	-	1	-	-	-	-	1	3	2	-
12.1-13.0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
13.1-14.0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	30	30	28	18	17	17	22	30	13	29	30	30	30	30	30
NO.LARVAE COLLECTED	61	50	28	20	17	17	22	103	13	29	55	67	74	38	48
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	6.9	6.7	5.5	5.9	5.9	6.1	7.3	6.6	6.4	5.3	7.4	7.[illegible]	7.3	8.0	7.3
STD DEV	1.43	1.62	1.25	1.31	1.41	1.41	1.52	.93	1.59	1.09	1.11	1.64	2.25	2.16	1.32

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.4

SAMPLE LOCATION - WEIGHTED TUCKER
SPECIES - *F

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	NUMBER OF FISH PER SAMPLE 0550216 23 JUL	0550219 23 JUL	0550221 24 JUL	0550226 24 JUL	0550231 24 JUL	0550235 24 JUL	0550236 24 JUL	05 0239 24 JUL
3.1- 4.0	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-
7.1- 8.0	-	-	-	-	-	-	-	-
8.1- 9.0	-	-	-	-	-	-	-	-
9.1-10.0	-	-	-	-	-	-	-	-
10.1-11.0	-	-	-	-	-	-	-	-
11.1-12.0	-	-	-	-	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-
14.1-15.0	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VER 1.4

SAMPLE LOCATION - WEIGHTED TUCKER
SPECIES - EA

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550111 5 JUL	0550116 6 JUL	0550119 6 JUL	0550152 18 JUL	0550156 18 JUL	0550159 19 JUL	0550164 19 JUL	0550166 19 JUL	0550170 19 JUL	0550174 19 JUL	0550175 19 JUL	0550180 19 JUL	0550183 19 JUL	0550211 25 JUL	0550212 25 JUL
1.1- 2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.1- 3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	6	10	-	-	-	-	-	-	-	-	-	-	-	
6.1- 7.0	4	9	8	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	4	5	7	-	-	-	-	-	-	-	-	1	-	-	-
8.1- 9.0	4	1	2	-	-	-	-	-	-	-	-	-	1	2	4
9.1-10.0	8	5	2	-	-	-	-	-	-	-	-	2	-	3	2
10.1-11.0	3	1	-	1	-	-	-	-	-	1	-	3	-	3	5
11.1-12.0	2	1	1	1	-	1	-	1	-	-	3	4	2	2	3
12.1-13.0	1	-	-	-	-	2	2	1	-	3	1	7	2	3	.
13.1-14.0	1	-	-	2	2	2	3	2	4	1	2	2	4	2	-
14.1-15.0	1	-	-	1	2	2	2	2	-	1	2	3	3	3	1
15.1-16.0	-	-	-	-	1	4	2	6	6	1	5	2	3	2	-
16.1-17.0	-	-	-	2	8	4	6	10	4	3	4	1	4	6	-
17.1-18.0	-	-	-	-	4	6	4	2	1	-	6	-	7	3	1
18.1-19.0	-	-	-	1	4	5	5	3	2	-	4	2	1	1	3
19.1-20.0	-	-	-	-	3	2	3	1	-	-	2	3	2	-	4
20.1-21.0	-	-	-	1	-	1	2	-	-	-	1	-	-	-	1
21.1-22.0	-	-	-	-	1	1	1	1	-	-	-	-	1	-	1
22.1-23.0	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO. LARVAE MEASURED	30	30	30	9	25	30	30	30	18	10	30	30	30	30	30
NO. LARVAE COLLECTED	1169	1005	107	9	25	48	54	44	29	11	41	320	184	288	276
NO. SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	9.1	7.3	7.0	15.1	17.2	16.7	17.0	16.4	16.2	14.2	16.2	13.5	15.6	13.6	13.7
STD DEV	2.32	1.83	1.35	3.14	1.95	2.43	2.40	2.32	2.28	2.03	2.45	3.18	2.78	2.99	4.18

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
V-E 1.d

GEAR LOCATION = WEIGHTED TUCKER
DEPTH = AOD

LIFE STAGE = ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	[illegible] 24 JUN	[illegible] 25 JUN	0550089 29 JUN	0550074 30 JUN	0550078 30 JUN	0550079 30 JUN	0550083 30 JUN	0550087 30 JUN	0550091 30 JUN	0550095 30 JUN	0550098 5 JUL	0550101 6 JUL	0550102 6 JUL	0550103 6 JUL	0550110 6 JUL
	NUMBER OF FISH PER SAMPLE														
53.1- 54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.1- 55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55.1- 56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56.1- 57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57.1- 58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58.1- 59.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59.1- 60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60.1- 61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61.1- 62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62.1- 63.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63.1- 64.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	[illegible]
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VOL 1.8

SAMPLE LOCATION - WEIGHTED TICK R
SPECIES - [illegible]
LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	0550219 24 JUL	0550220 24 JUL	0550223 24 JUL	0550227 24 JUL	0550232 24 JUL	0550233 24 JUL	0550237 24 JUL	0550242 24 JUL
53.1- 54.0	-	-	-	-	-	-	-	-
54.1-55.0	-	-	-	-	-	-	-	-
55.1-56.0	-	-	-	-	-	-	-	-
56.1-57.0	-	-	-	-	-	-	-	-
57.1-58.0	-	-	-	-	-	-	-	-
58.1-59.0	-	-	-	-	-	-	-	-
59.1-60.0	-	-	-	-	-	-	-	-
60.1-61.0	-	-	-	-	-	-	-	-
61.1-62.0	-	-	-	-	-	-	-	-
62.1-63.0	1	-	-	-	-	-	-	-
63.1-64.0	-	1	-	-	-	-	-	-
NO.LARVAE MEASURED	1	1	0	0	0	0	0	0
NO.LARVAE COLLECTED	1	1	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	63.0	64.0	.0	.0	.0	.0	.0	.0
STD DEV	63.00	64.00	NA	NA	NA	NA	NA	NA

EE3C&RE3E1

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VER 1.8

SAMPLE LOCATION - WEIGHTED TICKER
SPECIES - SB

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550112 6 JUL	0550114 6 JUL	0550117 6 JUL	0550153 19 JUL	0550155 18 JUL	0550158 18 JUL	0550165 19 JUL	0550169 19 JUL	0550172 19 JUL	0550176 19 JUL	0550178 19 JUL	0550181 19 JUL	0550184 19 JUL	0550210 23 JUL	0550215 23 JUL
5.1- 6.0	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	-	1	4	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
9.1-10.0	1	4	2	-	-	-	-	-	-	-	-	-	-	-	-
10.1-11.0	1	3	2	-	-	-	-	-	-	1	-	-	-	-	-
11.1-12.0	1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
12.1-13.0	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.1-15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.1-16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	6	16	13	0	0	0	0	0	0	1	0	0	0	0	0
NO.LARVAE COLLECTED	6	16	13	0	0	0	0	0	0	1	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	9.3	10.0	8.6	.0	.0	.0	.0	.0	.0	10.8	.0	.0	.0	.0	.0
STD DEV	1.88	2.03	2.14	NA	NA	NA	NA	NA	NA	10.80	NA	NA	NA	NA	NA

LUSCANCSEP

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.8

SAMPLE LOCATION - WEIGHTED TICKER
SPECIES - MP

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550069 24 JUN	0550067 29 JUN	0550063 29 JUN	0550079 30 JUN	0550077 30 JUN	0550073 30 JUN	0550083 30 JUN	0550087 30 JUN	0550091 30 JUN	0550095 30 JUN	0550096 5 JUL	0550101 4 JUL	0550102 6 JUL	0550105 6 JUL	0550111 6 JUL
3.1- 4.0	4	1	-	-	-	-	1	1	1	-	-	-	-	-	-
4.1- 5.0	3	2	-	1	1	-	-	4	3	2	-	3	[illegible]	3	[illegible]
5.1- 6.0	10	8	13	5	7	1	2	5	4	[illegible]	1	5	[illegible]	4	2
6.1- 7.0	8	9	7	12	8	5	4	6	2	3	4	3	5	4	9
7.1- 8.0	4	8	4	5	2	1	-	5	5	-	5	7	10	7	5
8.1- 9.0	1	2	3	5	1	-	1	2	-	1	2	[illegible]	4	7	7
9.1-10.0	-	-	2	2	-	-	1	2	1	-	6	[illegible]	2	5	3
10.1-11.0	-	-	1	-	-	-	-	-	-	-	4	9	-	-	1
11.1-12.0	-	-	-	-	-	-	-	-	-	-	7	-	-	-	2
12.1-13.0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	30	30	30	30	19	7	9	25	14	12	30	30	30	30	2-
NO.LARVAE COLLECTED	397	155	138	47	19	7	9	27	14	12	32	67	50	36	28
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	5.8	6.4	6.8	7.1	6.3	6.6	6.6	6.6	6.1	5.9	9.2	7.4	7.1	7.4	7.[illegible]
STD DEV	1.30	1.13	1.36	1.13	.87	.67	1.82	1.51	1.65	.96	2.06	1.81	1.27	1.51	1.85

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VEL 1.8

SAMPLE LOCATION - WEIGHTED TICKER
SPECIES - SP

LIFE STAGE - ALL LIFE STAGES COMBINED

LENGTH INTERVAL (MM)	0550215 24 JUL	0550220 24 JUL	0550223 24 JUL	0550227 24 JUL	0550232 24 JUL	0550233 24 JUL	0550237 24 JUL	0550242 24 JUL
	NUMBER OF FISH PER SAMPLE							
3.1- 4.0	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-
6.1- 7.0	-	-	-	-	-	-	-	-
7.1- 8.0	-	-	-	-	-	-	-	-
8.1- 9.0	-	-	-	-	-	-	-	-
9.1-10.0	-	-	-	-	-	-	-	-
10.1-11.0	-	-	-	-	-	-	-	-
11.1-12.0	-	-	-	-	-	-	-	-
12.1-13.0	-	-	-	-	-	-	-	-
13.1-14.0	-	-	-	-	-	-	-	-
NO.LARVAE MEASURED	0	0	0	0	0	0	0	0
NO.LARVAE COLLECTED	0	0	0	0	0	0	0	0
NO.SAMPLES	1	1	1	1	1	1	1	1
MEAN LENGTH	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV	NA	NA	NA	NA	NA	NA	NA	NA

ICHTHYOPLANKTON DATA SHEET
LENGTH FREQUENCY
VER 1.8

SAMPLE LOCATION - WEIGHTED TUCKER
SPECIES - BA

LIFE STAGE - ALL LIFE STAGES COMBINED

NUMBER OF FISH PER SAMPLE

LENGTH INTERVAL (MM)	0550112 5 JUL	0550114 6 JUL	0550117 6 JUL	0550153 18 JUL	0550155 18 JUL	0550156 18 JUL	0550165 19 JUL	0550169 19 JUL	0550172 19 JUL	0550176 19 JUL	0550178 19 JUL	0550181 19 JUL	0550184 19 JUL	0550210 23 JUL	0550213 23 JUL
.1- 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.1- 3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1- 4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.1- 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1- 6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.1- 7.0	-	1	4	-	-	-	-	-	-	-	-	-	-	-	-
7.1- 8.0	6	2	5	-	-	-	-	-	-	-	-	-	-	-	-
8.1- 9.0	5	7	13	-	-	-	-	-	-	-	-	-	1	-	-
9.1-10.0	8	7	4	-	-	-	-	-	-	-	-	-	-	1	-
10.1-11.0	4	6	1	-	-	1	-	-	2	-	1	1	-	1	1
11.1-12.0	4	3	1	-	-	2	-	1	-	-	1	3	-	3	3
12.1-13.0	1	-	-	-	1	-	1	-	1	-	4	1	2	-	4
13.1-14.0	1	2	2	1	1	-	4	3	-	3	2	3	-	3	4
14.1-15.0	-	2	-	2	1	3	5	2	3	2	1	3	-	5	3
15.1-16.0	-	-	-	-	2	6	7	2	2	2	5	3	5	3	3
16.1-17.0	-	-	-	-	2	5	4	5	7	3	2	3	7	2	2
17.1-18.0	1	-	-	1	2	5	4	4	3	3	5	6	5	6	2
18.1-19.0	-	-	-	-	1	1	2	3	1	1	2	5	5	2	3
19.1-20.0	-	-	-	2	1	1	-	3	2	-	4	1	2	3	1
20.1-21.0	-	-	-	2	1	1	2	1	1	-	-	-	2	-	3
21.1-22.0	-	-	-	-	1	-	1	1	-	-	-	1	-	1	-
22.1-23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
23.1-24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.1-25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1-26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.1-27.0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
NO.LARVAE MEASURED	30	30	30	8	13	25	30	25	23	14	27	30	29	30	30
NO.LARVAE COLLECTED	1524	1127	351	9	16	25	64	27	23	27	56	73	25	319	281
NO.SAMPLES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN LENGTH	9.[illegible]	10.1	8.8	17.5	17.0	16.0	16.2	16.8	16.6	15.9	15.8	15.9	16.8	15.6	15.5
STD DEV	2.12	2.04	1.79	2.94	2.71	2.34	2.23	2.32	3.35	1.71	2.71	2.70	2.51	2.95	3.21

APPENDIX 3-3

TOW SPEED COMPARISON STUDY

1.0-m^2 EPIBENTHIC SLED AND 1.0-m^2 TUCKER TRAWL

COLLECTION INFORMATION BY SAMPLE

Gear Code:
Standard Tucker trawl = 65
Weighted Tucker trawl = 72
Weighted Epibenthic sled = 64

LONG L.NO.

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES STRIPED BASS

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNK LIFE STAGE
0550001	64	3	39	1.0	84/06/20	2100	5.0	10410	280.4475	.00	.00	-	-	-	-
0550016	64	3	[illegible]	1.0	84/06/20	2249	5.0	9301	250.3699	.00	71.91	-	71.91	-	-
0550017	64	3	[illegible]	1.0	84/06/21	2259	5.0	11405	306.4667	.00	412.93	-	412.93	-	-
0550022	64	3	[illegible]	1.0	84/06/21	0032	5.0	14908	402.2355	.00	32.32	-	32.32	-	-
0550023	64	3	37	1.0	84/06/21	2100	5.0	9335	250.6597	.00	87.70	-	87.70	-	-
0550028	64	3	37	1.0	84/06/21	2225	5.0	10318	277.2755	.00	.00	-	-	-	-
0550031	64	3	37	1.0	84/06/21	2313	5.0	9545	256.5650	.00	71.42	-	71.42	-	-
0550032	64	3	37	1.0	84/06/21	2329	5.0	9369	251.2360	.00	11.94	-	11.94	-	-
0550010	64	3	37	1.1	84/06/21	0026	5.0	10315	277.1983	.00	432.71	-	432.71	-	-
0550008	64	3	36	1.3	84/06/20	2340	5.0	9454	254.0202	.00	228.78	-	228.78	-	-
0550002	64	3	39	1.4	84/06/20	2124	4.0	12936	347.6295	.00	5.75	-	5.75	-	-
0550005	64	3	36	1.4	84/06/20	2228	4.0	10283	276.3354	.00	21.71	-	21.71	-	-
0550009	64	3	36	1.4	84/06/20	2322	4.0	9325	250.5910	.00	203.52	-	203.52	-	-
0550011	64	3	37	1.4	84/06/21	0023	4.0	10228	274.8574	.00	374.79	-	374.79	-	-
0550018	64	3	38	1.4	84/06/21	0312	4.0	12277	329.9202	.00	882.03	5.03	877.00	-	-
0550020	64	3	38	1.4	84/06/21	0356	4.0	16165	434.4025	.00	154.23	2.30	151.93	-	-
0550024	64	3	37	1.4	84/06/21	2117	4.0	9862	265.0593	.00	37.50	-	37.50	-	-
0550027	64	3	37	1.4	84/06/21	2208	4.0	11769	316.8062	.00	37.88	-	37.88	-	-
0550030	64	3	37	1.4	84/06/21	2258	4.0	11907	319.9772	.00	30.00	-	30.00	-	-
0550033	64	3	37	1.4	84/06/21	2344	4.0	9690	260.3937	.00	38.40	-	38.40	-	-
0550003	64	3	34	1.8	84/06/20	2149	3.0	11305	303.7896	.00	35.21	-	35.21	-	-
0550004	64	3	36	1.8	84/06/20	2213	3.0	11948	321.0790	.00	68.52	-	68.52	-	-
0550007	64	3	36	1.8	84/06/20	2306	3.0	9964	267.7625	.00	70.76	-	70.76	-	-
0550013	64	3	37	1.8	84/06/21	0055	3.0	10627	285.5797	.00	540.40	-	540.40	-	-
0550019	64	3	38	1.8	84/06/21	0329	3.0	12180	327.3135	.00	812.68	3.06	809.62	-	-
0550021	64	3	36	1.8	84/06/21	0416	3.0	14889	400.1129	.00	209.44	-	209.44	-	-
0550025	64	3	37	1.8	84/06/21	2137	3.0	11899	319.7622	.00	34.40	-	34.40	-	-
0550026	64	3	37	1.8	84/06/21	2153	3.0	11197	300.8973	.00	39.88	-	39.88	-	-
0550029	64	3	37	1.8	84/06/21	2244	3.0	9594	257.8198	.00	124.12	-	124.12	-	-
0550034	64	3	37	1.8	84/06/22	0003	3.0	11988	322.1535	.00	96.23	3.10	93.12	-	-
0550145	64	3	37	1.0	84/07/08	0355	5.0	10306	276.9534	.00	7.22	-	7.22	-	-
0550149	64	3	37	1.0	84/07/08	0504	5.0	11898	319.7330	.00	15.64	-	15.64	-	-
0550138	64	3	37	1.1	84/07/08	0222	5.3	11110	298.5524	.00	13.40	-	13.40	-	-
0550140	64	3	37	1.1	84/07/08	0252	5.0	9796	263.2482	.00	3.80	-	3.80	-	-
0550143	64	3	37	1.1	84/07/08	0332	5.0	10354	278.2434	.00	14.38	-	14.38	-	-
0550124	64	3	37	1.2	84/07/07	2215	5.0	10565	283.9136	.00	56.36	-	56.36	-	-
0550129	64	3	37	1.2	84/07/07	2344	5.0	9080	244.0071	.00	32.79	-	32.79	-	-
0550135	64	3	37	1.2	84/07/08	0135	5.0	9953	267.4673	.00	7.48	-	7.48	-	-
0550146	64	3	37	1.4	84/07/08	0414	4.0	12674	340.5888	.00	23.49	-	23.49	-	-
0550150	64	3	37	1.4	84/07/08	0523	4.0	12329	331.3276	.00	21.13	-	21.13	-	-
0550139	64	3	37	1.5	84/07/08	0237	4.0	11096	298.1831	.00	6.72	-	6.71	-	-
0550142	64	3	37	1.5	84/07/08	0318	4.0	10318	277.2755	.00	3.61	-	3.61	-	-
0550126	64	3	37	1.6	84/07/07	2249	4.0	12075	324.4918	.00	9.25	-	9.25	-	-
0550127	64	3	37	1.6	84/07/07	2307	4.0	11011	295.8985	.00	20.28	-	20.28	-	-
0550133	64	3	37	1.6	84/07/08	0109	4.0	10616	285.2841	.00	7.01	-	7.01	-	-
0550137	64	3	37	1.6	84/07/08	0206	4.0	11120	298.8261	.00	10.04	-	10.04	-	-
0550147	64	3	37	1.8	84/07/08	0433	3.0	12655	340.3465	.00	35.25	-	35.26	-	-

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES STRIPED BASS

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550263	64	3	37	1.8	84/07/25	0315	4.0	9561	256.9330	.00	.00	-	-	-	-
0550268	64	3	37	1.6	84/07/25	0435	3.0	16609	446.3342	.00	.00	-	-	-	-
0550247	64	3	37	1.9	84/07/24	2235	3.0	14409	387.2135	.00	.00	-	-	-	-
0550250	64	3	37	1.9	84/07/24	2323	3.0	18637	506.2073	.00	.00	-	-	-	-
0550254	64	3	37	1.9	84/07/25	0049	3.0	12125	325.4355	.00	.00	-	-	-	-
0550256	64	3	37	2.0	84/07/25	0122	3.0	11844	318.2642	.00	.00	-	-	-	-
0550258	64	3	37	2.0	84/07/25	0153	3.0	11367	305.4557	.00	.00	-	-	-	-
0550260	64	3	37	2.2	84/07/25	0328	3.0	9469	254.4607	.00	.00	-	-	-	-

NO.SAMPLES = 102

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES WHITE PERCH

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAL	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550148	64	3	37	1.8	84/07/08	0445	3.0	12383	332.7687	.00	63.11	-	63.11	-	-
0550151	64	3	37	1.8	84/07/08	0532	3.0	12836	344.9422	.00	107.26	-	107.26	-	-
0550141	64	3	37	1.9	84/07/08	0305	3.0	11193	300.7898	.00	86.44	-	83.11	-	3.32
0550144	64	3	37	1.9	84/07/08	0346	3.0	11373	305.6270	.00	101.43	-	101.43	-	-
0550132	64	3	37	2.0	84/07/08	0052	3.0	10127	272.1432	.00	231.50	-	231.50	-	-
0550134	64	3	37	2.0	84/07/08	0126	3.0	7937	213.2912	.00	318.81	-	318.81	-	-
0550136	64	3	37	2.0	84/07/08	0155	3.0	10406	279.2408	.00	278.93	-	278.93	-	-
0550186	64	3	37	1.0	84/07/19	2218	5.0	10687	287.1921	.00	3.48	-	3.48	-	-
0550191	64	3	37	1.0	84/07/20	0012	5.0	16575	445.4205	.00	11.23	-	11.23	-	-
0550196	64	3	37	1.0	84/07/20	0202	5.0	15940	428.3561	.00	16.68	-	16.68	-	-
0550198	64	3	37	1.0	84/07/20	0233	5.0	16528	444.1574	.00	2.25	-	2.25	-	-
0550201	64	3	37	1.0	84/07/20	0322	5.0	15041	404.1372	.00	.00	-	-	-	-
0550203	64	3	37	1.0	84/07/20	0348	5.0	14578	391.7550	.00	.00	-	-	-	-
0550207	64	3	37	1.0	84/07/20	0451	5.0	13670	367.3343	.00	.00	-	-	-	-
0550187	64	3	37	1.4	84/07/19	2235	4.0	13545	363.5952	.00	2.75	-	2.75	-	-
0550189	64	3	37	1.4	84/07/19	2316	5.0	10307	276.9803	.00	18.05	-	18.05	-	-
0550192	64	3	37	1.4	84/07/20	0036	4.0	15460	415.4570	.00	33.70	-	33.70	-	-
0550194	64	3	37	1.4	84/07/20	0120	4.0	14948	401.6981	.00	7.47	-	7.47	-	-
0550199	64	3	37	1.4	84/07/20	0250	4.0	17769	477.5069	.00	12.57	-	12.57	-	-
0550200	64	3	37	1.4	84/07/20	0306	4.0	17046	458.0777	.00	2.18	-	2.18	-	-
0550204	64	3	37	1.4	84/07/20	0408	4.0	15152	407.1802	.00	4.91	-	4.91	-	-
0550206	64	3	37	1.4	84/07/20	0436	4.0	14874	399.7094	.00	7.51	-	7.51	-	-
0550185	64	3	37	1.8	84/07/19	2150	3.0	10777	289.6106	.00	13.81	-	13.81	-	-
0550188	64	3	37	1.8	84/07/19	2300	3.0	10903	292.9966	.00	3.41	-	3.41	-	-
0550190	64	3	37	1.8	84/07/19	2333	4.0	12204	327.9585	.00	15.25	-	15.25	-	-
0550193	64	3	37	1.8	84/07/20	0056	3.0	17183	461.7593	.00	8.66	-	8.66	-	-
0550195	64	3	37	1.8	84/07/20	0140	3.0	16274	437.3317	.00	2.29	-	2.29	-	-
0550197	64	3	37	1.8	84/07/20	0219	3.0	16581	445.5617	.00	6.73	-	6.73	-	-
0550202	64	3	37	1.8	84/07/20	0340	3.0	15315	411.5605	.00	4.86	-	4.86	-	-
0550205	64	3	37	1.8	84/07/20	0419	3.0	14639	393.3943	.00	.00	-	-	-	-
0550208	64	3	37	1.8	84/07/20	0506	3.0	14369	386.1384	.00	.00	-	-	-	-
0550248	64	3	37	1.0	84/07/24	2250	5.0	11921	320.3534	.00	.00	-	-	-	-
0550266	64	3	37	1.0	84/07/25	0355	5.0	18174	488.3904	.00	.00	-	-	-	-
0550244	64	3	37	1.1	84/07/24	2138	5.0	13056	350.8543	.00	.00	-	-	-	-
0550249	64	3	37	1.1	84/07/24	2305	5.0	12025	323.1482	.00	.00	-	-	-	-
0550252	64	3	37	1.1	84/07/25	0004	5.0	11499	309.0130	.00	.00	-	-	-	-
0550255	64	3	37	1.2	84/07/25	0103	5.0	10299	276.7653	.00	.00	-	-	-	-
0550262	64	3	37	1.4	84/07/25	0259	5.0	9199	247.2050	.00	.00	-	-	-	-
0550267	64	3	37	1.4	84/07/25	0415	4.0	18770	504.4068	.00	.00	-	-	-	-
0550245	64	3	37	1.5	84/07/24	2208	4.0	12958	348.2207	.00	.00	-	-	-	-
0550246	64	3	37	1.5	84/07/24	2222	4.0	13495	362.6515	.00	.00	-	-	-	-
0550251	64	3	37	1.5	84/07/24	2341	4.0	15705	422.0409	.00	.00	-	-	-	-
0550253	64	3	37	1.5	84/07/25	0028	4.0	12987	349.0000	.00	.00	-	-	-	-
0550261	64	3	37	1.5	84/07/25	0240	5.0	10362	278.4563	.00	.00	-	-	-	-
0550259	64	3	37	1.6	84/07/25	0210	4.0	10900	292.9160	.00	.00	-	-	-	-
0550243	64	3	37	1.8	84/07/24	2121	3.0	12285	330.1352	.00	.00	-	-	-	-
0550257	64	3	37	1.8	84/07/25	0138	4.0	12798	343.9210	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES ALOSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNI LIFE STAGE
										------(IN NO./1000 CU. M.)------					
0550001	64	3	36	1.0	84/06/20	2100	5.0	10810	290.4975	.00	.00	-	-	-	-
0550006	64	3	36	1.0	84/06/20	2249	5.0	9901	266.0695	.00	.00	-	-	-	-
0550017	64	3	37	1.0	84/06/21	0254	5.0	11405	306.4065	.00	3.25	-	3.25	-	-
0550022	64	3	38	1.0	84/06/21	0432	5.0	14966	402.2355	.00	.00	-	-	-	-
0550023	64	3	37	1.0	84/06/21	2100	5.0	9333	250.6597	.00	.00	-	-	-	-
0550028	64	3	37	1.0	84/06/21	2225	5.0	10318	277.2755	.00	.00	-	-	-	-
0550031	64	3	37	1.0	84/06/21	2313	5.0	9845	264.3651	.00	.00	-	-	-	-
0550032	64	3	37	1.0	84/06/21	2325	5.0	9349	251.2380	.00	3.98	-	3.98	-	-
0550010	64	3	37	1.1	84/06/21	0006	5.0	10315	277.1433	.00	3.61	-	3.61	-	-
0550009	64	3	36	1.3	84/06/20	2340	5.0	9430	253.[illegible]	.00	.00	-	-	-	-
0550002	64	3	34	1.4	84/06/20	2124	4.0	12933	347.[illegible]	.00	.00	-	-	-	-
0550005	64	3	35	1.4	84/06/20	2220	4.0	10263	275.3354	.00	7.24	-	7.24	-	-
0550008	64	3	36	1.4	84/06/20	2322	4.0	9325	250.[illegible]	.00	.00	-	-	-	-
0550011	64	3	37	1.4	84/06/21	0023	4.0	10228	274.8574	.00	18.19	-	18.19	-	-
0550018	64	3	38	1.4	84/06/21	0312	4.0	12277	329.9202	.00	.00	-	-	-	-
0550020	64	3	38	1.4	84/06/21	0356	4.0	16165	434.4025	.00	.00	-	-	-	-
0550024	64	3	37	1.4	84/06/21	2117	4.0	9822	263.9593	.00	11.30	-	11.30	-	-
0550027	64	3	37	1.4	84/06/21	2208	4.0	11789	316.8362	.00	.00	-	-	-	-
0550030	64	3	37	1.4	84/06/21	2258	4.0	11907	319.9772	.00	3.15	-	3.15	-	-
0550033	64	3	37	1.4	84/06/21	2344	4.0	9690	260.3917	.00	.00	-	-	-	-
0550003	64	3	34	1.8	84/06/20	2149	3.0	11305	303.7996	.00	.00	-	-	-	-
0550004	64	3	36	1.8	84/06/20	2213	3.0	11948	321.0790	.00	.00	-	-	-	-
0550007	64	3	36	1.8	84/06/20	2306	3.0	9964	267.7629	.00	.00	-	-	-	-
0550013	64	3	37	1.8	84/06/21	0055	3.0	10627	285.5797	.00	3.50	-	3.50	-	-
0550014	64	3	38	1.8	84/06/21	0325	3.0	12180	327.3135	.00	27.50	-	27.50	-	-
0550021	64	3	38	1.8	84/06/21	0416	3.0	14889	400.1125	.00	2.50	-	2.50	-	-
0550025	64	3	37	1.8	84/06/21	2137	3.0	11899	319.7622	.00	.00	-	-	-	-
0550026	64	3	37	1.8	84/06/21	2153	3.0	11197	300.8972	.00	3.32	-	3.32	-	-
0550029	64	3	37	1.8	84/06/21	2244	3.0	9594	257.8198	.00	3.88	-	3.88	-	-
0550034	64	3	37	1.8	84/06/22	0003	3.0	11968	322.1535	.00	12.42	-	12.42	-	-
0550145	64	3	37	1.0	84/07/08	0359	5.0	10306	276.9534	.00	.00	-	-	-	-
0550149	64	3	37	1.0	84/07/08	0504	5.0	11898	319.7353	.00	.00	-	-	-	-
0550136	64	3	37	1.1	84/07/08	0222	5.3	11110	298.5594	.00	.00	-	-	-	-
0550140	64	3	37	1.1	84/07/08	0252	5.0	9796	263.2482	.00	.00	-	-	-	-
0550143	64	3	37	1.1	84/07/08	0332	5.0	10354	278.2434	.00	.00	-	-	-	-
0550124	64	3	37	1.2	84/07/07	2215	5.0	10565	283.9136	.00	.00	-	-	-	-
0550125	64	3	37	1.2	84/07/07	2344	5.0	9060	243.0071	.00	.00	-	-	-	-
0550135	64	3	37	1.2	84/07/08	0139	5.0	9953	267.4673	.00	.00	-	-	-	-
0550146	64	3	37	1.4	84/07/08	0414	4.0	12674	340.5886	.00	.00	-	-	-	-
0550150	64	3	37	1.4	84/07/08	0523	4.0	12329	331.3176	.00	.00	-	-	-	-
0550139	64	3	37	1.5	84/07/08	0237	4.0	11096	298.1631	.00	.00	-	-	-	-
0550142	64	3	37	1.5	84/07/08	0318	4.0	10318	277.2759	.00	.00	-	-	-	-
0550126	64	3	37	1.6	84/07/07	2249	4.0	12075	324.4916	.00	.00	-	-	-	-
0550127	64	3	37	1.6	84/07/07	2307	4.0	11011	295.8989	.00	.00	-	-	-	-
0550133	64	3	37	1.6	84/07/08	0109	4.0	10616	285.2841	.00	.00	-	-	-	-
0550137	64	3	37	1.6	84/07/08	0208	4.0	11123	298.8241	.00	.00	-	-	-	-
0550147	64	3	37	1.8	84/07/08	0433	3.0	12665	340.3469	.00	.00	-	-	-	-

LOBC CONT

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES AMERICAN SHAD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
										(IN NO./1000 CU. M.)					
0550196	64	3	37	1.8	84/07/08	0445	3.0	12383	332.7687	.00	.00	-	-	-	-
0550151	64	3	37	1.8	84/07/08	0532	3.0	12836	344.4922	.00	.00	-	-	-	-
0550141	64	3	37	1.9	84/07/08	0305	3.0	11193	300.7898	.00	.00	-	-	-	-
0550144	64	3	37	1.9	84/07/08	0346	3.0	11373	305.6270	.00	.00	-	-	-	-
0550132	64	3	37	2.0	84/07/08	0052	3.0	10127	272.1432	.00	.00	-	-	-	-
0550134	64	3	37	2.0	84/07/08	0126	3.0	7937	213.2712	.00	.00	-	-	-	-
0550136	64	3	37	2.0	84/07/08	0155	3.0	10406	279.6408	.00	.00	-	-	-	-
0550186	64	3	37	1.0	84/07/19	2218	5.0	10687	287.1321	.00	3.48	-	-	3.48	-
0550198	64	3	37	1.0	84/07/20	0012	5.0	16575	445.4205	.00	2.25	-	-	2.25	-
0550196	64	3	37	1.0	84/07/20	0202	5.0	15940	428.2561	.00	.00	-	-	-	-
0550152	64	3	37	1.0	84/07/20	0233	5.0	16528	444.1574	.00	.00	-	-	-	-
0550201	64	3	37	1.0	84/07/20	0322	5.0	15041	404.1372	.00	.00	-	-	-	-
0550203	64	3	37	1.0	84/07/20	0348	5.0	14578	391.7550	.00	.00	-	-	-	-
0550207	64	3	37	1.0	84/07/20	0451	5.0	13670	367.3543	.00	.00	-	-	-	-
0550187	64	3	37	1.4	84/07/19	2235	4.0	13545	363.9352	.00	.00	-	-	-	-
0550189	64	3	37	1.4	84/07/19	2316	5.0	10307	276.9803	.00	.00	-	-	-	-
0550192	64	3	37	1.4	84/07/20	0036	4.0	15460	415.4570	.00	.00	-	-	-	-
0550194	64	3	37	1.4	84/07/20	0120	4.0	14948	401.6981	.00	.00	-	-	-	-
0550199	64	3	37	1.4	84/07/20	0250	4.0	17769	477.5065	.00	.00	-	-	-	-
0550200	64	3	37	1.4	84/07/20	0306	4.0	17046	458.0777	.00	.00	-	-	-	-
0550204	64	3	37	1.4	84/07/20	0408	4.0	15152	407.1602	.00	.00	-	-	-	-
0550206	64	3	37	1.4	84/07/20	0436	4.0	14874	399.7094	.00	.00	-	-	-	-
0550185	64	3	37	1.8	84/07/19	2150	3.0	10777	289.6106	.00	.00	-	-	-	-
0550186	64	3	37	1.8	84/07/19	2300	3.0	10903	292.5966	.00	.00	-	-	-	-
0550190	64	3	37	1.8	84/07/19	2333	4.0	12204	327.5585	.00	.00	-	-	-	-
0550193	64	3	37	1.8	84/07/20	0056	3.0	17183	461.7592	.00	2.17	-	-	2.17	-
0550195	64	3	37	1.8	84/07/20	0148	3.0	16274	437.2317	.00	.00	-	-	-	-
0550197	64	3	37	1.8	84/07/20	0219	3.0	16581	445.5817	.00	.00	-	-	-	-
0550202	64	3	37	1.8	84/07/20	0340	3.0	15315	411.5605	.00	.00	-	-	-	-
0550205	64	3	37	1.8	84/07/20	0419	3.0	14639	393.3343	.00	.00	-	-	-	-
0550208	64	3	37	1.8	84/07/20	0506	3.0	14369	386.1386	.00	.00	-	-	-	-
0550248	64	3	37	1.0	84/07/24	2250	5.0	11921	320.3534	.00	.00	-	-	-	-
0550266	64	3	37	1.0	84/07/25	0355	5.0	18174	488.3704	.00	.00	-	-	-	-
0550244	64	3	37	1.1	84/07/24	2138	5.0	13056	350.8543	.00	.00	-	-	-	-
0550249	64	3	37	1.1	84/07/24	2305	5.0	12025	323.1482	.00	.00	-	-	-	-
0550252	64	3	37	1.1	84/07/25	0004	5.0	11499	309.0130	.00	.00	-	-	-	-
0550255	64	3	37	1.2	84/07/25	0103	5.0	10299	276.7253	.00	.00	-	-	-	-
0550262	64	3	37	1.4	84/07/25	0259	5.0	9199	247.2050	.00	.00	-	-	-	-
0550267	64	3	37	1.4	84/07/25	0415	4.0	18770	504.4068	.00	.00	-	-	-	-
0550245	64	3	37	1.5	84/07/24	2208	4.0	12958	348.2207	.00	.00	-	-	-	-
0550246	64	3	37	1.5	84/07/24	2222	4.0	13495	362.6515	.00	.00	-	-	-	-
0550251	64	3	37	1.5	84/07/24	2341	4.0	15705	422.0409	.00	.00	-	-	-	-
0550253	64	3	37	1.5	84/07/25	0028	4.0	12987	349.0000	.00	.00	-	-	-	-
0550261	64	3	37	1.5	84/07/25	0240	5.0	10362	278.4583	.00	.00	-	-	-	-
0550259	64	3	37	1.6	84/07/25	0210	4.0	10900	292.9160	.00	.00	-	-	-	-
0550243	64	3	37	1.8	84/07/24	2121	3.0	12285	330.1352	.00	.00	-	-	-	-
0550257	64	3	37	1.8	84/07/25	0138	4.0	12798	343.9210	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES ATLANTIC TOMCOD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	(IN NO./1000 CU. M.) TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	LIF LIFE STAGE
0550001	64	3	34	1.0	84/06/20	2100	5.0	10810	290.4475	.00	1049.52	-	-	1049.92	-
0550006	64	3	34	1.0	84/06/20	2249	5.0	9901	266.0693	.00	160.40	-	-	160.40	-
0550017	64	3	36	1.0	84/06/21	0254	5.0	11405	306.4865	.00	267.55	-	-	267.55	-
0550022	64	3	36	1.0	84/06/21	0432	5.0	14968	402.2355	.00	949.69	-	-	949.69	-
0550023	64	3	37	1.0	84/06/21	2100	5.0	9335	250.8597	.00	63.78	-	-	63.78	-
0550028	64	3	37	1.0	84/06/21	2225	5.0	10318	277.2755	.00	97.38	-	-	97.38	-
0550031	64	3	37	1.0	84/06/21	2313	5.0	9845	264.5650	.00	223.01	-	-	223.01	-
0550032	64	3	37	1.0	84/06/21	2329	5.0	9343	251.2360	.00	159.21	-	-	159.21	-
0550010	64	3	37	1.1	84/06/21	0006	5.0	10315	277.1953	.00	414.87	-	-	414.87	-
0550019	64	3	36	1.3	84/06/20	2340	5.0	9434	253.5202	.00	1238.56	-	-	1232.5?	-
0550002	64	3	34	1.4	84/06/20	2124	4.0	12936	347.6235	.00	218.62	-	-	212.62	-
0550005	64	3	36	1.4	84/06/20	2228	4.0	10283	276.3354	.00	220.75	-	-	220.75	-
0550008	64	3	34	1.4	84/06/20	2322	4.0	9325	250.5310	.00	762.20	-	-	762.20	-
0550011	64	3	37	1.4	84/06/21	0023	4.0	10228	274.8574	.00	287.42	-	-	287.42	-
0550018	64	3	38	1.4	84/06/21	0312	4.0	12277	329.9202	.00	187.92	-	-	187.92	-
0550020	64	3	38	1.4	84/06/21	0356	4.0	16165	434.4025	.00	1070.44	-	-	1070.44	-
0550024	64	3	37	1.4	84/06/21	2117	4.0	9882	265.5593	.00	64.02	-	-	64.02	-
0550027	64	3	37	1.4	84/06/21	2208	4.0	11789	316.8062	.00	41.03	-	-	41.03	-
0550030	64	3	37	1.4	84/06/21	2258	4.0	11907	319.5772	.00	331.27	-	-	331.27	-
0550033	64	3	37	1.4	84/06/21	2344	4.0	9690	260.3947	.00	165.13	-	-	165.13	-
0550003	64	3	34	1.8	84/06/20	2149	3.0	11305	303.7996	.00	373.25	-	-	375.25	-
0550004	64	3	36	1.8	84/06/20	2213	3.0	11948	321.0790	.00	115.24	-	-	115.24	-
0550007	64	3	36	1.8	84/06/20	2306	3.0	9964	267.7629	.00	395.87	-	-	395.87	-
0550013	64	3	37	1.8	84/06/21	0055	3.0	13627	285.2797	.00	169.09	-	-	189.09	-
0550015	64	3	38	1.8	84/06/21	0329	3.0	12180	327.3135	.00	235.25	-	-	235.25	-
0550021	64	3	38	1.8	84/06/21	0416	3.0	14889	400.1125	.00	867.26	-	-	867.26	-
0550025	64	3	37	1.8	84/06/21	2137	3.0	11899	319.7522	.00	175.13	-	-	175.13	-
0550026	64	3	37	1.8	84/06/21	2153	3.0	11197	300.8775	.00	122.97	-	-	122.97	-
0550029	64	3	37	1.8	84/06/21	2244	3.0	9594	257.8198	.00	248.24	-	-	248.24	-
0550034	64	3	37	1.8	84/06/22	0003	3.0	11988	322.1539	.00	186.25	-	-	186.25	-
0550145	64	3	37	1.0	84/07/08	0359	5.0	10306	276.5530	.00	357.46	-	-	357.46	-
0550149	64	3	37	1.0	84/07/06	0504	5.0	11898	319.7353	.00	572.35	-	-	572.35	-
0550138	64	3	37	1.1	84/07/08	0222	5.3	11110	298.5594	.00	298.10	-	-	298.10	-
0550140	64	3	37	1.1	84/07/08	0252	5.0	9796	263.2482	.00	383.67	-	-	383.67	-
0550143	64	3	37	1.1	84/07/08	0332	5.0	10354	278.2434	.00	352.21	-	-	352.21	-
0550124	64	3	37	1.2	84/07/07	2215	5.0	10565	283.9136	.00	225.42	-	-	225.42	-
0550129	64	3	37	1.2	84/07/07	2344	5.0	9080	244.0071	.00	524.57	-	-	524.57	-
0550135	64	3	37	1.2	84/07/08	0139	5.0	9953	267.4673	.00	407.53	-	-	407.53	-
0550146	64	3	37	1.4	84/07/08	0414	4.0	12674	340.5888	.00	601.90	-	-	601.90	-
0550150	64	3	37	1.4	84/07/08	0523	4.0	12329	331.3176	.00	555.36	-	-	555.36	-
0550139	64	3	37	1.5	84/07/08	0237	4.0	11096	298.1831	.00	412.50	-	-	412.50	-
0550142	64	3	37	1.5	84/07/08	0318	4.0	10318	277.2755	.00	324.59	-	-	324.59	-
0550126	64	3	37	1.6	84/07/07	2249	4.0	12075	324.4918	.00	277.36	-	-	277.36	-
0550127	64	3	37	1.6	84/07/07	2307	4.0	11011	295.8989	.00	233.19	-	-	233.19	-
0550133	64	3	37	1.6	84/07/08	0109	4.0	10616	285.2641	.00	199.80	-	-	199.80	-
0550137	64	3	37	1.6	84/07/08	0208	4.0	11120	298.8281	.00	458.46	-	-	458.46	-
0550147	64	3	37	1.8	84/07/08	0433	3.0	12655	340.3469	.00	76.39	-	-	76.39	-

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550001	64	3	34	1.0	84/06/20	2100	5.0	10810	290.4975	99.83	.00	-	-	-	-
0550006	64	3	36	1.0	84/06/20	2244	5.0	9901	266.0699	.00	.00	-	-	-	-
0550017	64	3	38	1.0	84/06/21	0254	5.0	11405	306.4665	.00	.00	-	-	-	-
0550022	64	3	38	1.0	84/06/21	0432	5.0	14968	402.2355	.00	.00	-	-	-	-
0550023	64	3	37	1.0	84/06/21	2100	5.0	9335	250.8597	322.89	.00	-	-	-	-
0550028	64	3	37	1.0	84/06/21	2225	5.0	10318	277.2759	1193.76	.00	-	-	-	-
0550031	64	3	37	1.0	84/06/21	2313	5.0	9845	264.5650	.00	.00	-	-	-	-
0550032	64	3	37	1.0	84/06/21	2329	5.0	9349	251.2350	282.60	.00	-	-	-	-
0550010	64	3	37	1.1	84/06/21	0006	5.0	10315	277.1953	3.61	.00	-	-	-	-
0550009	64	3	36	1.3	84/06/20	2340	5.0	9434	253.5202	.00	.00	-	-	-	-
0550002	64	3	34	1.4	84/06/20	2124	4.0	12936	347.6295	.00	.00	-	-	-	-
0550005	64	3	36	1.4	84/06/20	2228	4.0	10283	276.3354	3.62	.00	-	-	-	-
0550008	64	3	36	1.4	84/06/20	2322	4.0	9325	250.5910	.00	.00	-	-	-	-
0550011	64	3	37	1.4	84/06/21	0023	4.0	10228	274.8574	.00	.00	-	-	-	-
0550018	64	3	38	1.4	84/06/21	0312	4.0	12277	329.9202	.00	.00	-	-	-	-
0550020	64	3	38	1.4	84/06/21	0356	4.0	16165	434.4025	.00	.00	-	-	-	-
0550024	64	3	37	1.4	84/06/21	2117	4.0	9882	265.5593	824.67	.00	-	-	-	-
0550027	64	3	37	1.4	84/06/21	2208	4.0	11789	316.8062	918.54	.00	-	-	-	-
0550030	64	3	37	1.4	84/06/21	2258	4.0	11907	319.9772	56.25	.00	-	-	-	-
0550033	64	3	37	1.4	84/06/21	2344	4.0	9690	260.3997	103.69	.00	-	-	-	-
0550003	64	3	34	1.8	84/06/20	2149	3.0	11305	303.7998	.00	.00	-	-	-	-
0550004	64	3	36	1.8	84/06/20	2213	3.0	11948	321.0790	.00	3.11	-	3.11	-	-
0550007	64	3	36	1.8	84/06/20	2306	3.0	9964	267.7825	.00	.00	-	-	-	-
0550013	64	3	37	1.8	84/06/21	0055	3.0	10627	285.5797	.00	.00	-	-	-	-
0550019	64	3	38	1.8	84/06/21	0329	3.0	12180	327.3135	.00	.00	-	-	-	-
0550021	64	3	38	1.8	84/06/21	0416	3.0	14889	400.1125	174.95	.00	-	-	-	-
0550025	64	3	37	1.8	84/06/21	2137	3.0	11699	313.7622	18.76	.00	-	-	-	-
0550026	64	3	37	1.8	84/06/21	2153	3.0	11197	300.8973	109.67	.00	-	-	-	-
0550029	64	3	37	1.8	84/06/21	2244	3.0	9594	257.8198	.00	.00	-	-	-	-
0550034	64	3	37	1.8	84/06/22	0003	3.0	11988	322.1539	15.52	.00	-	-	-	-
0550145	64	3	37	1.0	84/07/08	0359	5.0	10306	276.9534	.00	205.81	-	205.81	-	-
0550149	64	3	37	1.0	84/07/08	0504	5.0	11898	319.7353	.00	62.55	-	62.55	-	-
0550138	64	3	37	1.1	84/07/08	0222	5.3	11110	298.5594	.00	40.19	-	40.19	-	-
0550140	64	3	37	1.1	84/07/08	0252	5.0	9796	263.2482	.00	75.97	-	75.97	-	-
0550143	64	3	37	1.1	84/07/08	0332	5.0	10354	278.2434	.00	35.94	-	35.94	-	-
0550124	64	3	37	1.2	84/07/07	2215	5.0	10565	283.9136	.00	764.32	-	764.32	-	-
0550129	64	3	37	1.2	84/07/07	2344	5.0	9080	244.0071	.00	6036.71	-	6036.71	-	-
0550135	64	3	37	1.2	84/07/08	0139	5.0	9953	267.4673	.00	1364.65	-	1364.65	-	-
0550146	64	3	37	1.4	84/07/08	0414	4.0	12674	340.5988	.00	82.21	-	82.21	-	-
0550150	64	3	37	1.4	84/07/08	0523	4.0	12329	331.3176	.00	84.51	-	84.51	-	-
0550139	64	3	37	1.5	84/07/08	0237	4.0	11096	298.1831	.00	43.60	-	43.60	-	-
0550142	64	3	37	1.5	84/07/08	0318	4.0	10318	277.2759	.00	115.41	-	115.41	-	-
0550126	64	3	37	1.6	84/07/07	2249	4.0	12075	324.4916	.00	1741.18	-	1741.18	-	-
0550127	64	3	37	1.6	84/07/07	2307	4.0	11011	295.8989	.00	4109.51	-	4109.51	-	-
0550133	64	3	37	1.6	84/07/08	0109	4.0	10616	285.2841	.00	1090.14	-	1090.14	-	-
0550137	64	3	37	1.6	84/07/08	0208	4.0	11120	298.8281	.00	599.01	-	599.01	-	-
0550147	64	3	37	1.8	84/07/08	0433	3.0	12665	340.3469	.00	85.21	-	85.21	-	-

CON EDISON GEAR COMPARISON STUDY
EPIBENTHIC SLED

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UIC LIFE STAGE
0550263	64	3	37	1.8	84/07/25	0315	4.0	9561	256.5330	16502.36	4020.50	-	4020.50	-	-
0550268	64	3	37	1.8	84/07/25	0435	3.0	16609	446.3342	974.61	1097.83	-	1097.83	-	-
0550247	64	3	37	1.9	84/07/24	2236	3.0	14409	387.2135	188.53	963.29	-	963.29	-	-
0550250	64	3	37	1.9	84/07/24	2323	3.0	18837	506.2073	6163.48	3302.99	-	3302.99	-	-
0550254	64	3	37	1.9	84/07/25	0048	3.0	12125	325.8355	197645.75	3115.07	-	3115.07	-	-
0550256	64	3	37	2.0	84/07/25	0122	3.0	11844	318.2842	83196.09	3597.41	-	3597.41	-	-
0550258	64	3	37	2.0	84/07/25	0153	3.0	11367	305.4657	77573.36	5354.58	-	5354.58	-	-
0550264	64	3	37	2.2	84/07/25	0328	3.0	9469	254.4507	80169.56	4753.01	-	4763.01	-	-

NO.SAMPLES = 102

CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES A_OSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550155	72	3	37	1.8	84/07/18	2259	3.0	11649	284.2904	.00	.00	-	-	-	-
0550158	72	3	37	1.8	84/07/18	2335	3.0	11998	284.0467	.00	.00	-	-	-	-
0550169	72	3	37	1.9	84/07/19	0149	3.0	12276	283.3584	.00	.00	-	-	-	-
0550172	72	3	37	1.9	84/07/19	0223	3.0	12264	283.3972	.00	.00	-	-	-	-
0550176	72	3	37	1.9	84/07/19	0305	3.0	13018	279.2370	.00	.00	-	-	-	-
0550181	72	3	37	1.9	84/07/19	0359	3.0	12976	279.6504	.00	.00	-	-	-	-
0550165	72	3	37	2.0	84/07/19	0058	3.0	12990	279.5471	.00	.00	-	-	-	-
0550184	72	3	37	2.0	84/07/19	0118	3.0	12400	282.9086	.00	.00	-	-	-	-
0550178	72	3	37	2.0	84/07/19	0325	3.0	13612	273.7858	.00	.00	-	-	-	-
0550211	72	3	37	1.4	84/07/23	2239	4.0	13091	366.2400	.00	.00	-	-	-	-
0550212	72	3	37	1.4	84/07/23	2249	4.0	12433	358.8147	.00	.00	-	-	-	-
0550231	72	3	37	1.4	84/07/24	0228	4.0	14162	374.7939	.00	.00	-	-	-	-
0550235	72	3	37	1.4	84/07/24	0331	4.0	14053	374.1285	.00	.00	-	-	-	-
0550236	72	3	37	1.4	84/07/24	0342	4.0	15083	378.5063	.00	.00	-	-	-	-
0550239	72	3	37	1.4	84/07/24	0413	4.0	17232	373.3655	.00	.00	-	-	-	-
0550216	72	3	37	1.5	84/07/23	2334	4.0	14193	374.9745	.00	.00	-	-	-	-
0550221	72	3	37	1.5	84/07/24	0036	4.0	14319	375.6691	.00	.00	-	-	-	-
0550218	72	3	37	1.6	84/07/23	2359	4.0	14445	376.3000	.00	.00	-	-	-	-
0550226	72	3	37	1.6	84/07/24	0135	4.0	14322	375.6848	.00	.00	-	-	-	-
0550210	72	3	37	1.8	84/07/23	2229	3.0	12708	281.4068	.00	.00	-	-	-	-
0550213	72	3	37	1.8	84/07/23	2301	3.0	12922	280.0382	.00	.00	-	-	-	-
0550223	72	3	37	1.8	84/07/24	0058	3.0	14319	264.4240	.00	.00	-	-	-	-
0550232	72	3	37	1.8	84/07/24	0247	3.0	13565	274.3015	.00	.00	-	-	-	-
0550233	72	3	37	1.8	84/07/24	0305	3.0	15055	251.4520	.00	.00	-	-	-	-
0550237	72	3	37	1.8	84/07/24	0349	3.0	13963	269.5150	.00	.00	-	-	-	-
0550242	72	3	37	1.8	84/07/24	0453	3.0	14447	262.4056	.00	.00	-	-	-	-
0550215	72	3	37	1.9	84/07/23	2323	3.0	12459	282.6634	.00	.00	-	-	-	-
0550220	72	3	37	1.9	84/07/24	0023	3.0	14140	267.0798	.00	.00	-	-	-	-
0550227	72	3	37	2.0	84/07/24	0145	3.0	14169	266.6627	.00	.00	-	-	-	-

NO.SAMPLES = 76

CON EDISON GEAR COMPARISON STUDY
STANDARD TUCKER TRAWL

SPECIES ALOSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550063	65	4	41	1.0	84/06/29	2205	5.0	13340	380.5693	.00	.00	-	-	-	-
0550066	65	4	41	1.0	84/06/29	2242	5.0	14009	385.1463	.00	5.14	-	5.14	-	-
0550070	65	4	41	1.0	84/06/29	2336	5.0	14525	394.8344	.00	.00	-	-	-	-
0550073	65	4	41	1.0	84/06/30	0007	5.0	14126	390.5077	.00	.00	-	-	-	-
0550076	65	4	41	1.0	84/06/30	0041	5.0	13863	387.3892	.00	.00	-	-	-	-
0550078	65	4	41	1.0	84/06/30	0105	5.0	13629	384.4388	.00	.00	-	-	-	-
0550086	65	4	41	1.0	84/06/30	0242	5.0	13049	376.4241	.00	.00	-	-	-	-
0550088	65	4	41	1.0	84/06/30	0303	5.0	12393	366.1814	.00	.00	-	-	-	-
0550092	65	4	41	1.0	84/06/30	0352	5.0	11915	357.5530	.00	.00	-	-	-	-
0550094	65	4	41	1.0	84/06/30	0418	5.0	11195	344.3814	.00	.00	-	-	-	-
0550108	65	3	37	1.0	84/07/06	0315	5.0	6524	226.0268	.00	.00	-	-	-	-
0550113	65	3	37	1.0	84/07/06	0408	5.0	13067	376.6877	.00	.00	-	-	-	-
0550115	65	3	37	1.0	84/07/06	0430	5.0	13184	378.3780	.00	.00	-	-	-	-
0550118	65	3	37	1.0	84/07/06	0503	5.0	13151	377.9053	.00	.00	-	-	-	-
0550104	65	3	37	1.1	84/07/06	0158	5.0	10313	325.9046	.00	.00	-	-	-	-
0550107	65	3	37	1.2	84/07/06	0243	5.0	13209	378.7340	.00	.00	-	-	-	-
0550097	65	3	37	1.3	84/07/05	2147	5.0	11753	355.0213	.00	.00	-	-	-	-
0550099	65	3	37	1.4	84/07/06	0102	5.0	12641	370.1982	.00	.00	-	-	-	-
0550154	65	3	37	1.0	84/07/18	2246	5.0	13139	377.7326	.00	.00	-	-	-	-
0550157	65	3	37	1.0	84/07/18	2323	5.0	12582	365.2584	.00	.00	-	-	-	-
0550160	65	3	37	1.0	84/07/18	2355	5.0	12693	371.0183	.00	.00	-	-	-	-
0550167	65	3	37	1.1	84/07/19	0127	5.0	12785	372.4503	.00	.00	-	-	-	-
0550171	65	3	37	1.1	84/07/19	0205	5.0	12708	371.2534	.00	.00	-	-	-	-
0550173	65	3	37	1.1	84/07/19	0233	5.0	14221	391.5823	.00	.00	-	-	-	-
0550179	65	3	37	1.1	84/07/19	0335	5.0	13098	377.1394	.00	.00	-	-	-	-
0550182	65	3	37	1.1	84/07/19	0409	5.0	14693	396.5087	.00	.00	-	-	-	-
0550163	65	3	37	1.2	84/07/19	0035	5.0	13178	378.2923	.00	.00	-	-	-	-
0550177	65	3	37	1.2	84/07/19	0314	5.0	14254	391.9491	.00	.00	-	-	-	-
0550209	65	3	37	1.0	84/07/23	2213	5.0	12372	365.8333	.00	.00	-	-	-	-
0550222	65	3	37	1.0	84/07/24	0047	5.0	12729	371.5815	.00	.00	-	-	-	-
0550230	65	3	37	1.0	84/07/24	0215	5.0	14736	396.9231	.00	.00	-	-	-	-
0550234	65	3	37	1.0	84/07/24	0314	5.0	15432	402.8175	.00	.00	-	-	-	-
0550238	65	3	37	1.0	84/07/24	0404	5.0	15932	406.0925	.00	.00	-	-	-	-
0550241	65	3	37	1.0	84/07/24	0440	5.0	15867	405.7127	.00	.00	-	-	-	-
0550214	65	3	37	1.1	84/07/23	2310	5.0	12240	363.6168	.00	.00	-	-	-	-
0550219	65	3	37	1.1	84/07/24	0010	5.0	12801	372.6968	.00	.00	-	-	-	-
0550217	65	3	37	1.2	84/07/23	2345	5.0	13126	377.5451	.00	.00	-	-	-	-
0550225	65	3	37	1.2	84/07/24	0121	5.0	12547	368.6962	.00	.00	-	-	-	-

NO.SAMPLES = 38

CON EDISON GEAR COMPARISON STUDY
STANDARD TUCKER TRAWL

SPECIES ATLANTIC TOMCOD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
										(IN NO./1000 CU. M.)					
0550063	65	4	41	1.0	84/06/29	2205	5.0	13340	380.5693	.00	110.36	-	-	110.36	-
0550066	65	4	41	1.0	84/06/29	2242	5.0	14009	385.1463	.00	.00	-	-	-	-
0550070	65	4	41	1.0	84/06/29	2336	5.0	14525	394.8344	.00	12.66	-	-	12.66	-
0550073	65	4	41	1.0	84/06/30	0007	5.0	14126	390.5077	.00	.00	-	-	-	-
0550076	65	4	41	1.0	84/06/30	0041	5.0	13863	387.3892	.00	.00	-	-	-	-
0550078	65	4	41	1.0	84/06/30	0105	5.0	13629	384.4388	.00	.00	-	-	-	-
0550086	65	4	41	1.0	84/06/30	0242	5.0	13049	376.4241	.00	26.57	-	-	26.57	-
0550088	65	4	41	1.0	84/06/30	0303	5.0	12393	366.1814	.00	43.69	-	-	43.69	-
0550092	65	4	41	1.0	84/06/30	0352	5.0	11915	357.5530	.00	27.94	-	-	27.94	-
0550094	65	4	41	1.0	84/06/30	0418	5.0	11195	344.3814	.00	23.23	-	-	23.23	-
0550108	65	3	37	1.0	84/07/06	0315	5.0	6524	226.0268	.00	44.24	-	-	44.24	-
055011[illegible]	65	3	37	1.0	84/07/06	0408	5.0	13067	376.6877	.00	34.51	-	-	34.51	-
0550115	65	3	37	1.0	84/07/06	0430	5.0	13184	378.3780	.00	15.86	-	-	15.86	-
05501[illegible]	65	3	37	1.0	84/07/06	0503	5.0	13151	377.9053	.00	142.89	-	-	142.89	-
0550104	65	3	37	1.1	84/07/06	0158	5.0	10313	325.9046	.00	24.55	-	-	24.55	-
0550107	65	3	37	1.2	84/07/06	0243	5.0	13209	378.7340	.00	58.09	-	-	58.09	-
0550097	65	3	37	1.3	84/07/05	2147	5.0	11753	355.0213	.00	14.08	-	-	14.08	-
0550099	65	3	37	1.4	84/07/06	0102	5.0	12641	370.1982	.00	2.70	-	-	2.70	-
0550154	65	3	37	1.0	84/07/18	2246	5.0	13139	377.7326	.00	45.01	-	-	45.01	-
0550157	65	3	37	1.0	84/07/18	2323	5.0	12582	369.2584	.00	5.42	-	-	5.42	-
0550160	65	3	37	1.0	84/07/18	2355	5.0	12693	371.0183	.00	13.48	-	-	13.48	-
0550167	65	3	37	1.1	84/07/19	0127	5.0	12785	372.4503	.00	16.11	-	-	16.11	-
0550171	65	3	37	1.1	84/07/19	0209	5.0	12708	371.2534	.00	5.39	-	-	5.39	-
0550173	65	3	37	1.1	84/07/19	0233	5.0	14221	391.5823	.00	51.07	-	-	51.07	-
0550179	65	3	37	1.1	84/07/19	0335	5.0	13098	377.1394	.00	159.09	-	-	159.09	-
0550182	65	3	37	1.1	84/07/19	0405	5.0	14693	396.5087	.00	2.52	-	-	2.52	-
0550163	65	3	37	1.2	84/07/19	0035	5.0	13178	378.2923	.00	52.87	-	-	52.87	-
0550177	65	3	37	1.2	84/07/19	0314	5.0	14254	391.9491	.00	91.85	-	-	91.85	-
0550209	65	3	37	1.0	84/07/23	2213	5.0	12372	365.6333	.00	.00	-	-	-	-
0550222	65	3	37	1.0	84/07/24	0047	5.0	12729	371.5815	.00	.00	-	-	-	-
0550230	65	3	37	1.0	84/07/24	0215	5.0	14736	396.9231	.00	.00	-	-	-	-
0550234	65	3	37	1.0	84/07/24	0314	5.0	15432	402.8175	.00	.00	-	-	-	-
0550238	65	3	37	1.0	84/07/24	0404	5.0	15932	406.0925	.00	.00	-	-	-	-
0550241	65	3	37	1.0	84/07/24	0440	5.0	15867	405.7127	.00	.00	-	-	-	-
0550214	65	3	37	1.1	84/07/23	2310	5.0	12240	363.6168	.00	.00	-	-	-	-
0550219	65	3	37	1.1	84/07/24	0010	5.0	12801	372.6968	.00	.00	-	-	-	-
0550217	65	3	37	1.2	84/07/23	2345	5.0	13126	377.5451	.00	.00	-	-	-	-
0550225	65	3	37	1.2	84/07/24	0121	5.0	12547	368.6962	.00	.00	-	-	-	-

NO.SAMPLES = 38

CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES STRIPED BASS

TASK/ SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550065	72	4	41	1.4	84/06/29	2230	4.0	12395	358.3365	.00	404.65	-	404.65	-	-
0550068	72	4	41	1.4	84/06/29	2307	4.0	12744	362.5252	.00	466.17	-	466.17	-	-
0550071	72	4	41	1.4	84/06/29	2344	4.0	13510	370.1166	.00	216.15	-	216.15	-	-
0550072	72	4	41	1.4	84/06/29	2358	4.0	15129	378.6005	.00	176.97	-	176.97	-	-
0550075	72	4	41	1.4	84/06/30	0030	4.0	14222	375.1400	.00	186.60	-	186.60	-	-
0550082	72	4	41	1.4	84/06/30	0156	4.0	13471	365.7842	.00	105.47	-	105.47	-	-
0550085	72	4	41	1.4	84/06/30	0232	4.0	14093	374.3781	.00	104.17	-	104.17	-	-
0550089	72	4	41	1.4	84/06/30	0320	4.0	13573	370.6411	.00	137.60	-	137.60	-	-
0550090	72	4	41	1.4	84/06/30	0333	4.0	12929	364.5620	.00	13.72	-	13.72	-	-
0550093	72	4	41	1.4	84/06/30	0409	4.0	12471	359.2872	.00	41.75	-	41.75	-	-
0550064	72	4	41	1.8	84/06/29	2218	3.0	13159	278.2087	.00	1768.46	-	1768.46	-	-
0550067	72	4	41	1.8	84/06/29	2256	3.0	13103	278.6708	.00	789.46	-	789.46	-	-
0550069	72	4	41	1.8	84/06/29	2324	3.0	13265	277.2830	.00	602.27	-	602.27	-	-
0550074	72	4	41	1.8	84/06/30	0020	3.0	13555	274.4096	.00	291.53	-	291.53	-	-
0550077	72	4	41	1.8	84/06/30	0052	3.0	13562	274.3340	.00	116.65	-	116.65	-	-
0550079	72	4	41	1.8	84/06/30	0117	3.0	11738	284.2934	.00	45.73	-	45.73	-	-
0550083	72	4	41	1.8	84/06/30	0205	3.3	13366	312.0950	.00	230.70	-	230.70	-	-
0550087	72	4	41	1.8	84/06/30	0252	3.0	12123	283.7918	.00	74.00	-	74.00	-	-
0550091	72	4	41	1.8	84/06/30	0342	3.0	11098	283.2925	.00	45.89	-	45.89	-	-
0550095	72	4	41	1.8	84/06/30	0432	3.0	10658	281.3068	.00	74.65	-	74.65	-	-
0550109	72	3	37	1.4	84/07/06	0327	4.0	13943	373.4093	.00	40.17	-	40.17	-	-
0550111	72	3	37	1.4	84/07/06	0348	4.0	14720	377.4545	.00	31.79	-	31.79	-	-
0550116	72	3	37	1.4	84/07/06	0443	4.0	12503	359.6810	.00	25.02	-	25.02	-	-
0550119	72	3	37	1.4	84/07/06	0513	4.0	3529	130.2614	.00	23.03	-	23.03	-	-
0550106	72	3	37	1.6	84/07/06	0222	4.0	14722	377.4618	.00	47.69	-	47.69	-	-
0550098	72	3	37	1.7	84/07/06	0050	4.0	11211	340.8647	.00	14.67	-	14.67	-	-
0550096	72	3	37	1.8	84/07/05	2137	3.0	10836	282.2357	.00	77.95	-	77.95	-	-
0550100	72	3	37	1.8	84/07/06	0115	4.0	14692	377.3510	.00	21.20	-	21.20	-	-
0550103	72	3	37	1.8	84/07/06	0148	4.0	14758	377.5899	.00	121.83	-	121.83	-	-
0550110	72	3	37	1.8	84/07/06	0337	3.0	13046	279.1222	.00	42.99	-	42.99	-	-
0550112	72	3	37	1.8	84/07/06	0400	3.0	12714	281.3721	.00	21.32	-	21.32	-	-
0550114	72	3	37	1.8	84/07/06	0423	3.0	12456	282.6764	.00	56.60	-	56.60	-	-
0550117	72	3	37	1.8	84/07/06	0452	3.0	8694	260.2686	.00	49.95	-	49.95	-	-
0550105	72	3	37	2.0	84/07/06	0210	3.0	14083	267.8847	.00	126.92	-	126.92	-	-
0550101	72	3	37	2.2	84/07/06	0126	3.0	13360	276.3969	.00	79.60	-	79.60	-	-
0550102	72	3	37	2.2	84/07/06	0139	3.0	13556	274.3988	.00	178.57	-	178.57	-	-
0550152	72	3	37	1.4	84/07/18	2221	4.0	13176	367.0806	.00	.00	-	-	-	-
0550156	72	3	37	1.4	84/07/18	2312	4.0	12264	356.6495	.00	.00	-	-	-	-
0550159	72	3	37	1.4	84/07/18	2345	4.0	12615	361.0295	.00	.00	-	-	-	-
0550170	72	3	37	1.5	84/07/19	0157	4.0	13203	367.3419	.00	.00	-	-	-	-
0550174	72	3	37	1.5	84/07/19	0245	4.0	13120	366.5295	.00	.00	-	-	-	-
0550175	72	3	37	1.5	84/07/19	0255	4.0	14270	375.4065	.00	.00	-	-	-	-
0550180	72	3	37	1.5	84/07/19	0349	4.0	14637	377.1384	.00	.00	-	-	-	-
0550183	72	3	37	1.5	84/07/19	0422	4.0	14012	373.8660	.00	.00	-	-	-	-
0550164	72	3	37	1.6	84/07/19	0046	4.0	15037	378.4030	.00	.00	-	-	-	-
0550166	72	3	37	1.6	84/07/19	0107	4.0	14471	376.4223	.00	.00	-	-	-	-
0550153	72	3	37	1.8	84/07/18	2235	3.0	12524	282.2701	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES WHITE PERCH

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UNID LIFE STAGE
0550065	72	4	41	1.4	84/06/29	2230	4.0	12395	358.3369	.00	170.23	2.79	167.44	-	-
0550068	72	4	41	1.4	84/06/29	2307	4.0	12744	362.5252	2.76	137.92	-	137.92	-	-
0550071	72	4	41	1.4	84/06/29	2344	4.0	13510	370.1166	.00	75.65	-	75.65	-	-
0550072	72	4	41	1.4	84/06/29	2358	4.0	15129	378.6009	.00	52.83	-	50.18	-	2.64
0550075	72	4	41	1.4	84/06/30	0030	4.0	14222	375.1400	.00	45.32	2.67	42.65	-	-
0550082	72	4	41	1.4	84/06/30	0156	4.0	13471	369.7842	.00	45.97	-	45.97	-	-
0550085	72	4	41	1.4	84/06/30	0232	4.0	14093	374.3781	.00	58.76	-	58.76	-	-
0550089	72	4	41	1.4	84/06/30	0320	4.0	13573	370.6411	.00	277.90	-	277.90	-	-
0550090	72	4	41	1.4	84/06/30	0333	4.0	12929	364.5620	.00	35.66	-	35.66	-	-
0550093	72	4	41	1.4	84/06/30	0405	4.0	12471	359.2872	.00	80.72	-	80.72	-	-
0550064	72	4	41	1.8	84/06/29	2218	3.0	13159	278.2087	.00	1247.27	7.19	1240.08	-	-
0550067	72	4	41	1.8	84/06/29	2256	3.0	13103	278.6708	.00	556.21	-	556.21	-	-
0550069	72	4	41	1.8	84/06/29	2324	3.0	13265	277.2830	.00	497.69	-	497.69	-	-
0550074	72	4	41	1.8	84/06/30	0020	3.0	13555	274.4096	.00	171.28	-	171.28	-	-
0550077	72	4	41	1.8	84/06/30	0052	3.0	13562	274.2340	.00	69.26	-	69.26	-	-
0550079	72	4	41	1.8	84/06/30	0117	3.0	11738	284.2934	.00	24.62	-	24.62	-	-
0550083	72	4	41	1.8	84/06/30	0205	3.3	13366	312.0950	.00	28.84	-	28.84	-	-
0550087	72	4	41	1.8	84/06/30	0252	3.0	12123	283.7918	.00	95.14	-	95.14	-	-
0550091	72	4	41	1.8	84/06/30	0342	3.0	11098	283.2925	.00	49.42	-	49.42	-	-
0550095	72	4	41	1.8	84/06/30	0432	3.0	10658	281.3068	.00	42.66	-	42.66	-	-
0550109	72	3	37	1.4	84/07/06	0327	4.0	13943	373.4093	.00	128.55	-	128.55	-	-
0550111	72	3	37	1.4	84/07/06	0348	4.0	14720	377.4545	.00	111.27	-	111.27	-	-
0550116	72	3	37	1.4	84/07/06	0443	4.0	12503	359.6810	.00	86.19	-	86.19	-	-
0550119	72	3	37	1.4	84/07/06	0513	4.0	3529	130.2614	.00	69.09	-	69.09	-	-
0550106	72	3	37	1.6	84/07/06	0222	4.0	14722	377.4618	.00	100.67	-	100.67	-	-
0550098	72	3	37	1.7	84/07/06	0050	4.0	11211	340.8647	.00	161.35	-	161.35	-	-
0550096	72	3	37	1.8	84/07/05	2137	3.0	10836	282.2357	.00	113.38	-	113.38	-	-
0550100	72	3	37	1.8	84/07/06	0115	4.0	14692	377.3510	.00	177.55	-	177.55	-	-
0550103	72	3	37	1.8	84/07/06	0148	4.0	14758	377.5899	.00	195.98	-	195.98	-	-
0550110	72	3	37	1.8	84/07/06	0337	3.0	13046	279.1222	.00	100.31	-	100.31	-	-
0550112	72	3	37	1.8	84/07/06	0400	3.0	12714	281.3721	.00	191.92	-	191.92	-	-
0550114	72	3	37	1.8	84/07/06	0423	3.0	12456	282.6764	.00	134.43	-	134.43	-	-
0550117	72	3	37	1.8	84/07/06	0452	3.0	8694	260.2686	.00	176.74	-	176.74	-	-
0550105	72	3	37	2.0	84/07/06	0210	3.0	14083	267.6847	.00	134.39	-	134.39	-	-
0550101	72	3	37	2.2	84/07/06	0126	3.0	13360	276.3969	.00	242.40	-	242.40	-	-
0550102	72	3	37	2.2	84/07/06	0139	3.0	13556	274.3988	.00	182.22	-	182.22	-	-
0550152	72	3	37	1.4	84/07/18	2221	4.0	13176	367.0806	.00	5.45	-	5.45	-	-
0550156	72	3	37	1.4	84/07/18	2312	4.0	12264	356.6495	.00	8.41	-	8.41	-	-
0550159	72	3	37	1.4	84/07/18	2345	4.0	12615	361.0295	.00	2.77	-	2.77	-	-
0550170	72	3	37	1.5	84/07/19	0157	4.0	13203	367.3419	.00	8.17	-	8.17	-	-
0550174	72	3	37	1.5	84/07/19	0245	4.0	13120	366.5299	.00	27.28	-	27.28	-	-
0550175	72	3	37	1.5	84/07/19	0255	4.0	14270	375.4065	.00	10.66	-	10.66	-	-
0550180	72	3	37	1.5	84/07/19	0349	4.0	14637	377.1384	.00	5.30	-	5.30	-	-
0550183	72	3	37	1.5	84/07/19	0422	4.0	14012	373.6660	.00	2.67	-	2.67	-	-
0550164	72	3	37	1.6	84/07/19	0046	4.0	15037	378.4030	.00	2.64	-	2.64	-	-
0550166	72	3	37	1.6	84/07/19	0107	4.0	14471	376.4223	.00	2.66	-	2.66	-	-
0550153	72	3	37	1.8	84/07/18	2235	3.0	12524	282.3701	.00	3.54	-	3.54	-	-

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CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES A_OSA SP

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550065	72	4	41	1.4	84/06/29	2230	4.0	12395	358.3365	.00	.00	-	-	-	-
0550068	72	4	41	1.4	84/06/29	2307	4.0	12744	362.5252	.00	.00	-	-	-	-
0550071	72	4	41	1.4	84/06/29	2344	4.0	13510	370.1166	.00	.00	-	-	-	-
0550072	72	4	41	1.4	84/06/29	2358	4.0	15129	378.6005	.00	.00	-	-	-	-
0550075	72	4	41	1.4	84/06/30	0030	4.0	14222	375.1400	.00	.00	-	-	-	-
0550082	72	4	41	1.4	84/06/30	0156	4.0	13471	359.7842	.00	.00	-	-	-	-
0550085	72	4	41	1.4	84/06/30	0232	4.0	14093	374.3781	.00	.00	-	-	-	-
0550089	72	4	41	1.4	84/06/30	0320	4.0	13573	370.6411	.00	.00	-	-	-	-
0550090	72	4	41	1.4	84/06/30	0333	4.0	12929	364.5620	.00	.00	-	-	-	-
0550093	72	4	41	1.4	84/06/30	0409	4.0	12471	355.2872	.00	.00	-	-	-	-
0550064	72	4	41	1.8	84/06/29	2218	3.0	13159	278.2087	.00	3.59	-	3.59	-	-
0550067	72	4	41	1.8	84/06/29	2256	3.0	13103	278.6708	.00	.00	-	-	-	-
0550069	72	4	41	1.8	84/06/29	2324	3.0	13265	277.2830	.00	.00	-	-	-	-
0550074	72	4	41	1.8	84/06/30	0020	3.0	13555	274.4096	.00	.00	-	-	-	-
0550077	72	4	41	1.8	84/06/30	0052	3.0	13562	274.3340	.00	.00	-	-	-	-
0550079	72	4	41	1.8	84/06/30	0117	3.0	11738	284.2934	.00	.00	-	-	-	-
0550083	72	4	41	1.8	84/06/30	0205	3.3	13366	312.0950	.00	.00	-	-	-	-
0550087	72	4	41	1.8	84/06/30	0252	3.0	12123	233.7918	.00	.00	-	-	-	-
0550091	72	4	41	1.8	84/06/30	0342	3.0	11098	283.2925	.00	.00	-	-	-	-
0550095	72	4	41	1.8	84/06/30	0432	3.0	10658	231.3068	.00	.00	-	-	-	-
0550109	72	3	37	1.4	84/07/06	0327	4.0	13943	373.4093	.00	.00	-	-	-	-
0550111	72	3	37	1.4	84/07/06	0348	4.0	14720	377.4545	.00	2.65	-	2.65	-	-
0550116	72	3	37	1.4	84/07/06	0443	4.0	12503	359.6810	.00	.00	-	-	-	-
0550119	72	3	37	1.4	84/07/06	0513	4.0	3529	130.2614	.00	.00	-	-	-	-
0550106	72	3	37	1.6	84/07/06	0222	4.0	14722	377.4618	.00	.00	-	-	-	-
0550098	72	3	37	1.7	84/07/06	0050	4.0	11211	340.8647	.00	.00	-	-	-	-
0550096	72	3	37	1.8	84/07/05	2137	3.0	10836	282.2357	.00	.00	-	-	-	-
0550100	72	3	37	1.8	84/07/06	0115	4.0	14692	377.3510	.00	.00	-	-	-	-
0550103	72	3	37	1.8	84/07/06	0148	4.0	14758	377.5899	.00	.00	-	-	-	-
0550110	72	3	37	1.8	84/07/06	0337	3.0	13046	279.1222	.00	.00	-	-	-	-
0550112	72	3	37	1.8	84/07/06	0400	3.0	12714	281.3721	.00	.00	-	-	-	-
0550114	72	3	37	1.8	84/07/06	0423	3.0	12456	282.6764	.00	.00	-	-	-	-
0550117	72	3	37	1.8	84/07/06	0452	3.0	8694	260.2686	.00	.00	-	-	-	-
0550105	72	3	37	2.0	84/07/06	0210	3.0	14083	267.6847	.00	.00	-	-	-	-
0550101	72	3	37	2.2	84/07/06	0126	3.0	13360	276.3969	.00	.00	-	-	-	-
0550102	72	3	37	2.2	84/07/06	0139	3.0	13556	274.3988	.00	.00	-	-	-	-
0550152	72	3	37	1.4	84/07/18	2221	4.0	13176	367.0806	.00	.00	-	-	-	-
0550156	72	3	37	1.4	84/07/18	2312	4.0	12264	356.6495	.00	.00	-	-	-	-
0550159	72	3	37	1.4	84/07/18	2345	4.0	12615	361.0235	.00	.00	-	-	-	-
0550170	72	3	37	1.5	84/07/19	0157	4.0	13203	367.3415	.00	.00	-	-	-	-
0550174	72	3	37	1.5	84/07/19	0245	4.0	13120	366.5295	.00	.00	-	-	-	-
0550175	72	3	37	1.5	84/07/19	0255	4.0	14270	375.4065	.00	.00	-	-	-	-
0550180	72	3	37	1.5	84/07/19	0349	4.0	14637	377.1384	.00	.00	-	-	-	-
0550183	72	3	37	1.5	84/07/19	0422	4.0	14012	373.6660	.00	.00	-	-	-	-
0550164	72	3	37	1.6	84/07/19	0046	4.0	15037	378.4030	.00	.00	-	-	-	-
0550166	72	3	37	1.6	84/07/19	0107	4.0	14471	376.4223	.00	.00	-	-	-	-
0550153	72	3	37	1.8	84/07/18	2235	3.0	12524	282.3701	.00	.00	-	-	-	-

CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES AMERICAN SHAD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0550155	72	3	37	1.8	84/07/18	2259	3.0	11649	284.2904	.00	3.52	-	-	3.52	-
0550158	72	3	37	1.8	84/07/18	2335	3.0	11998	284.0467	.00	3.52	-	-	3.52	-
0550169	72	3	37	1.9	84/07/19	0149	3.0	12276	283.3584	.00	3.53	-	-	3.53	-
0550172	72	3	37	1.9	84/07/19	0223	3.0	12264	283.3972	.00	.00	-	-	-	-
0550176	72	3	37	1.9	84/07/19	0305	3.0	13018	279.3370	.00	.00	-	-	-	-
0550181	72	3	37	1.9	84/07/19	0359	3.0	12976	279.6504	.00	7.15	-	-	7.15	-
0550165	72	3	37	2.0	84/07/19	0058	3.0	12990	279.5471	.00	3.58	-	-	3.58	-
0550184	72	3	37	2.0	84/07/19	0118	3.0	12400	282.9086	.00	3.53	-	-	3.53	-
0550178	72	3	37	2.0	84/07/19	0325	3.0	13612	273.7858	.00	.00	-	-	-	-
0550211	72	3	37	1.4	84/07/23	2239	4.0	13091	366.2400	.00	5.46	-	-	5.46	-
0550212	72	3	37	1.4	84/07/23	2249	4.0	12433	358.8147	.00	.00	-	-	-	-
0550231	72	3	37	1.4	84/07/24	0228	4.0	14162	374.7939	.00	.00	-	-	-	-
0550235	72	3	37	1.4	84/07/24	0331	4.0	14053	374.1285	.00	5.35	-	-	5.35	-
0550236	72	3	37	1.4	84/07/24	0342	4.0	15083	378.5063	.00	.00	-	-	-	-
0550239	72	3	37	1.4	84/07/24	0413	4.0	17232	373.3655	.00	.00	-	-	-	-
0550216	72	3	37	1.5	84/07/23	2334	4.0	14193	374.5745	.00	.00	-	-	-	-
0550221	72	3	37	1.5	84/07/24	0036	4.0	14319	375.6691	.00	.00	-	-	-	-
0550218	72	3	37	1.6	84/07/23	2359	4.0	14445	376.3000	.00	.00	-	-	-	-
0550226	72	3	37	1.6	84/07/24	0135	4.0	14322	375.6848	.00	5.32	-	-	5.32	-
0550210	72	3	37	1.8	84/07/23	2229	3.0	12708	281.4068	.00	.00	-	-	-	-
0550213	72	3	37	1.8	84/07/23	2301	3.0	12922	280.0382	.00	.00	-	-	-	-
0550223	72	3	37	1.8	84/07/24	0058	3.0	14319	264.4240	.00	.00	-	-	-	-
0550232	72	3	37	1.8	84/07/24	0247	3.0	13565	274.3015	.00	.00	-	-	-	-
0550233	72	3	37	1.8	84/07/24	0305	3.0	15055	251.4520	.00	.00	-	-	-	-
0550237	72	3	37	1.8	84/07/24	0349	3.0	13963	265.5150	.00	.00	-	-	-	-
0550242	72	3	37	1.8	84/07/24	0453	3.0	14447	262.4056	.00	.00	-	-	-	-
0550215	72	3	37	1.9	84/07/23	2323	3.0	12459	282.6634	.00	3.54	-	-	3.54	-
0550220	72	3	37	1.9	84/07/24	0023	3.0	14140	267.0798	.00	3.74	-	-	3.74	-
0550227	72	3	37	2.0	84/07/24	0145	3.0	14169	266.6627	.00	.00	-	-	-	-

NO.SAMPLES = 76

CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES ATLANTIC TOMCOD

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UIC LIFE STAGE
0550155	72	3	37	1.8	84/07/18	2259	3.0	11649	284.2904	.00	3.52	-	-	3.52	-
0550158	72	3	37	1.8	84/07/18	2335	3.0	11998	284.0467	.00	.00	-	-	-	-
0550169	72	3	37	1.9	84/07/19	0149	3.0	12276	283.3584	.00	3.53	-	-	3.53	-
0550172	72	3	37	1.9	84/07/19	0223	3.0	12264	283.2972	.00	3.53	-	-	3.53	-
0550176	72	3	37	1.9	84/07/19	0305	3.0	13018	279.3370	.00	3.58	-	-	3.58	-
0550181	72	3	37	1.9	84/07/19	0359	3.0	12976	279.6504	.00	7.15	-	-	7.15	-
0550165	72	3	37	2.0	84/07/19	0058	3.0	12990	279.5471	.00	.00	-	-	-	-
0550184	72	3	37	2.0	84/07/19	0118	3.0	12400	282.9086	.00	7.07	-	-	7.07	-
0550178	72	3	37	2.0	84/07/19	0325	3.0	13612	273.7858	.00	10.96	-	-	10.96	-
0550211	72	3	37	1.4	84/07/23	2239	4.0	13091	366.2400	.00	2.73	-	-	2.73	-
0550212	72	3	37	1.4	84/07/23	2249	4.0	12433	358.8147	.00	.00	-	-	-	-
0550231	72	3	37	1.4	84/07/24	0228	4.0	14162	374.7939	.00	.00	-	-	-	-
0550235	72	3	37	1.4	84/07/24	0331	4.0	14053	374.1285	.00	.00	-	-	-	-
0550236	72	3	37	1.4	84/07/24	0342	4.0	15083	378.5063	.00	.00	-	-	-	-
0550239	72	3	37	1.4	84/07/24	0413	4.0	17232	373.3655	.00	.00	-	-	-	-
0550216	72	3	37	1.5	84/07/23	2334	4.0	14193	374.9745	.00	.00	-	-	-	-
0550221	72	3	37	1.5	84/07/24	0036	4.0	14319	375.6691	.00	.00	-	-	-	-
0550218	72	3	37	1.6	84/07/23	2359	4.0	14445	376.3000	.00	.00	-	-	-	-
0550226	72	3	37	1.6	84/07/24	0135	4.0	14322	375.6848	.00	.00	-	-	-	-
0550210	72	3	37	1.8	84/07/23	2229	3.0	12708	281.4068	.00	.00	-	-	-	-
0550213	72	3	37	1.8	84/07/23	2301	3.0	12922	280.0382	.00	.00	-	-	-	-
0550223	72	3	37	1.8	84/07/24	0058	3.0	14319	264.4240	.00	.00	-	-	-	-
0550232	72	3	37	1.8	84/07/24	0247	3.0	13565	274.3015	.00	3.65	-	-	3.65	-
0550233	72	3	37	1.8	84/07/24	0305	3.0	15055	251.4520	.00	.00	-	-	-	-
0550237	72	3	37	1.8	84/07/24	0349	3.0	13963	269.5150	.00	.00	-	-	-	-
0550242	72	3	37	1.8	84/07/24	0453	3.0	14447	262.4056	.00	.00	-	-	-	-
0550215	72	3	37	1.9	84/07/23	2323	3.0	12459	282.6634	.00	.00	-	-	-	-
0550220	72	3	37	1.9	84/07/24	0023	3.0	14140	267.0798	.00	.00	-	-	-	-
0550227	72	3	37	2.0	84/07/24	0145	3.0	14169	266.6627	.00	.00	-	-	-	-

NO.SAMPLES = 76

CON EDISON GEAR COMPARISON STUDY
WEIGHTED TUCKER TRAWL

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UIC LIFE STAGE
0550155	72	3	37	1.8	84/07/18	2259	3.0	11649	284.2904	.00	56.28	-	56.28	-	-
0550158	72	3	37	1.8	84/07/18	2335	3.0	11998	284.0467	.00	88.01	-	88.01	-	-
0550169	72	3	37	1.9	84/07/19	0149	3.0	12276	283.3584	.00	95.25	-	95.29	-	-
0550172	72	3	37	1.9	84/07/19	0223	3.0	12264	283.3972	.00	81.16	-	81.16	-	-
0550176	72	3	37	1.9	84/07/19	0305	3.0	13018	275.3370	.00	96.66	-	96.66	-	-
0550181	72	3	37	1.9	84/07/19	0359	3.0	12976	275.6504	.00	250.31	-	250.31	-	-
0550165	72	3	37	2.0	84/07/19	0058	3.0	12990	275.5471	.00	228.54	-	228.94	-	-
0550184	72	3	37	2.0	84/07/19	0118	3.0	12400	282.9086	.00	102.51	-	102.51	-	-
0550178	72	3	37	2.0	84/07/19	0325	3.0	13612	273.7858	.00	204.54	-	204.54	-	-
0550211	72	3	37	1.4	84/07/23	2239	4.0	13091	366.2400	125.60	786.37	-	786.37	-	-
0550212	72	3	37	1.4	84/07/23	2249	4.0	12433	358.8147	11.15	769.20	-	769.20	-	-
0550231	72	3	37	1.4	84/07/24	0228	4.0	14162	374.7939	18.68	973.87	-	973.87	-	-
0550235	72	3	37	1.4	84/07/24	0331	4.0	14053	374.1285	3715.30	1181.41	-	1181.41	-	-
0550236	72	3	37	1.4	84/07/24	0342	4.0	15083	378.5063	5920.64	1212.66	-	1212.65	-	-
0550239	72	3	37	1.4	84/07/24	0413	4.0	17232	373.3655	13.39	1197.22	-	1197.22	-	-
0550216	72	3	37	1.5	84/07/23	2324	4.0	14193	374.5745	178.68	805.35	-	805.39	-	-
0550221	72	3	37	1.5	84/07/24	0036	4.0	14319	375.6691	10.65	995.56	-	995.56	-	-
0550218	72	3	37	1.6	84/07/23	2359	4.0	14445	376.3000	.00	821.15	-	821.15	-	-
0550226	72	3	37	1.6	84/07/24	0135	4.0	14322	375.6848	95.82	367.33	-	367.33	-	-
0550210	72	3	37	1.8	84/07/23	2229	3.0	12708	281.4068	.00	1133.55	-	1133.59	-	-
0550213	72	3	37	1.8	84/07/23	2301	3.0	12922	280.0382	121.41	1003.43	-	1003.43	-	-
0550223	72	3	37	1.8	84/07/24	0058	3.0	14319	264.4240	11.35	329.02	-	329.02	-	-
0550232	72	3	37	1.8	84/07/24	0247	3.0	13565	274.3015	21.87	689.02	-	689.02	-	-
0550233	72	3	37	1.8	84/07/24	0305	3.0	15055	251.4520	270.43	417.57	-	417.57	-	-
0550237	72	3	37	1.8	84/07/24	0349	3.0	13963	269.5150	29.68	1306.05	-	1306.05	-	-
0550242	72	3	37	1.8	84/07/24	0453	3.0	14447	262.4056	7.62	1265.22	-	1265.22	-	-
0550215	72	3	37	1.9	84/07/23	2323	3.0	12459	282.6634	2600.27	866.76	-	866.76	-	-
0550220	72	3	37	1.9	84/07/24	0023	3.0	14140	267.0798	572.86	1119.52	-	1119.52	-	-
0550227	72	3	37	2.0	84/07/24	0145	3.0	14169	266.6627	82.50	585.01	-	585.01	-	-

NO.SAMPLES = 76

APPENDIX 4-1

COLLECTION INFORMATION

MILLER HIGH SPEED SAMPLER EVALUATION STUDY

BAY ANCHOVY

Gear Code : Miller High Speed Sampler = 71
1.0 m^2 Tucker trawl = 65

CON EDISON GEAR COMPARISON STUDY
MILLER HIGH SPEED SAMPLER

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW_SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS (IN NO./1000 CU. M.)	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
0560003	71	3	37	3.0	84/07/12	2158	11.0	74776	30.9436	.00	32.31	-	32.31	-	-
0560006	71	3	37	3.0	84/07/12	2248	11.0	81208	33.6075	.00	.00	-	-	-	-
0560014	71	3	37	3.0	84/07/13	0135	11.0	87127	36.0570	.00	.00	-	-	-	-
0560018	71	3	37	3.0	84/07/13	0204	11.0	89151	36.8947	.00	54.21	-	54.21	-	-
0560021	71	3	37	3.0	84/07/13	0318	11.0	90607	37.4972	.00	106.67	-	106.67	-	-
0560023	71	3	37	3.0	84/07/13	0355	11.0	78981	32.6855	.00	.00	-	-	-	-
0560004	71	3	37	4.0	84/07/12	2219	8.5	79765	33.0103	.00	.00	-	-	-	-
0560008	71	3	37	4.0	84/07/12	2324	8.5	82659	34.2080	.00	58.47	-	58.47	-	-
0560010	71	3	37	4.0	84/07/13	0039	8.5	84130	34.8168	.00	28.72	-	28.72	-	-
0560017	71	3	37	4.0	84/07/13	0222	8.5	75978	31.4431	.00	.00	-	-	-	-
0560019	71	3	37	4.0	84/07/13	0250	8.5	79340	32.8344	.00	60.91	-	60.91	-	-
0560026	71	3	37	4.0	84/07/13	0435	8.5	86452	35.7777	.00	.00	-	-	-	-
0560024	71	3	37	4.1	84/07/13	0411	7.0	80820	33.4469	.00	29.90	-	29.90	-	-
0560012	71	3	37	4.5	84/07/13	0104	7.0	80341	33.2487	.00	30.08	-	30.08	-	-
0560015	71	3	37	4.7	84/07/13	0153	7.0	80963	33.5061	.00	.00	-	-	-	-
0560005	71	3	37	4.8	84/07/12	2235	7.0	81035	33.5359	.00	.00	-	-	-	-
0560009	71	3	37	4.8	84/07/12	2339	7.0	80989	33.5169	.00	29.84	-	29.84	-	-
0560020	71	3	37	4.8	84/07/13	0304	7.0	77647	32.1338	.00	31.12	-	31.12	-	-
0560031	71	3	37	5.8	84/07/25	2241	11.0	87465	36.1963	.00	1243.20	-	1243.20	-	-
0560035	71	3	37	5.8	84/07/26	0004	11.0	80897	33.4788	.00	955.83	-	955.83	-	-
0560042	71	3	37	5.8	84/07/26	0140	11.0	80302	33.2326	30.09	1233.73	-	1233.73	-	-
0560043	71	3	37	5.8	84/07/26	0205	11.0	85689	35.5447	168.80	1181.61	-	1181.61	-	-
0560053	71	3	37	5.8	84/07/26	0440	11.0	74586	30.8670	23163.89	2786.13	-	2786.13	-	-
0560027	71	3	37	9.2	84/07/25	2124	7.0	80897	33.4786	59.74	418.18	-	418.18	-	-
0560037	71	3	37	9.3	84/07/26	0030	7.0	76019	31.4601	.00	635.73	-	635.73	-	-
0560040	71	3	37	9.3	84/07/26	0115	7.0	72575	30.0348	.00	466.13	-	466.13	-	-
0560047	71	3	37	9.3	84/07/26	0320	7.0	72429	29.9744	1267.75	500.43	-	500.43	-	-
0560052	71	3	37	9.3	84/07/26	0430	7.0	82743	34.2427	730.08	262.83	-	262.83	-	-
0560051	71	3	37	11.0	84/07/26	0420	5.5	75216	31.1277	353.38	32.13	-	32.13	-	-
0560041	71	3	37	11.1	84/07/26	0135	4.7	73511	30.4221	1150.48	131.48	-	131.48	-	-
0560030	71	3	37	11.7	84/07/25	2227	5.5	77043	31.8838	.00	188.18	-	188.18	-	-
0560033	71	3	37	11.7	84/07/25	2311	5.5	79136	32.7500	.00	61.07	-	61.07	-	-
0560038	71	3	37	11.7	84/07/26	0045	5.5	81564	33.7548	.00	148.13	-	148.13	-	-
0560045	71	3	37	11.7	84/07/26	0255	5.5	73023	30.2202	35.09	430.18	-	430.18	-	-
0560054	71	3	37	11.7	84/07/26	0506	4.7	68875	28.5036	35.08	175.42	-	175.42	-	-
0560046	71	3	37	11.8	84/07/26	0305	4.7	73553	30.4395	5059.22	131.41	-	131.41	-	-
0560032	71	3	37	12.3	84/07/25	2259	4.7	69345	28.6981	.00	.00	-	-	-	-
0560036	71	3	37	12.4	84/07/26	0020	4.7	76758	31.7659	2644.34	188.88	-	188.88	-	-
0560058	71	3	37	5.8	84/07/26	2140	11.0	80613	33.3613	.00	1588.67	-	1588.67	-	-
0560063	71	3	37	5.8	84/07/26	2253	11.0	85091	35.2145	.00	1079.10	-	1079.10	-	-
0560066	71	3	37	5.8	84/07/27	0046	11.0	83420	34.5225	231.73	1448.31	-	1448.31	-	-
0560071	71	3	37	5.8	84/07/27	0126	11.0	79208	32.7798	18548.01	579.63	-	579.63	-	-
0560079	71	3	37	5.8	84/07/27	0324	11.0	68709	28.4349	2145.25	1301.22	-	1301.22	-	-
0560081	71	3	37	5.9	84/07/27	0356	11.0	79432	32.8973	12189.45	599.15	-	599.15	-	-
0560056	71	3	37	9.3	84/07/26	2110	7.0	77767	32.1835	186.43	466.08	-	466.08	-	-
0560064	71	3	37	9.3	84/07/26	2310	7.0	74612	30.8778	.00	291.47	-	291.47	-	-
0560067	71	3	37	9.3	84/07/27	0013	7.0	74265	30.7342	645.96	422.38	-	422.38	-	-

CON EDISON GEAR COMPARISON STUDY
STANDARD TUCKER TRAWL

SPECIES BAY ANCHOVY

TASK & SAMPLE	GEAR	SEG	RIVER MILE	TOW SP (M/S)	SAMPLE DATE	TIME	DUR (MIN)	NO.METER REVS.	VOLUME (CU. M.)	TOTAL EGGS	TOTAL LARVAE	YOLK-SAC	POST YOLK-SAC	JUVENILE	UID LIFE STAGE
										(IN NO./1000 CU. M.)					
0560001	65	3	37	1.1	84/07/12	2124	5.0	13106	377.2556	.00	13.25	-	13.25	-	-
0560002	65	3	37	1.1	84/07/13	0423	5.0	12505	338.6170	.00	46.19	-	46.19	-	-
0560007	65	3	37	1.2	84/07/12	2306	5.0	13404	331.4476	.00	34.08	-	34.08	-	-
0560014	65	3	37	1.2	84/07/13	0237	5.0	12658	370.4672	.00	91.78	-	91.78	-	-
0560011	65	3	37	1.3	84/07/13	0052	5.0	13585	343.6657	.00	28.66	-	28.66	-	-
0560022	65	3	37	1.3	84/07/13	0333	5.0	12104	351.2823	.00	445.53	-	445.53	-	-
0560050	65	3	37	1.0	84/07/26	0401	5.0	18287	410.2564	20551.00	553.26	-	553.26	-	-
0560025	65	3	37	1.2	84/07/25	2209	5.0	12363	355.6837	5171.13	3609.68	-	3609.68	-	-
0560034	65	3	37	1.2	84/07/25	2347	5.0	13757	386.0731	51430.67	2388.15	-	2384.15	-	-
0560039	65	3	37	1.2	84/07/26	0100	5.0	13303	330.0561	14566.27	2254.93	-	2254.93	-	-
0560044	65	3	37	1.2	84/07/26	0225	5.0	12402	356.3302	340632.62	720.66	-	720.66	-	-
0560057	65	3	37	1.0	84/07/26	2127	5.0	14443	393.5853	83.76	1530.51	-	1530.51	-	-
0560062	65	3	37	1.1	84/07/26	2241	5.0	12560	370.4584	1101.22	1543.36	-	1543.36	-	-
0560066	65	3	37	1.1	84/07/26	2357	5.0	13169	378.1635	15041.11	2348.19	-	2348.19	-	-
0560073	65	3	37	1.2	84/07/27	0155	5.0	12710	371.2847	10609.11	1536.04	-	1533.34	2.69	-
0560071	65	3	37	1.2	84/07/27	0259	5.0	11344	347.2036	102089.31	895.47	-	895.47	-	-
0560084	65	3	37	1.4	84/07/27	0437	5.0	10755	355.4128	58411.61	2227.11	-	2227.11	-	-

NO.SAMPLES = 17

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FLOW METER FIELD TESTS

RESEARCH REPORT

EP 82-18

Prepared by:
Energy & Environmental Analysts, Inc.
Garden City, New York

Final Report
January 1985

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FLOW METER FIELD TESTS

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Energy & Environmental Analysts, Inc.
Garden City, New York

JANUARY 1985

PERFORMANCE OF PLANKTON NETS AND FLOW METERS UNDER FIELD CONDITIONS: PHASE II PROGRAM
ESEERCO PROJECT EP 82-18

Prepared for:

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PERFORMANCE OF PLANKTON NETS AND FLOW METERS UNDER FIELD CONDITIONS: PHASE II PROGRAM
ESEERCO PROJECT EP-82-18

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ESEERCO PROJECT EP-82-18

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METERS UNDER FIELD CONDITIONS: PHASE II PROGRAM
ESEERCO PROJECT EP-82-18

LIST OF FIGURES

EXECUTIVE SUMMARY

The purpose of this Executive Summary is to briefly present the major results of field test experiments on flow meters and plankton nets. The number of experimental variables tested was high, so the results are rather complex. It would be advisable to carefully read the body of the report before formulating opinions on the operating characteristics of the various net and meter combinations.

In an earlier program (the Phase I study), a series of tow tank tests were conducted with three types of plankton net flow meters commonly utilized by New York State Utilities. The results of the Phase I study showed that all of the meters tested had adequate performance from the standpoint of linear response and precision but only when utilized in the linear portion of their performance range.

This program (known as the Phase II study) was designed to determine flow meter-plankton net responses to changes in field operating conditions, such as towing velocity, meter placement, mesh size and meter type. Over a nine-month period, 253 tows were made testing for the effects of changing the variables. The results showed that:

1. Different types of meters should not be interchanged between different types of nets without recalibrating the new gear arrangement. The response of a net flow meter appears to be a complex function involving interaction of the net type and the meter type.

2. The relative reading of the net (experimental) meter, when compared to a control meter, could vary as much as 30% with changing towing velocities.

3. Velocity differences had no statistically significant effect on all the gear types taken together; however, two of the gear types tested showed statistically significant trends.

4. Center versus off-center meter location produced statistically different results. The center position recorded less water flow than the off-center in one gear type and more in a different one. These results are significant at P = .05.

5. First hoop versus second hoop (center) meter locations produced statistically different results. The second hoop position records greater water flow (a locally higher velocity) than the first hoop. This result is significant at $P = 0.001$.

6. Differing mesh size nets mounted on a Bongo net frame yield results showing the coarser mesh (571 um) having a proportionately greater water flow than the finer mesh as the towing velocity increases.

7. There can be marked variation ($\pm$ 10%) between individual meters of the same class and type. This variation increases as the towing velocity decreases, but can be overcome by mathematic corrections.

8. The inter-meter comparison showed that the three types of meters tested have essentially constant but different ratios over the velocities tested.

9. One gear type tested (1.0 m diameter, 571 um, closing net) exhibited a constriction or "crimp" of the impervious collar. The effect became more marked with increasing velocity.

10. For meters tested in both the Phase I and Phase II studies, there was no appreciable performance change with time.

ESEERCO PROJECT EP-82-18

PERFORMANCE OF PLANKTON NETS AND FLOW METERS UNDER FIELD CONDITIONS

I. INTRODUCTION AND REVIEW OF PRIOR STUDIES

A. PHASE I PROGRAM

This report summarizes the methodologies, results and conclusions of performance testing of plankton net flow meters under actual field operating conditions. The tests were conducted from September 1982 to May 1983. Prior to initiation of this program, a series of tests were made in 1981 under controlled test tank conditions to assess the accuracy and linearity of plankton net flow meters. This previous study is referred to as the "Phase I" program and the present program as "Phase II." The results of the earlier program led to some of the protocols utilized in this present study.

The Phase I program was conducted in 1981 at the Webb Institute of Naval Architecture Model Basin Test Tank. Specifically, the objectives of the program were:

1. to determine threshold velocities;

2. to determine linear response ranges; and

3. to assess precision for selected plankton net flow meters used by New York State utilities and their consultants.

In order to clarify terminology, a glossary of terms used in this report is given on the following page.

The results of the Phase I testing program indicated that all of the meters tested had adequate performance from the standpoint of linear response and precision, but only when utilized in the linear portion of their performance plots. Inspection of the plots (revolutions per foot versus velocity) shows that in all cases the performance degrades rapidly below a critical velocity (not to be confused with the threshold velocity). The major factor governing accuracy in flow meter readings seems to be the towing velocity and consequently the velocity of the meter through the water column. Specific results of the tests are given in Table 1.

GLOSSARY OF TERMS

Threshold velocity	- lowest velocity at which flow meter rotor begins to consistently revolve.
Linear response range	- velocity range over which meter exhibits constant number of turns per unit advance.
Precision	- term used to describe the repeatability of specific flow meters during replicate tests, e.g., a measure of variance.
Critical velocity	- lowest velocity at which a flow meter exhibits linear response; (lower point of Linear Response Range).

TABLE 1

LISTING OF METERS TESTED IN THE PHASE I PROGRAM AND SYNOPSIS OF RESULTS

Meter Type	Serial or Ident. Number	Number of Runs[4]	Vane Size	Threshold[1] (fps)	Linear[1,2] Response Range	Coefficient of Variation[3]
General Oceanics	B02036	30	large	0.32	1.0 - 1.3	0.30
General Oceanics	B03204	112	small	0.88	1.2 - 5.6	0.25
General Oceanics	B00093	85	small	0.52	1.5 - 5.5	0.21
General Oceanics	B00263[5]	67	small	1.58	2.5 - 5.5	0.26
General Oceanics	B00263[5]	73	large	0.33	0.8 - 4.6	0.17
General Oceanics	B02018	49	large	0.33	0.6 - 1.4	0.18
Ocean Instruments	1	61	small	0.83	1.0 - 5.5	0.59
Ocean Instruments	3	68	small	0.69	1.5 - 5.6	0.93
Ocean Instruments	3	55	large	0.21	0.9 - 5.5	0.40
TSK	3099	67		0.40	1.0 - 5.6	1.34
TSK	2889	74		0.34	1.2 - 6.2	0.99
TSK	3011	49		0.53	1.2 - 4.2	2.09
TSK	3165	24		0.74	1.2 - 4.0	1.57

1. See text for definition.
2. The upper figure of the linear response range is the highest velocity tested; some meters may be linear above this figure.
3. This term expresses the mean of the standard deviations for the five replicate velocity runs; the lower the number, the less variation shown by the meter.
4. Normally five runs were made at each velocity increment; however, only one or two runs were needed for threshold measurements. Therefore, the total number of runs does not necessarily equal a multiple of 5.
5. Remote read-out.

B. PHASE II PROGRAM

While completion of the Phase I program answered several questions about flow meter performance under test tank conditions, their actual response under field conditions could not be extrapolated. To investigate flow meter responses to such typical variables as types of plankton nets, towing velocity and meter location, a second program (Phase II) was conceived. The hypothesis tested in the Phase II program was that the response of a flow meter type varied with changes in velocity, meter location and net mesh size.

The main objectives of the Phase II program were to determine the comparative responses of paired flow meters mounted within and without plankton nets to the following variables:

1. Velocity - Towing velocities were varied from the low end of the linear response range determined in Phase I (1.3 fps) to the highest velocity commonly utilized to tow plankton nets (6.6 fps).

2. Meter Location - The location of the flow meter was altered from the first hoop to the second hoop and from center to off-center position.

3. Mesh Size - Mesh sizes were varied from 363 um to 505 um to 571 um in otherwise identical net configurations.

4. Meter Type - The three meter types tested were mounted side by side and run in the varying velocity regimes.

A secondary objective of the Phase II program was to assess the precision of the flow meters under the varying field conditions. The Phase I program documented the precision of flow meters under controlled (test tank) conditions.

Flow meters were obtained from member utilities and all were calibrated under controlled conditions (i.e., a tow test tank). The flow meters were then taken into the field and tested with different plankton nets under varying conditions. All meters were tested in the condition received.

The present (Phase II) program is essentially empirical in approach. The program was designed to measure responses of flow meters to variations in field parameters. The reasons why certain behavioral anomalies occur were not investigated in this study and, in most cases, are questions of hydrodynamics beyond the scope of this program.

II. METHODOLOGIES

A. GEAR TYPES TESTED

Table 2 gives a listing of the plankton net flow meters obtained from member utilities. The serial numbers are provided because, as will be explained, the meters occasionally exhibited unique operating characteristics. A total of 11 General Oceanics (GO) meters were tested, as were 3 TSK's and 2 Ocean Instruments (OI). Table 2 also lists the plankton nets utilized; they included 1 meter, 0.75 m and 0.5 m diameter nets with varying length to open end ratios and mesh sizes. Both the meters and nets reflected the gear types most commonly used by member utilities. Other associated gear, such as bridles and depressors, were obtained from the same sources. A brief description of the flow meters utilized is given below:

1. General Oceanics

The General Oceanics meter consists of a cylindrical clear plastic body with an unsurrounded high pitch, trailing rotor. A six-digit counter records rotor revolutions to the nearest 0.1 revolution. Some meters are oil-filled, others are water-filled. Two types of vanes are available, large and small for slow and fast velocity regimes, respectively. Backward rotation is possible. Some meters are equipped with magnetic impulse sensors for real time, remote read out of velocity.

2. TSK

The meter body consists of a metal cylindrical duct surrounding a plastic four-vaned rotor. Rotor turns are transmitted through right angle bevel gears and drive shafts to a counting mechanism consisting of four dials representing tens, hundreds, thousands and ten thousands of counts. One rotor revolution equals one count, but this single count must be estimated because the lowest meter subdivision is in sets of ten. The meter has a stop which prevents backward rotation of the rotor.

TABLE 2

LISTING OF GEAR TYPES UTILIZED

A. FLOW METERS

Description	No.	Serial Number
General Oceanics (standard)	7	01775, 05033, 05864 05963, 05880, 06017 02729
General Oceanics (remote readout)	3	00263, 06731, 06723
TSK	2	3099, 3420
Ocean Instruments	2	1, 2

B. PLANKTON NETS

1. 1 meter diameter, 571 um mesh, closing
2. 0.75 m diameter, 363 um mesh closing
3. 0.50 m diameter Bongo configuration (363 um and 571 um mesh sizes)
4. 0.50 m diameter, 571 um mesh (non closing)
5. 0.50 m diameter, 505 um mesh (non closing)
6. 0.50 m diameter, Bongo configuration (505 um mesh size on both sides)

3. Ocean Instruments

The Ocean Instruments meter consists of a three-bladed model airplane propellor mounted on the front of a rectangular-shaped counter case. One revolution of the propellor is recorded as one count. Backward rotation is possible.

B. EXPERIMENTAL PROTOCOLS (Calibration Runs in the Test Tank)

Before conducting the Phase II field trials with the flow meters and nets, all the flow meters were tested in a model basin test tank during both the Phase I and Phase II programs. These "calibration" runs were conducted in the model basin test tank of the Webb Institute of Naval Architecture located in Glen Cove, New York. The test tank is approximately 100 feet long, 15 feet wide and 5 feet deep. A towing trolley runs down the center of the tank and is used for towing ship models under a variety of conditions. Speed control of the towing trolley is governed by a motor controller and repeatable velocities from 1.0 to 9.0 feet per second can be attained. A modification of the towing assembly allowed velocities as low as 0.2 fps. A timer, accurate to 0.01 seconds, records the time for the towing trolley to traverse a 30.0 foot interval of the course, located between the 50 and 80 foot marks. (The first 50 feet is used for acceleration and speed stabilization, the last 20 feet for deceleration.) The flow meters were allowed to run only over the timed distance of the tank course. A series of trip pins and release mechanisms were used to start and stop the meters.

Each of the meters (see Table 2 for a listing) was tested for five consecutive runs at a given velocity. The velocities employed ranged from threshold up to approximately 6 feet per second. In the Phase II program, the velocities utilized were 1, 2, 3, 5 and 6 fps. The velocity interval was decreased in the lower velocities for better definition of the non-linear ranges. Thresholds were empirically determined by visual observation of the meters at incrementally decreasing velocities. If the meter was observed to not rotate smoothly during a run, that velocity was judged to be below the threshold.

Data recorded included meter number, run number, elapsed time, and total turns of the meter rotor. The five runs at each velocity were averaged and standard deviations calculated. A total of 445 calibration runs were conducted during the Phase II program. Since the meters could not be adjusted, the data were unitized to revolutions per foot and feet per second and used to provide a "correction table" with a correction factor for each meter at each velocity tested. Statistical parameters, including standard deviation error and variance, were computed.

A few of the meters tested in this program had been previously tested in the Phase I program. In order to determine if the meter's performance changed with age or use, the results of both programs were compared (see section IIIG).

C. <u>EXPERIMENTAL PROTOCOLS (Field Tests)</u>

1. <u>General Protocol</u>

Field tests were performed from September 1982 to August 1983 in Long Island Sound near the Long Island Lighting Company (LILCO) Shoreham Generating Station, in Mt. Sinai Harbor, (11 miles west of Shoreham) and in the Great South Bay offshore of Babylon. The velocity of the research vessel was monitored and controlled by suspending a calibrated remote readout GO meter over the side. The meter was held perpendicular to the water flow and was sufficiently far from the hull to be in undisturbed water. Plankton nets were trailed astern from a boom designed to keep them out of the ship's propellor wake. Tows were made for three-, four- or five-minutes, depending on the velocity selected. The low velocity tows (1.3 fps) were run for five minutes, the medium velocity (2.6 and 3.9 fps) for four minutes and the high velocity (5.2 and 6.6 fps) for three minutes. This protocol was designed to reduce differences in total volumes of water filtered between runs at different velocities. All experiments had five replicate runs. Every tow had a control which was a similar meter mounted in a net hoop, but without a net. The control was launched and retrieved simultaneously with the experimental net configurations. A total of 256 boat runs were made, each with paired experimental and control configurations (in some cases, two or three test and control configurations were towed at once). The total number of individual meter runs was in excess of 600.

Field tests were conducted during times and in areas where the ambient water was least turbid so as to minimize the effects of clogging. Nets were washed as needed during the field tests.

2. <u>Gear Types and Specific Protocols</u>

Flow meter and net combinations were selected to reflect the most commonly employed configurations. Each meter and net combination (gear type) was assigned a letter code for identification as shown in Table 3.

The combinations shown in Table 3 were used in five basic types of field experiments. These types of experiments were:

<u>Varying Velocities</u> - The purpose of this experiment was to determine how meters within net configuration types responded to variations in towing velocities. The gear tested over varying velocities were A, B, F, G and H. Since gear type H is a Bongo net, the results of each meter were recorded separately as right and left. Velocities tested ranged from a low of 1.3 fps to a high of 6.6 fps. The test increments utilized were generally 1.3, 2.6, 3.9, 5.2, and 6.6 fps. The constraint on the low velocity range was directional control of the research vessel and, for the upper velocity range, physical strength of the gear type. Due to deformation of the steel hoop, gear type B could not be towed at a velocity of 6.6 fps.

<u>Meter Location (Center or Off-Center)</u> - The purpose of this series was to determine the difference in response with TSK or OI flow meters mounted in the center and off-center position. Gear types A and B were used for these runs. The first hoop of the closing type nets were utilized with velocity regimes of approximately 2.6, 3.9, and 5.2 fps.

<u>Meter Location (First or Second Hoop)</u> - This series was similar in protocol to the above series, except that the difference between mounting the meter in the first and second hoop (center location) of closing nets was examined. Gear types A and B were used.

<u>Mesh Size</u> - A Bongo frame (Gear Type C) equipped with two nets (363 and 571 um mesh sizes) was utilized to examine the difference in flow meter response to different mesh sizes under otherwise identical conditions. Also, a comparison was made between gear type F (571 um mesh) and gear type G (505 um mesh) which were identical, except for the small difference in mesh size.

<u>Inter-Meter Comparison</u> - Gear type D was utilized to examine differences in response of three meters mounted in the same net and subjected to varying velocity regimes. The

TABLE 3

LISTING OF PLANKTON NET AND FLOW METER COMBINATIONS TESTED

ID	Opening, m (Meters)	Mesh, um (Microns)	Length Diameter Ratio	Meter	Net Type
A	0.75	363	5:1	O.I.	Closing Type[1]
B	1.00	571	5:1	TSK	Closing Type[1]
C	0.50	571, 363	3:1	GO	Bongo Type[2]
D	1.00	571	5:1	GO, OI, TSK	Closing Type[3]
E	1.00	571	5:1	TSK	Closing Type 2 Meters[4]
F	0.50	571	3:1	GO	Standard[5]
G	0.50	505	3:1	GO	Standard[5]
H	0.50	505, 505	3:1	GO	Bongo Type[2]

Notes:

1. A closing type net (Birge net) has two hoops connected with a cylindrical, impervious shroud. Meter was normally mounted in the first hoop.

2. Bongo nets are two nets mounted side by side on a rigid frame.

3. This gear type had 3 meters mounted within the first hoop of the net.

4. Two meters were mounted in the first and second hoops, respectively.

5. Single hoop, non-closing.

meters obviously could not all be mounted in the center. They were installed 120° apart, approximately one half the distance from the center to the rim of the net hoop.

In all of the above protocols, a control net was utilized which had the same number, type and configuration of flow meters as the experimental gear, except that the frames had no net mesh attached. Alternatively, a control meter was attached to a 1/4" steel rod which was in turn attached to the frame. Figure 1 presents a schematic diagram of the towing configuration, the velocity meter, and the set-up for the inter-meter comparison.

3. Data Collection, Reduction and Statistical Analysis

A. Data Collection

For each run, the following data were collected: run number, time in/time out, meter start, meter stop and velocity. For each series of runs, the recorded data included gear type, experiment type, date, meter serial numbers and pertinent field conditions.

B. Data Normalization (Test Tank Program)

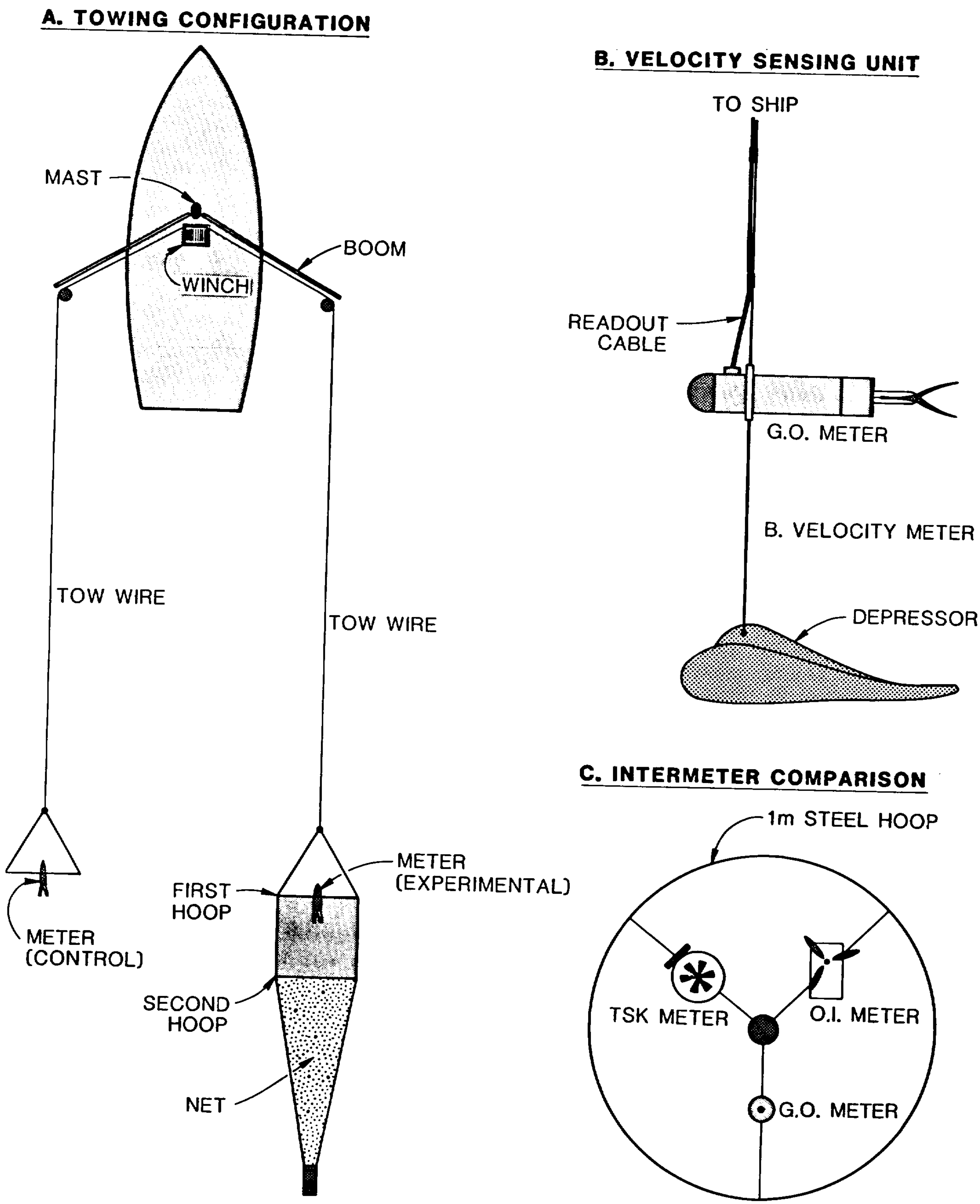
Data reduction first involved a series of steps that were designed to correct for or "normalize" individual variations between meters of the same class. The results of the tow tank tests were used to generate plots of meter response at the various velocity regimes. The particular plot (turns per foot advance versus velocity) for each meter had to be normalized at various points in the velocity regime during interpretation of the field trials.

The rationale for this correction or "normalization" process was as follows: the results of the calibration runs in the test tank showed that each meter had an individual response that deviated from the mean of all the meters tested of that particular class. If this deviation was not corrected for, comparisons could not be made of meter readings taken in the field.

To normalize the meter readings, a table was prepared listing the revolution per foot of advance for each meter of a class at each of the test tank velocity regimes utilized. One flow meter was then selected as the "normal" meter and the results of the other meters divided into the "normal" meter's data at each velocity increment. This latter step resulted in a table giving the relative deviation in turns

FIGURE 1

SCHEMATIC DIAGRAMS OF FIELD OPERATIONS



per unit distance; typically, the differences ranged from 0.901 to 1.066 for the GO meters. These "correction factors" were utilized in the data reduction process to "normalize" the meters.

C. Data Treatment (Field Program)

A computer program was written to assist the tow tank data reduction process. Inputs to the program were the tow tank test results: output included (for each set of 5 replicates), the beginning and ending run numbers, raw data values, data correction factor, corrected data, mean, standard deviation and variance. The data correction factor was utilized to normalize the variations between meters. This factor was then employed to correct for deviations between meters for the field data results so that only differences due to net influences would be recorded.

The field data were treated somewhat differently than the tow-tank data. The five replicate runs for each trial were not averaged because the time in/time out could not be duplicated exactly from run to run due to the problems of handling the equipment in the field. Instead, the ratios of the experimental and control flow meters were recorded because the nets were launched and retrieved simultaneously. The results of the individual replicate runs were used to generate a ratio of numbers of meter revolutions (experiment) to numbers of meter revolutions (control). The ratios of the five replicates were then summed, the mean calculated, as well as the standard deviation and variance. This was also carried out with a computer program. This procedure allowed the responses of experimental meters to be compared to control meters.

The two computer programs developed for this study reduced the raw data and produced summaries of the finished data sets. The primary statistical analyses utilized were mean, standard deviation and variance. Prior to initiation of this (Phase II) program, the earlier study (Phase I) indicated that five replicate runs were sufficient to produce acceptable quality data sets. This was the reason for the initial selection of five replicate runs for the Phase II program. Standard deviation was selected as the main statistical test because it provides a measure of the deviation of the meters, is widely utilized, and is readily understood by scientists in the field.

D. STATISTICAL ANALYSES

1. Effects of Varying Velocities on All Gear Types Taken Together

Because of the importance of the varying velocity experiments (all other experimental results were keyed to the varying velocity regimes) this experiment was statistically analyzed to determine if the results of all gear types taken together were significantly different at each of the velocities tested.

Whether or not there is a significant added effect of velocity on the flow meter readings due to the configuration of any one of six gear arrangements (A,B,F,G,H_r and H_l) was first investigated with a two-way analysis by ranks. The null hypothesis tested was that there is no difference in the mean of the normalized ratio of experimental and control flow meter turns between the velocities. As described previously, the experimental flow meter readings were compared to the control meter readings so that all other effects except those due to gear arrangement presumably were negated. A non-parametric approach was taken because other analyses showed that the variances between means differed to such an extent that the underlying assumptions for parametric analysis of variance are violated. The non-parametric technique used was the Friedman Test (Siegel, 1956). Since gear type B lacked observations for the fifth velocity, (it could not be towed at 6.6 fps), the test was broken into two steps -- in the first, the other five gear types were tested with all five velocities and in the second, gear type B was included with the five others but only four velocities were considered. In this manner, all tests had an equal number of data points in their arrays, and all information was utilized.

2. Effects of Varying Velocities on Individual Gear Types

In order to determine if the individual gear types responded significantly different to the varying velocity regimes, a non-parametric test was utilized. The Kruskal-Wallis test (Freund, 1973) is a rank-sum test which is used to test the null hypothesis that k independent random samples come from identical populations. (If the null hypothesis is accepted, then there is no significant difference (P = .05) between tested velocities for each gear type.) Results from gear types A,B,F,G, H_r and H_l were analyzed.

3. Center versus Off-Center Meter Location

A non-parametric rank-sum test was selected (Mann - Whitney or U-test) to determine whether the center location meter readings from gear types A and B were significantly different at P = .05 from the off-center meter location readings. Each gear type was tested separately. In effect, this test determines whether two samples come from identical populations or whether these populations have unequal means (Freund 1973). The null hypothesis (Ho) was that no difference existed in flow meter readings between the center and off-center locations.

4. First Hoop-Second Hoop Meter Locations

Statistical analyses were conducted on the first hoop - second hoop experimental configurations. In order to examine the effects of meter placement, the results of both gear types A and B were pooled. While the gear types were different, they both involved two hoop nets with impervious collars (e.g., closing nets). If the presumed effect was common to both nets, then the pooled data would reflect the effect.

The nonparametric Mann-Whitney U-test (Freund, 1973) was selected to test for differences between the first and second hoop meter readings. In conducting the test, the pooled means of the second hoop ratios were compared to pooled means of the first hoop ratios. The null hypothesis was that the number of revolutions registered by the first hoop flow meter (compared to the control) was not significantly different than the number of revolutions of the second hoop meter compared to the control.

In all statistical tests, the level of significance (acceptance or rejection of the null hypothesis) was set at P = .05.

III. RESULTS

A. MODEL BASIN FLOW METER TESTS

The results of the Phase II flow meter tests in the model basin tank are summarized in Appendix A as plots of velocity versus rotor turns per foot of advance. The results are similar to the results obtained in the Phase I report, with the meters showing a linear response range above the critical velocity. (By coincidence, three of the meters tested were also tested in the Phase I study; comparison of present performance with data for Phase I are presented in Section G of this chapter.)

An example of a typical computer print-out for a flow meter (TSK 3420) is given in Table 4. This print-out summarizes the results of run numbers 48-52, 53-57 and 59-63. Each set of 5 replicate runs were conducted at a single velocity.

B. VARYING VELOCITIES

1. Overall Results

As shown in Figure 2 and Table 5, gear type A (0.75 m, 5 to 1, 363 um, OI meters in first hoop) exhibited experimental to control ratios of 0.71 at 1.3 fps to 1.0 at 6.0 fps. The standard deviation (SD) for the low velocity runs was appreciable (.11) but became very small at all higher velocities*. The generally small SD indicates that there was little variation among replicates in the data set and that the precision was good. The high SD at the low velocity resulted from marginal meter performance since the meters were at the low end of the linear response range. The ratio of 1.0 at the highest velocity tested shows that the net meter encountered the same velocity regime as the control meter. The total difference in ratios from the lowest velocity to the highest was 29%. The difference in the ratios was statistically significant at P = .05.

Gear type B (1.0 m, 5 to 1, 571 um, TSK meters in first hoop) reacted in an opposite manner from gear type A, with experiment to control ratios of .91 at the low velocity (1.3 fps) and .79 at the higher velocities (5.2 fps). The standard deviations indicate that the data are reliable. The ratios of experimental (net) meter revolutions to control meter revolutions decrease with increasing velocity. Statistical analyses showed that the differences were significant at P = .05.

*It should be noted that the standard deviation (SD) bars shown in Figure 1 are accurate for SDs larger than the dot size, but not for SDs smaller than the data point dot. (They are too small to plot accurately.)

EXAMPLE OF TYPICAL COMPUTER PRINTOUT OF TANK TEST RESULTS

TSK 3420

BEGINNING RUN NUMBER	48				
ENDING RUN NUMBER	52				
RAW DATA VALUES	1.95	2.02	1.92	2.11	1.92
DATA CORRECTION FACTOR	1				
CORRECTED DATA	1.95	2.02	1.92	2.11	1.92
MEAN	1.984				
STANDARD DEVIATION	.0814248				
VARIANCE	6.63001E-03				

BEGINNING RUN NUMBER	53				
ENDING RUN NUMBER	57				
RAW DATA VALUES	2.05	2.02	2.14	2.02	2.02
DATA CORRECTION FACTOR	1				
CORRECTED DATA	2.05	2.02	2.14	2.02	2.02
MEAN	2.05				
STANDARD DEVIATION	.0519615				
VARIANCE	2.7E-03				

BEGINNING RUN NUMBER	59				
ENDING RUN NUMBER	63				
RAW DATA VALUES	1.98	1.98	1.95	1.98	2.02
DATA CORRECTION FACTOR	1				
CORRECTED DATA	1.98	1.98	1.95	1.98	2.02
MEAN	1.982				
STANDARD DEVIATION	.0248998				
VARIANCE	6.19999E-04				

FIGURE 2

RESPONSE OF PLANKTON NETS AND FLOW METERS TO VARYING VELOCITIES

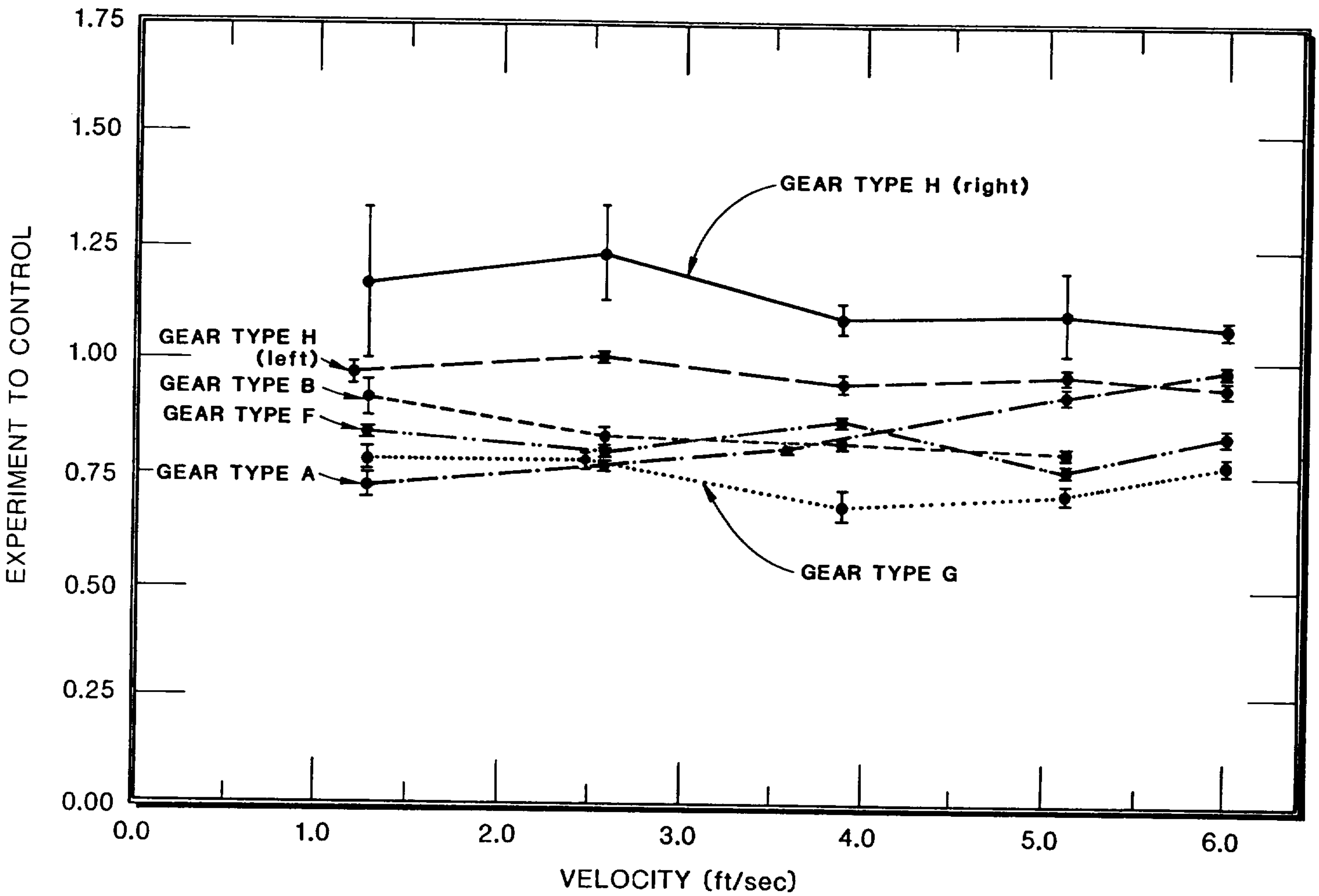


TABLE 5

RESPONSE OF PLANKTON NETS AND FLOW METERS TO VARYING VELOCITIES[1]

TOWING VELOCITY (ft/sec)

Gear Type	1.3	2.6	3.9	5.2	6.6	Stat. Sig.[3]
A	0.71	0.77	0.80	0.92	0.99	Yes
B	0.91	0.86	0.82	0.79	---[2]	Yes
F	0.84	0.81	0.87	0.79	0.83	No
G	0.78	0.79	0.69	0.73	0.80	No
H (right)	1.13	1.22	1.10	1.12	1.08	No
H (left)	0.93	0.99	0.94	0.97	0.95	No

1 Response is presented as ratio of revolutions of experimental meter in net to the control meter without a net. Each data point is the mean of 5 replicate runs.

2 Gear type B could not be towed at this velocity without risk of structural failure.

3 Assessment of whether the difference in results between each velocity regime are statistically significant at P = .05.

Gear type F (0.5 m, 3 to 1, 571 um mesh, GO meters) responded to the varying velocity regimes with a relatively constant ratio of experimental to control meter revolutions. Although there was variation from one velocity increment to the next, there was no apparent pattern as with the other two types. The SDs were small enough to indicate lack of appreciable deviation, but were not as low (in most cases) as the other meters. Differences in results at each velocity were not significant.

Gear type G (0.5 m, 500 um mesh, GO meters) exhibited experimental to control ratios of 0.69 to 0.80 but, as shown in Figure 2, variation was apparent over the velocities tested. The SDs were moderately high indicating deviations from the mean in the replicate runs. Differences in results at each velocity were not statistically significant.

Gear type H (0.5 m, 500 um mesh, GO meters, Bongo configuration) results were recorded separately, as right and left nets, because the results were different for each side. The right side had experiment to control ratios well in excess of unity with large deviations between runs, while the left side ratios were less than one and had small deviation. A possible explanation for this anomalous behavior is erratic behavior of one of the flow meters, although no such condition was readily identified during the field trials. The differences in results at each velocity were not significantly different for either the left or right net.

2. Statistical Analyses: Effects of Varying Velocities on all Gear Types Taken Together

As described in the methodology section, statistical analyses were performed in two steps: in the first, all gear types except B were tested with all five velocities and in the second, gear type B was included with the other five types, but only four velocity regimes were considered.

For all the gear types taken together and for the velocities to which they were subjected, there is no consistent effect due to velocity. This test does not exclude the possibility that an effect exists, it is just that it is not the same for all the gear arrangements. It was shown earlier that, individually, several gear types responded significantly different with varying velocity. In the case with all gear types are taken together, the variations seem to cancel each other out and individual differences are masked.

C. METER LOCATION (center or off-center)

Figure 3 summarizes the results of locating the flow meter off-center in the first hoop of gear types A and B and testing the gear in varying velocity regimes. Gear type A (0.75 m, 363 um, OI meters) responded in the same pattern as it did with the flow meter located in the center for the middle velocity regimes. The ratio of experimental (net) meter to control meter revolutions increased with increasing velocity.

Comparison of the experiment/control meter ratios between the center and off-center locations, showed that mounting the meter in the center location produced a lower ratio of experimental to control revolutions than mounting in the off-center location. In other words, the centrally located flow meter had less water flow pass by than did the off-center meter, relative to the control. This effect was significant at P = .05. (The null hypothesis was rejected.)

In gear type B, at low velocities, the off-center meter experienced less flow but at velocities of 3.9 and 5.2 fps, the results were identical. This net appears to be less sensitive to meter location (at higher velocities) than gear type A, although the difference between center and off-center locations was significant at P = .05. (The null hypothesis was rejected.)

The experiment to control ratio remained relatively constant at all tested velocities for gear type B. The SDs of the data points are very close to overlapping showing that random variation could account for much of the variation.

D. METER LOCATION (first hoop versus second hoop)

Gear types A and B (meters in the second hoop) exhibited more revolutions (see Figure 4) of the experimental meter than the control meter in all cases. Gear type A had ratios of 1.06, 1.11 and 1.12 in velocity regimes of 2.6, 3.9 and 5.2 fps, respectively. Gear type B showed a similar response of greater revolutions of the experimental meter in the second hoop compared to the control. Comparison of these results to experimental/control ratios derived from the varying velocity runs with the meters mounted in the center of the first hoop showed that in all cases, the second hoop mounted meters exhibited greater numbers of revolutions. This phenomena is summarized on Figure 3 and in Table 6. Examination of Table 6 shows that a flow meter located on the second hoop

FIGURE 3

RESPONSE OF PLANKTON NETS AND FLOW METERS TO DIFFERENT OFF-CENTER METER LOCATIONS

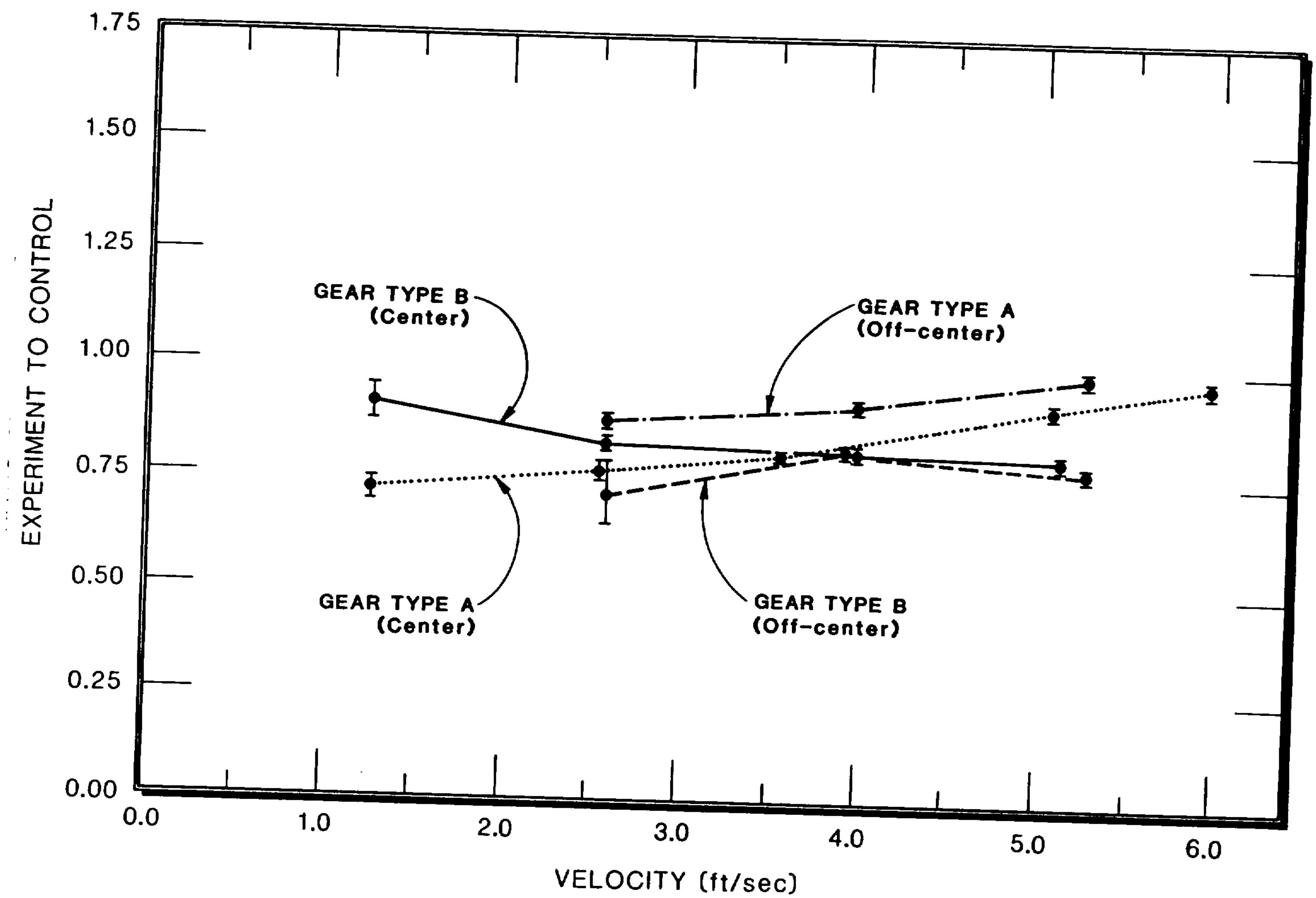


FIGURE 4

RESPONSE OF PLANKTON NETS AND FLOW METERS TO SECOND HOOP METER LOCATIONS

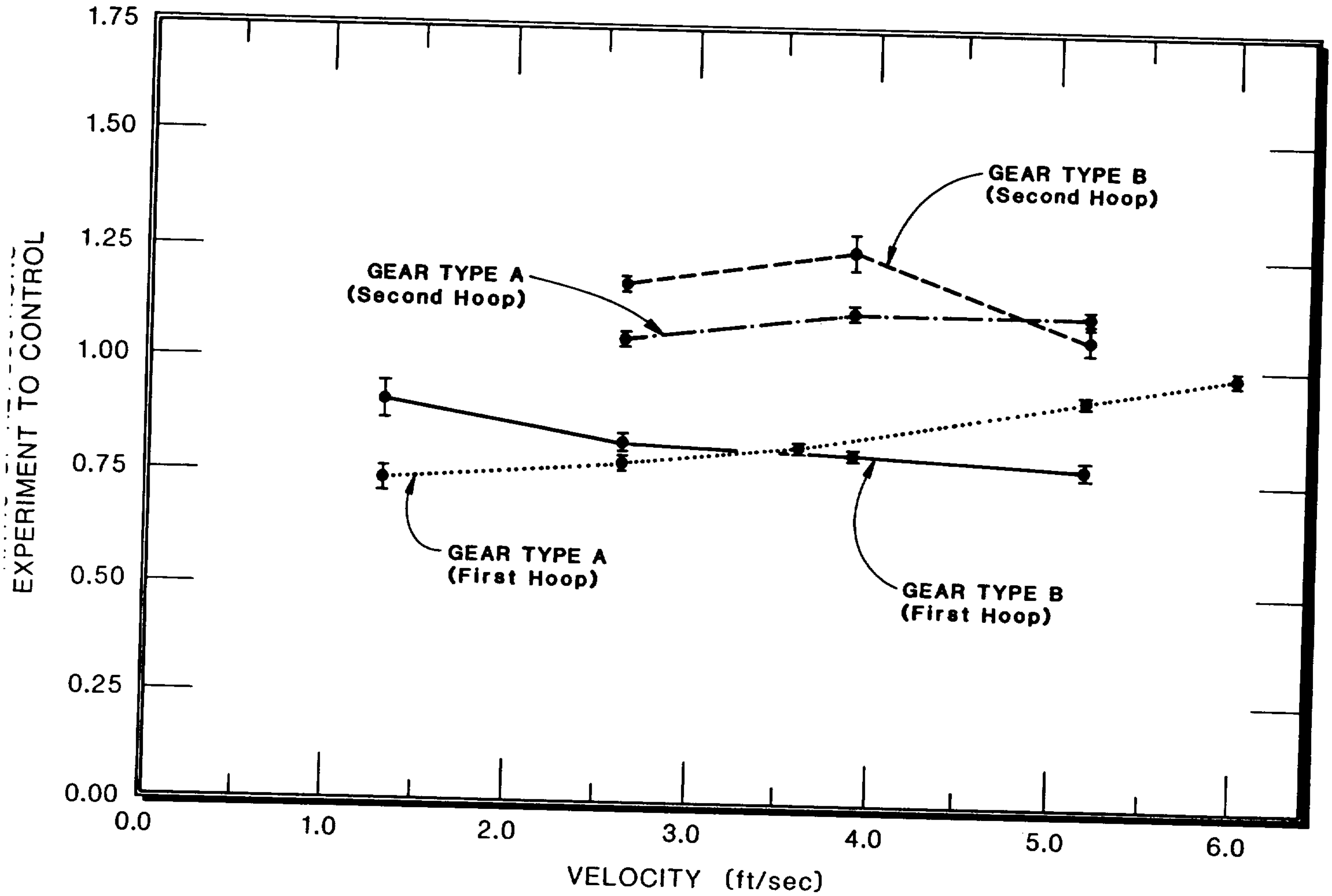


TABLE 6

SUMMARY OF FIRST HOOP/SECOND HOOP FLOW METER RESULTS[1]

Gear Type	Meter Location	Velocity (ft/sec) 2.6	3.9	5.2	
A	First hoop	.775±.021	.804±.009	.917±.034	
	Second hoop	1.063±.059	1.112±.022	1.120±.044	
	Ratio (first to second)	.729	.723	.819	x = .757 SD = .053
B	First hoop	.863±.027	.824±.019	.794±.031	
	Second hoop	1.185±.037	1.273±.171	1.091±.058	
	Ratio (first to second)	.728	.647	.727	x = .701 SD = .046

1 Results expressed as ratio of revolutions measured with experimental meter to that measured with control meter.

(center) consistently shows higher revolutions than the first hoop. (The ratio's presented in the table are experimental [net] to control). Further, if a ratio is computed of the first to second hoop meter location for each velocity and each gear type, a strong similar pattern emerges. The pattern of higher revolutions in the second hoop location compared to the first hoop holds true over all velocity ranges tested and with two completely different gear types.

The results of the statistical examination (Mann-Whitney U-test) were highly significant. The null hypothesis was rejected and the result is significant at P = 0.001. In short, the first and second hoop mounting locations significantly influence meter readings with the second hoop averaging 37% higher readings than the first.

Since the results described above were unexpected, five additional runs at one velocity were performed with gear type B and two TSK meters mounted simultaneously, one on the first hoop (center) and the other on the second (no control meter was available). The results agreed with the other tests. The ratio of the second hoop meter to the first hoop meter was 1.34 to 1 with a SD of .071.

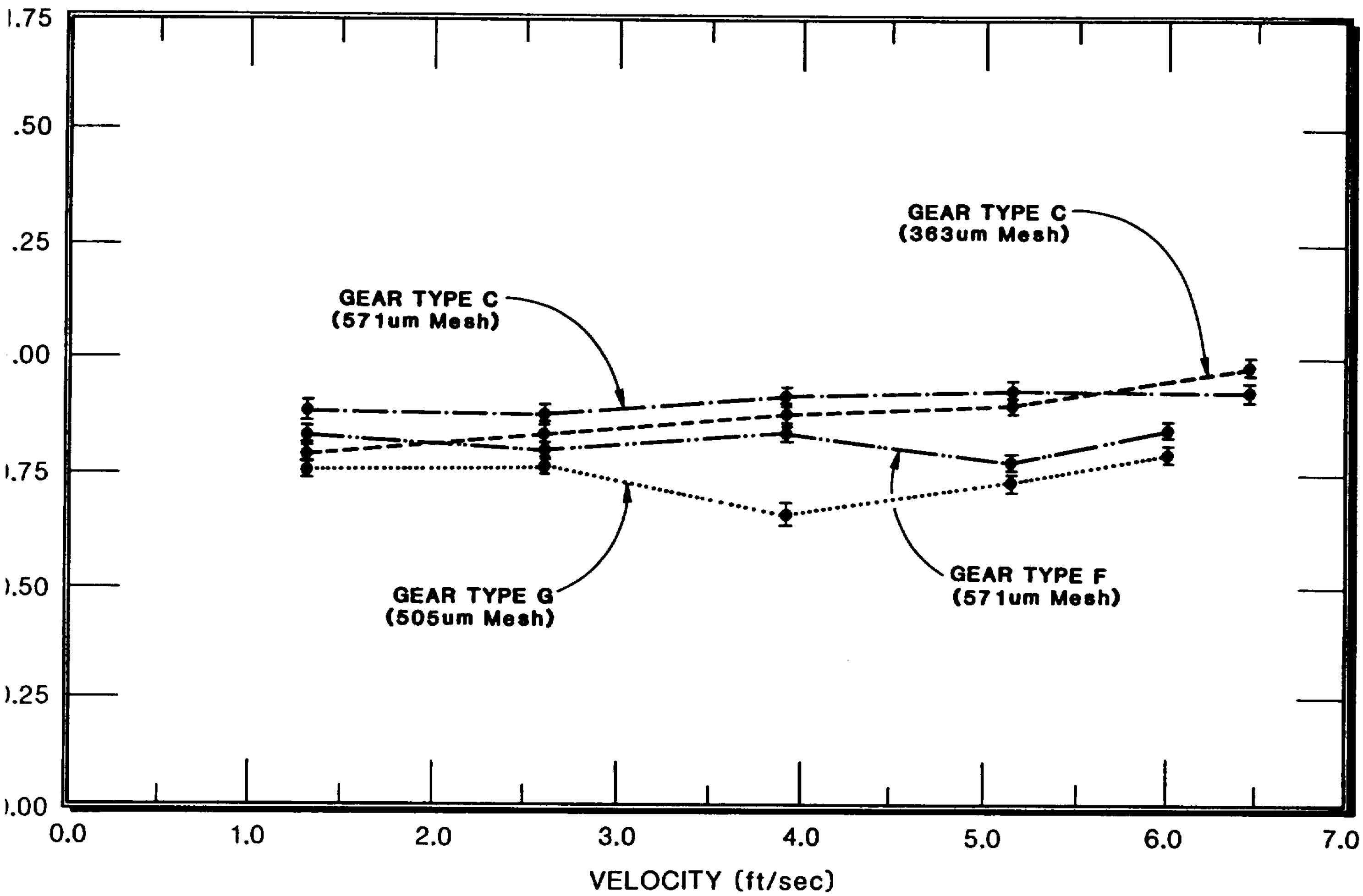
E. MESH SIZE

Gear type C (Bongo net) was utilized to determine the effects of different mesh sizes on flow meter response. One mesh was 363 um and the other 571 um; otherwise the nets were identical. To evaluate the results, the responses of the 363 and 571 um mesh nets and meters were compared separately to the control meter. The results are shown on Figure 5. In the lower and mid-velocity ranges (1.3 to 4.0 fps), the 363 um mesh exhibited a proportionately lower ratio of experiment to control revolutions than the 571 um mesh. As velocity increased, this ratio narrowed until at the highest velocity tested, the 363 um mesh meter exhibited greater revolutions than the 571 um mesh meter, which was analogous to gear type A in varying velocities.

Another mesh size comparison can be provided by comparing the results of gear type F (571 um mesh) to gear type G (505 um mesh) as shown in Figure 5. The results show that in the higher velocity ranges (3.9, 5.2 and 6.6 fps) the smaller mesh size (505 um) has a generally lower experiment to control meter turn ratio, indicating that more water flow is present in the 571 um mesh net.

FIGURE 5

RESPONSE OF PLANKTON NETS AND FLOW METERS TO MESH SIZE VARIATIONS



F. INTER-METER COMPARISON

For this comparison, three meters were mounted in the first hoop of gear type D (1.0 m, 571 um mesh) and three in a 1m hoop without a net as the control. Data were collected at four velocity increments. The results are shown on Figure 6. The data show that the G.O and TSK meters performed erratically at the lowest velocity regime (1.3 fps) while the OI operated satisfactorily. At the higher velocities, all three meters operated well, although the results were not consistent from type to type. The OI meters recorded experimental to control ratios of approximately 1.0 while the TSK exhibited about 0.9 and the G.O about 0.85. (However, the GO ratio is suspect - see below.) The ratios appear consistent from one velocity increment to the next.

While the experimental meters were mounted in the first hoop of gear type B, these results cannot be compared to the varying velocity experimental results because the meters were not mounted in the center; they were installed about mid-way between the center and the rim.

During this test, the control GO meter (No. 06017) exhibited anomalous readings. When total distance run was calculated for each of the three meters, the OI and TSK units showed good agreement, but the GO control meter recorded about 25% high on a consistent basis. The reason for this discrepancy could not be determined.

G. COMPARISON OF METERS OVER TIME

Three of the meters tested in this program had been tested in the Phase I program at the Model Basin Test Tank in 1981. The results of the two tests are compared in Table 7. It is obvious that the GO and TSK had similar results in each of the tests, but that the OI had degraded approximately 4% in the mid-velocity range (4 fps). This slight degradation of performance could be due to wear or damage to the rotors.

H. OTHER OBSERVATIONS

During a series of runs when the water was unusually transparent, gear type B (1.0 m, 571 um mesh) was observed to have a severe constriction in the collar between the first and second hoop (see Figure 7). This constriction increased in depth as the net velocity increased. At low velocities (< 1.5 fps), it was hardly noticeable whereas at high velocities (>5.2 fps), it was very pronounced. Because

FIGURE 6
INTER-METER COMPARISON OF DIFFERENT METERS TESTED SIMULTANEOUSLY

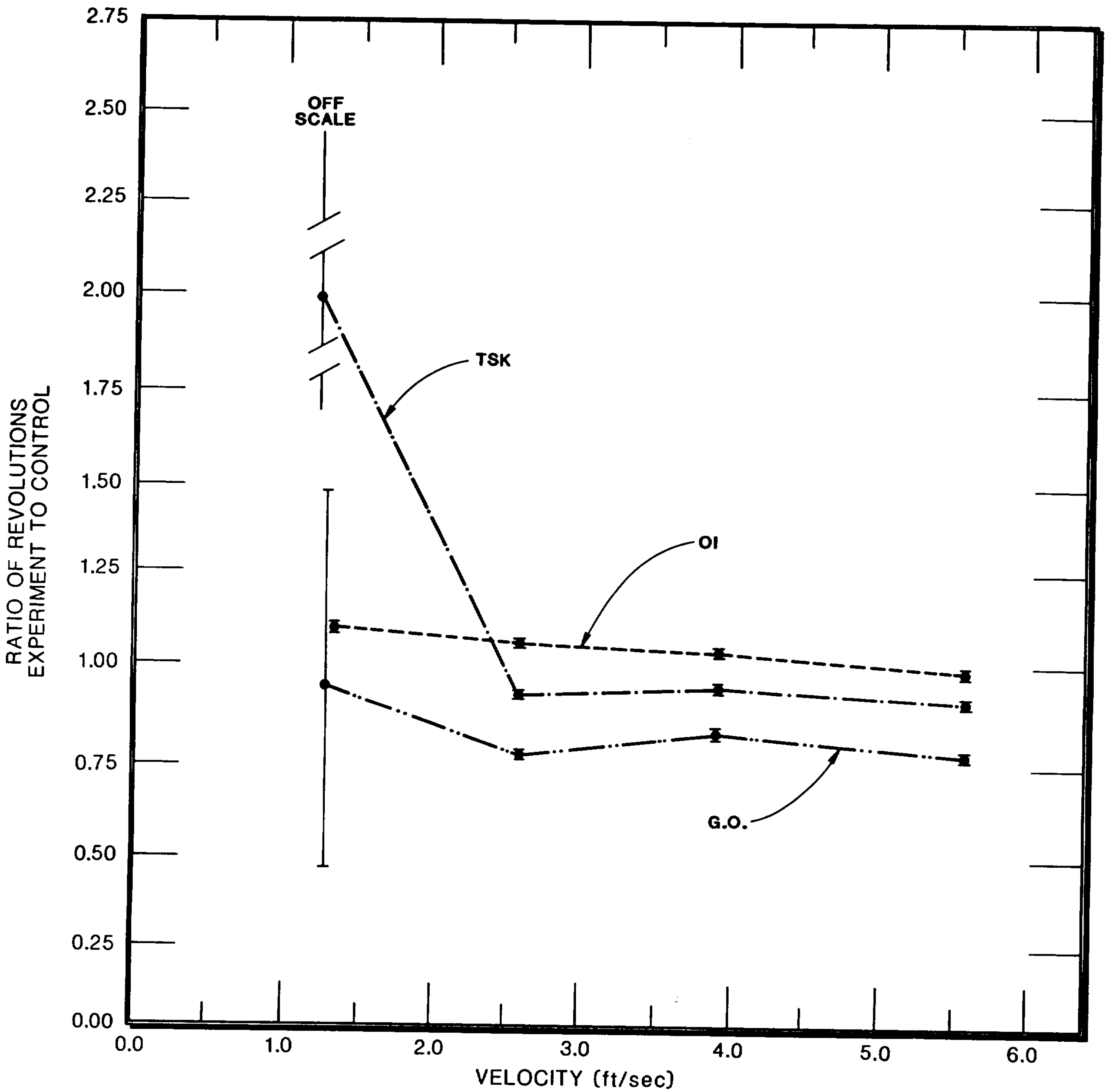


TABLE 7

COMPARISON OF PRIOR AND CURRENT MODEL BASIN TANK TESTS

Meter Type & No.	Test Period	Rev/ft of advance as a function of v in ft/sec. 1.0	2.0	3.0	4.0	5.0	6.0
G.O. 00263	1981	--	9.7	10.3	10.3	10.3	--
	1983	9.05	10.2	10.4	10.4	10.5	10.7
TSK 3099	1981	1.93	1.96	2.00	1.97	1.94	--
	1983	1.99	2.00	--	2.02	--	1.95
OI 1	1981	2.00	2.15	2.24	2.23	2.21	--
	1983	2.05	2.14	--	2.15	--	2.11

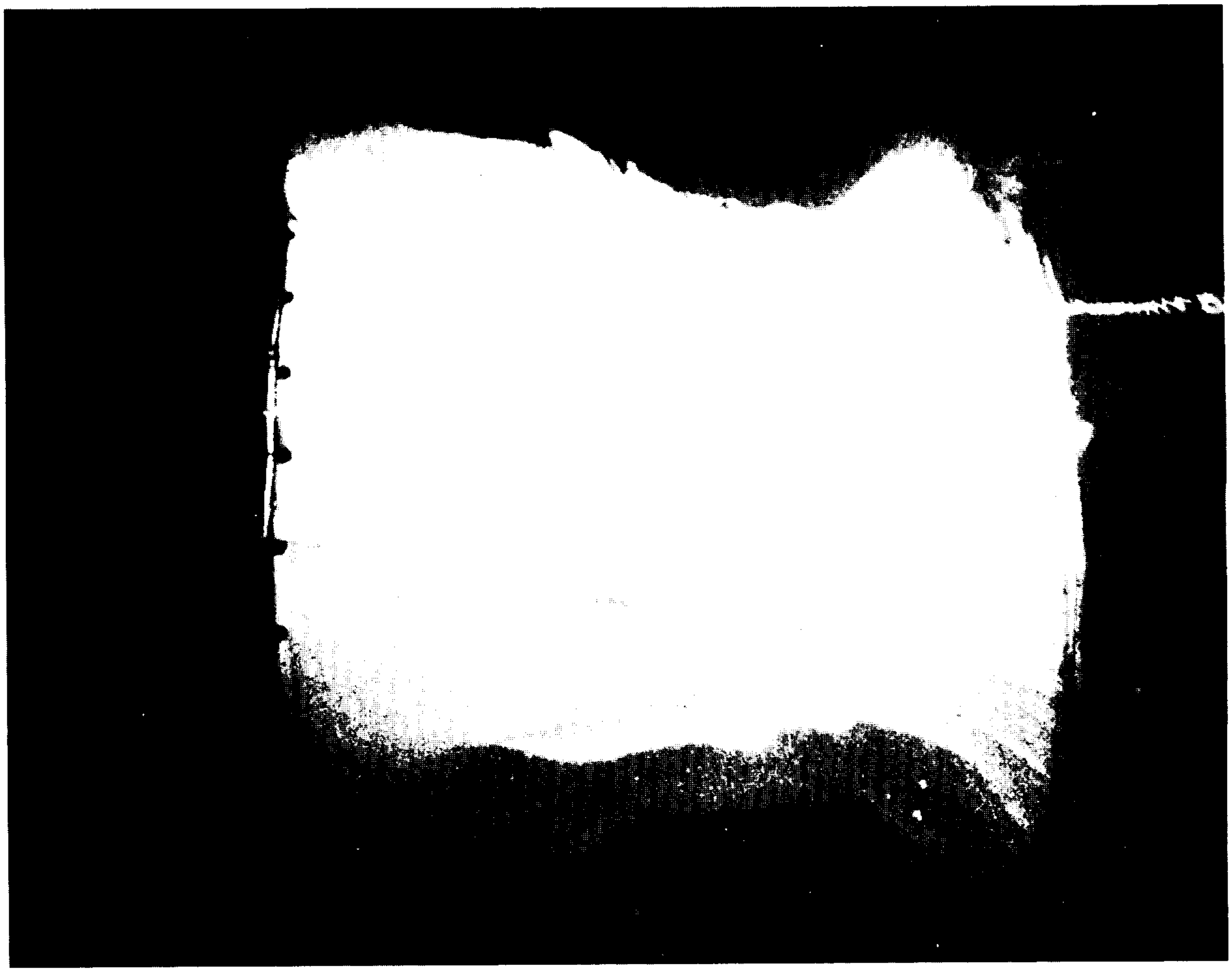


FIGURE 7

CONSTRICTION OF COLLAR ("CRIMPING") OF THE 1 meter, 571 um MESH NET the collar material is impervious, this observation was quite unexpected. It would be expected that the higher the towing velocity, the greater the internal net pressure. Apparently hydrodynamic factors operate which lead to locally decreased pressure regimes within the net collar and result in higher velocities as shown by the meter readings in the second hoop.

I. SUMMARY OF RESULTS

- The relative reading of the net (experimental) meter, when compared to a control meter, could vary with changing towing velocities.

- Towing velocity differences had no statistically significant effect on all the gear types taken together; however, two of the gear types when treated individually showed statistically significant trends. For one gear type, the ratio of turns of the experimental (net) flow meter to the control meter increased as the velocity increased and for the other gear type, the ratio decreased.

- First hoop versus second hoop (center) meter locations produced different results. The second hoop position experiences greater water flow (a locally higher velocity) than the first hoop. This result is significant at P = 0.001. It is likely caused by constriction of the impervious collar on this type of net. Overall, meters located in the second hoop read 37% higher than meters in the first hoop.

- Locating the meter in the second hoop (center), produced ratios of experiment to control meters above 1 for gear types A and B. Gear type A, which had higher ratios in the varying velocities and off-center tests, had lower ratios in these tests.

- Center versus off-center meter location produced different results. The center position experiences fewer meter revolutions than the off-center. This result is significant at P = .05.

- The inter-meter comparison showed that all three meters have essentially constant but different ratios over the velocities tested.

- For three meters tested in the prior and current programs, there was no appreciable change in performance over time.

Table 8 gives an example of a computer print-out of the results of the field tests. This print-out covers five replicate runs (Nos. 151, 152, 153, 154, 156; run number 155 was a null run). These particular runs were for gear type C at 2.6 fps.

TABLE 8

TYPICAL COMPUTER PRINTOUT OF FIELD TEST RESULTS

FIELD RUN NUMBER	151	
SUBGROUP RUN NUMBER	1	
BEGIN. & END. METER READINGS (NET)	28823	35517
BEGIN. & END. METER READINGS (CONTROL)	39546	47284
TOTAL READING (NET)	6694	
TOTAL READING (CONTROL)	7738	
CALIBRATION FACTORS (NET & CONTROL)	1.015	1.028
CORRECTED READINGS (NET & CONTROL)	6794.41	7954.67
RATIO OF NET TO CONTROL READINGS	.854142	

FIELD RUN NUMBER	152	
SUBGROUP RUN NUMBER	2	
BEGIN. & END. METER READINGS (NET)	35517	45145
BEGIN. & END. METER READINGS (CONTROL)	47284	58515
TOTAL READING (NET)	9628	
TOTAL READING (CONTROL)	11231	
CALIBRATION FACTORS (NET & CONTROL)	1.015	1.028
CORRECTED READINGS (NET & CONTROL)	9772.42	11545.5
RATIO OF NET TO CONTROL READINGS	.846429	

FIELD RUN NUMBER	153	
SUBGROUP RUN NUMBER	3	
BEGIN. & END. METER READINGS (NET)	45145	53396
BEGIN. & END. METER READINGS (CONTROL)	58515	68181
TOTAL READING (NET)	8251	
TOTAL READING (CONTROL)	9666	
CALIBRATION FACTORS (NET & CONTROL)	1.015	1.028
CORRECTED READINGS (NET & CONTROL)	8374.77	9936.65
RATIO OF NET TO CONTROL READINGS	.842816	

FIELD RUN NUMBER	154	
SUBGROUP RUN NUMBER	4	
BEGIN. & END. METER READINGS (NET)	53396	61720
BEGIN. & END. METER READINGS (CONTROL)	68181	77912
TOTAL READING (NET)	8324	
TOTAL READING (CONTROL)	9731	
CALIBRATION FACTORS (NET & CONTROL)	1.015	1.028
CORRECTED READINGS (NET & CONTROL)	8448.86	10003.5
RATIO OF NET TO CONTROL READINGS	.844593	

FIELD RUN NUMBER	156	
SUBGROUP RUN NUMBER	5	
BEGIN. & END. METER READINGS (NET)	69438	76301
BEGIN. & END. METER READINGS (CONTROL)	89628	98375
TOTAL READING (NET)	6863	
TOTAL READING (CONTROL)	8747	
CALIBRATION FACTORS (NET & CONTROL)	1.015	1.028
CORRECTED READINGS (NET & CONTROL)	6965.94	8991.92
RATIO OF NET TO CONTROL READINGS	.77469	

SUMMARY OF PREVIOUS FIVE RUNS

MEAN OF NET TO CONTROL RATIOS	.832
STANDARD DEVIATION	.032

IV. DISCUSSION

The variation in response of gear type A to gear type B at different velocities is difficult to explain. Gear type B exhibits what might be considered a "normal" or expected response with increasingly lower experiment to control ratios as velocity increases whereas A shows ratios that ultimately reach unity. The main difference in the two gears was mesh size and diameter. The SDs were quite small, thereby discounting random error as an explanation. Statistical analyses showed that the results were significant. The reason for the two opposing trends is not known but would seem to be related to mesh size.

Locating the meter off-center in the first hoop of gear types A & B seemed to appreciably alter meter response compared to the normal central location. Primarily, the center meter location produced a lower ratio of experiment to control revolutions than the off-center location. Therefore, the centrally located meter experiences less water flow than the off-center location for gear type A. Gear type B exhibited nearly identical responses for center and off-center locations at the 3.9 and 5.2 fps velocity regimes. It should be noted that gear type B is the 1 m diameter net, while gear type A is the 0.75 m diameter net; apparently, the wider net is less sensitive to meter placement. The off-center results, apparently typical for gear type A, were interpreted by Tranter and Smith (1968) in which they state "...the flow meter should not be located in the centre of the net mouth but between the centre and the rim." They did not offer any data to support this statement.

Installing the meter in the second hoop produced an unexpected response in all tests with experiment to control ratios running in excess of unity. A possible explanation of this phenomena may be a higher velocity "funneling" effect of the water flow through the net. If this is the case, it is related to the tendency of the net collars to crimp inward as velocities increase. The increased meter ratio was more pronounced in gear type B which also showed a more significant constriction or crimping of the collar.

In the inter-meter comparison the meters could not be installed in the center, but only at an intermediate point between the center and the rim. All three types of meters exhibited reasonably constant ratios as the velocities increased, although the difference in ratios is quite pronounced.

Reviewing the results from an operational point of view points up several aspects of gear type design and handling that may not have been commonly known.

- Operation of nets and meters below velocities of at least 1.5 fps can lead to inconsistent data. This factor is most applicable to nets deployed in intake bays or discharge canals as vessel towing speeds are usually selected to be in excess of this velocity.

- There can be marked variation (± 10% or more) between individual meters of the same class and type. This variation increases as the towing velocity decreases but can be overcome by mathematic corrections.

- Mounting a meter in the center of the second hoop of a closing net (a common practice) leads to readings higher than the control meter at all velocities tested. Additionally, flow meters mounted in the second hoop of a closing net record greater water flows than meters mounted in the first hoop. The first hoop location appears to provide a more accurate reading.

- Differing mesh sizes mounted on a Bongo net frame yield results showing the coarser mesh (571 um) having a proportionately greater water flow than the finer mesh as towing velocity increases. Another test of two nets towed separately but otherwise identical except for mesh size showed the same results in the higher velocity ranges tested.

- Different types of meters should not be interchanged between different types of nets without recalibrating the new gear arrangement. The response of a net meter to its control appears to be a complex function involving interaction of the net type and the meter type.

- Based upon a very limited sample, TSK meters exhibited the least meter to meter variation, in terms of uncorrected reading, GOs the next least and OIs the greatest, although all three types appeared to be sufficiently precise. Meter-to-meter variation can be eliminated through the use of normalization or correction factors.

- Generally, a flow meter mounted in the center of a net experiences less water flow than one mounted between the center and the rim. This effect is less noticeable with large nets (1.0 m).

Bibliography

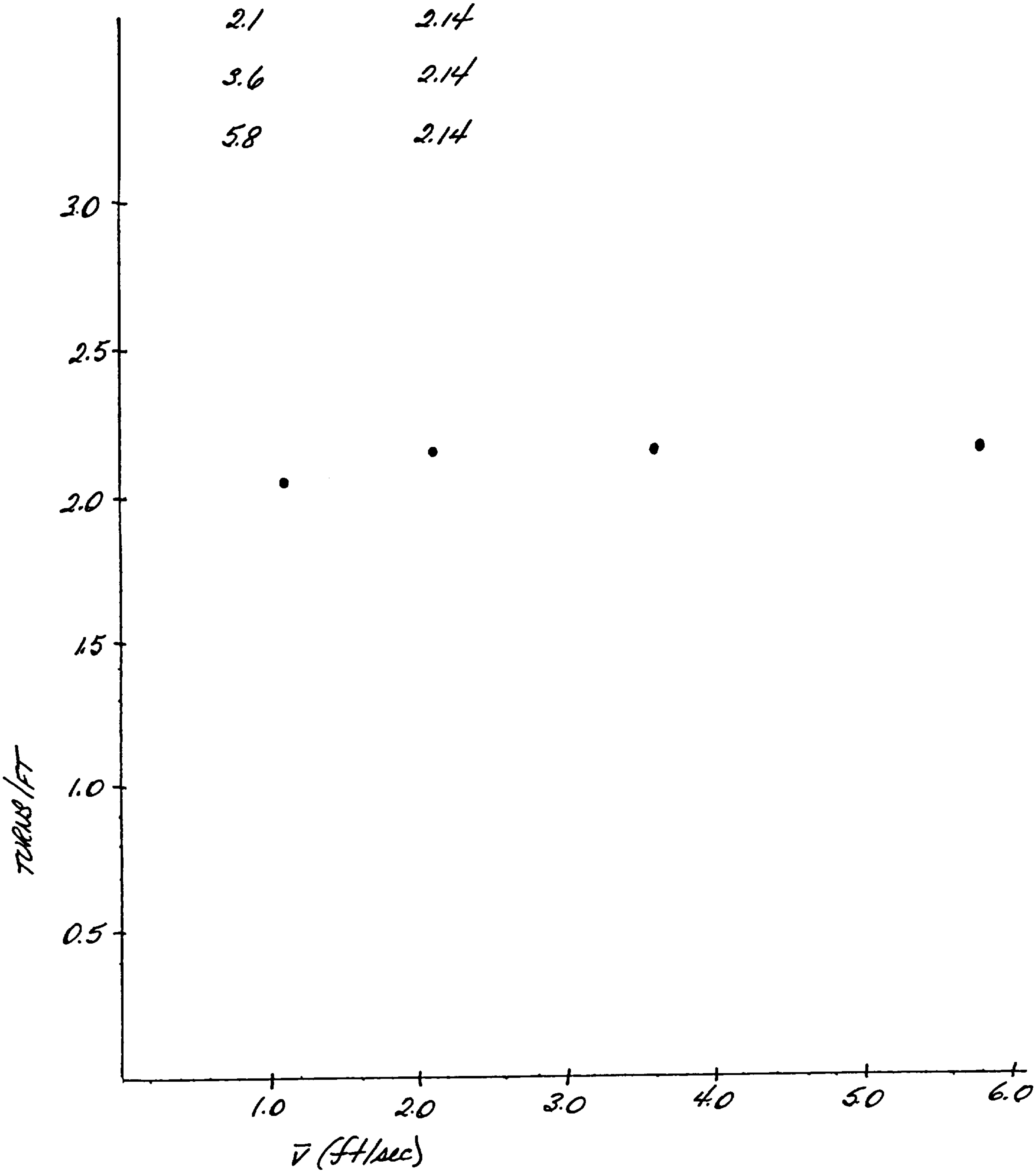
Freund, J.E. 1973. Modern Elementary Statistics. Prentice Hall, New Jersey.

Tranter, D.J. and P.E. Smith. 1968. "Filtration Performance"; from "Zooplankton Sampling," UNESCO.

APPENDIX A

SUMMARY OF RESULTS: TOW TEST TANK PHASE II RESULTS

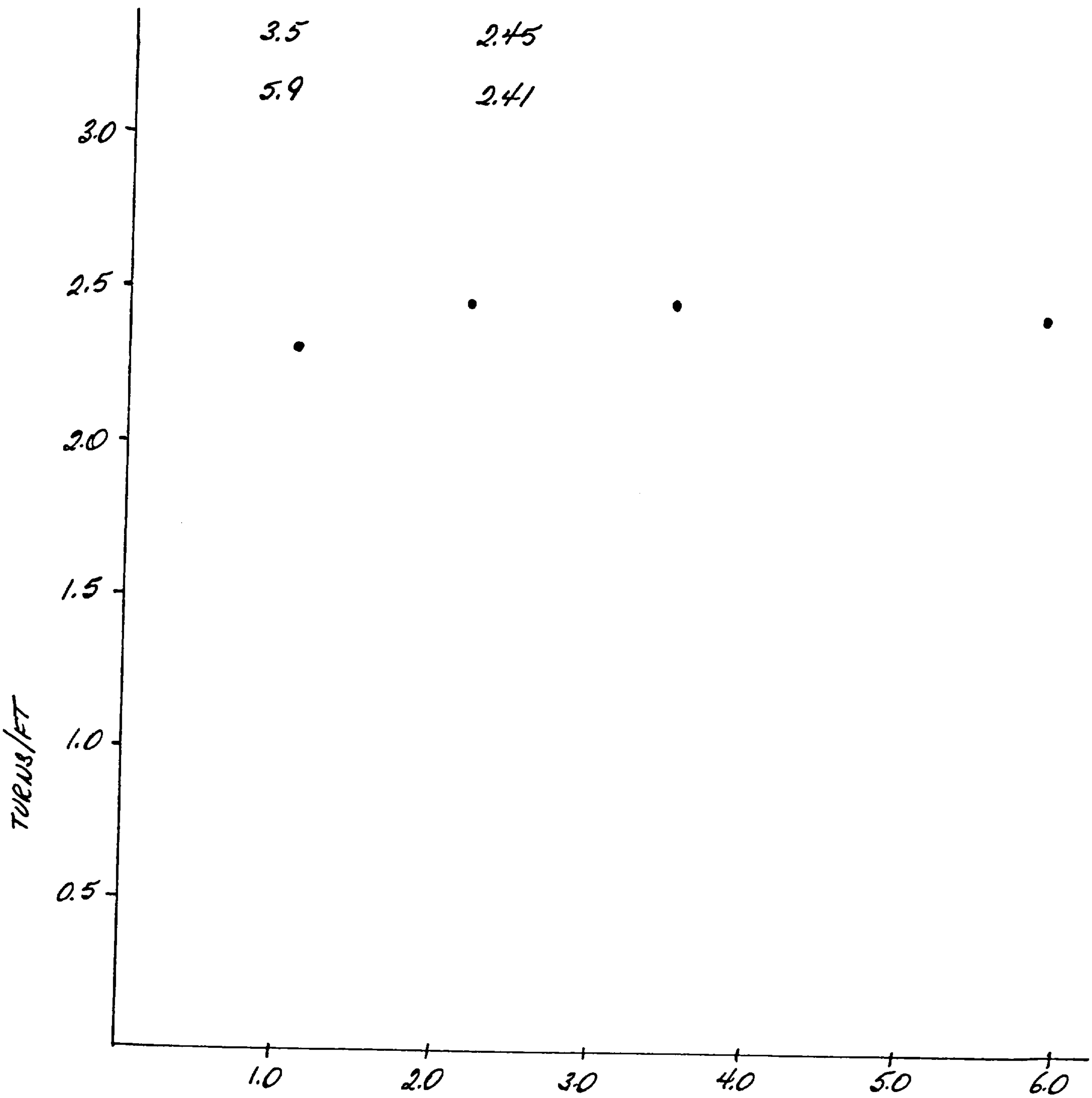
$\bar{V}$	TURNS/FT
1.1	2.05
2.1	2.14
3.6	2.14
5.8	2.14



PLOT OF TURNS/FT VS $\bar{V}$

OI 1

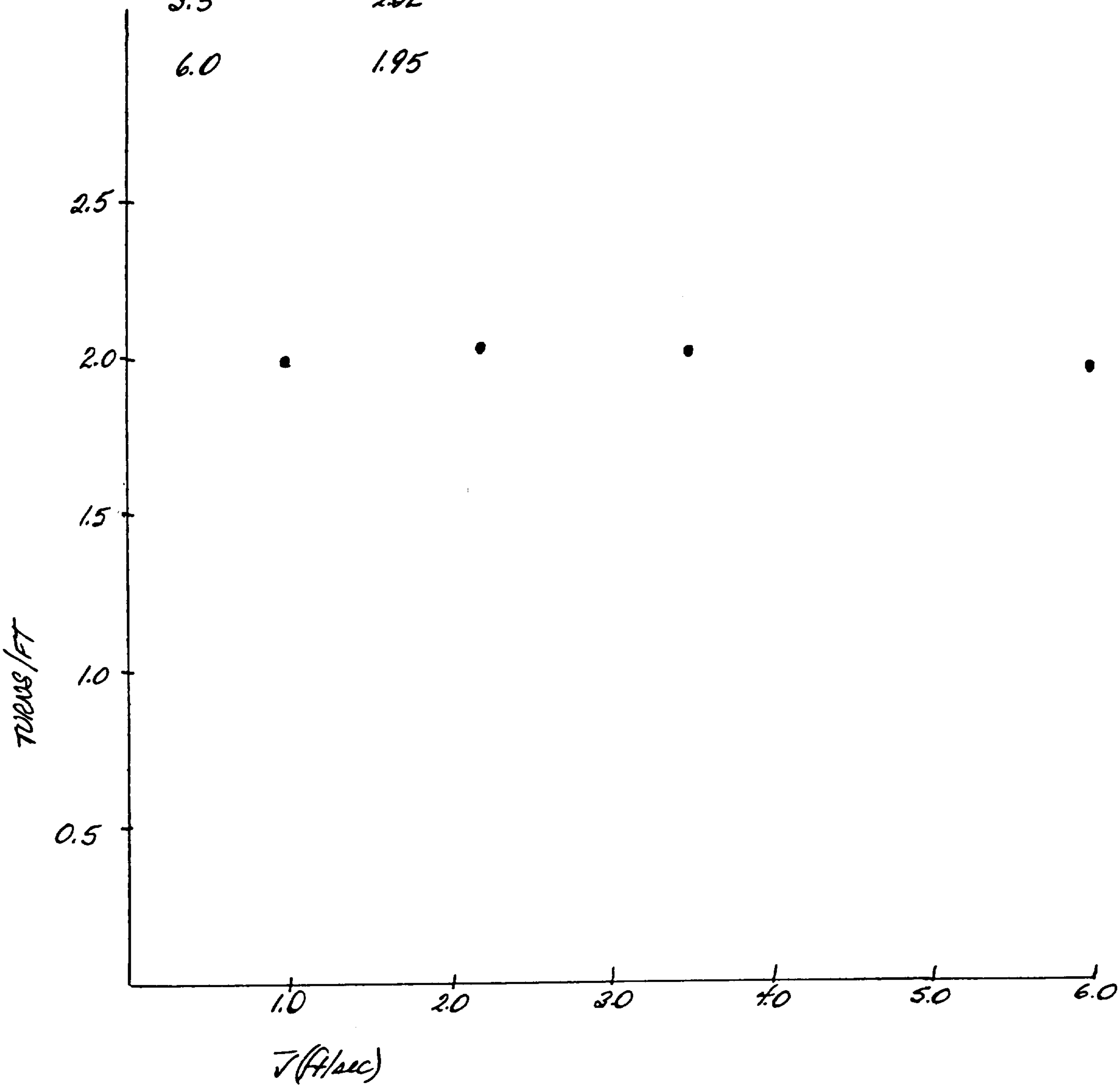
$\bar{V}$	TURNS/FT
1.1	2.30
2.2	2.45
3.5	2.45
5.9	2.41



PLOT OF TURNS/FT VS $\bar{V}$

OI 2

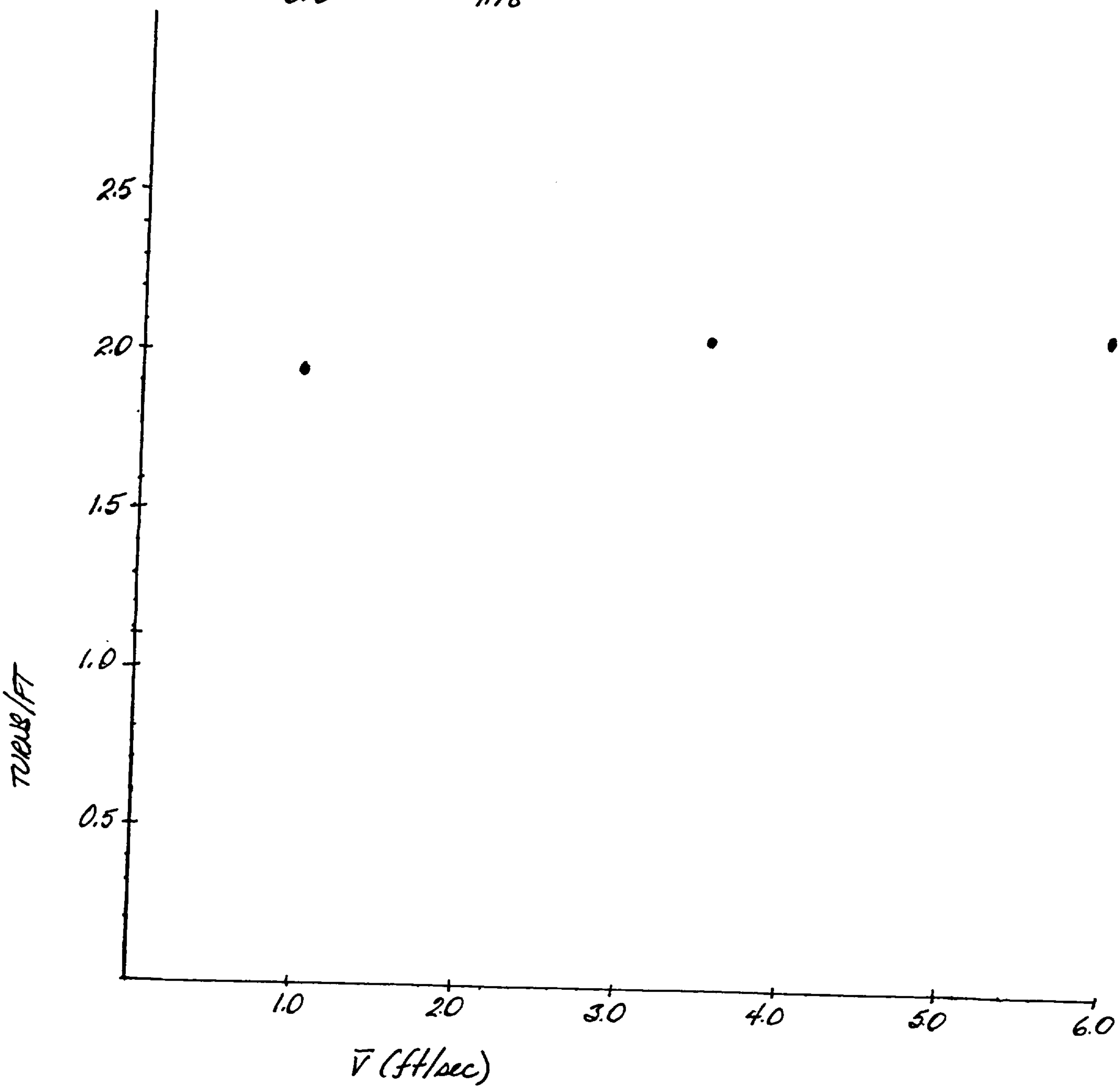
$\bar{V}$	TURNS/FT
1.0	1.99
2.2	2.02
3.5	2.02
6.0	1.95



PLOT OF TURNS/FT VS $\bar{V}$

TSK 3099

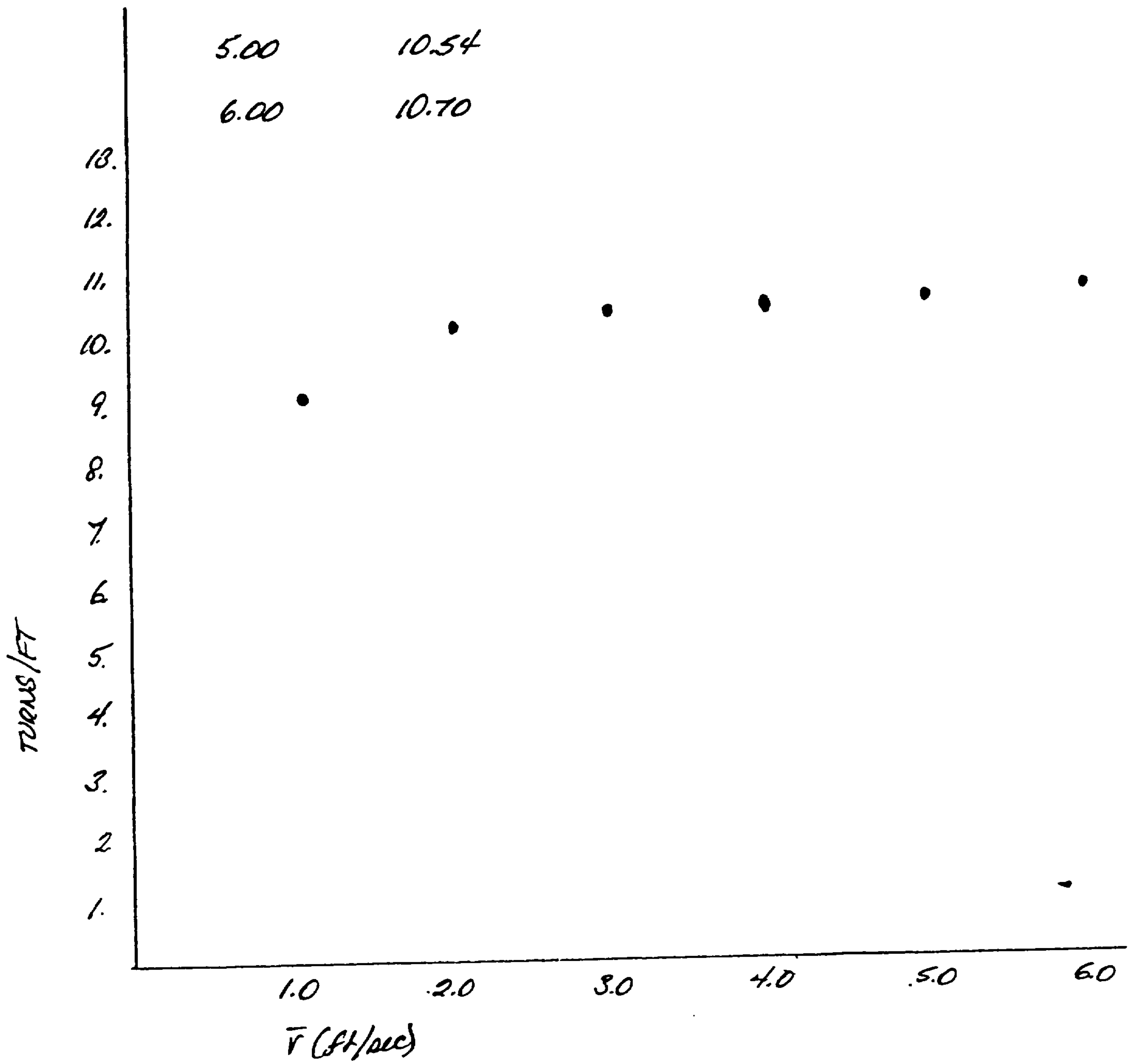
$\bar{V}$	TURNS/FT
1.0	1.95
3.5	2.05
6.0	1.98



PLOT OF TURNS VS $\bar{V}$

TSK 3420

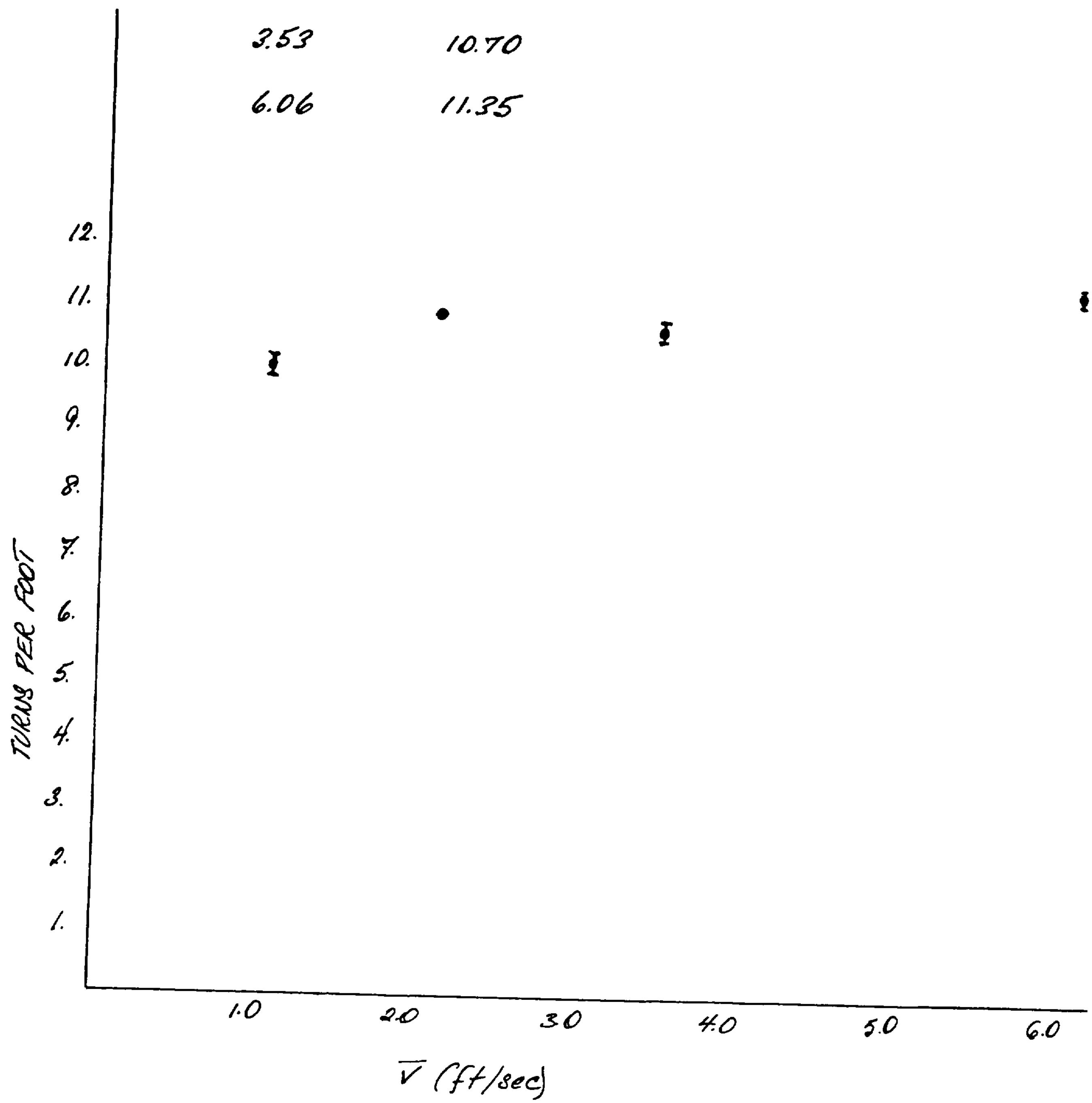
$\bar{V}$	TURNS/FT
1.10	9.05
2.06	10.21
3.05	10.44
4.01	10.42
5.00	10.54
6.00	10.70



PLOT OF TURNS/FT VS $\bar{V}$

G.O. 00263

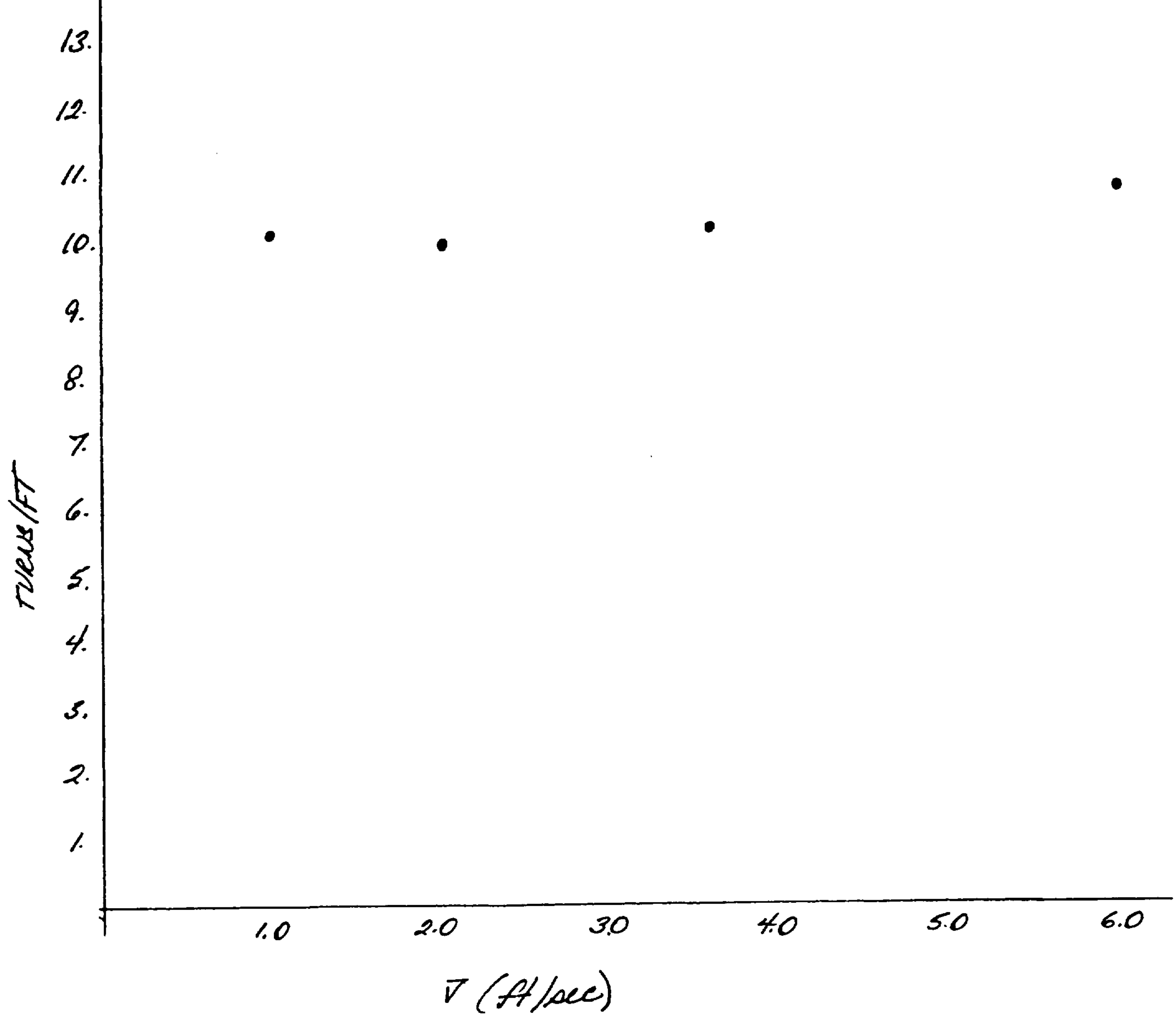
$\bar{V}$	TURNS/FT
1.03	10.04
2.10	10.92
3.53	10.70
6.06	11.35



PLOT OF TURNS/FT VS $\bar{V}$

G.O. 00839

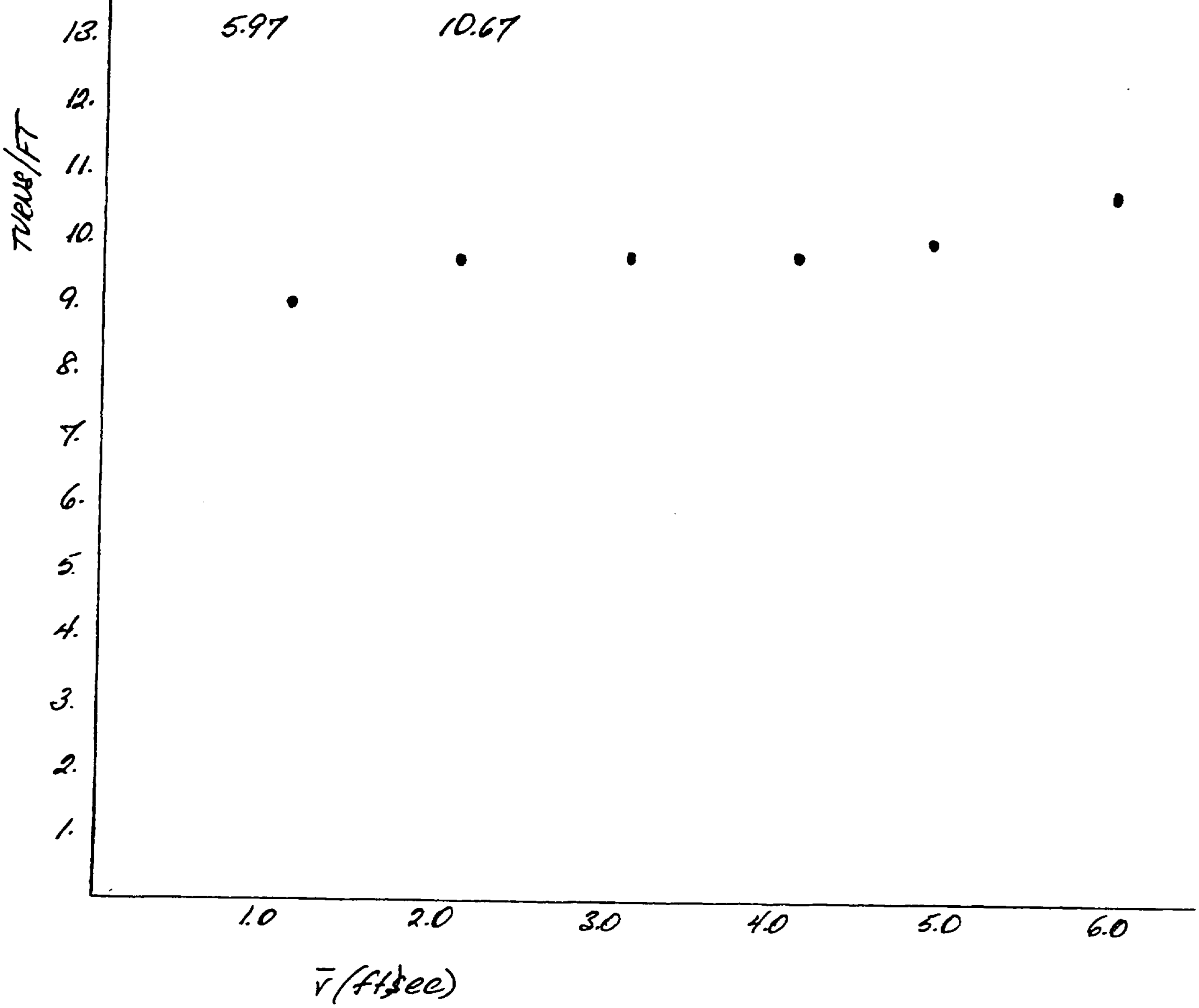
$\bar{V}$	TURNS/FT
0.99	9.28
2.06	9.94
3.56	10.17
6.00	10.72



PLOT OF TURNS/FT VS $\bar{V}$

G.O. 01775

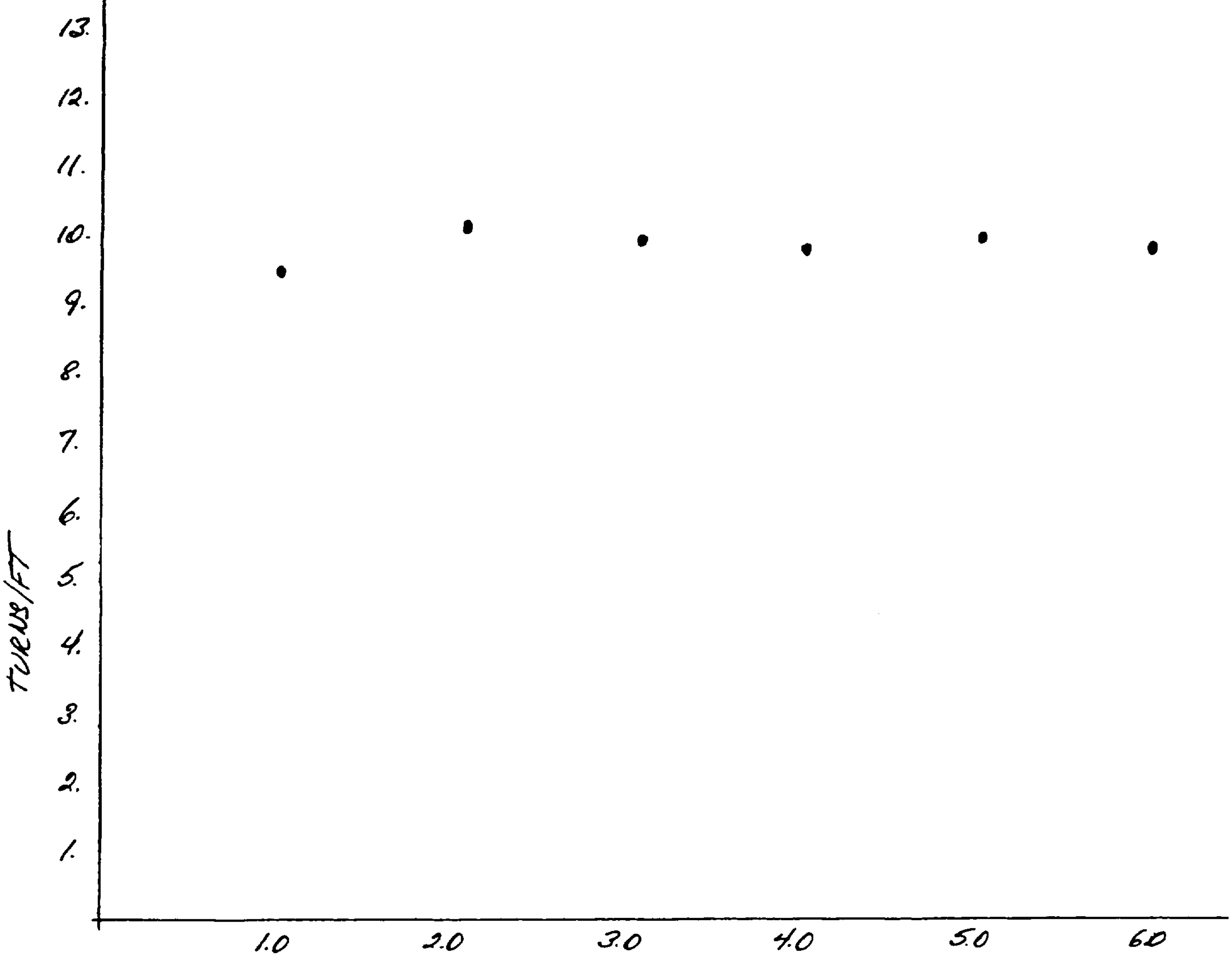
$\bar{V}$	TURNS/FT
1.13	8.98
2.10	9.64
3.06	9.65
4.06	9.77
4.90	9.97
5.97	10.67



PLOT OF TURNS/FT VS $\bar{V}$

6.0 06731

$\bar{V}$	TURNS/FT
1.06	9.46
2.10	10.05
3.08	9.91
4.06	9.77
5.05	9.85
6.06	9.74

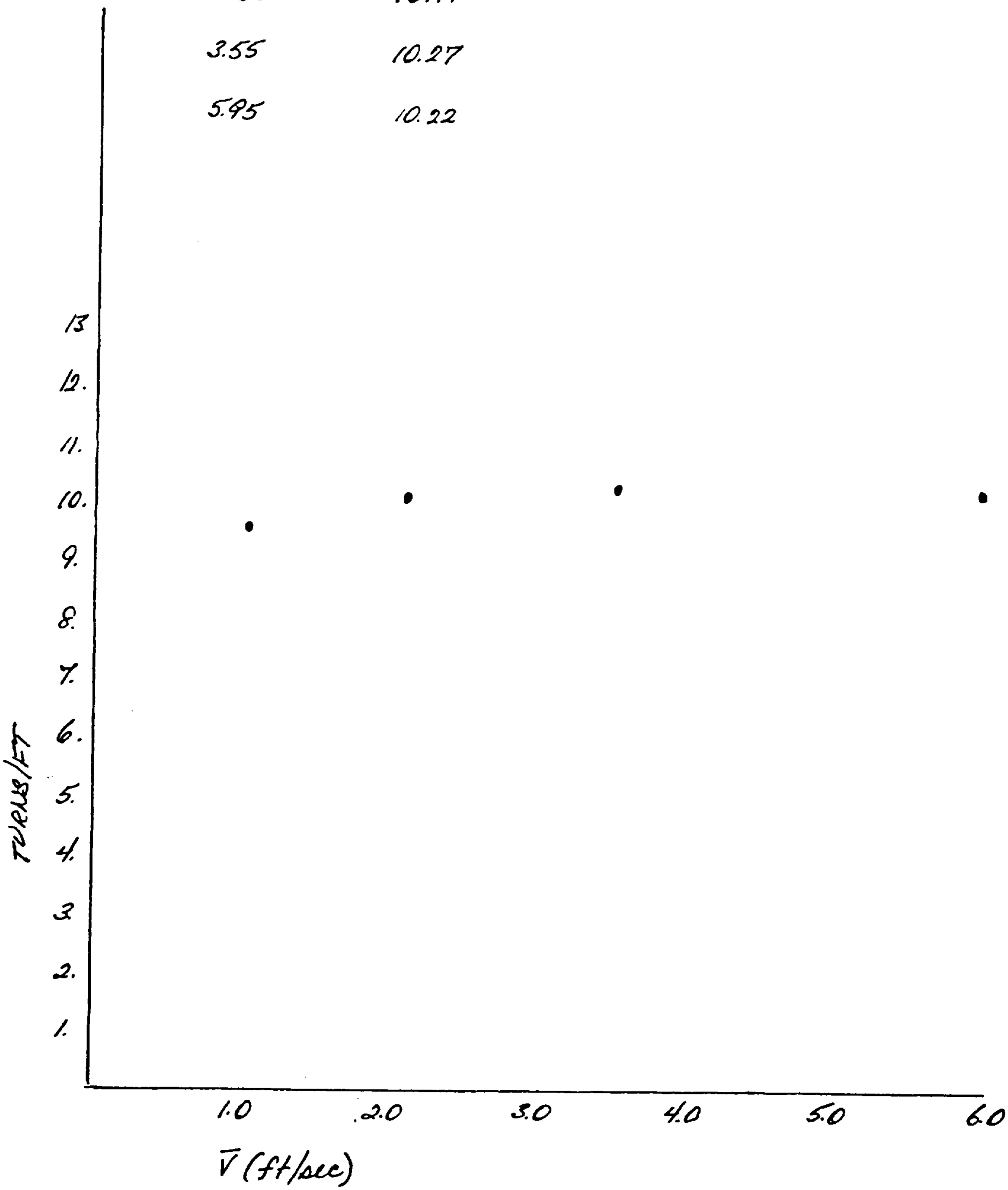


$\bar{V}$ (ft/sec)

PLOT OF TURNS/FT VS $\bar{V}$

G.O. 02729

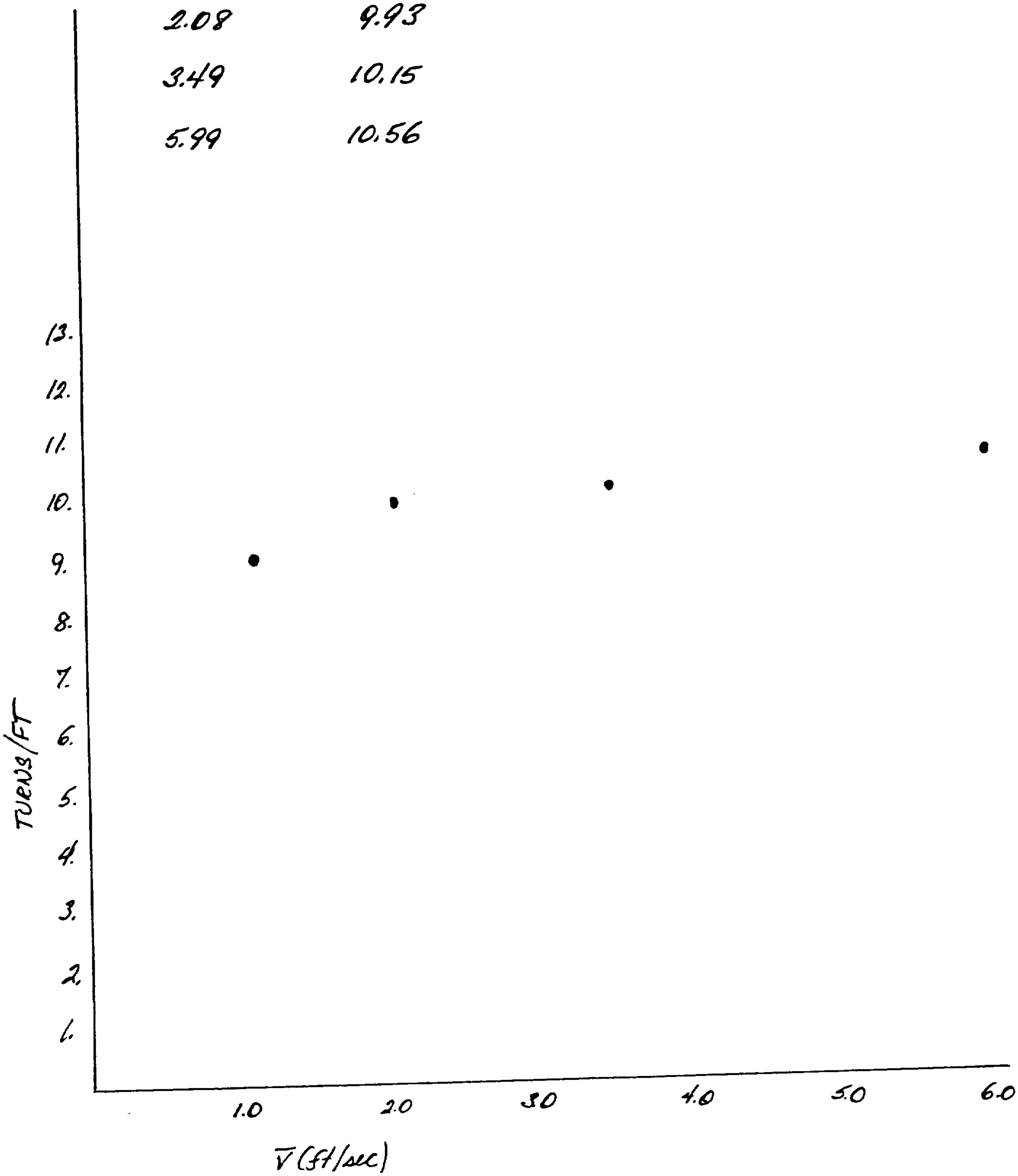
$\bar{V}$	TURNS/FT
1.06	9.57
2.08	10.11
3.55	10.27
5.95	10.22



PLOT OF TURNS/FT VS $\bar{V}$

6.0. 06017

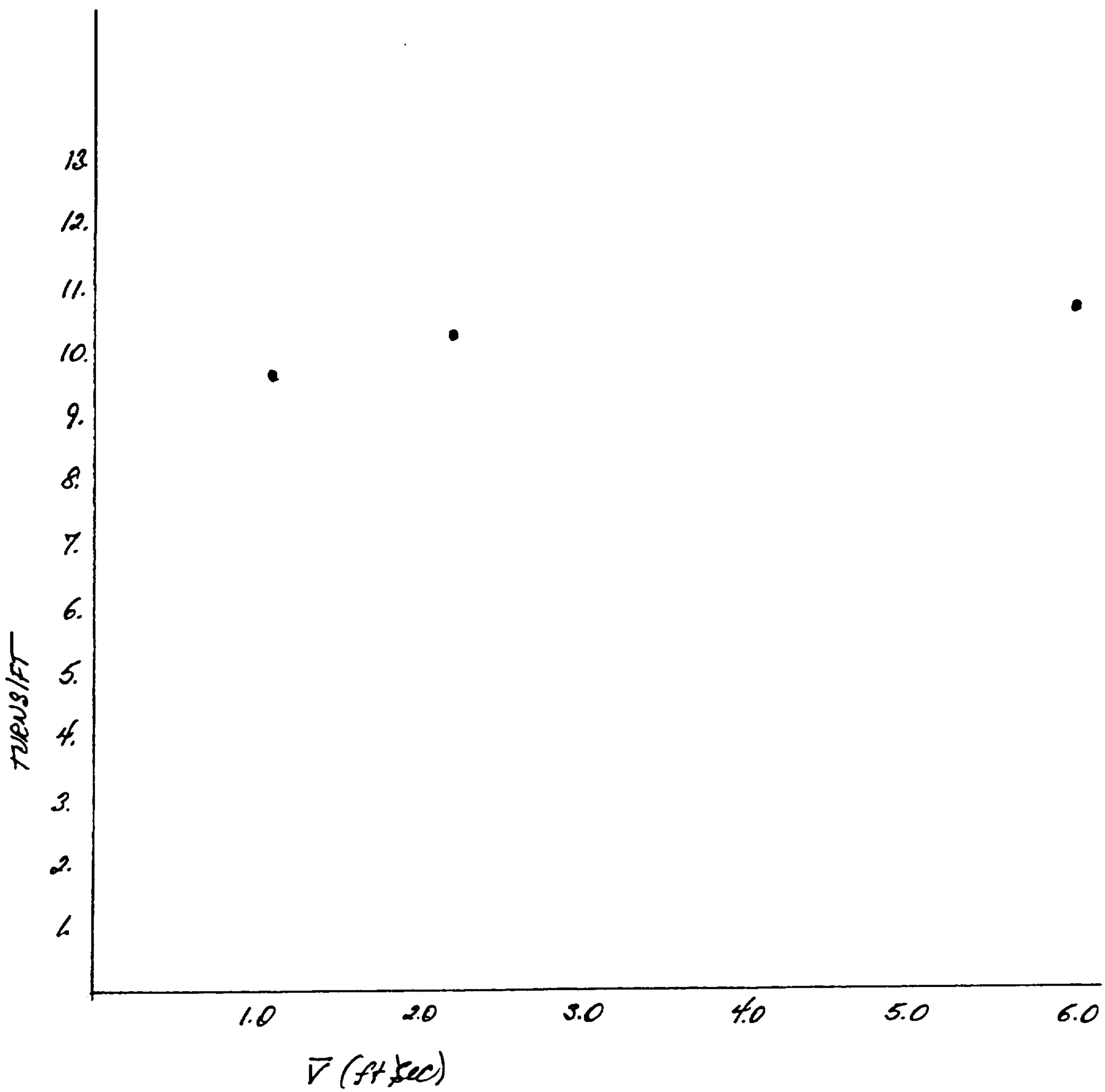
$\bar{V}$	TURNS/FT
1.07	8.96
2.08	9.93
3.49	10.15
5.99	10.56



PLOT OF TURNS/FT vs $\bar{V}$

G.O. 05864

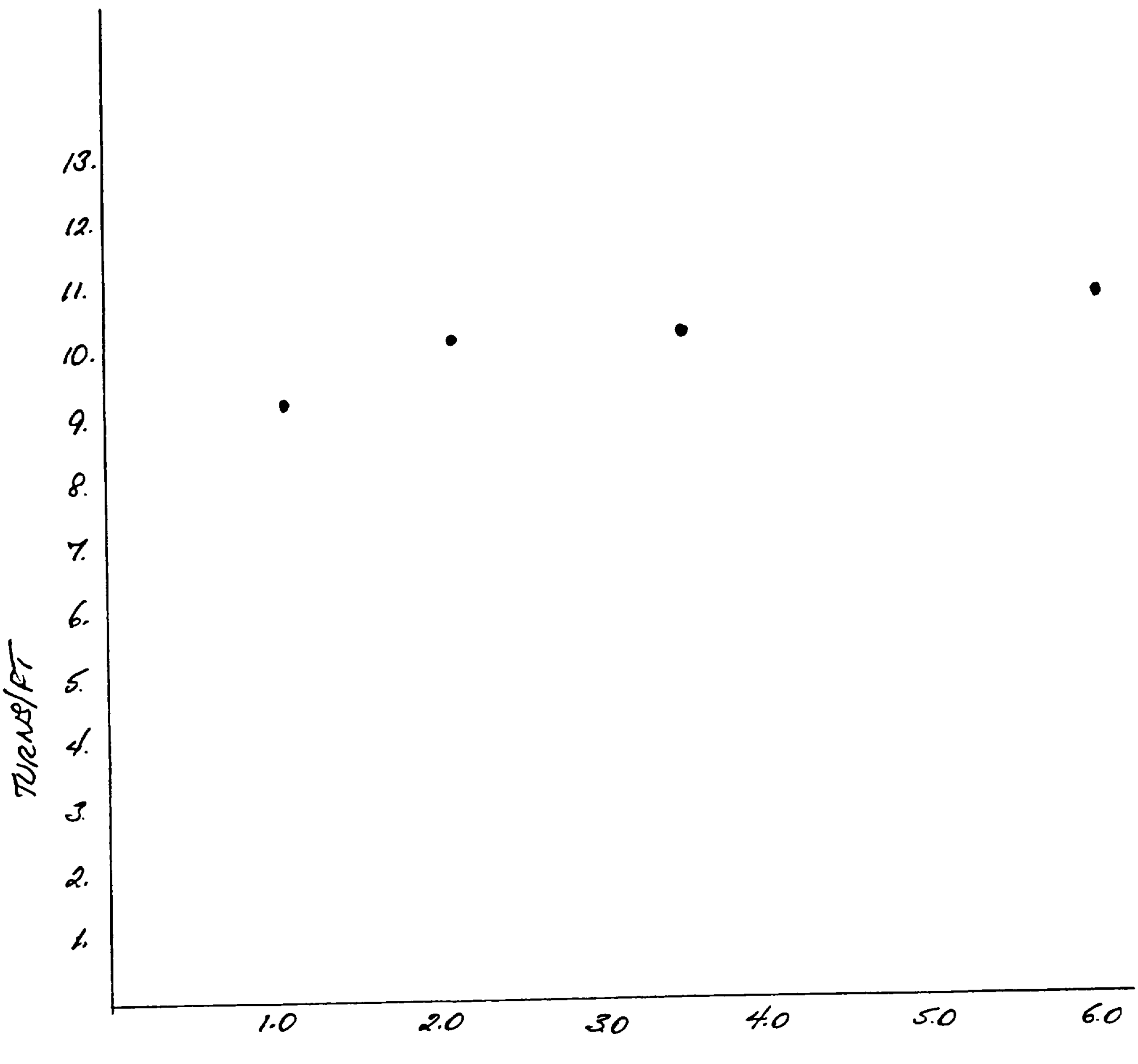
$\bar{V}$	TURNS/FT
1.09	9.65
2.23	10.31
6.00	10.73



PLOT OF TURNS/FT vs $\bar{V}$

GO# 05880

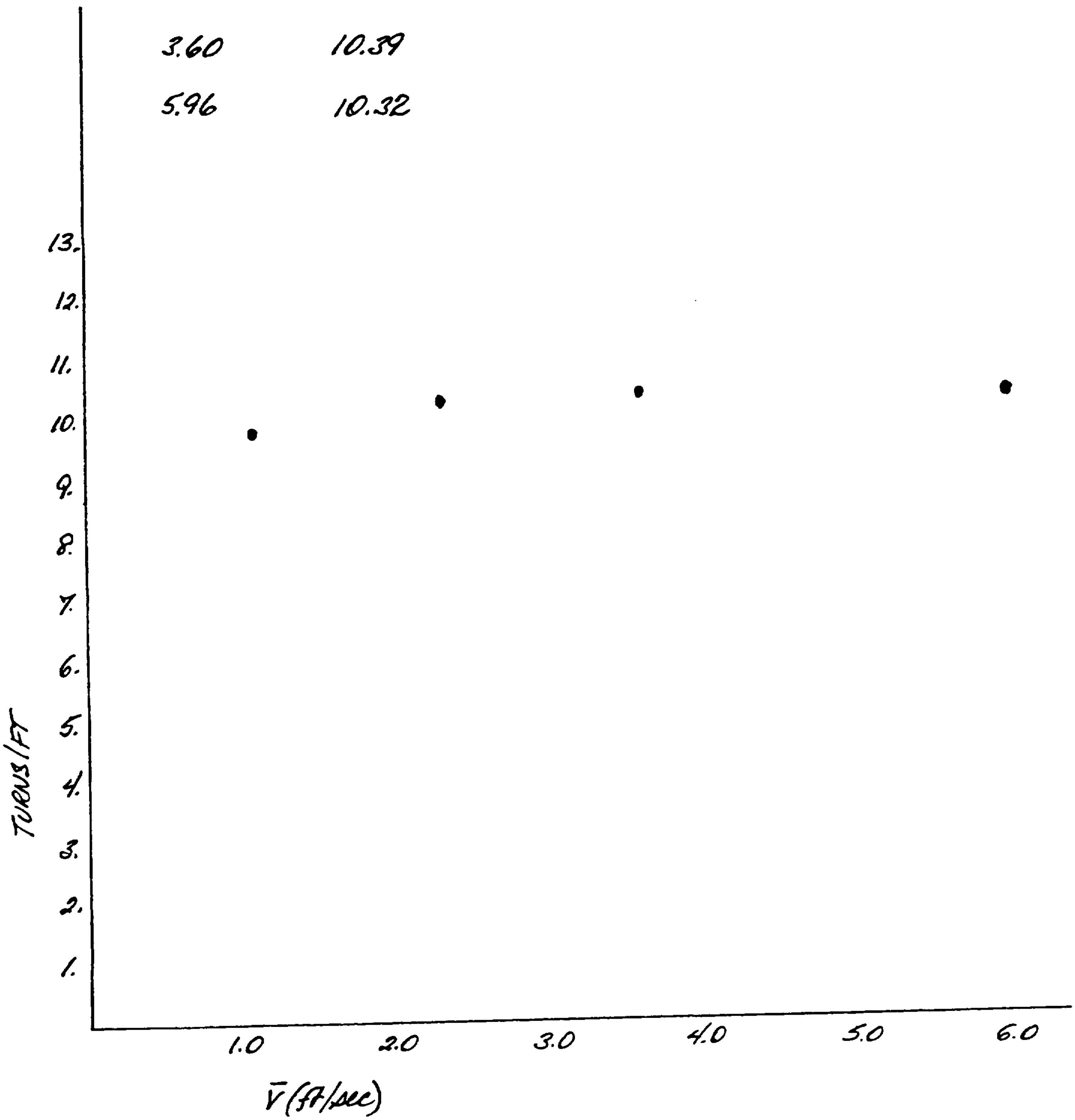
$\bar{V}$	TURNS/FT
1.12	9.20
2.08	10.10
3.55	10.26
5.98	10.73



PLOT OF TURNS/FT vs $\bar{V}$

G.0.05033

$\bar{V}$	TURNS/FT
1.08	9.74
2.28	10.24
3.60	10.39
5.96	10.32



PLOT OF TURNS/FT vs $\bar{V}$

G.O. 05963

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1974 AND 1975

GEAR EVALUATION STUDIES

APRIL 1977

Prepared for

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4 Irving Place
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ECOLOGICAL SERVICES

P.O. Box 5621
Dallas, Texas 75222

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SECTION I

INTRODUCTION

This report examines the efficiency of sampling gear relative to estimating ichthyoplankton density in the Hudson River estuary. Gear evaluation studies conducted by Texas Instruments Incorporated (TI) during 1974 and 1975 and reported herein deal with three major aspects of ichthyoplankton gear evaluation:

- Catch efficiency: the ability of sampling gear to catch all the organisms of a prescribed size or type that exist in the sampled volume of water

  Catch efficiency is reduced through gear avoidance by motile organisms, the gear's selectivity for certain sizes based on the net's mesh size, or some other factor such as reduced filtration efficiency.

- Filtration efficiency: the water-straining ability of the sampling gear

  This is best described as the ratio of the volume of water strained by a net to the volume of water that would have passed through the net frame had there been no net.

- Comparability: the ability to equate data collected by different sampling gear

  Comparability of data is diminished when sampling gear have different efficiencies.

A. HISTORICAL BACKGROUND

Ichthyoplankton studies on the Hudson River estuary have been conducted by several investigators since Rathjen and Miller (1957) collected eggs and larvae as part of an interstate Atlantic Coast striped bass (*Morone saxatilis*) survey:

- From 1966 through 1968, Northeast Biologists Incorporated (Carlson and McCann, 1969), as part of the Hudson River Fisheries Investigations (HRFI), conducted an ichthyoplankton survey to evaluate the potential impact of a pumped-storage facility in the Cornwall area as proposed by Consolidated Edison Company of New York, Inc. (Con Edison)

- Raytheon Company (1971) studied ichthyoplankton distribution in 1969 and 1970 in the vicinity of Con Edison's Indian Point nuclear plant to establish baseline information prior to the operation of Units 2 and 3.

- In 1971, New York University (NYU) initiated studies to determine the effects of entrainment of ichthyoplankton in the vicinity of the Indian Point nuclear power plant (NYU, 1973, 1974, 1976). These studies are still in progress.

- In 1971, Quirk, Lawler and Matusky Engineers (QLM), now Lawler, Matusky and Skelly Engineers (LMS), began ichthyoplankton investigations (QLM, 1974) to study the composition and distribution of fish eggs and larvae and the effects of their entrainment at the Bowline, Lovett, Danskammer, and Roseton power plants. These investigations are still under way.

- TI (1973a) conducted a study in the Ossining area for Con Edison in 1972 and 1973 and began a continuing longitudinal river survey (TI, 1973b) encompassing the Hudson River from Yonkers to Albany in 1973. Since 1974, the longitudinal river studies by TI have been jointly funded by Con Edison, Central Hudson Gas and Electric Company, and Orange and Rockland Utilities, Incorporated.

Because these investigators have used many types of ichthyoplankton sampling gear and deployment procedures (Appendix A), direct comparisons of data from these studies may not be valid. These differences in gear and procedures necessitate studies to quantify the important variables affecting the operation of the gear.

Gear efficiency and comparability have been discussed and/or evaluated several times earlier in an attempt to establish a quantitative basis for cross-study comparisons of ichthyoplankton data. Carlson and McCann (1969) observed that an 18 in. (46 cm) diameter conical (or ring) net with 500 x 800 μ mesh was more efficient for catch than the same net with smaller mesh (300 x 500 μ) or a 3 ft (1 m) square frame net with 500 x 800 μ mesh. Selectivity for larval striped bass was noted when larger mesh nets (1525 x 1650 μ and 3300 x 3300 μ) were used.

QLM (1973) conducted the first study explicitly designed to evaluate the ichthyoplankton sampling gear used in the Hudson River prior to 1972. Using a 1.0 m diameter Hensen net with 571 μ mesh as a reference, QLM tested the HRFI gear (18 in. [46 cm] diameter conical net and 3 ft [0.9 m] square frame net) with four mesh sizes (300 x 500 μ, 500 x 800 μ, 1500 x 1700 μ, 2000 x 2000 μ) and a 0.5 m diameter conical net with two mesh sizes (363 and 571 μ). The effects of six variables on the catch per volume filtered were studied: the presence of a TSK flowmeter mounted in the center of the net mouth; the presence of a polyethlene collar at the net mouth; mesh size; tow speed; size of the net mouth; and time of day (day or night). QLM concluded that the presence of a flowmeter, the mesh size, and the size of the net mouth significantly affected the number of larvae collected per volume of water filtered. The other variables--collar, tow speed, and time of day--produced no significant differences. Overall, nets with flowmeters captured fewer larvae per volume than did unmetered nets, and nets with larger mouth openings collected more larvae than did nets with smaller mouths. The most efficient mesh size differed for the gear tested--300 x 500 μ mesh for the 18 in. (46 cm) conical net and 1500 x 1700 μ mesh for the 3 ft (0.9 m) square frame net. Since all these nets were towed in a frame, no net bridles were necessary. QLM compared the catch per volume strained by the reference net with the catch by a net identical except for the presence of a bridle and found that more larvae per volume were captured in the net without a bridle.

In 1973 when TI began evaluating ichthyoplankton gear used in the Hudson River, preliminary studies (TI, 1973a, b) noted that a 0.5 m diameter conical net with 500 μ mesh caught more fish eggs than a 1.0 m conical net with 1000, 1500, or 2000 μ mesh. This held true for larvae, including those of striped bass, during May-July. As the season progressed, the 1.0 m net with 1000 to 2000 μ mesh first (August and September) equaled and then (October) exceeded the 0.5 m net in the catch of larvae per volume strained. A 1.0 m^2 epibenthic sled and 2.0 m^2 Tucker trawl, both equipped with 500 μ mesh, caught more striped bass larvae per volume of water filtered than did the other gear tested (0.5 m and 1.0 m diameter conical nets and a 3 ft [0.9 m] square net, with mesh sizes ranging from 500 to 2500 μ).

B. 1974 AND 1975 GEAR EVALUATION

TI undertook the gear evaluation described in this report to provide the information necessary to permit valid comparisons of catch data from the three groups of investigators (NYU, LMS, and TI) currently collecting ichthyoplankton data in the Hudson River. The studies also assessed the effects of net mouth size (Tucker trawl and epibenthic sled) and tow speed (Tucker trawl) on the catch efficiency of TI sampling gear to determine whether changes in these factors would change catch efficiency. The nets' filtration efficiency, or the ability to strain water, and the changes in filtration efficiency with the duration of tow were also studied. Specifically, the objectives of the 1974-1975 studies conducted by TI were to:

- Develop a method of comparing data from 0.5 m and 1.0 m ring (or conical) nets (NYU and QLM-LMS gear), 1.0 m Hensen nets (NYU and QLM-LMS gear) and the 1.0 m^2 epibenthic sled and 1.0 m^2 Tucker trawl (TI gear) by applying correction factors
- Determine the effect of net mouth size on the catch efficiency of the epibenthic sled and Tucker trawl
- Determine the effect of tow speed on the catch efficiency of the 1.0 m^2 Tucker trawl
- Determine the ratio of the volume of water strained through both a 1.0 m^2 epibenthic sled and a 1.0 m^2 Tucker trawl equipped with 500 μ mesh to the volume of water that would have passed through the net frame had no net been present (filtration efficiency)
- Describe the effect of tow duration on filtration efficiency for the 1.0 m^2 Tucker trawl and 1.0 m^2 epibenthic sled

SECTION II

METHODS AND MATERIALS

Ichthyoplankton sampling gear used in this study and the experimental design employed for evaluating the gear's comparability and efficiency are described in this section. The evaluation procedures differed between 1974 and 1975; therefore the studies are described separately by year. The analytical procedures for each study are presented at the conclusion of this section.

A. FIELD AND LABORATORY PROCEDURES

1. Gear Comparability Studies

During 1974 and 1975, ichthyoplankton sampling gear used by New York University (NYU) and Lawler, Matusky and Skelly Engineers (LMS) were compared with that used by Texas Instruments Incorporated (TI) by comparing the catch of striped bass eggs and larvae per unit volume sampled by each gear. The objective was to obtain a method for comparing past and future data obtained by the use of these gear in the Hudson River estuary.

a. 1974 Comparability Study

From late June through early August 1974, five gear types (1.0 m Hensen net, 1.0 m ring net, 0.5 m ring net, 1.0 m^2 Tucker trawl, and 1.0 m^2 epibenthic sled) were towed in pairs to determine the relative catchability of striped bass post yolk-sac larvae and early juveniles between these gear. Each gear type used by TI (Tucker trawl and epibenthic sled) was paired with each gear type used by LMS and NYU (Table II-1), resulting in a total of six pairings. The paired gear were towed side by side using two 40 ft (12 m) converted lobster boats which were 10 to 30 m apart. The Tucker trawl was towed at mid-depth, while the epibenthic sled was run on the river bottom. Mesh sizes matched those normally used for each gear in the Hudson River: 505 μ for the Tucker trawl and epibenthic sled and 571 μ for the Hensen trawl and ring nets. Each gear type is described in detail in Appendix A.

Table II-1

Pairings of Ichthyoplankton Sampling Gear Employed during 1974 and 1975 Gear Comparability Studies

	Texas Instruments Gear (1.0 m^2)			
	1974		1975	
LMS,NYU Gear	Tucker Trawl	Epibenthic Sled	Tucker Trawl	Epibenthic Sled
1.0 m Hensen net	x	x	x	x
0.5 m ring net	x	x	x	x
1.0 m ring net*	x	x		

* not studied during 1975

Each pair was towed for 5 min; tow speed, measured with a General Oceanics (G.O.) Model 2031 electronic flowmeter mounted just above the gear, was approximately 80 cm/s. Velocity was monitored on a G.O. Model 2035 electronic meter mounted on the boat. Volume of water sampled was determined using G.O. Model 2030 digital flowmeters centered in each gear.

The experimental design specified 10 samples for each of the six gear pairings, or a total of 60 samples. Pairings were replicated four times, twice during daylight and twice during darkness (Table II-2) for a grand total of 240 samples. Daylight sampling commenced at least 0.5 hr after sunrise; night sampling, at least 0.5 hr after sunset. Samplings were taken from 24 June through 1 August in areas of known striped bass larval presence near Cornwall-on-the-Hudson (river miles 55-57 [kilometre 88-91]) or Croton-on-Hudson (RM 35-38 [KM 56-61]). The variable measured was the catch of striped bass larvae per 1000 m^3. After each sample was taken, the net was washed with river water to concentrate the sample in the collection cup at the cod end of the net. The sample was preserved in 5% buffered formalin stained with rose bengal.

In the laboratory, samples were placed in enamel pans and picked and sorted with the aid of illuminated magnifiers; rose bengal stain facilitated separation of larvae and juvenile fish from organic detritus and inorganic matter. Identification was made with binocular microscopes having a maximum power of 70X. The following are the phenotypic characteristics (Mansueti, 1958; Doroshev, 1971; Bayless, 1972) used to identify striped bass larvae:

Table II-2

1974 Comparability Study Design Showing Gear Pairings, Time, and Date of Sampling and Number of Samples Taken per Gear Pairing

LMS,NYU Gear	Samples per Gear Pairing — Texas Instruments Gear: $1.0\ m^2$ Tucker Trawl, Daylight		Darkness		$1.0\ m^2$ Epibenthic Sled, Daylight		Darkness	
	6/24-25	7/22-23	7/8-11	7/29-30	6/26-7/2	7/23-24	7/10-11	7/30-8/1
1.0 m Hensen net	10	10	10	10	10	10	10	10
0.5 m ring net	10	10	10	10	10	10	10	10
1.0 m ring net	10	10	10	10	10	10	10	10

- Hatching length approximately 3.0 mm
- Head attached to yolk-sac; back straight
- Oil globule in anterior yolk mass generally extending beyond anterior margin of eye
- Teeth well-developed and early (4-5) branchiostegal rays formed when urostyle becomes oblique
- Oil possibly visible in thoracic region until urostyle develops heterocercal bend
- Preopercular spine development during or just after development of seventh branchiostegal ray
- Anal fin that includes two spines and 10-13 soft rays; spines of relatively equal thickness
- Total of 12 preanal and 11-13 postanal myomeres
- Snout-to-vent length approximately 55% of total length

b. 1975 Comparability Study

The 1975 comparability study made the following changes to the 1974 study:

- The 1.0 m ring net (Table II-I) was excluded.
- At time of sampling, striped bass eggs and yolk-sac larvae were more common than during the 1974 study.
- Sampling was conducted only during daylight between RM 35 and 39 (KM 56 and 62) on 30 May 1975.
- One complete set (40 samples) of gear pairings (Table II-3) was run, with 10 samples collected per pairing.
- G.O. flowmeters were checked for precision of measurement by tests in the Johns Hopkins flume; from these tests, individual conversion factors for each flowmeter were determined.

- Trawl samples were taken near the river surface rather than at midwater depths.
- In 1975, the Tucker trawl was towed alongside the boat whereas the 0.5 m ring net was towed 40 ft (12 m) and the 1.0 m Hensen net 200 ft (61 m) behind the boat.
- The 1.0 m Hensen net was mounted on an epibenthic sled frame for sampling near the river bottom.

All tows were against the prevailing current. Sample processing and laboratory analyses remained the same as those used in 1974.

Table II-3

1975 Comparability Study Design Showing Gear Pairings and Number of Samples Taken per Gear Pairing on 30 May 1975 (Daylight Only)

	Samples per Gear Pairing	
	Texas Instruments Gear	
LMS, NYU Gear	1.0 m^2 Tucker Trawl	1.0 m^2 Epibenthic Sled
1.0 m Hensen net	10	10
0.5 m ring net	10	10

2. Gear Efficiency Studies

The effects of gear mouth size and tow speed on larval striped bass catches were examined as follows: in 1974, the effect of the mouth size of the Tucker trawl and epibenthic sled; in 1975, the effect of Tucker trawl tow speed.

a. 1974 Mouth Size Efficiency Study

The effect of the net's mouth size on the catch of larval striped bass per unit volume sampled was determined for TI sampling gear, i.e., the Tucker trawl and the epibenthic sled. Different net mouth sizes were achieved by changing the mouth width while the mouth height remained the same. The height of the net mouth of both gear was always 1.0 m but mouth widths were 0.25, 0.5, 0.75, and 1.0 m for the epibenthic sled and 0.5, 0.75, 1.0, and 1.25 m for the Tucker trawl.

During July and August 1974 between RM 55 and 58 (KM 88-93), six complete sets of comparisons (Table II-4) were made for each gear: three during daylight and three during darkness. A set consisted of six or nine samples for each mouth size. One boat towed the Tucker trawl and another towed the epibenthic sled side by side 10 to 30 m apart, pairing mouth sizes in every combination. All tows were against the current. Tows with the Tucker trawl were at mid-depth, while the sleds were towed along the river bottom. The towing vessels maintained a speed of approximately 80 cm/s for 5 min. Gear were as described for the 1974 gear comparability study (see Appendix A).

G.O. digital flowmeters centered in each gear determined the volume of water sampled. To be consistent with the 1974 data used in a previous report (TI, 1975), the analysis used only tows for which flowmeter differences were between 3566 and 19007 counts. Sample processing and laboratory analyses were as described for the 1974 comparability study.

Table II-4

1974 Gear Mouth Size Efficiency Study Design Showing Number of Samples for Each Gear and Mouth Size and Time and Dates of Sampling

Width of Mouth (m)	Number of Samples											
	Epibenthic Sled						Tucker Trawl					
	Daylight			Darkness			Daylight			Darkness		
	7/1	7/16	8/5-6	7/3	7/18-19	8/7-9	7/1	7/15	8/5-6	7/3	7/17-18	8/7-9
0.25	6	9	9	6	9	9	*	*	*	*	*	*
0.5	6	9	9	6	9	9	6	9	9	6	9	9
0.75	6	9	9	6	9	9	6	9	9	6	9	9
1.0	6	9	9	6	9	9	6	9	9	6	9	9
1.25	6	9	9	6	9	9	6	9	9	6	9	9

*Not tested

services group

b. 1975 Tow Speed Efficiency Study

The effects of tow speed on the collection efficiency of a single gear, the 1.0 m^2 Tucker trawl, were examined in 1975 by sampling in an area of known striped bass larval presence, RM 43 to 64 (km 69-102), on 9-11 July. Catches at tow speeds of 80 and 120 cm/s were compared; at each tow speed, 25 samples were taken by two boats running parallel about 45 m apart and each towing a 1.0 m^2 Tucker trawl at identical depths. The faster boat (120 cm/s) towed for 4 min, and the slower boat (80 cm/s) towed for 6 min; therefore, each boat sampled comparable volumes of water in approximately the same area of the river. The Tucker trawl towed at 120 cm/s weighed approximately 230 lb (104 kg), while the trawl towed at 80 cm/s weighed approximately 180 lb (82 kg); weight was adjusted to assure that the sampling angle (appendix Figure A-3) remained constant.

Sample processing and laboratory procedures were identical to those used for the comparability studies.

3. Filtration Efficiency Studies

A pair of studies performed in 1975 tested the filtration or straining efficiency of the nets used in TI sampling gear, the 1.0 m^2 epibenthic sled and the 1.0 m^2 Tucker trawl. The first study--a net/no-net experiment--compared flow of water through gear fitted with a 505 μ mesh net to gear without a net in order to determine if the net had a significant effect on water flow by its resistance to the passage of water. The second study--the sustained efficiency experiment--compared mean water flow for several towing durations to determine if increased towing duration affected the net's water-straining ability.

The net/no-net experiment was conducted during daylight on 3-4 September 1975 at RM 35 (km 59). Each gear type was towed 15 times with and 15 times without a net; all tows were against the current for 5 min at approximately 100 cm/s. A G.O. electronic flowmeter with a boat-mounted readout meter indicated the tow speed. The epibenthic sled was towed at depths of 15 ft (4.6 m), and the Tucker trawl was towed near the river surface; all gear were set and retrieved in an open position. Three calibrated G.O. digital flowmeters were mounted in the mouth frame of each gear (Figure II-1): one in the upper left corner, one in the center, and one in the lower right corner. The experimental variable was digital flowmeter readings, which were recorded for each tow.

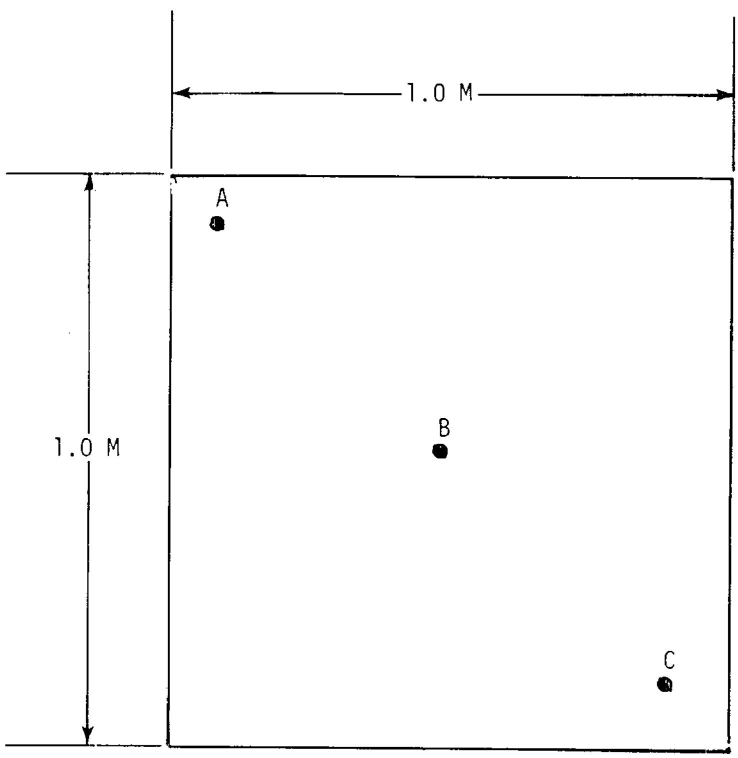

Figure II-1. Approximate Positions of Three Flowmeters in Mouths of Sampling Gear during 1975 Filtration Efficiency Studies

The sustained efficiency experiment was conducted 5-17 September 1975 during daylight within RM 34-39 (KM 54-62). There were 10 tows for each of eight duration intervals (Table II-5) and each gear, the epibenthic sled and Tucker trawl (with nets mounted); the tow duration intervals (in minutes) were 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, and 20. All tows were made against the current at approximately 100 cm/s. As with the net/no-net experiment, three calibrated G.O. digital flowmeters were mounted in the mouth of each gear (Figure II-1): one in the upper left corner, one in the center, and one in the lower right corner. Other sampling procedures were the same as for the net/no-net experiment. Digital flowmeter readings represented the experimental variable.

Table II-5

Design of Sustained Efficiency Experiment Showing Number of Samples for Each Tow Duration and Gear

Duration of Tows (min)	Number of Samples	
	Tucker Trawl	Epibenthic Sled
2.5	10	10
5.0	10	10
7.5	10	10
10.0	10	10
12.5	10	10
15.0	10	10
17.5	10	10
20.0	10	10

B. ANALYTICAL PROCEDURES

This subsection discusses the statistical models used for data analysis, their advantages, and the assumptions necessary for making the models both realistic and precise.

1. Gear Comparability Studies

a. 1974 Comparability Study

Differences between estimated density and actual density underlie the theory of comparing efficiencies of ichthyoplankton sampling gear. Because of gear avoidance by motile ichthyoplankton and the gears' size selectivity, the gear may catch fewer organisms than are in the volume they strain and this, in turn, makes them less efficient. Thus, the catches are not absolute indices of abundance of ichthyoplankton; instead, they are estimates of abundance that differ because of differing efficiencies of the gear.

A statistical model that would account for differing efficiencies had to be devised in order to compare data for different gear. The statistical model with which the 1974 catch data were compared was as follows:

$$D_{ij} = K_i \mu \varepsilon_{ij}$$

where

D_{ij} = catch of larval striped bass per 1000 m^3 in tow j with gear i

μ = expected number of larvae per 1000 m^3 in sampling area

K_i = proportion of μ caught by gear i ($0 \le K_i \le 1$)

ε_{ij} = random error, and error associated with gear and natural variation in distribution of larvae

and was based on the assumptions that:

- The random error was multiplicative rather than additive.
- The efficiency term K was constant; this means that the number of larvae missed did not remain constant for all densities and that the proportion missed was not a function of density.
- The linearized model was a fixed-effects model.

The term K_i represented the relative catch efficiency, expressed as the ratio of number of larvae caught to total number of larvae present in the sampled volume of water prior to sampling.

An advantage of the model was that it could yield a realistic method for arriving at correction factors to adjust catch data obtained from gear having differences in efficiency (see Appendix B). Statistical tests performed on the catch data (D_{ij}) ultimately were tests for significant difference between the efficiencies (K_i) of the compared gear. During the sampling period (24 June-2 August), post yolk-sac larvae were the predominant life stage caught for striped bass; thus, the analysis was univariate.

To normalize the catch data and stabilize its variance, a log transformation was used. The model was linearized to be consistent with least squares theory by using the natural logarithm of the data:

$$\log_e (D_{ij} + 1) = \log_e K_i + \log_e \mu + \log_e \varepsilon_{ij}$$

Addition of 1 to D_{ij} facilitated analysis of small catch values (Steel and Torrie, 1960). The transformed data from each gear comparison were tested for normality by the Shapiro-Wilks test (Dunn and Clark, 1974) and for homogeneity of variance by an F test (Brownlee, 1967). A 2-tailed unpaired t test was then performed on data for which the Shapiro-Wilks test and F test were nonsignificant ($\alpha = 0.05$). All data were subjected also to the nonparametric Wilcoxon rank sum test (Hollander and Wolfe, 1973) since no assumptions of normality and equality of variance were necessary for this test.

b. 1975 Comparability Study

The 1975 comparability model was identical to that used for the 1974 study with one exception: when the 1975 comparability samples were taken, three planktonic life stages of striped bass were common rather than only one being predominant, which had been the case during the 1974 study; thus, a multivariate test of means had to be performed rather than a univariate test in order to compare all three life stages in a hypothesis-testing situation.

The model with which the 1975 data were analyzed was as follows:

$$D_{rij} = K_{ri} \mu_r \varepsilon_{rij}$$

where $r = 1...3$ were the three life stages present (eggs, yolk-sac larvae, and post yolk-sac larvae). The other variables in the model were the same as for the 1974 model. The linearization of the model by natural logarithms then became:

$$\log_e (D_{rij} + 1) = \log_e \mu_r + \log_e K_{ri} + \log_e \varepsilon_{rij}$$

The data were first tested for equality of covariance matrices between gears (Morrison, 1967). If this test was nonsignificant, then the test of equality of mean vectors (Morrison, 1967) was performed. Additionally, the nonparametric Wilcoxon rank sum test was performed univariately on the data for each life stage.

In addition to assumptions and analyses used in 1974, the 1975 model was based also on the analytical assumption that the vector $\log_e \varepsilon_{rij}$ was multivariately normal with a mean of zero and constant variance for gear and samples.

2. Gear Efficiency Studies

a. 1974 Gear Mouth-Size Efficiency Study

The efficiencies of various gear mouth sizes were tested for both the epibenthic sled and the Tucker trawl. The purpose was to find if adequate gear mouth sizes were being used and if there would be any significant change in efficiency if mouth area were increased or decreased. Analysis of results was based on the principle that a relationship exists between gear mouth area and number of organisms caught in a volume of water; theoretically, this relationship is a function that is asymptotic and strictly monotonic (Figure II-2). Statistical testing of mean catch for equivalent gear would indicate if gear efficiency could be improved by changing the size of the mouth. Equality of means would imply that the mouth sizes were of the range

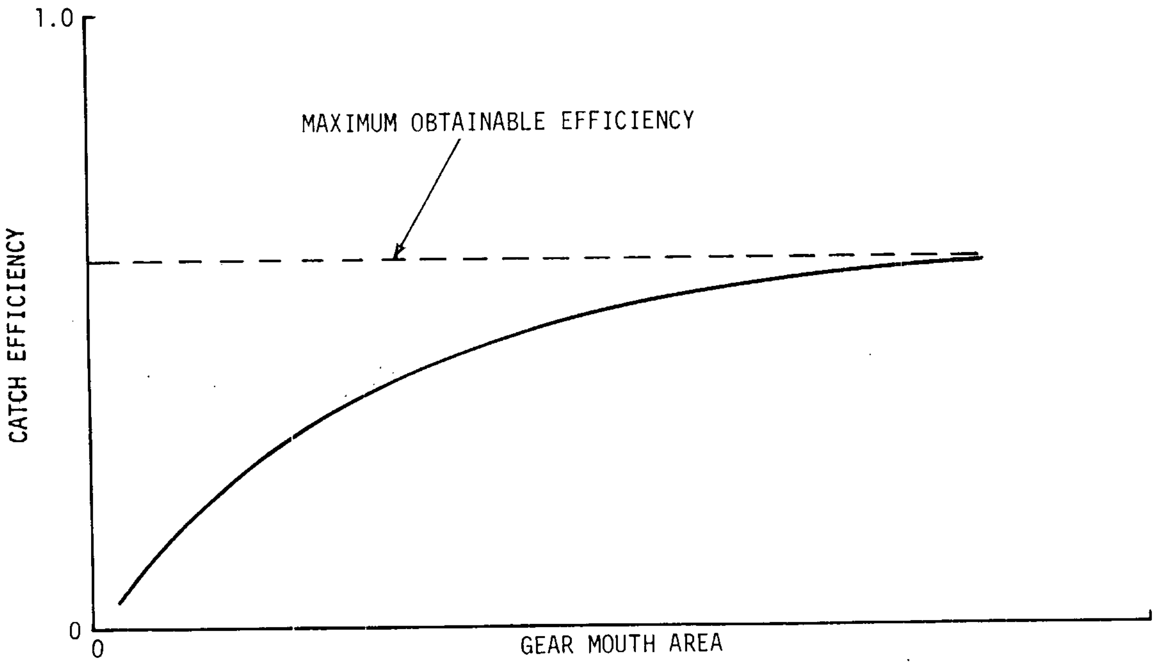

Figure II-2. Theoretical Relationship between Gear Mouth Area and Catch Efficiency

where catch efficiencies were asymptotic (Figure II-2), i.e., at the maximum obtainable efficiency for the gear design and deployment procedure.

The statistical model used to analyze the catch data was a variation of the gear comparability model, using assumptions identical to those for the 1974 gear comparability study. The new model was:

$$D_{ij} = C_i \, X_i^{\phi} \, \mu \, \varepsilon_{ij}$$

where

D_{ij} = catch of larval striped bass per 1000 m^3 in tow j with gear i

C_i = a fractional constant for gear i

X_i = mouth area of gear i

ϕ = a constant exponent

μ = expected number of larvae per 1000 m^3 in water column

ε_{ij} = random error

This model was chosen because, for the range of X_i (0.5 m^2 to 1.25 m^2 for the Tucker trawl and 0.25 m^2 to 1.0 m^2 for the epibenthic sled), it could be used to reasonably describe the theoretical function (Figure II-2) or another monotonic function. This model also was consistent with the comparability model $D_{ij} = K_i \mu \varepsilon_{ij}$ in which the relative efficiency term K_i was analogous to the term $C_i X_i^{\phi}$ of this model. If ϕ were not significantly different from 0 in the present model, mouth area would have little effect on the catch per volume, and efficiency would be stable and perhaps maximal with respect to design and deployment (e.g., for a constant tow speed).

The data were tested for normality by the Shapiro-Wilkes test (Dunn and Clark, 1974) and for homogeneity of variance by Bartlett's test (Brownlee, 1967) after a natural log transformation:

$$\log_e (D_{ij} + 1) = \log_e C_i + \phi \log_e X_i + \log_e \mu + \log_e \varepsilon_{ij}$$

If these tests were nonsignificant, an ANOVA test for $\phi = 0$ (i.e., equality of means) and for lack of fit was performed (Draper and Smith, 1966). In addition to this parametric analysis, a nonparametric Kruskal-Wallis test

(Hollander and Wolfe, 1973) for equality of median densities of gears was performed for all data; if the latter was nonsignificant, this too implied that $\phi = 0$, i.e., gear mouth area did not influence catch efficiency.

b. 1975 Tow-Speed Efficiency Study

Tow speed replaced mouth size (Figure II-2) as the independent variable in the theoretical model that formed the basis for analyzing 1975 gear efficiency with respect to tow speed. Catch data analysis would indicate whether the asymptotic maximum obtainable efficiency had been reached for the tow speeds used.

The statistical model used for comparing tow speeds was identical to that used for comparing gear:

$$D_{ij} = K_i \, \mu \, \varepsilon_{ij}$$

where

D_{ij} = catch of larval striped bass per 1000 m^3 in tow j with tow speed i

K_i = proportion of μ caught at tow speed i $(0 \leq K_i \leq 1)$

μ = actual number of larvae per 1000 m^3

ε_{ij} = random error

Assumptions were identical to those for the 1974 comparability study.

For analysis, the model was linearized by the following transformation:

$$\log_e (D_{ij} + 1) = \log_e K_i + \log_e \mu + \log_e \varepsilon_{ij}$$

The transformed data were analyzed for normality by the Shapiro-Wilks test and for equality of variances by an F test. If both tests were nonsignificant, an unpaired t test for equal means was performed. All data also were subjected to a nonparametric Wilcoxon sum rank test.

3. 1975 Filtration Efficiency Studies

a. Net/No-Net Experiment

The net/no-net experiment of 1975 investigated the effects a 505 μ mesh net on the filtration efficiency of an epibenthic sled and Tucker trawl; i.e., it tested for a reduction in flow of water through the gear as a result of the resistance of the net. Unlike the earlier tests dealing with catch data, the observed dependent variable was water flow, as measured by flowmeters.

The flowmeter data were analyzed by a simple analysis of covariance. The statistical model was:

$$X_{ij} = \alpha_i + \beta Z_{ij} + \varepsilon_{ij}$$

where

X_{ij} = distance (cm) as measured by center flowmeter divided by tow duration for j^{th} tow of the i^{th} gear

α_i = effect due to net in gear i

Z_{ij} = recorded boat speed (cm/s) from electronic flowmeter

β = slope or rate of change of X with Z

ε_{ij} = random error

Spurious flowmeter readings or tow-speed errors were excluded from the analyses by examining profiles of digital flowmeter readings adjusted by electronic flowmeter readings, assuming $\beta = 1$. The profiles and methods for data exclusion appear in Appendix C.

The data were tested first for normality by the Shapiro-Wilks test, then for equality of variance of the tow treatment (βZ_{ij}) by an F test. The assumptions used were that $\beta = 1$ for both tests and that the effect of a net (α_i) on the gear speed was equal to the no-net effect for the second test. The equality of the effect (α_i) of a net to that of no-net was tested by an analysis of covariance (Brownlee, 1967), which "adjusts" the means of the net/no-net effects for changes in boat speed. Had this adjustment not been made, changes in speed would have confounded the results of the experiment.

The following were the assumptions necessary for applying the statistical model:

- The effect of boat speed is a first-order polynomial.
- Boat-speed effects are the same for net and no-net data.
- Random errors are independently and identically normal, with a mean of 0 and constant variance of σ^2.

b. Sustained Efficiency Experiment

This 1975 experiment investigated the effects of tow duration (2.5 to 20 min) on the filtration efficiency or water-straining ability of the epibenthic sled and Tucker trawl. As with the net/no-net experiment, the observed dependent variable was water flow, as measured by flowmeters. If flow rates change significantly as tow duration increases, then net clogging or some other phenomenon is occurring. Flowmeter outlier data were detected and excluded in the same manner as with the net/no-net experiment (Appendix C).

The statistical model used for data analysis was:

$$f_{ijk} = \mu_k + \alpha_{ik} + \beta Z_{ijk} + \varepsilon_{ijk}$$

where

f_{ijk} = distance (cm) as measured by center flowmeter divided by tow duration (i = 2.5, 5.0, 7.5... 20 min) in j^{th} tow of k^{th} gear

μ_k = overall mean flow rate (cm/s) for gear k

α_{ik} = mean flow rate effect of i^{th} duration for gear k

Z_{ijk} = boat speed (cm/s) recorded on electronic flowmeter

β = slope or rate of change of f with Z

ε_{ijk} = random error

The adjusted flowmeter data were tested for normality (assuming $\beta = 1$) by the Shapiro-Wilks test and for homogeneity of variance (again assuming $\beta = 1$) by Bartlett's test. Differences in flow rate among tow durations were detected by using a simple analysis of covariance and adjustments to free the mean flow rates from the influence of changing tow speeds.

SECTION III

RESULTS AND DISCUSSION

A. GEAR COMPARABILITY STUDIES

1. 1974 Comparability Study

The ichthyoplankton sampling gear of TI, NYU, and LMS usually appeared to have similar catch efficiencies. This would imply directly comparable larval striped bass catch data if the gear are deployed in the same manner as during this study, with no need for correction factors. There was at least one statistical comparison between each TI gear and its NYU or LMS counterpart.

Of the 24 gear pairings run during the 1974 comparability study (Section II, Table II-1; Appendix C), 14 had sufficient catch for analysis; catch data for a gear pairing were judged to be sufficient if five or more of the 10 samples taken had non-zero catch. All but one of the 10 gear pairings with insufficient catch were run during the last week of July. The lower catch in late July may have been caused by increased gear avoidance by larval and early juvenile striped bass or lower densities of planktonic striped bass; however, since the catch was low both day and night and ichthyoplankton are more likely to avoid gear during daylight (Clutter and Anraku, 1968), gear avoidance probably was less important than decreased density due to mortality and dispersal.

Parametric statistical analysis was possible for seven of the 14 gear pairings (Table III-1). For these seven pairings, log-transformed

Table III-1

Tests for Normality and Equality of Variance of 1974 Gear Comparability Data

Gear	Time	Date	Normality W		n	Equality of Variance F		df
1.0 m ring; 1.0 m^2 Tucker trawl	Day	6/24	0.938	ns	18	1.13	ns	9,7
0.5 m ring; 1.0 m^2 Tucker trawl	Day	6/24	0.917	ns	20	1.057	ns	9,9
1.0 m Hensen; 1.0 m^2 Tucker trawl	Day	6/25	0.887	ns	13	4.254	ns	5,6
0.5 m ring; 1.0 m^2 Epibenthic sled	Day	6/26	0.941	ns	16	1.568	ns	5,9
1.0 m ring; 1.0 m^2 Epibenthic sled	Day	6/26	0.816	*	19	12.079	*	8,9
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Day	7/2	0.944	ns	10	2.541	ns	4,4
1.0 m ring; 1.0 m^2 Tucker trawl	Night	7/8	0.948	ns	20	1.570	ns	9,9
1.0 m Hensen; 1.0 m^2 Tucker trawl	Night	7/9-10	0.967	ns	20	1.298	ns	9,9
0.5 m ring; 1.0 m^2 Tucker trawl	Night	7/11	0.716	*	17	3.453	ns	7,8
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Night	7/10	0.853	*	17	1.325	ns	9,6
1.0 m ring; 1.0 m^2 Epibenthic sled	Night	7/11	0.878	*	15	2.022	ns	4,9
0.5 m ring; 1.0 m^2 Epibenthic sled	Night	7/11	0.613	*	15	1.053	ns	6,7
1.0 m ring; 1.0 m^2 Tucker trawl	Day	7/22	✓			✓		
0.5 m ring; 1.0 m^2 Tucker trawl	Day	7/22	✓			✓		
1.0 m Hensen; 1.0 m^2 Tucker trawl	Day	7/23	✓			✓		
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Day	7/23	0.818	*	14	1.083	ns	3,9
1.0 m ring; 1.0 m^2 Epibenthic sled	Day	7/24	✓			✓		
0.5 m ring; 1.0 m^2 Epibenthic sled	Day	7/24	✓			✓		
1.0 m ring; 1.0 m^2 Tucker trawl	Night	7/29	✓			✓		
0.5 m ring; 1.0 m^2 Tucker trawl	Night	7/29-30	✓			✓		
1.0 m Hensen; 1.0 m^2 Tucker trawl	Night	7/30	✓			✓		
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Night	7/30	✓			✓		
1.0 ring; 1.0 m^2 Epibenthic sled	Night	8/1	0.674	*	12	2.109	ns	3,7
0.5 m ring; 1.0 m^2 Epibenthic sled	Night	8/1	✓			✓		

✓ = catch not sufficient for analysis; fewer than five samples with non-zero catch
* = significatn at α = 0.05
ns= not significant at α = 0.05
n = number of valid samples
df= degrees of freedom

data appeared to be normally distributed with equal variances, as determined by nonsignificant (α = 0.05) Shapiro-Wilks and F tests. Thus, t tests for equality of mean catch, signifying equal efficiency coefficients (K_i), could be performed on the catch data from the following gear comparisons:

1.0 m ring net vs 1.0 m^2 Tucker trawl, daylight
1.0 m ring net vs 1.0 m^2 Tucker trawl, darkness
0.5 m ring net vs 1.0 m^2 Tucker trawl, daylight
1.0 m Hensen net vs 1.0 m^2 Tucker trawl, daylight
1.0 m Hensen net vs 1.0 m^2 Tucker trawl, darkness
0.5 m ring net vs 1.0 m^2 epibenthic sled, daylight
1.0 m Hensen net vs 1.0 m^2 epibenthic sled, daylight

Unpaired t tests were nonsignificant (2-tailed; α = 0.05) for all of the above (Table III-2) except one that showed that the catch from a 1.0 m ring net was significantly greater than that from a 1.0 m^2 Tucker trawl during darkness (Figure III-1).

The nonparametric Wilcoxon rank sum test, for which no assumptions of normality and equal variance are necessary, indicated significantly different (α = 0.05) mean catches in two of the 14 gear pairings having sufficient catch data (Table III-2). The 1.0 m ring net caught significantly more larvae during daylight than did the 1.0 m^2 epibenthic sled (Figure III-2), and the 1.0 m ring net caught significantly more than did the 1.0 m^2 Tucker trawl at night (in agreement with the results of the parametric analysis). In these two cases, there was an apparent contradiction with the results of a pairing of the same gear during a different time (daylight vs darkness). This contradiction may have truly reflected differences in gear efficiency with respect to light

Table III-2

Parametric and Nonparametric Tests for Equality of Mean Catch from 1974 Gear Comparability Study

Gear	Time	Date	t-Test of Equality of Means t		df	Wilcoxon Rank Sum Test Z	
1.0 m ring; 1.0 m^2 Tucker trawl	Day	6/24	0.505	ns	16	0.62	ns
0.5 m ring; 1.0 m^2 Tucker trawl	Day	6/24	1.178	ns	18	1.29	ns
1.0 m Hensen; 1.0 m^2 Tucker trawl	Day	6/25	1.668	ns	11	1.59	ns
0.5 m ring; 1.0 m^2 Epibenthic sled	Day	6/26	0.632	ns	14	0.54	ns
1.0 m ring; 1.0 m^2 Epibenthic sled	Day	6/26	†			2.37	*
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Day	7/2	0.612	ns	8	0.73	ns
1.0 m ring; 1.0 m^2 Tucker trawl	Night	7/8	2.411	*	18	2.12	*
1.0 m Hensen; 1.0 m^2 Tucker trawl	Night	7/9,10	1.362	ns	18	1.13	ns
0.5 m ring; 1.0 m^2 Tucker trawl	Night	7/11	†			0.00	ns
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Night	7/10	†			0.83	ns
1.0 m ring; 1.0 m^2 Epibenthic sled	Night	7/11	†			0.00	ns
0.5 m ring; 1.0 m^2 Epibenthic sled	Night	7/11	†			0.12	ns
1.0 m ring; 1.0 m^2 Tucker trawl	Day	7/22	✓			✓	
0.5 m ring; 1.0 m^2 Tucker trawl	Day	7/22	✓			✓	
1.0 m Hensen; 1.0 m^2 Tucker trawl	Day	7/23	✓			✓	
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Day	7/23	†			0.51	ns
1.0 m ring; 1.0 m^2 Epibenthic sled	Day	7/24	✓			✓	
0.5 m ring; 1.0 m^2 Epibenthic sled	Day	7/24	✓			✓	
1.0 m ring; 1.0 m^2 Tucker trawl	Night	7/29	✓			✓	
0.5 m ring; 1.0 m^2 Tucker trawl	Night	7/29,30	✓			✓	
1.0 m Hensen; 1.0 m^2 Tucker trawl	Night	7/30	✓			✓	
1.0 m Hensen; 1.0 m^2 Epibenthic sled	Night	7/30	✓			✓	
1.0 m ring; 1.0 m^2 Epibenthic sled	Night	8/1	†			0.18	ns
0.5 m ring; 1.0 m^2 Tucker trawl	Night	8/1,2	✓			✓	

✓ = Catch not sufficient for analysis; fewer than five samples with non-zero catch
* = Significant at α = 0.05
ns = Not significant at α = 0.05
† = Assumptions of normality and equality of variance not met; see Table III-1
df = degrees of freedom

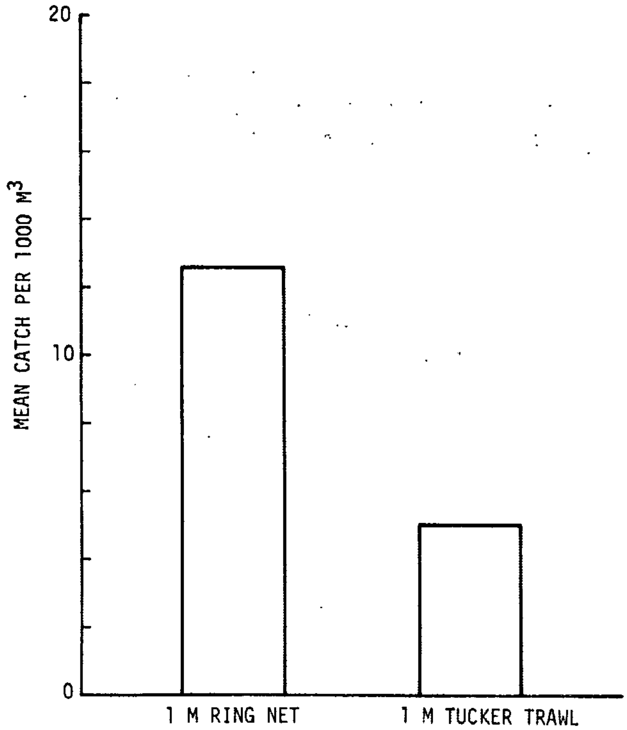

Figure III-1. Mean Catch of Striped Bass Post Yolk-Sac Larvae by 1.0 m Ring Net and 1.0 m^2 Tucker Trawl during Darkness, 8 July 1974

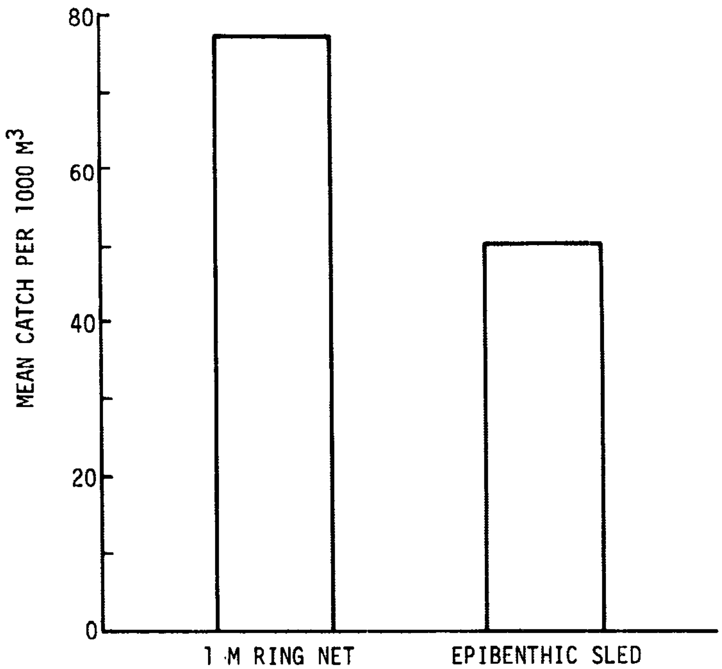

Figure III-2. Mean Catch of Striped Bass Post Yolk-Sac Larvae by 1.0 m Ring Net and 1.0 m^2 Epibenthic Sled during Daylight, 26 June 1974 and gear avoidance by ichthyoplankters or occurred purely by chance (probability of a type 1 error occurring in one or two of 14 tests at $\alpha = 0.05$ is 0.48).

2. 1975 Comparability Study

The 1975 gear comparability study afforded the opportunity to compare catch efficiencies of each gear for three life stages of striped bass--eggs, yolk-sac larvae, and post yolk-sac larvae--instead of primarily one (post yolk-sac larvae) as had been the case in the 1974 study. Generally, the 1975 study results indicated no significant difference in gear sampling for larval striped bass near the river bottom; the 0.5 m ring net appeared to be more efficient than the 1.0 m^2 epibenthic sled for sampling eggs near the river bottom. For sampling near the surface, the Tucker trawl appeared to be more efficient than either the 0.5 m ring net or the 1.0 m Hensen net in collecting larval striped bass.

Parametric statistical analysis of the catch data was possible for only one of the four gear comparisons (Table III-3): the 1.0 m Hensen net (mounted on a sled frame) vs the 1.0 m^2 epibenthic sled. For this gear comparison, the mean vectors were not significantly different ($\alpha = 0.05$), indicating that the epibenthic sled and Hensen net were equally efficient for the collection of the three life stages (Figure III-3). Nonparametric analysis by univariate testing of the life stages with the Wilcoxon rank sum test corroborated the results of the parametric test comparing the epibenthic sled and Hensen net (Table III-3). (Statements of significance about multivariate data, i.e., life

Table III-3

Tests of Equality of Covariance Matrices, Equality of Mean Vectors, and Nonparametric Equality of Mean Catch for 1975 Gear Comparability Study

Gear	Equality of Covariance Matrix			Parametric Equality of Mean Vectors			Nonparametric Equality of Mean Catch		
	χ^2	df		F	df		Z		Life Stage
1 m^2 Epibenthic sled vs 0.5 m ring net	17.3	6	*	---			2.73	*	Egg
							0.88	ns	Yolk-sac larvae
							0.88	ns	Post yolk-sac Larvae
1 m^2 Epibenthic sled vs 1 m Hensen net (on sled)	11.6	6	ns	0.2867	3, 16	ns	0.11	ns	Egg
							0.38	ns	Yolk-sac larvae
							0.15	ns	Post yolk-sac larvae
1 m^2 Tucker trawl vs 0.5 m ring net	∞		*	---			1.25	ns	Egg
							3.42	*	Yolk-sac larvae
							3.61	*	Post yolk-sac larvae
1 m^2 Tucker trawl vs 1 m Hensen net	∞		*	---			1.17	ns	Egg
							2.53	*	Yolk-sac larvae
							3.48	*	Post yolk-sac larvae

ns = not significant at $\alpha = 0.05$
 * = significant at $\alpha = 0.05$
df = degrees of freedom

services group

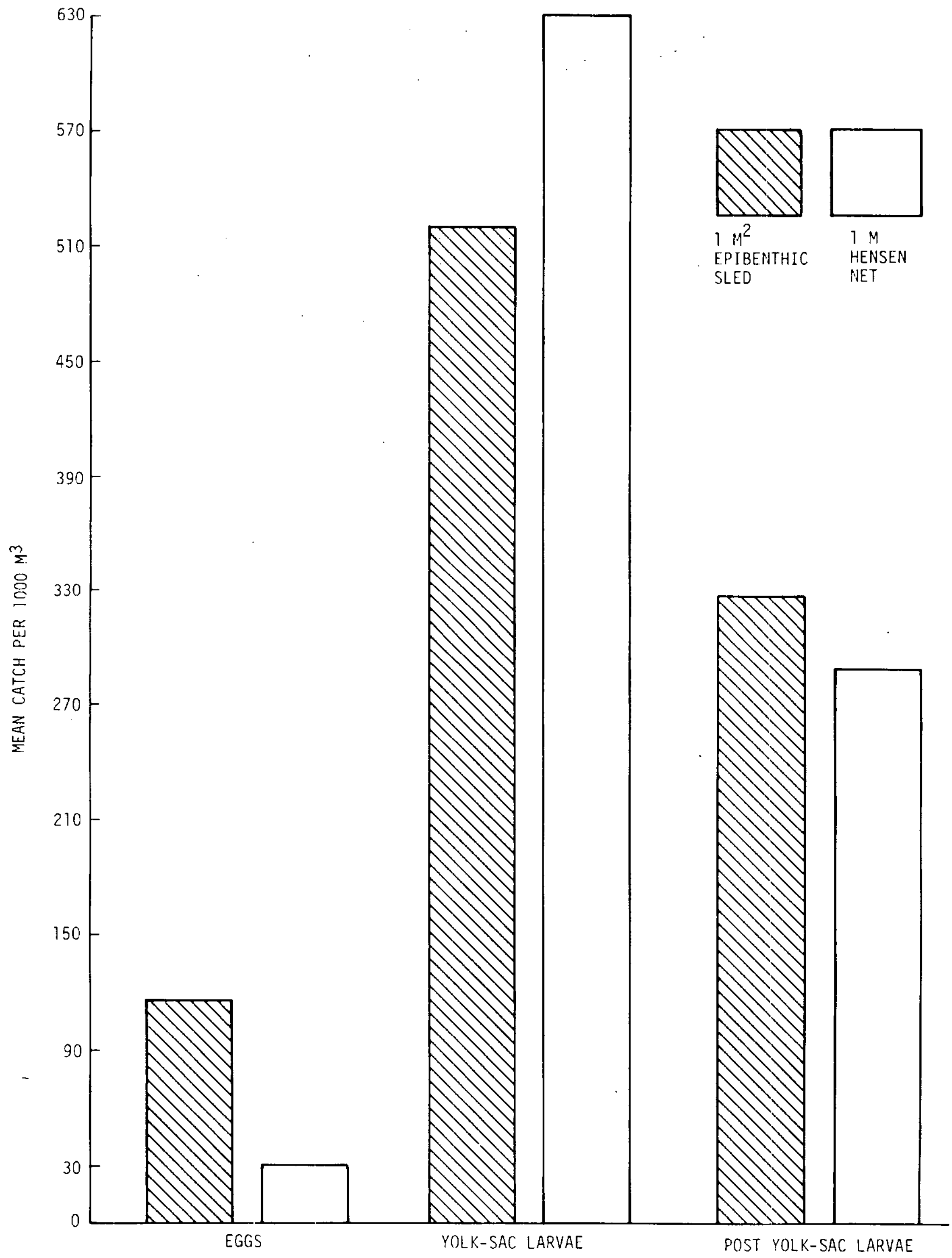

Figure III-3. Mean Catch of Striped Bass Eggs, Yolk-Sac Larvae, and Post Yolk-Sac Larvae by 1.0 m^2 Epibenthic Sled and 1.0 m Hensen Net during Daylight, 30 May 1975 stages, using a univariate test requires the assumption of noncorrelation between variables.) There were no significant differences in catch efficiences for eggs, yolk-sac larvae, and post yolk-sac larvae between these tow gear.

For the three gear comparisons that could be analyzed only with nonparametric statistical methods, significant differences (α = 0.05) in catch were frequently noted. The 1.0 m^2 epibenthic sled caught significantly fewer eggs (Figure III-4 and Table III-3) than did the 0.5 m ring net. The 1.0 m^2 Tucker trawl caught significantly more yolk-sac and post yolk-sac larvae (Table III-3) than did either the 0.5 m ring net (Figure III-5) or the 1.0 m Hensen net (Figure III-6).

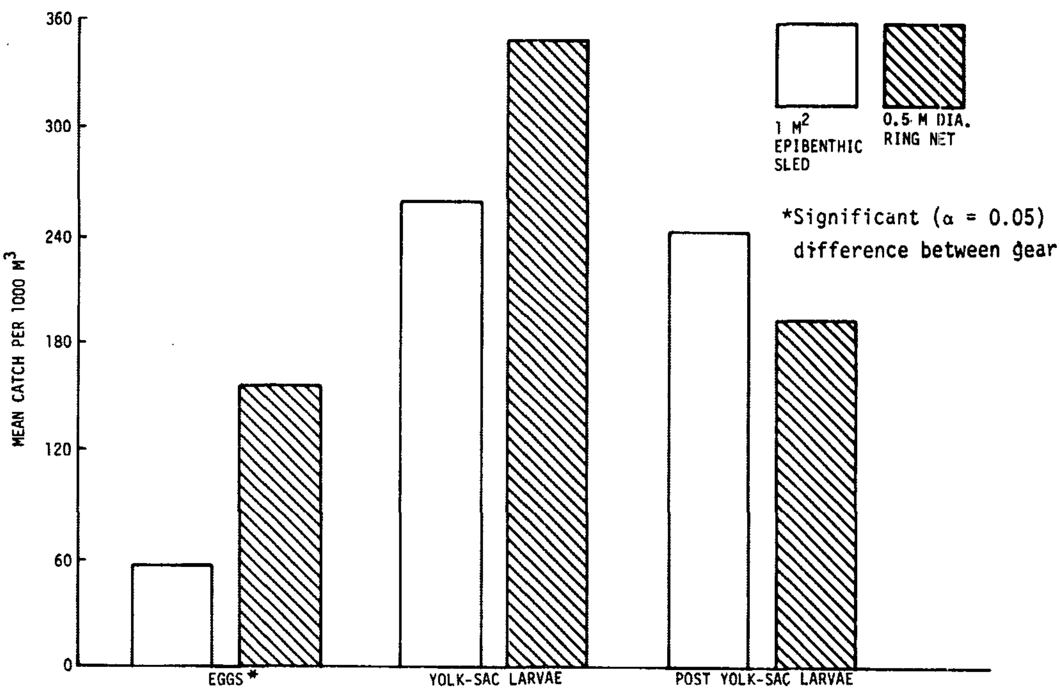

Figure III-4. Mean Catch of Striped Bass Eggs, Yolk-Sac Larvae, and Post Yolk-Sac Larvae by 1.0 m^2 Epibenthic Sled and 0.5 m Ring Net during Daylight, 30 May 1975

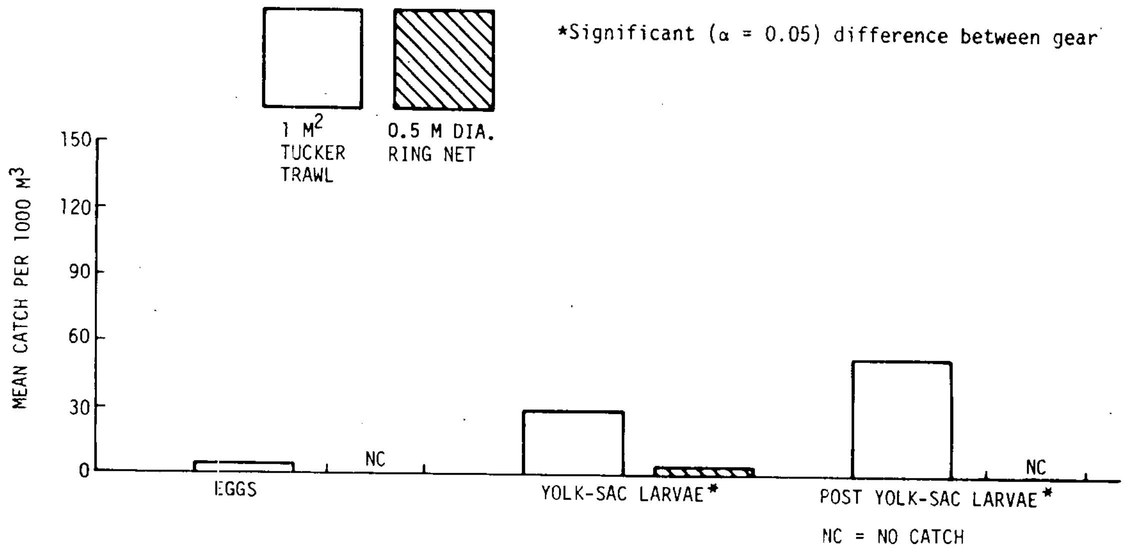

Figure III-5. Mean Catch of Striped Bass Eggs, Yolk-Sac Larvae, and Post Yolk-Sac Larvae by 1.0 m^2 Tucker Trawl and 0.5 m Ring Net during Daylight, 30 May 1975

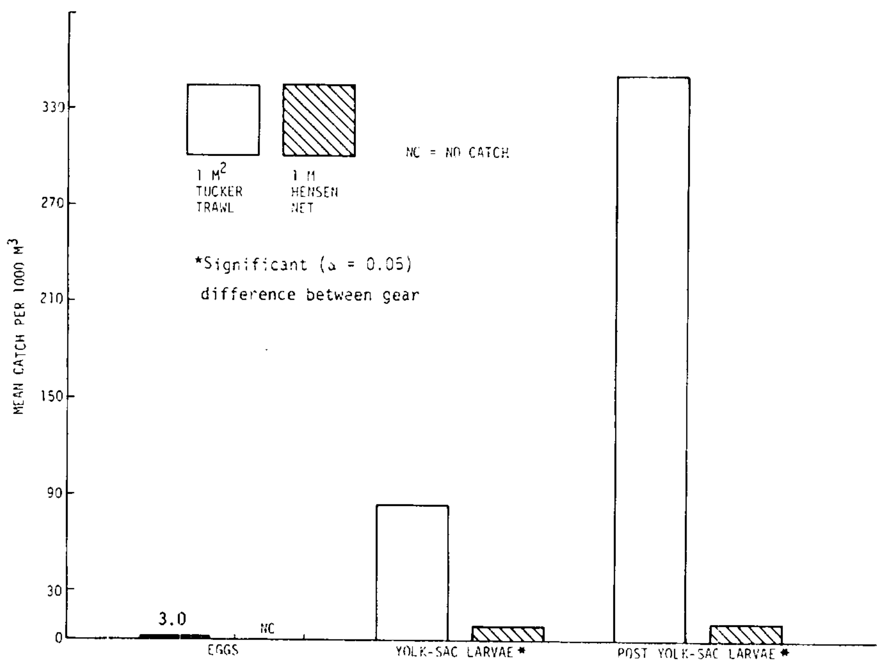

Figure III-6. Mean Catch of Striped Bass Eggs, Yolk-Sac Larvae, and Post Yolk-Sac Larvae by 1.0 m^2 Tucker Trawl and 1.0 m Hensen Net during Daylight, 30 May 1975

Differences in catch efficiency noted in the 1975 comparability study for the surface or midwater sampling gear (Tucker trawl, Hensen net, and 0.5 m ring net) contradicted 1974 study results in which these gear appeared equal in efficiency. The deployment of the gear may have caused the differences in the results of the two studies.

B. GEAR EFFICIENCY STUDIES

1. 1974 Gear Mouth-Size Efficiency Study

In all but one test, increasing the mouth width of the epibenthic sled and the Tucker trawl had no effect on their catch efficiency for larval striped bass. With respect to gear mouth size, both gear were sampling at or near their maximum obtainable efficiency (Section II, Figure II-2) for the methods of deployment used and the range of mouth sizes tested.

Seven of the 12 sets of samples taken during the 1974 efficiency study (Section II, Table II-4) had sufficient catch for analysis; catch data for a set of samples were judged to be sufficient if five or more samples had non-zero catch (Table III-4). All but one of the sets with insufficient catch occurred during early August. Only one set--daylight sampling with the epibenthic sled on 1 July--met the necessary assumptions (Table III-4) for parametrically testing the log-transformed catch data. The analysis-of-variance test for this data set (Table III-5) indicated that changing the mouth size of the epibenthic sled did not significantly ($F = 1.80$; $\alpha = 0.05$) affect mean catch per volume.

Table III-4

Tests for Normality, Homogeneity of Variance, and Lack of Fit in Gear Mouth Size Efficiency Study of 1974

Gear	Time	Date	Normality W		n	Homogenity of Variance F	Lack of Fit F		df
1 m Epibenthic sled	Day	7/1	0.97	ns	19	0.39	0.53	ns	2,15
1 m Tucker trawl	Day	7/1	0.83	*	24	---	---		
1 m Epibenthic sled	Night	7/3	0.88	*	17	---	---		
1 m Tucker trawl	Night	7/3	0.84	*	13	---	---		
1 m Epibenthic sled	Day	7/16	0.80	*	24	---	---		
1 m Tucker trawl	Day	7/15	✓			✓	✓		
1 m Epibenthic sled	Night	7/18,19	0.86	*	25	---	---		
1 m Tucker trawl	Night	7/17,18	0.87	*	33	---	---		
1 m Epibenthic sled	Day	8/5	✓			✓	✓		
1 m Tucker trawl	Day	8/6	✓			✓	✓		
1 m Epibenthic sled	Night	8/7,8	✓			✓	✓		
1 m Tucker trawl	Night	8/8,9	✓			✓	✓		

* Significant at $\alpha = 0.05$
ns Not significant at $\alpha = 0.05$
✓ Insufficient data for analysis; fewer than five samples with non-zero catch
df Degrees of freedom
n Number of valid samples

Table III-5

Analysis of Variance of Larval Striped Bass Catch per Volume Using Epibenthic Sleds with Five Different Mouth Sizes During Daylight of 1 July 1976

Source	d.f.	Sum of Squares	Mean Square	F
Slope	1	1.1804	1.1804	1.80+
Residual	17	11.1446	0.6556	
lack of fit	2	0.7377	0.3688	0.53+
pure error	5	10.4069	0.6933	
Total	18	12.325		

+ not significant at $\alpha = 0.05$

Nonparametric analysis of the seven sets by the Kruskal-Wallis test indicated no significant ($\alpha = 0.05$) change in catch per volume with change in gear mouth size except for one set--nighttime sampling with an epibenthic sled on 3 July (Table III-6). Those tests showing no significant differences included at least one replicate of each of the four combinations of day and night sampling with the epibenthic sled and Tucker trawl. The exceptional case having a significant Kruskal-Wallis test (Table III-6) did not show a consistent increase in catch with an increase in gear mouth size (Figure III-7), as might have been expected. Other studies (Fleminger and Clutter, 1965; McGowan and Fraundorf, 1966; Clutter and Anraku, 1968) have found an increase in catch with larger nets towed at the same speed and have attributed this increase to reduced gear avoidance by the sampled organisms.

Table III-6

Kruskal-Wallis Test for Difference in Mean Catch with Gear Mouth Size

Gear	Time	Date	χ^2_3		df
1 m Epibenthic sled	Day	7/1	2.35	ns	3
1 m Tucker trawl	Day	7/1	5.32	ns	3
1 m Epibenthic sled	Night	7/3	8.35	*	3
1 m Tucker trawl	Night	7/3	2.58	ns	3
1 m Epibenthic sled	Day	7/16	5.35	ns	3
1 m Tucker trawl	Day	7/15	✓		
1 m Epibenthic sled	Night	7/18,19	3.07	ns	3
1 m Tucker trawl	Night	7/17,18	6.16	ns	3
1 m Epibenthic sled	Day	8/5	✓		
1 m Tucker trawl	Day	8/6	✓		
1 m Epibenthic sled	Night	8/7,8	✓		
1 m Tucker trawl	Night	8/8,9	✓		

* Significant at $\alpha = 0.05$
ns Not significant at $\alpha = 0.05$
✓ Insufficient data for analysis; fewer than five samples with non-zero catch
df Degrees of freedom

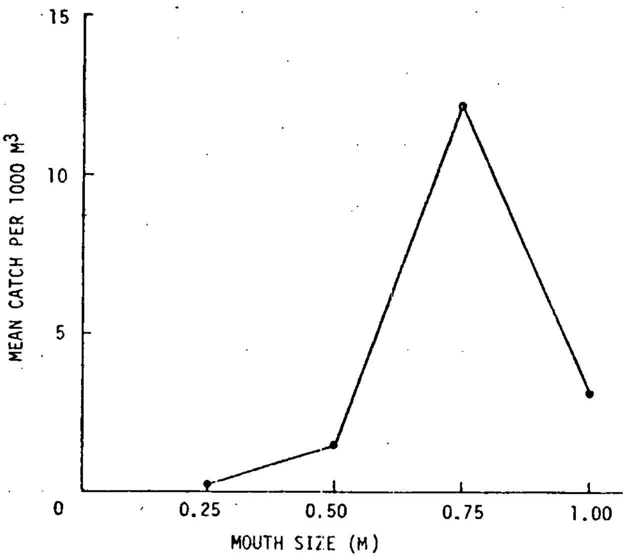

Figure III-7. Mean Catch of Larval Striped Bass by Epibenthic Sleds with Four Mouth Sizes, during Darkness, 3 July 1974

2. 1975 Tow Speed Efficiency Study

Nonparametric analysis by the Wilcoson rank sum test indicated that a 1.0 m^2 Tucker trawl caught significantly ($Z = 6.64$; $\alpha = 0.05$) more post yolk-sac striped bass per volume at a tow speed of 120 cm/s than at 80 cm/s; the 50% increase in tow speed approximately tripled the mean catch from 2.55 to 8.61 larvae/1000 m^3. Gear efficiency with respect to tow speed depends on the size and type of organisms sampled (Aron and Collard, 1969) and the organism's ability to perceive the gear and avoid it (Barkley, 1964; Sissenwine et al, 1974). The Tucker trawl's maximum obtainable efficiency for post yolk-sac larvae had not been reached at 80 cm/s--and may not have been reached at 120 cm/s. TI, in its ichthyoplankton surveys of the Hudson River, usually tows the Tucker trawl at 90-120 cm/s; tow speeds greater than 120 cm/s reduce depth control and stability of this gear.

The catch data from this study were not normally distributed (W = 0.55 at 80 cm/s and W = 0.90 at 120 cm/s; both significant at $\alpha = 0.05$) when transformed and thus were not subjected to parametric analysis.

C. FILTRATION EFFICIENCY STUDIES

1. Net/No-Net Experiment

The presence of a 505 μ mesh net had no detectable effect on the ability of the 1.0 m^2 epibenthic sled and the 1.0 m^2 Tucker trawl to strain water. Digital flowmeter data collected during the 1975 net/no-net experiment appeared to be normal, with equal variance for both gear (Table III-7). Tests for equality of mean flow rate for the gear with and without a 505 μ mesh net mounted, were nonsignificant (Table III-7) at $\alpha = 0.05$. The filtration efficiency of a particular gear depends on the porosity of the net gauze and its surface area in relation to the net mouth area: filtration efficiency increases with increasing open area (pores) of the gauze until the open area is approximately three times the area of the net mouth, then efficiencies of 85% or greater may result (Tranter and Smith, 1968). The open gauze area of 505 μ mesh nets used on the Tucker trawl and epibenthic sled was sufficient to avoid reduction of efficiency caused by the net's presence.

2. Sustained Efficiency Experiment

The results of the sustained efficiency experiment were inconclusive. Tow duration had a significant effect ($\alpha = 0.05$) on the

Table III-7

Tests for Normality, Equality of Variance, and Equality of Mean Flow Rates Recorded by Digital Flowmeters in Net/No-Net Experiment

Gear	Date	Normality W		n	Equality of Variance F	df	Equality of Means F		df
Epibenthic sled	9/4	0.952	ns	28	1.62	13,13	0.04	ns	1,25
Tucker trawl	9/3	0.932	ns	29	1.19	13,14	0.19	ns	1,26

df Degrees of freedom
ns Not significant at $\alpha = 0.05$
n Number of valid samples

filtration efficiency of the epibenthic sled (F = 13.42; df = 7,60) and Tucker trawl (F = 7.08; df = 7,69), as determined by an analysis of covariance; yet there was no clearly discernible trend in the data with increasing tow duration (Figures III-8 and III-9). Clogging of the mesh by plankton or detritus reduces the effective mesh size and straining area of the net, thus reducing the filtration efficiency of the gear (Fraser, 1968). If increased tow duration had increased clogging of the net, one would have expected a decrease in the measured flow rate at greater tow durations (Tranter and Smith, 1969). Unmeasured variation in tow speed caused by electronic flowmeter error among samples may have been the source of the great variability in the data observed for this experiment and may have obscured the effect of tow duration.

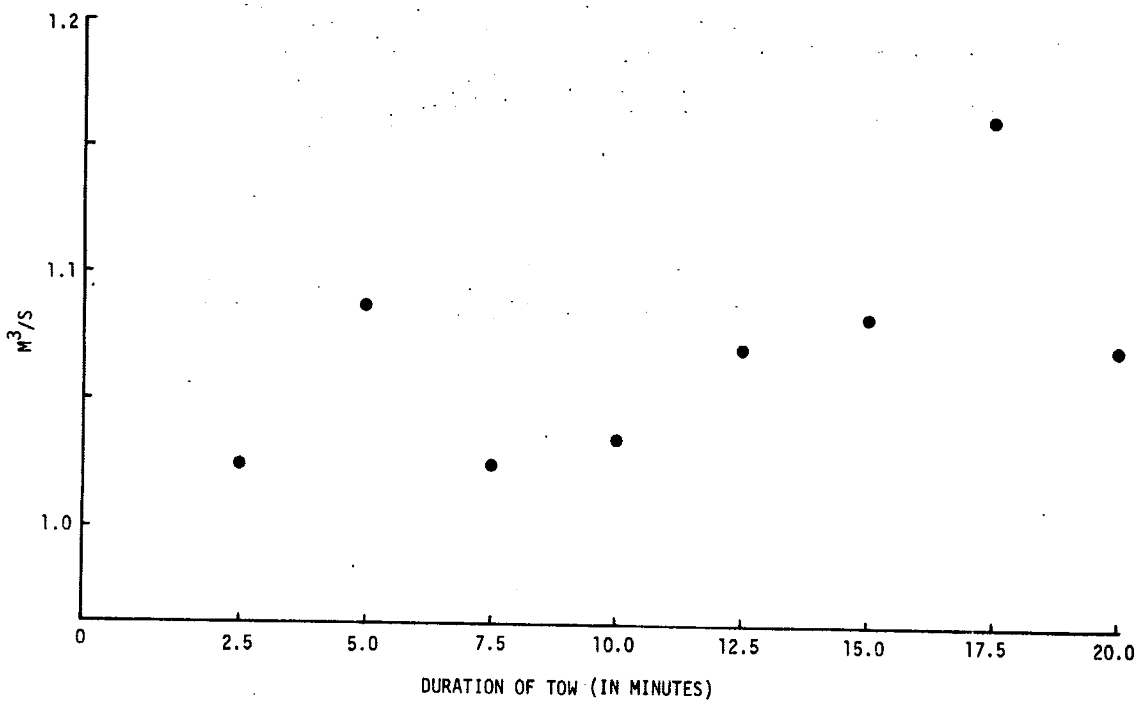

Figure III-8. Mean Volume per Second of Water Strained by 1.0 m^2 Tucker Trawl during 2.5 to 20 Min Tow

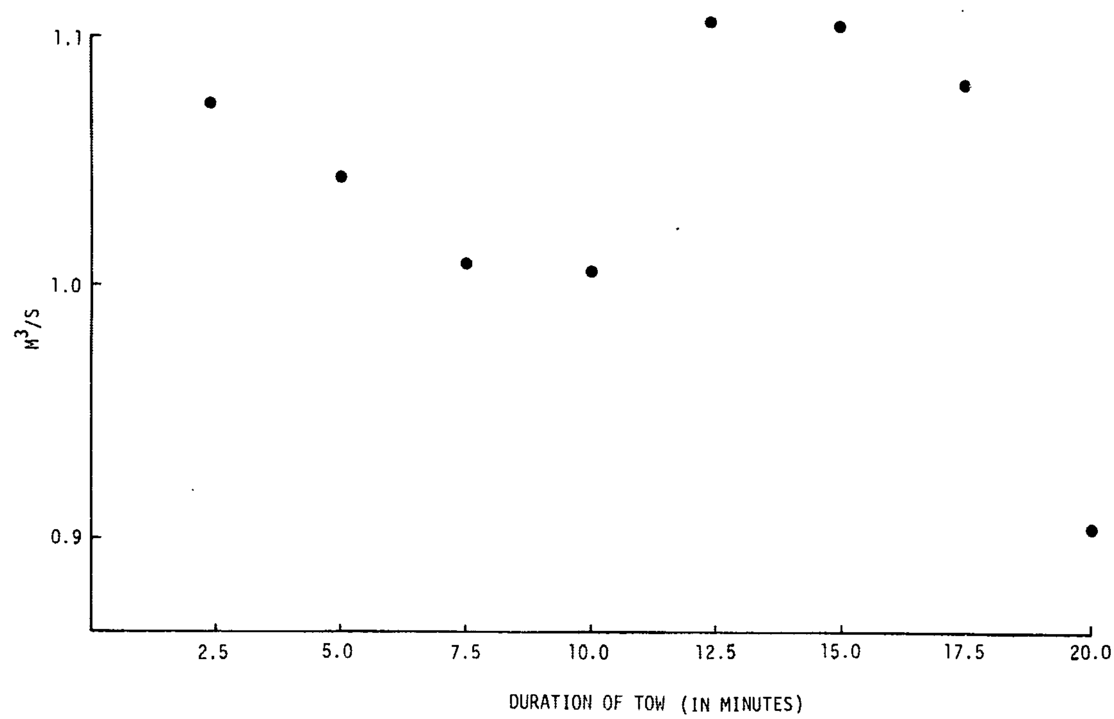

Figure III-9. Mean Volume per Second of Water Strained by 1.0 m^2 Epibenthic Sled during 2.5 to 20 Min Tow

SECTION IV

SUMMARY AND CONCLUSIONS

Much information has been obtained on the abundance and distribution of fish eggs and larvae, particularly striped bass, in the Hudson River estuary since 1965, but the reliability of comparisons of data collected with the different sampling gear was questionable because of potential differences in gear efficiency. Comparability of ichthyoplankton data would be enhanced if surveys conducted in the river used gear that (1) had similar abilities to catch all ichthyoplankters of the type desired from the sampled volume of water (catch efficiencies) and (2) had similar abilities to strain water (filtration efficiencies). Since catch efficiency often changes with the size or motility of the organism sampled, data from various surveys and sampling gear might be comparable for one life stage or species but not for another. The studies reported herein were concerned with the comparability of striped bass ichthyoplankton data collected by gear presently in use by investigators in the Hudson River estuary.

A. COMPARABILITY

The five gear types compared during 1974 and 1975 (1.0 m^2 epibenthic sled, 1.0 m^2 Tucker trawl, 1.0 m Hensen net, 1.0 m ring or conical net, and 0.5 m ring or conical net) usually had similar catch efficiencies (catch per volume) when deployed in the manner prescribed by the investigators using them. Most similar were the near-bottom sampling gear--the epibenthic sled, the Hensen net (towed separately or mounted on a sled frame), and the 0.5 m and 1.0 m ring nets. The only detectable difference occurred between the 0.5 m ring net and the 1.0 m^2 epibenthic sled in the collection of eggs during 1975, when the ring net proved more efficient. The gear towed at mid-depths during 1974--the 1.0 m^2 Tucker trawl, the 1.0 m Hensen net, and the 1.0 and 0.5 m ring nets--generally were indistinguishable with respect to their catch efficiency for striped bass post yolk-sac larvae. During 1975, however, when these gear (excluding the 1.0 m ring net) were towed near the surface, there were significant differences among their catch per volume of striped bass yolk-sac and post yolk-sac larvae; for these life stages, the Tucker trawl appeared to be more efficient than the Hensen net or 0.5 m ring net. There were no differences among catch efficiencies for striped bass eggs near the surface in the 1975 comparisons.

For analysis a statistical model was used that could also be adapted easily for applying correction factors to catch data for differing catch efficiencies. Based on the 1974 and 1975 results, however, correction factors usually would have equaled unity and thus would be unnecessary. Although the results of the comparability studies indicated similar efficiencies for the gear as deployed, it would be improper to equate catch-per-volume data without further study if deployment procedures or monitoring methods (e.g., use of flowmeters) differed among investigators.

B. GEAR MOUTH SIZE AND TOW SPEED VS CATCH EFFICIENCY

The effects of mouth size (epibenthic sled and Tucker trawl) and tow speed (Tucker trawl) on catch efficiency were studied for sampling gear used by TI. Size of the gear and the speed at which it is towed, in conjunction with the sampled organism's ability to perceive and avoid gear, have been frequently shown to affect catch. Both of these variables (tow speed and mouth size) are controllable within limits.

The maximum obtainable efficiency in collecting striped bass post yolk-sac larvae was apparently reached for the range of gear mouth sizes employed for the epibenthic sled and Tucker trawl. Increasing the sled's mouth width from 0.25 to 1.0 m and the trawl's from 0.5 to 1.25 m had no significant effect on catch per volume at a tow speed of 80 cm/s. An increase in tow speed of the 1.0 m^2 Tucker trawl from 80 to 120 cm/s significantly increased the catch per volume (approximately tripling it). Apparently, tow speed is a very important variable that must be standardized within a survey, and preferably between surveys, to maximize comparability.

C. FILTRATION EFFICIENCY

Two aspects of the filtration efficiency of TI sampling gear were studied during 1975: the ability of a 505 μ mesh net to strain water (i.e., filtration efficiency) and to sustain its filtration efficiency for tows lasting up to 20 min. The net's filtration efficiency was tested by observing water flow rates, as recorded by flowmeters, for an epibenthic sled and Tucker trawl towed with and without the net mounted. Flow rates were observed also for 2.5- to 20-min tows of each gear (with net mounted).

The presence of a 505 μ mesh net had no significant effect on either gear's flow rates. It may be concluded that the open area of net gauze in relation to the mouth area was sufficiently large to permit efficient filtration. The results of the test for effects of tow duration on the net's sustained filtration efficiency were inconclusive.

D. CONCLUSION

It may be concluded from the 1974 and 1975 gear evaluation studies that:

- Ichthyoplankton sampling gear used by TI, NYU, and LMS on the Hudson River estuary have similar efficiencies as deployed and, in most cases, would not require correction factors to make the data obtained with them comparable.

- Catch-per-volume data from independent investigators should not be equated without further study if the deployment or monitoring methods differ from those employed in the comparability studies.

- Mouth sizes used for the epibenthic sled and Tucker trawl are sufficiently large to permit maximal catch efficiency within the range of tow speeds tested.

- Tow speeds should be standardized at the highest speed possible while maintaining control of the gear.

- Net surface area:mouth-size ratios used for TI gear (epibenthic sled and Tucker trawl) are sufficiently large to insure efficient filtration.

SECTION V

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SECTION VI

GLOSSARY

Absolute abundance: actual total population in a volume.

Bridle: the assembly affixed to a plankton net's mouth in order to tow it.

Catchability: the fraction of a fish population that is caught by a defined unit of fishing.

Clogging: debris (organic or inorganic) accumulation between strands of net mesh, causing smaller organisms to be retained and reducing the rate of flow of water through the net.

Comparability: the ability to equate data collected by different sampling gear.

Depressor: an underwater device used with plankton samplers to eliminate erratic towing behavior and maintain consistent tow depth; its high lift/drag ratio allows for high depressing force without great weight.

Digital flowmeter: a metering device that records the distance traveled through the water.

Detritus: finely divided settleable material of organic or inorganic origin.

Drag: resistance experienced by a net being towed through the water; it is dependent on the shape of the sampler, mesh size, and tow speed.

Electronic flowmeter:	a device that generates electrical impulses as it moves through the water, the rate of the impulses being proportioned to the velocity.
Epibenthic:	the layer of water just above the river bottom.
Filtration efficiency:	ratio of volume of water strained through the net to volume of water that would have passed through the net frame had no net been present.
Formalin:	a chemical composed of 47% solution of formaldehyde gas dissolved in water; it is used both as a preservative and as a treatment for external fish parasites.
Gauze:	a general term referring to the material used in plankton netting.
Gear avoidance:	the behavior of organisms that enables them to escape capture in a sampling gear.
Gear efficiency:	ratio of number of organisms caught by a particular sampling gear to number of organisms actually present in the volume of water sampled.
Ichthyoplankton:	a general term referring to the early, planktonic, life stages of fish (eggs, yolk-sac larvae, post yolk-sac larvae, and early juveniles).
Outlier:	an observation lying far away from most of the other observations and, for "explainable" reasons, excluded from analysis.
Phenotypic characteristics:	the visible characters of an organism resulting from the interaction of its genetic makeup and the physical environment.

Plankton:	organisms floating passively or swimming weakly in a body of water.
Porosity:	ratio of the area of openings in the net material to the area of the material.
Rose bengal:	dye that stains the cytoplasm of organisms red.
Spurious:	false or erroneous.

APPENDIX A

SAMPLING GEAR AND DEPLOYMENT PROCEDURES

Table A-1

Description of Gear Used in Gear Comparability Studies

Gear	Mesh Size (μ)	Net		Weighting		Position of Boat Speed Device
		Lenth:Mouth	Closing Device	Method	Position	
1.0 m^2 Tucker trawl	505	8:1	Double-trip mechanism*	82 kg weight	Bottom bar	0.5 m above net
1.0 m^2 epibenthic sled	505	8:1	Double-trip mechanism*	None	None	0.5 m above net
1.0 m Hensen net	571	6:1	None	None (1975)†	None (1975)†	Hanging from boat side
				23 kg depressor (1974)	Off-bridle (1974)	
1.0 m conical net	571	3.8:1	None	23 kg depressor	1.5 m below net	Hanging from boat side
0.5 m conical net	571	7.6:1	None	23 kg depressor	1.5 m below net	Hanging from boat side

*General Oceanics

†Mounted on sled frame in 1975

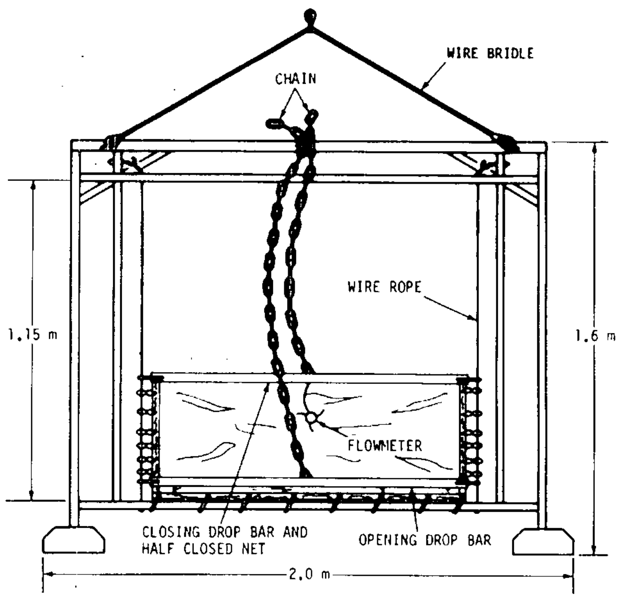


Figure A-1. Front View of 1.0 m^2 Epibenthic Sled

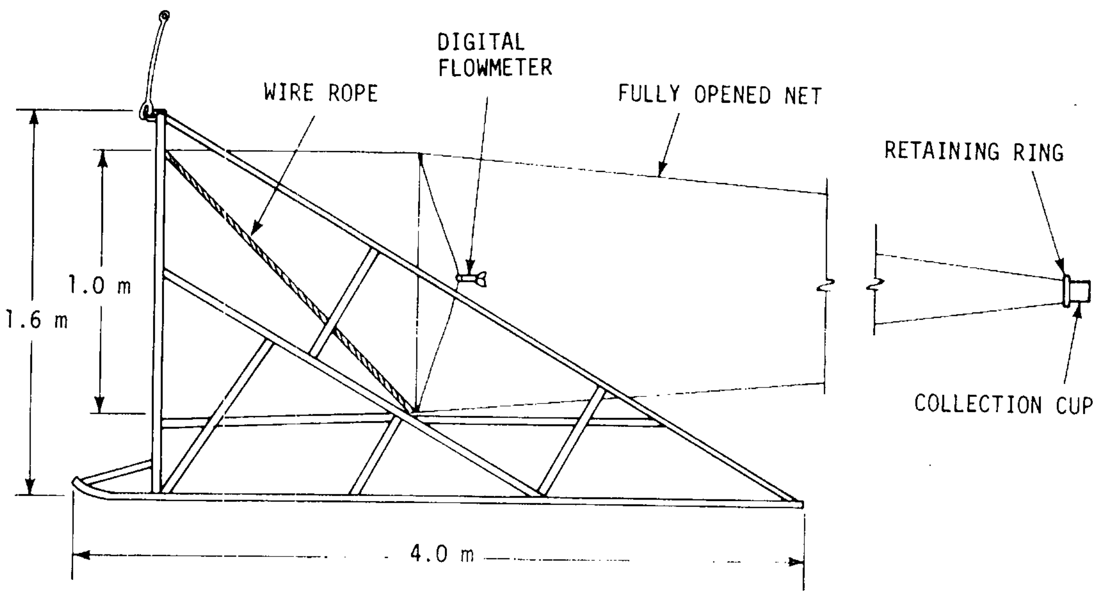


Figure A-2. Side View of 1.0 m^2 Epibenthic Sled

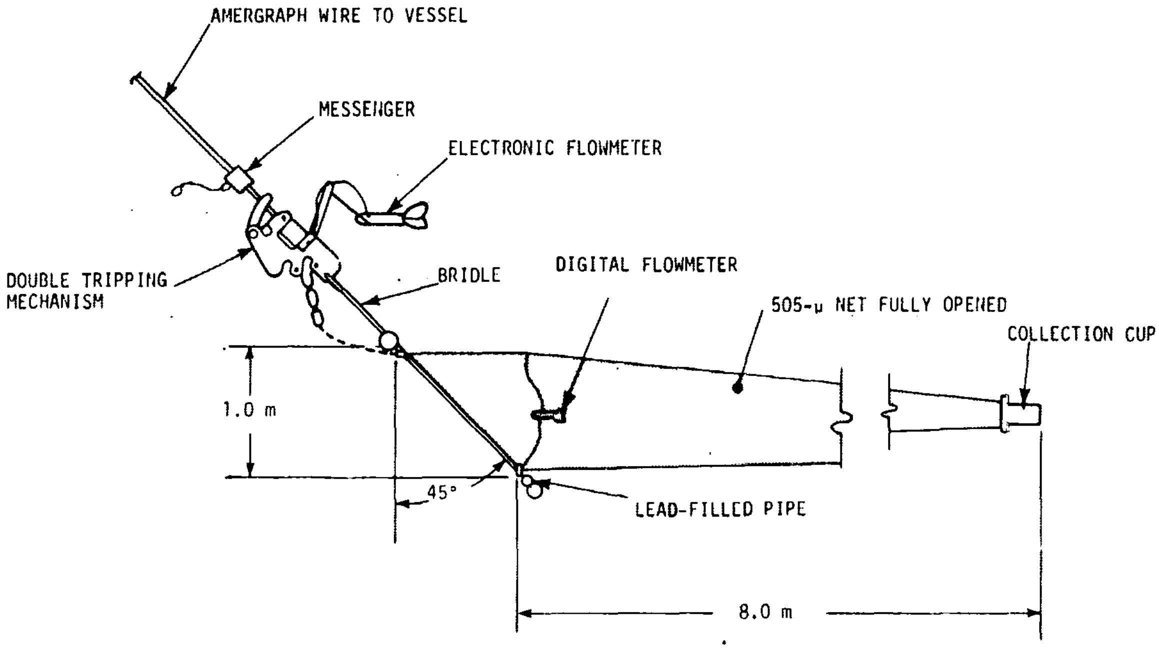


Figure A-3. Side View of 1.0 m^2 Tucker Trawl

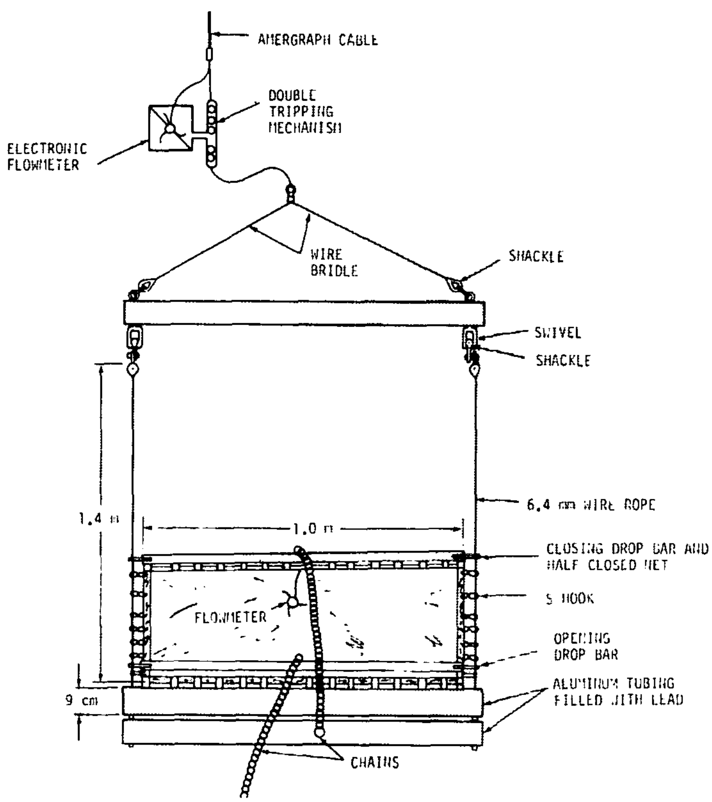


Figure A-4. Front View of 1.0 m^2 Tucker Trawl

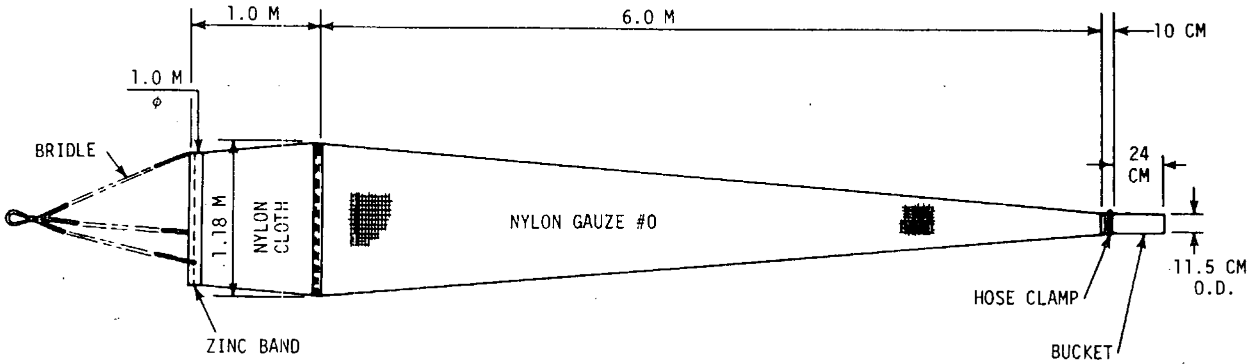
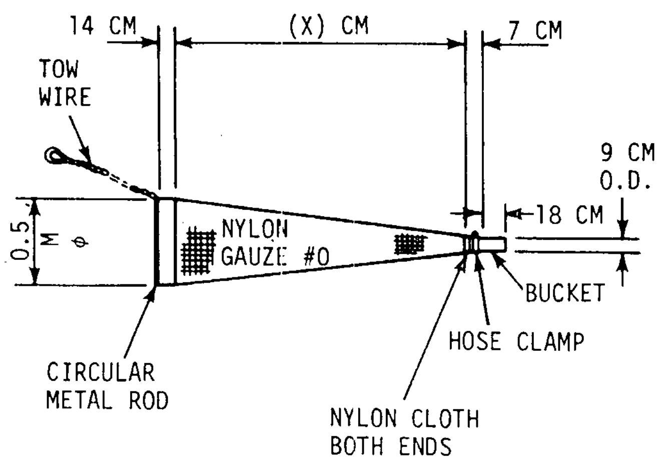


Figure A-5. Side View of 1.0 m Hensen Net (Adapted from QLM, 1973)



NET NO.	(X) LENGTH
1	140
2	200

Figure A-6. Side View of 0.5 m Ring or Conical Net (Adapted from QLM, 1973)

Table A-2

Description of Gear Used To Collect Ichthyoplankton in Hudson River Estuary, 1966-1974

Contractor: Northeast Biologist (HRFI)
Reference: Carlson and McCann, 1969

Period	Gear	Length:Mouth	Mesh Size (μ)	Flowmeter	Closing Device	Weighting
1966	1.5' (0.46m) conical net	4.3:1	300x500 500x800	Impeller type	None	Anchored
1967	1.5' (0.46m) conical net	4.3:1	300x500	Impeller type	None	3.6 kg mushroom anchor
1968	1.5' (0.46m) conical net	4.3:1	300x500 500x800 1500x1650 3300x3300	Impeller type	None	3.6 kg mushroom anchor
	3'x 3' (0.91m) pyramidal net	8:1	300x500 500x800 1500x1650 3300x3300	Impeller type	None	3.6 kg mushroom anchor

Contractor: Raytheon
Reference: Raytheon Company, 1971. Personal communication, David Crestin

Period	Gear	Length:Mouth	Mesh Size (μ)	Flowmeter	Closing Device	Weighting
Jul 1969-Feb 1970	1.5' (0.46m) conical net	4.7:1	300x500	None	None	17 kg depressor
Mar-Jul 1970	1.5' (0.46m) conical net	4.7:1	500	Mechanical	Throttling band	17 kg depressor

Contractor: NYU
Reference: New York University, 1973; 1974; 1976

Period	Gear	Length:Mouth	Mesh Size (μ)	Flowmeter	Closing Device	Weighting
1971-1972	0.5m conical net 1.0m conical net	7.6:1 3.8:1	571 1000	TSK TSK	None None	23 kg depressor 23 kg depressor
1973-1974	0.5m conical net 1.0m conical net 1.0m Hensen net	7.6:1 3.8:1 6:1	571 1000 571	G.O. 1031* G.O. 1031* G.O. 1031*	None None None	23 kg depressor 23 kg depressor 23 kg depressor

Contractor: QLM;LMS
Reference: Quirk, Lawler and Matusky Engineers, 1974; Lawler, Matusky and Skelly Engineers, 1975a, b. Personal communication with LMS staff

Period	Gear	Length:Mouth	Mesh Size (μ)	Flowmeter	Closing Device	Weighting
1971	0.5m conical net	3:1	363	TSK	None	14 to 18 kg depressor
1972	0.5m conical net	3:1	571	TSK	None	14 to 18 kg depressor
1973-1974	0.1m Hensen net	6:1	571	TSK	None	23 kg depressor

Contractor: TI, Ossining
Reference: Texas Instruments Incorporated, 1973

Period	Gear	Length:Mouth	Mesh Size (μ)	Flowmeter	Closing Device	Weighting
1972-1974	0.5m conical net 1.0m conical net	5:1 5:1	500 1000 1500 2000	G.O. 2030 G.O. 2030	None None	23 kg depressor 23 kg depressor

Contractor: TI, longitudinal river survey
Reference: Texas Instruments Incorporated, 1975a, 1975b

Period	Gear	Length:Mouth	Mesh Size (μ)	Flowmeter	Closing Device	Weighting
1973	1.0 m^2 Tucker trawl	8:1	505	G.O. 2030	Double-trip mechanism*	59 kg bar
	2.0 m^2 Tucker trawl	5:1	1800 3000	G.O. 2030	Double-trip mechanism*	141 kg bar
	1.0 m^2 epibenthic sled	8:1 5:1	505 1000 1800 3000	G.O. 2030	Double-trip mechanism*	None
1974	1.0 m^2 Tucker trawl	8:1	505	G.O. 2030	Double-trip mechanism*	110 kg bar
	1.0 m^2 epibenthic sled	8:1 5:1	505 3000	G.O. 2030	Double-trip mechanism*	None

*General Oceanics

Table A-3

Description of Gear Deployment Procedures Used To Collect Ichthyoplankton in Hudson River Estuary, 1966-1974

Contractor: Northeast Biologist
Reference: Carlson and McCann, 1969

Period	Speed	Duration (min)	Direction	Depth	Time of Day
1966	Anchored	15	NA	Surface to 1.5m from bottom	Day
1967-1968	0.8-0.9m/s	10	Countercurrent	Surface to bottom at 4.6m intervals	Day and Night

Contractor: Raytheon
Reference: Raytheon Co., 1971. Personal communication, David Crestin

Period	Speed	Duration (min)	Direction	Depth	Time of Day
Jul 1969-Feb 1970	Adjusted to keep surface net at surface	10	Countercurrent	Surface, bottom, and mid-depth	Day and Night
Mar-Jul 1970	Adjusted to keep surface net at surface	10	Countercurrent	Surface, mid-depth, and bottom	Day and Night

Contractor: NYU
Reference: New York University, 1973, 1974, 1976

Period	Speed	Duration (min)	Direction	Depth	Time of Day
1971-1973	0.7-1.1m/s	10	Countercurrent	Surface, mid-depth, and bottom	Day and Night
1974	Engine speed adjusted to 2000 rpm	10	Countercurrent	Surface, mid-depth, and bottom	Day and Night

Contractor: QLM;LMS
Reference: Quirk, Lawler and Matusky Engineers, 1974; Lawler Matusky and Skelly Engineers, 1975a, b

Period	Speed	Duration (min)	Direction	Depth	Time of Day
1971	1.2-1.7m/s	5	Countercurrent	Surface, mid-depth, and bottom	Day
1972	0.7-1.7m/s	5	Countercurrent	Surface, mid-depth, and bottom	Day and Night
1973	0.7-1.7m/s	5	Countercurrent	Surface to bottom at 3.0m intervals	Day and Night
1974	0.85-0.55m/s	5	Countercurrent	Surface, mid-depth, and bottom	Day and Night

Contractor: TI, Ossining
Reference: Texas Instruments Incorporated, 1973

Period	Speed	Duration (min)	Direction	Depth	Time of Day
1972-1973	0.9-1.2m/s	10	Countercurrent	Surface, bottom	Day and Night

Contractor: TI, longitudinal river survey
Reference: Texas Instruments Incorporated, 1975

Period	Speed	Duration (min)	Direction	Depth	Time of Day
1973	Tucker trawl, 0.9-1.2m/s Epibenthic sled 0.5-1.0m/s	5 or 2	Downriver	Surface, mid-depth, and bottom	Day and Night
1974	Tucker trawl, 0.9-1.2m/s Epibenthic sled, 0.5-1.0m/s	5	Downriver	Surface to bottom	Day and Night

NA = not applicable

APPENDIX B

METHODS FOR CALCULATING CORRECTION COEFFICIENTS
FOR COMPARING CATCH DATA FROM DIFFERENT GEAR

APPENDIX B

METHODS FOR CALCULATING CORRECTION COEFFICIENTS FOR COMPARING CATCH DATA FROM DIFFERENT GEAR

A correction coefficient $\widehat{\left(\frac{K_1}{K_2}\right)}$ for comparing catch efficiencies of different gear can be derived from the log transformation of the statistical model presented in Section II:

$$\log_e (D_{ij} + 1) = \log_e K_i + \log_e \mu + \log_e \varepsilon_{ij}$$

where

D_{ij} = catch per 1000 m^3 in tow j with gear i

K_i = proportion of μ caught by gear i

μ = expected number of organisms per 1000 m^3 in sampling area

ε_{ij} = random error

The "best linear unbiased" estimate of the natural log of the correction coefficient $\left(\log_e \frac{K_1}{K_2}\right)$ or $(\log_e K_1 - \log_e K_2)$ can be obtained (Graybill, 1961, theorem 11.1) by:

$$\widehat{\log_e K_1 - \log_e K_2} = \frac{\sum_{j=1}^{n_1} \log_e (D_{1j} + 1)}{n_1} - \frac{\sum_{j=1}^{n_2} \log_e (D_{2j} + 1)}{n_2}$$

where

n_i = number of tows for gear i

An untransformed estimate of the correction coefficient can be taken as

$$\widehat{\left(\frac{K_1}{K_2}\right)} = \exp\left(\frac{\sum_{j=1}^{n_1} \log_e (D_{1j} +1)}{n_1} - \frac{\sum_{j=1}^{n_2} \log_e (D_{2j} + 1)}{n_2}\right)$$

APPENDIX C

CATCH DATA OF THE 1974 GEAR COMPARABILITY STUDY

Table C-1

Mean Catch of Larval Striped Bass during 1974 Gear Comparability Study

Gear	Time	Date	No. of Samples	Mean Catch per 1000 m^3	Standard Deviation
1.0 m ring net	Day	6/24	10	5.5777	0.6698
1.0 m^2 Tucker trawl			8	5.7338	0.6295
0.5 m ring net	Day	6/24	10	5.6763	0.7460
1.0 m^2 Tucker trawl			10	5.2778	0.7669
1.0 m Hensen net	Day	6/24	6	5.3104	0.9843
1.0 m^2 Tucker trawl			7	6.0080	0.4772
0.5 m ring net	Day	6/26	6	3.6078	0.8463
1.0 m^2 Epibenthic sled			10	3.8498	0.6758
1.0 m ring net	Day	6/26	10	4.3183	0.2394
1.0 m^2 Epibenthic sled			9	3.7249	0.8321
1.0 m Hensen net	Day	7/2	5	3.2436	0.7857
1.0 m^2 Epibenthic sled			5	2.9895	0.4929
1.0 m ring net	Night	7/8	10	2.2168	1.0403
1.0 m^2 Tucker trawl			10	0.9450	1.3037
1.0 m Hensen net	Night	7/9,10	10	1.4382	1.3842
1.0 m^2 Epibenthic sled			10	2.2319	1.2148
0.5 m ring net	Night	7/11	8	0.7731	1.4646
1.0 m^2 Tucker trawl			9	0.5249	0.7881
1.0 m Hensen net	Night	7/10	10	1.5671	1.7204
1.0 m^2 Epibenthic sled			7	0.8139	1.4964
1.0 m ring net	Night	7/11	10	1.3130	0.9733
1.0 m^2 Epibenthic sled			5	1.3553	1.3839
0.5 m ring net	Night	7/11	8	0.6287	1.1643
1.0 m^2 Epibenthic sled			7	0.6816	1.1944
1.0 m Hensen net	Day	7/23	10	0.8481	0.9135
1.0 m^2 Epibenthic sled			4	0.4752	0.9505
1.0 m ring net	Night	8/1	8	0.3214	0.5953
1.0 m^2 Epibenthic sled			4	0.4900	0.9800

APPENDIX D

FLOWMETER READINGS FROM 1975 FILTRATION EFFICIENCY EXPERIMENTS

APPENDIX D

FLOWMETER READINGS FROM 1975 FILTRATION EFFICIENCY EXPERIMENTS

This appendix presents the graphical method for detecting erroneous flowmeter readings taken during the 1975 filtration efficiency experiments (net/no-net and sustained efficiency). The three flowmeter positions (A,B,C) shown in Figures D-1 through D-20 correspond to the flowmeter positions illustrated in Figure II-1 of Section II.

Readings from digital flowmeters were compared with the electronic flowmeter reading taken during the same tow. An adjusted flow index was computed by:

$$\text{Adjusted flow index} = \frac{X}{T} - S$$

where

X = distance traveled (cm) as measured by digital flowmeter

T = tow duration(s)

S = tow speed (cm/s) as measured by electronic flowmeter

Profiles, depicted by a line drawn between plots of the adjusted flow indices for the three flowmeter positions, were examined visually for outliers. Outliers could be caused by malfunction of one of the flowmeters, possibly because of clogging or the tow speed's effect on the precision of the meter. Since only the center flowmeter (position B) was used for analysis, data from a particular tow were excluded from analysis if the position B reading obviously fell outside the distribution of the majority of the readings (e.g., Figure D-2),

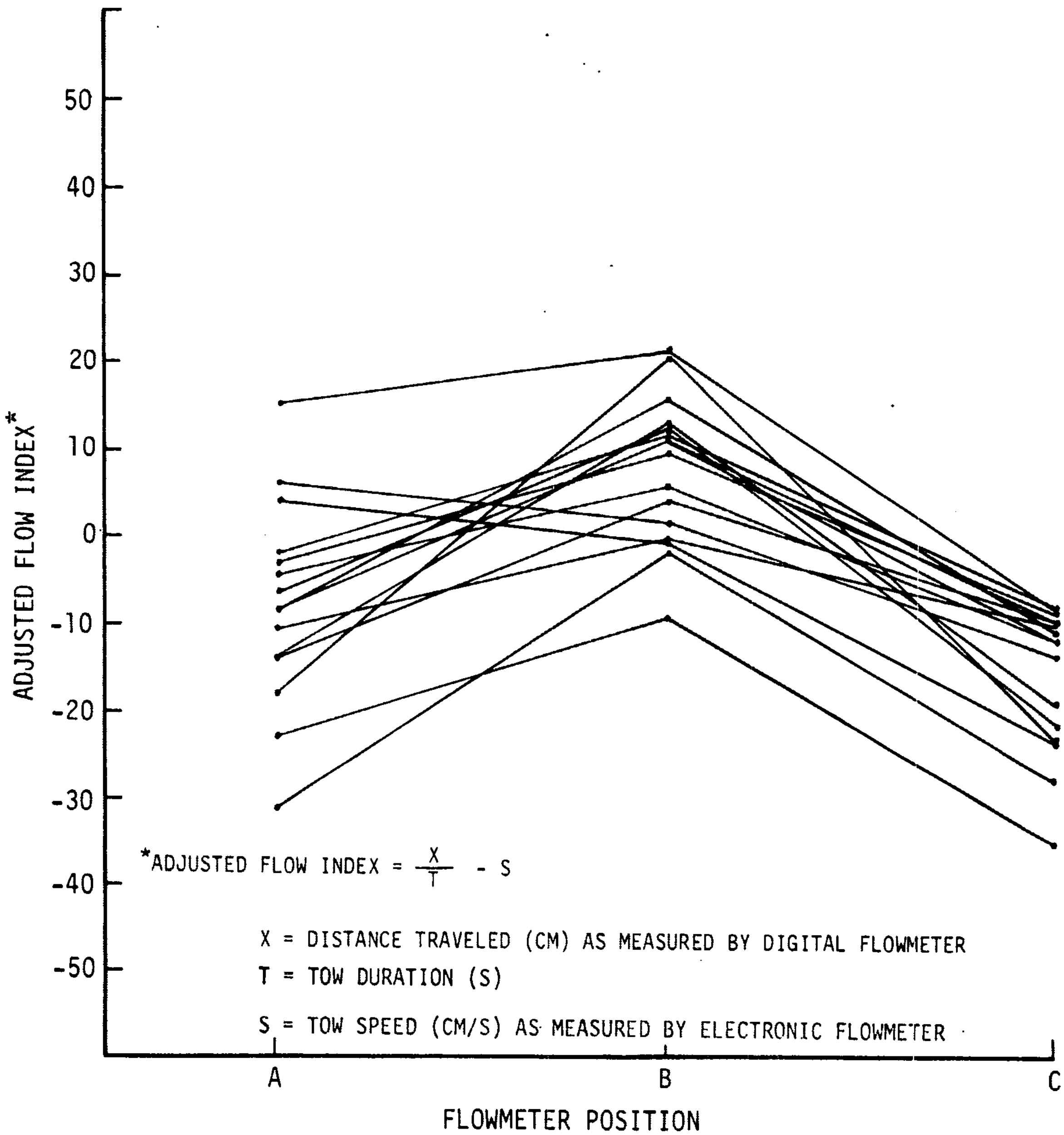


Figure D-1. Flowmeter Profiles for 15 Tows by 1.0 m^2 Tucker Trawl (with Net), 3 September 1975

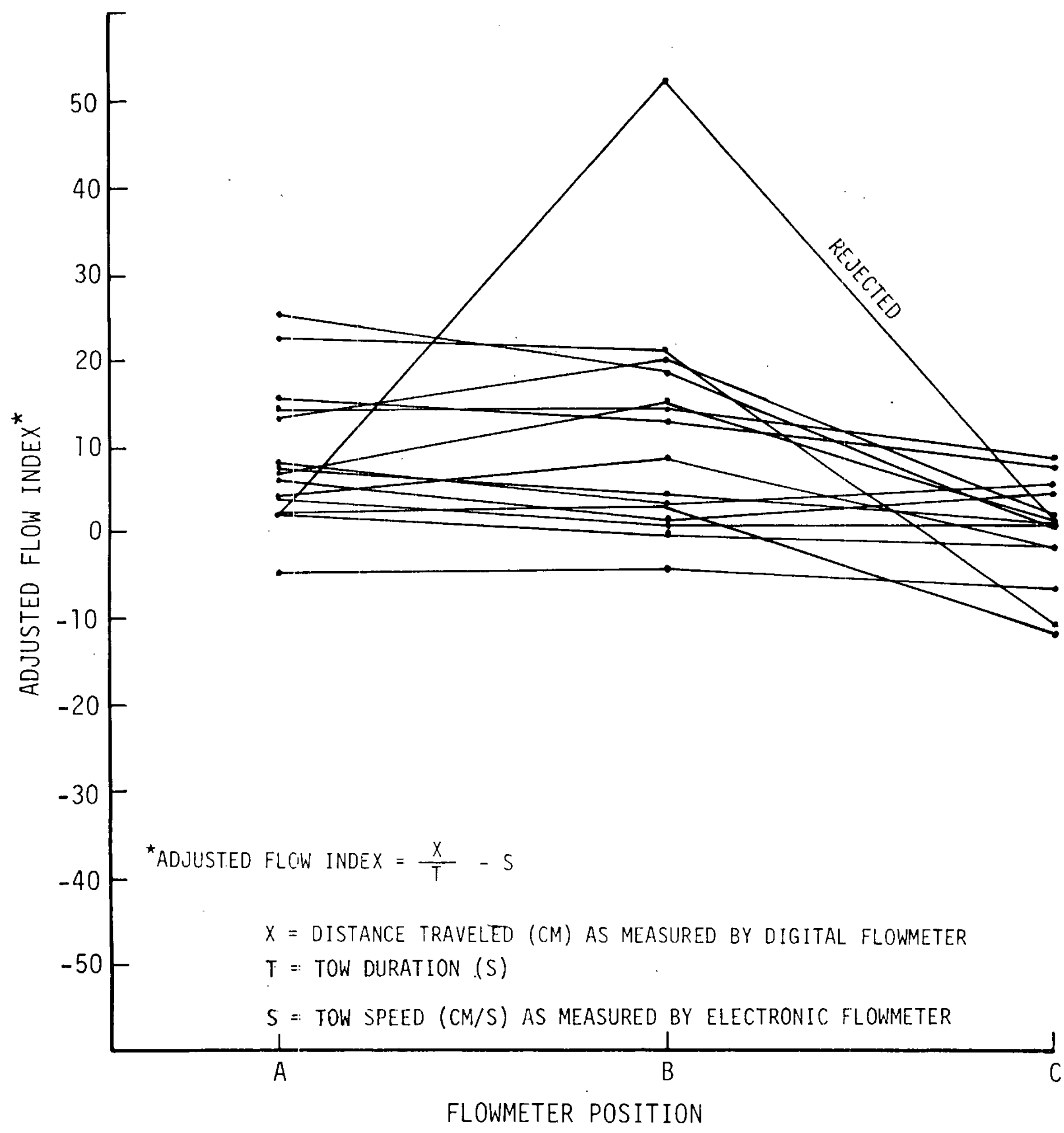


Figure D-2. Flowmeter Profiles for 15 Tows by 1.0 m^2 Tucker Trawl (without Net), 3 September 1975

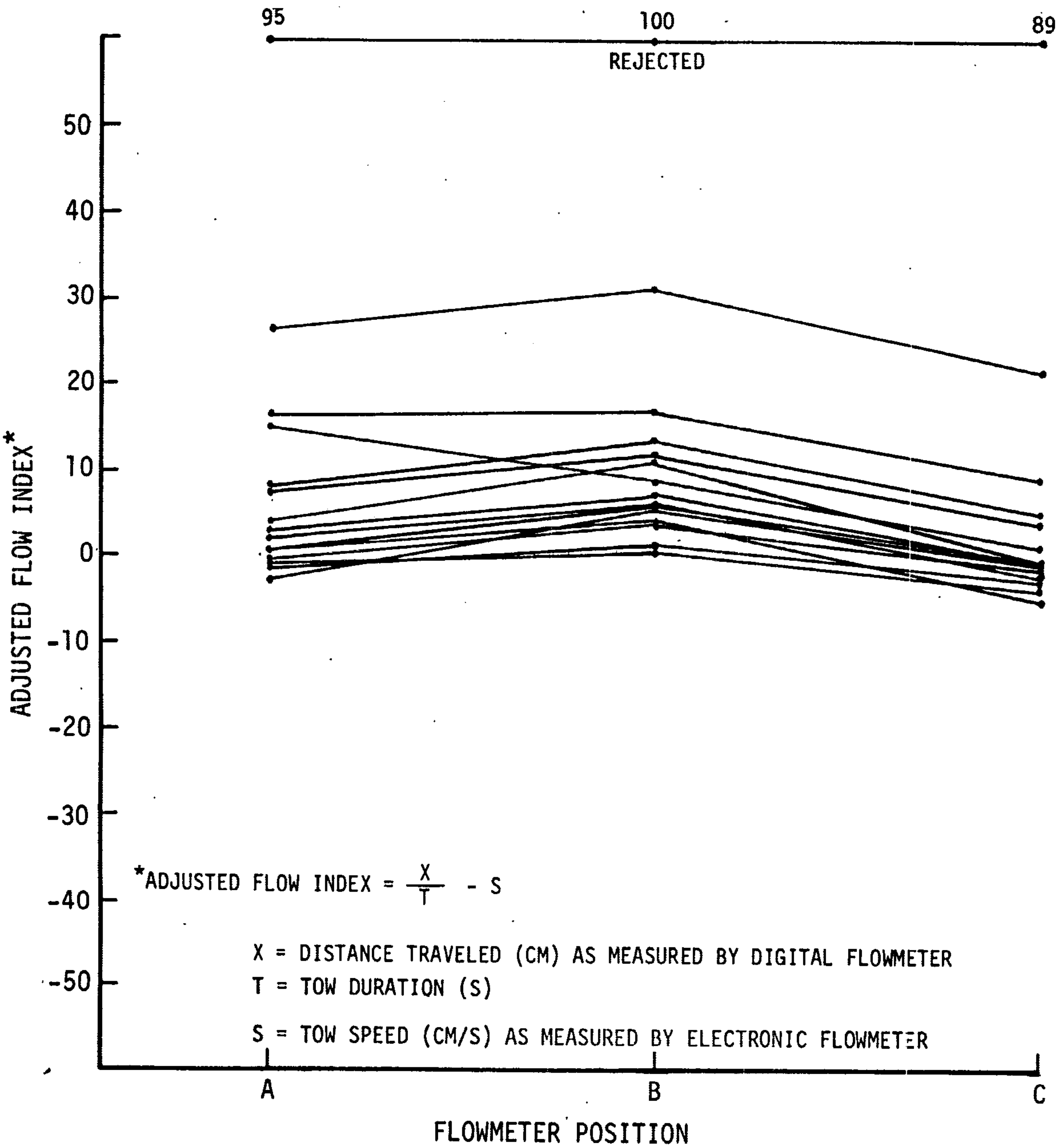


Figure D-3. Flowmeter Profiles for 15 Tows by 1.0 m^2 Epibenthic Sled (with Net), 4 September 1975

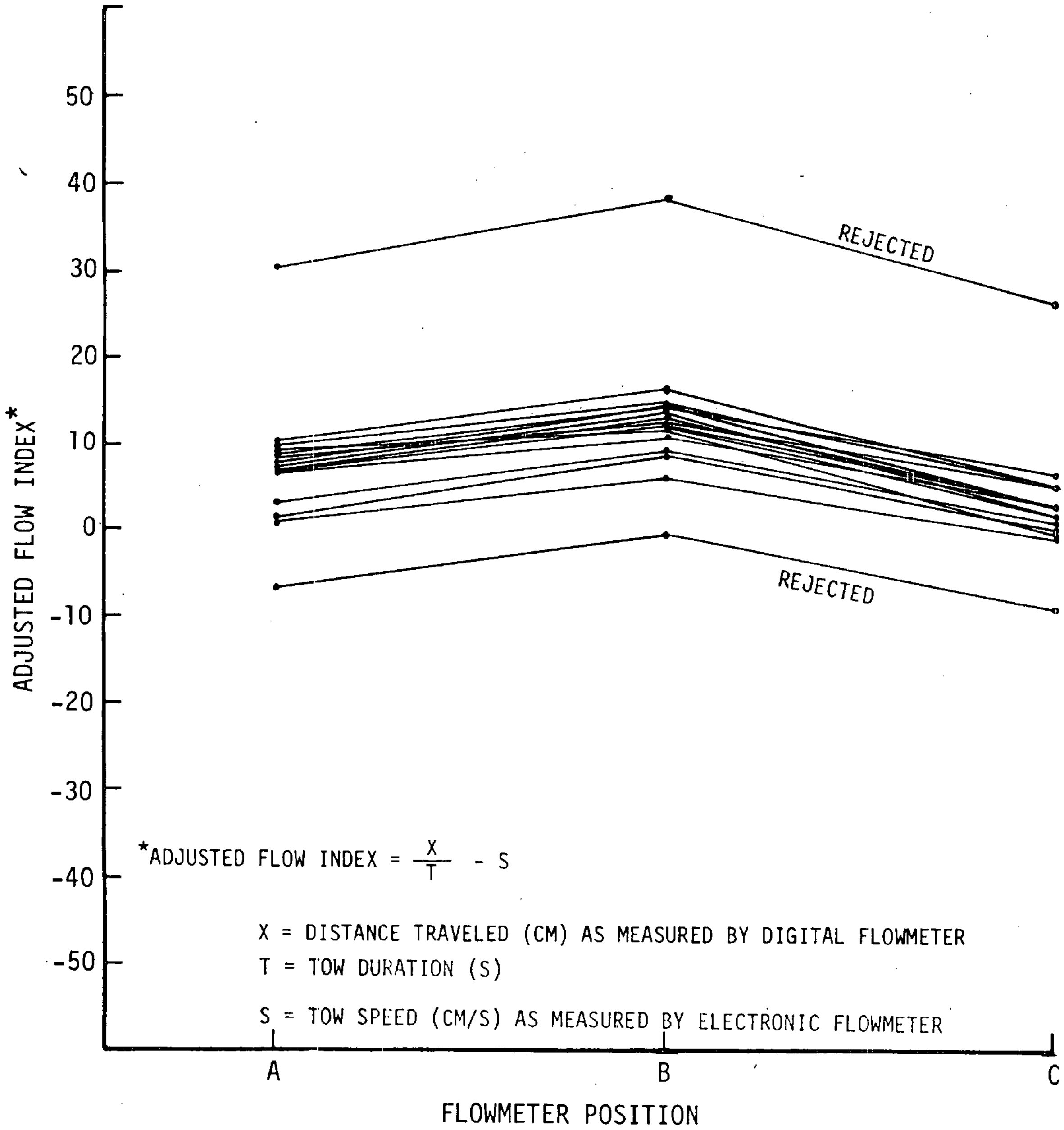


Figure D-4. Flowmeter Profiles for 15 Tows by 1.0 m^2 Epibenthic Sled (without Net), 4 September 1975

*ADJUSTED FLOW INDEX = $\frac{X}{T}$ - S

X = DISTANCE TRAVELED (CM) AS MEASURED BY DIGITAL FLOWMETER

T = TOW DURATION (S)

S = TOW SPEED (CM/S) AS MEASURED BY ELECTRONIC FLOWMETER

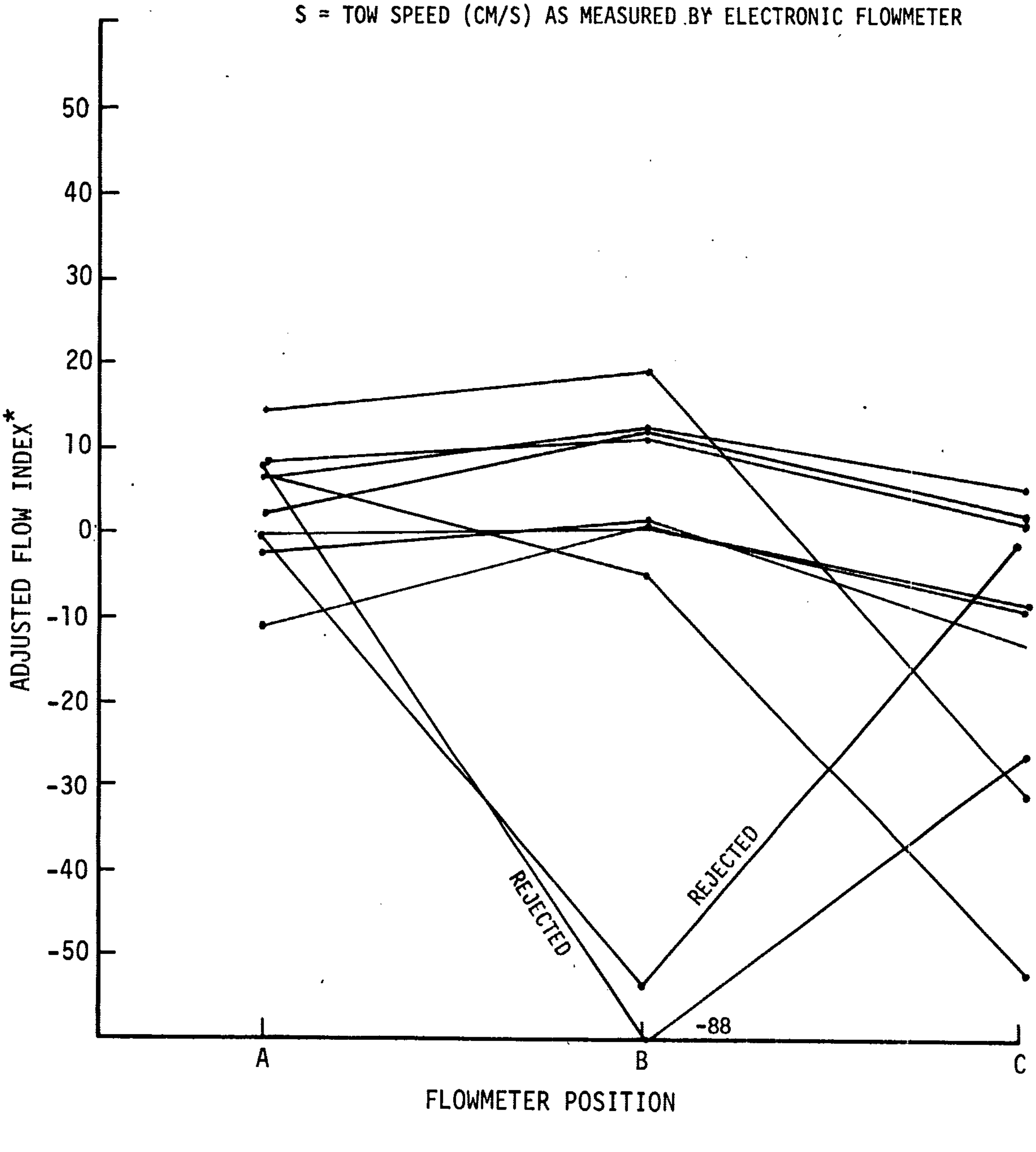


Figure D-5. Flowmeter Profiles for 2.5 Min Tows with 1.0 m^2 Epibenthic Sled, 5 September 1975

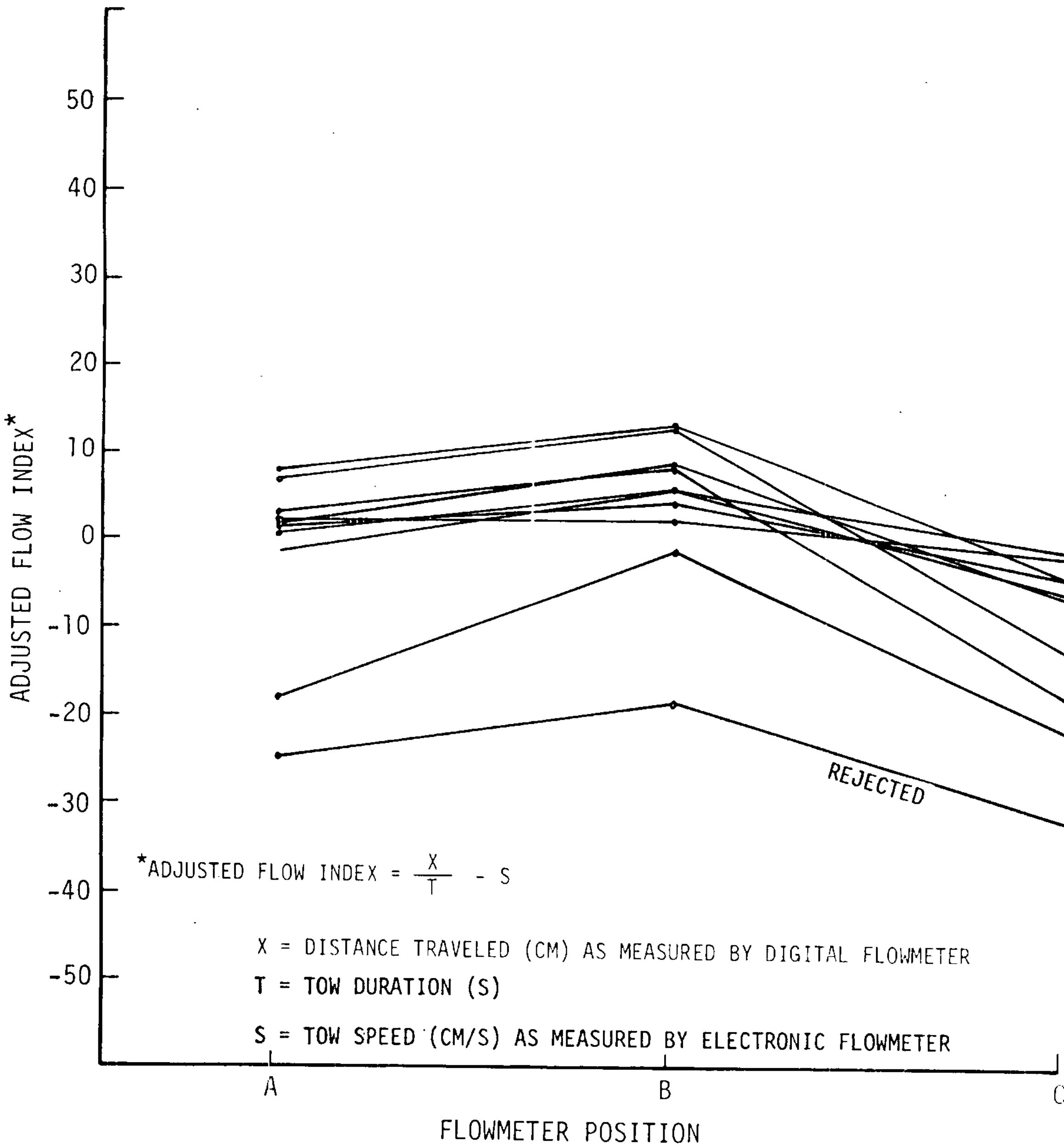


Figure D-6. Flowmeter Profiles for 5.0 Min Tows with 1.0 m^2 Epibenthic Sled, 8 September 1975

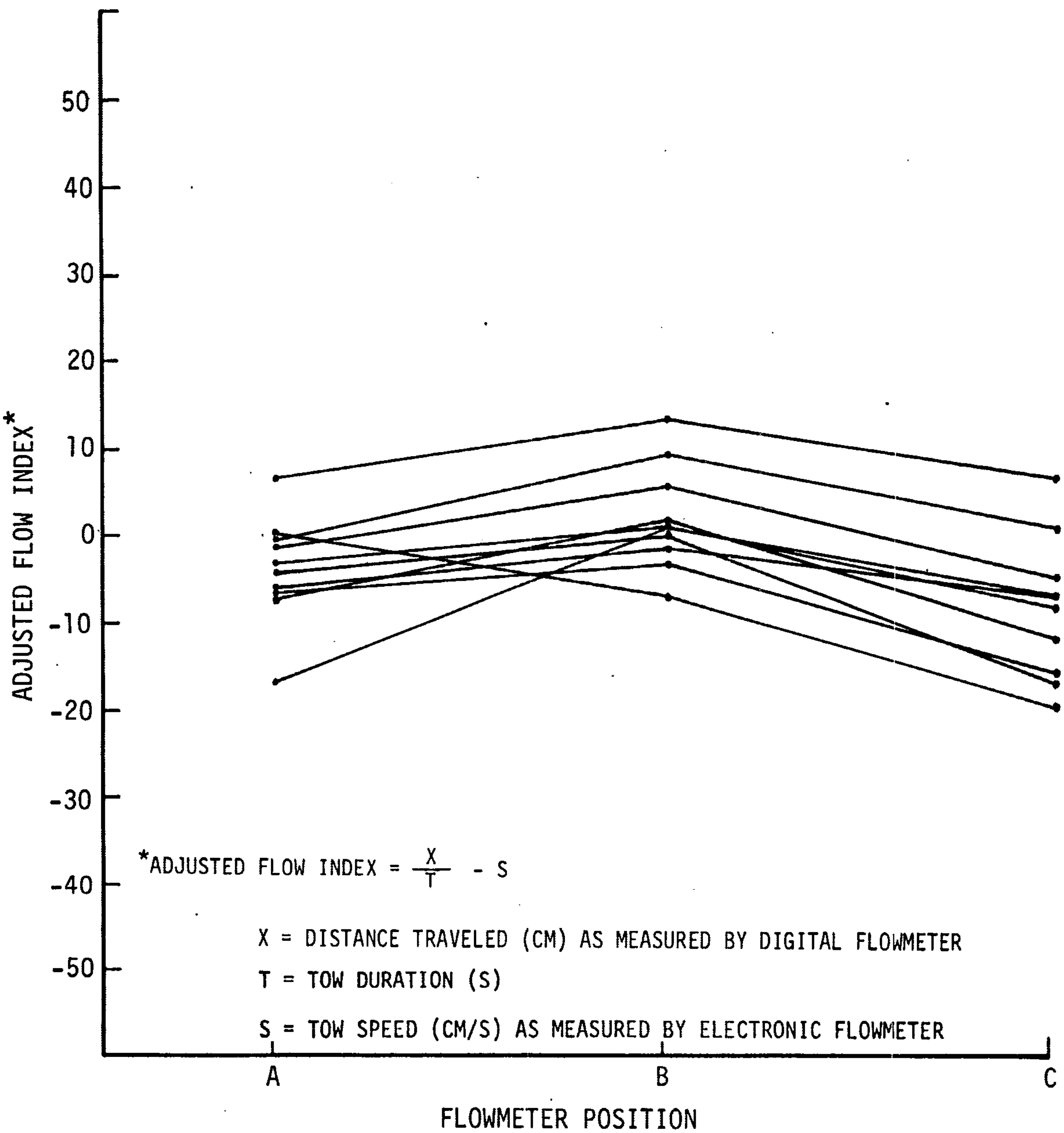


Figure D-7. Flowmeter Profiles for 7.5 Min Tows with 1.0 m^2 Epibenthic Sled, 8 September 1975

$$\text{*ADJUSTED FLOW INDEX} = \frac{X}{T} - S$$

X = DISTANCE TRAVELED (CM) AS MEASURED BY DIGITAL FLOWMETER

T = TOW DURATION (S)

S = TOW SPEED (CM/S) AS MEASURED BY ELECTRONIC FLOWMETER

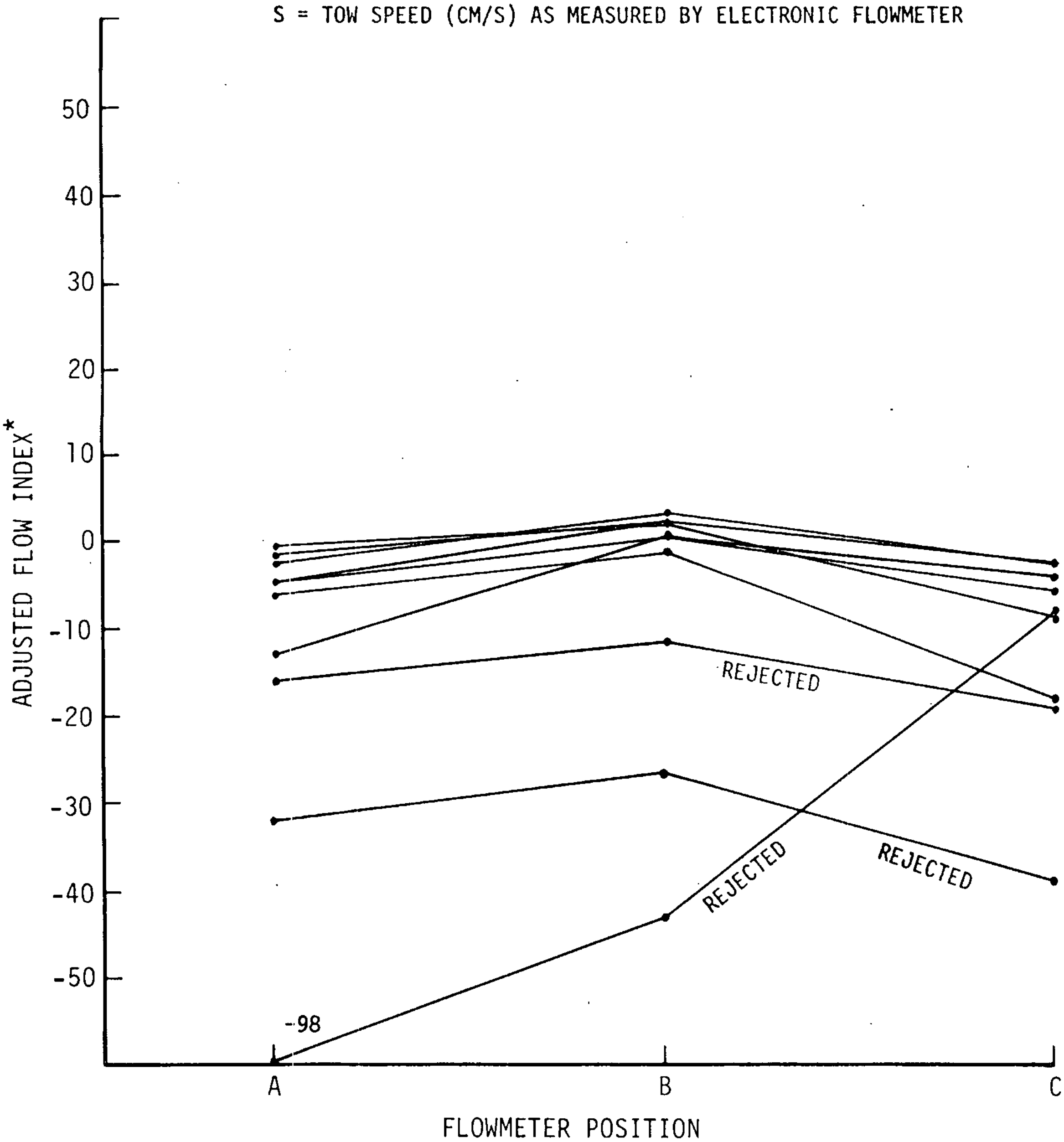


Figure D-8. Flowmeter Profiles for 10.0 Min Tows with 1.0 m^2 Epibenthic Sled, 9 September 1975

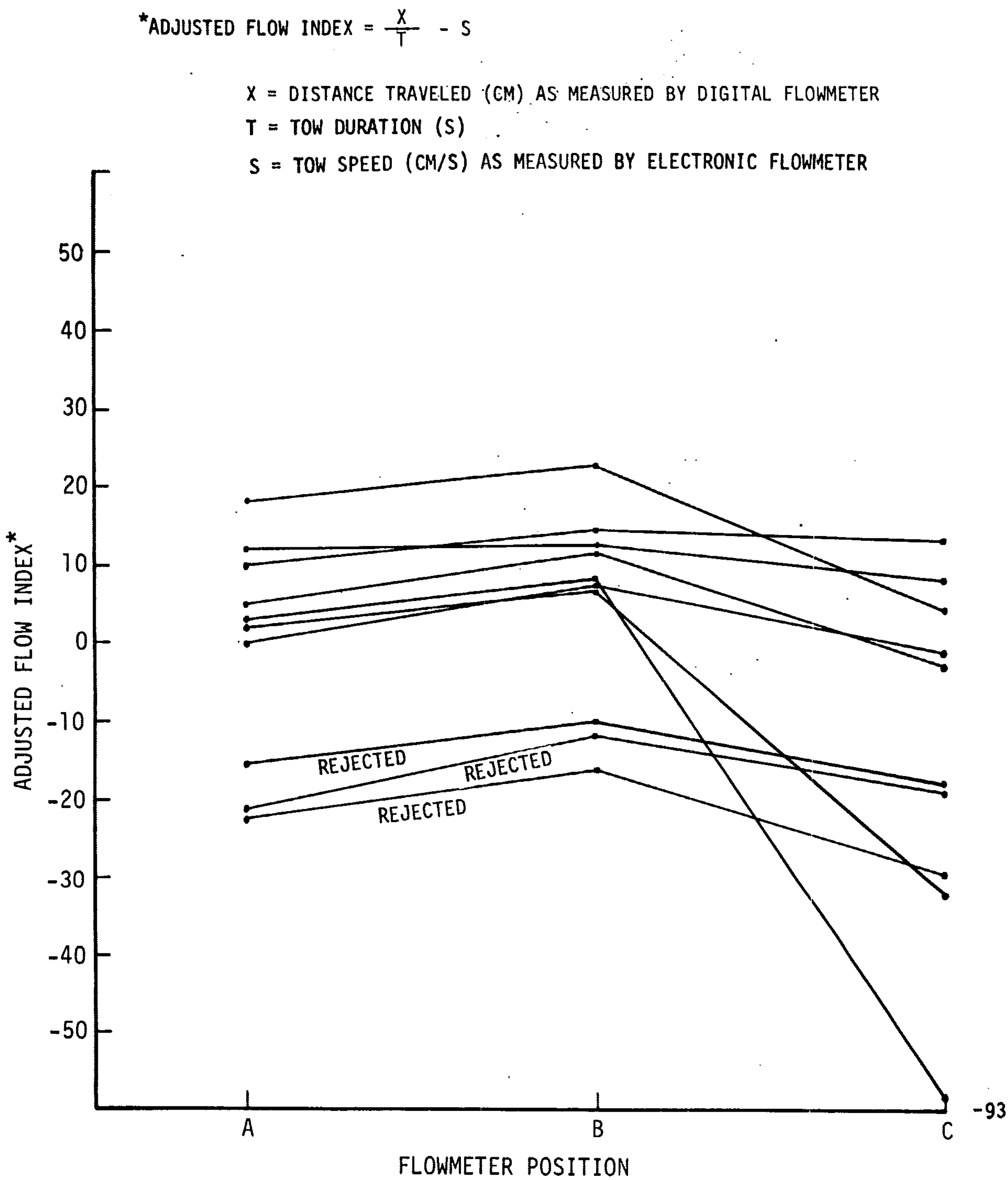


Figure D-9. Flowmeter Profiles for 12.5 Min Tows with 1.0 m^2 Epibenthic Sled, 9 September 1975

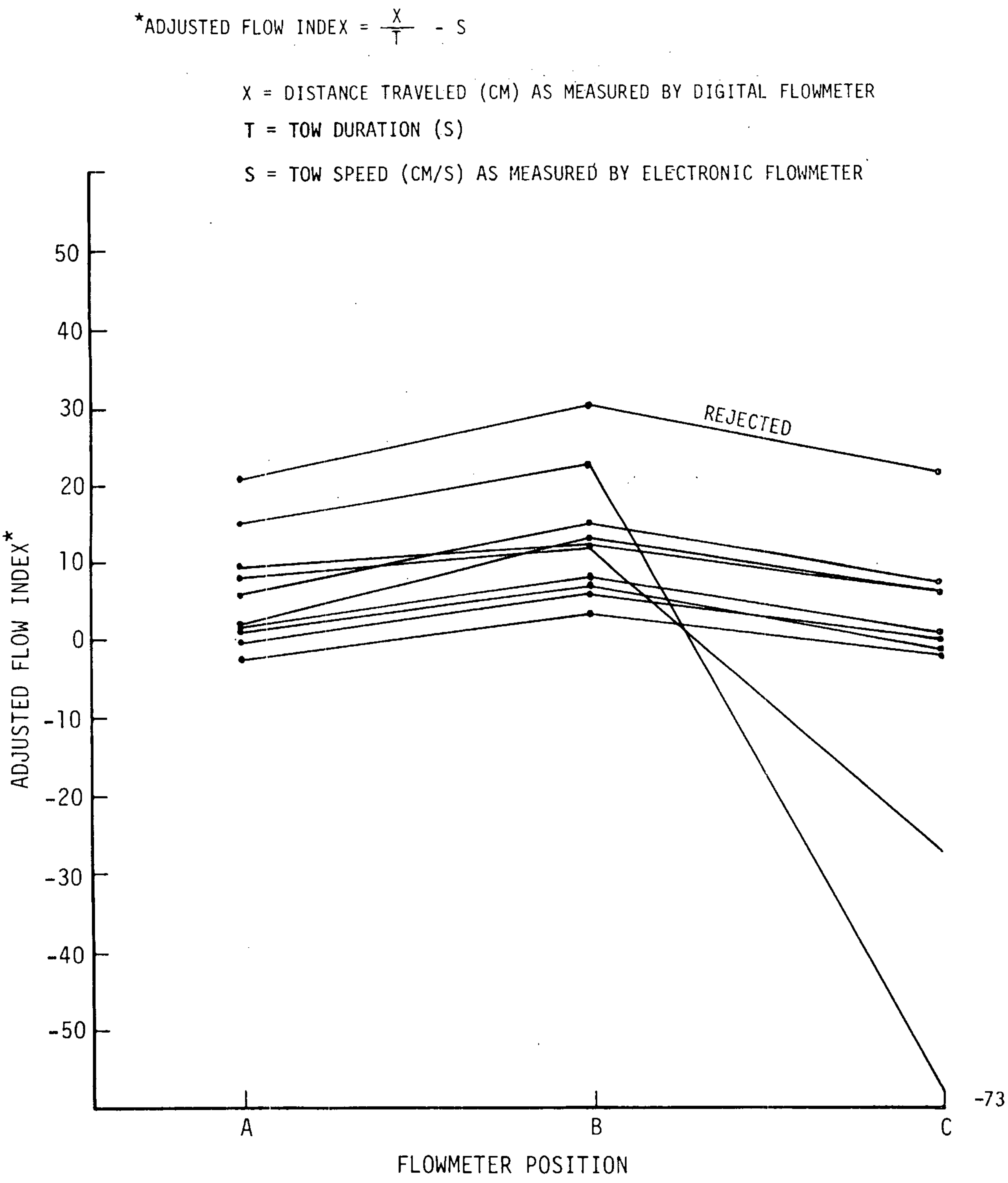


Figure D-10. Flowmeter Profiles for 15.0 Min Tows with 1.0 m^2 Epibenthic Sled, 10 September 1975

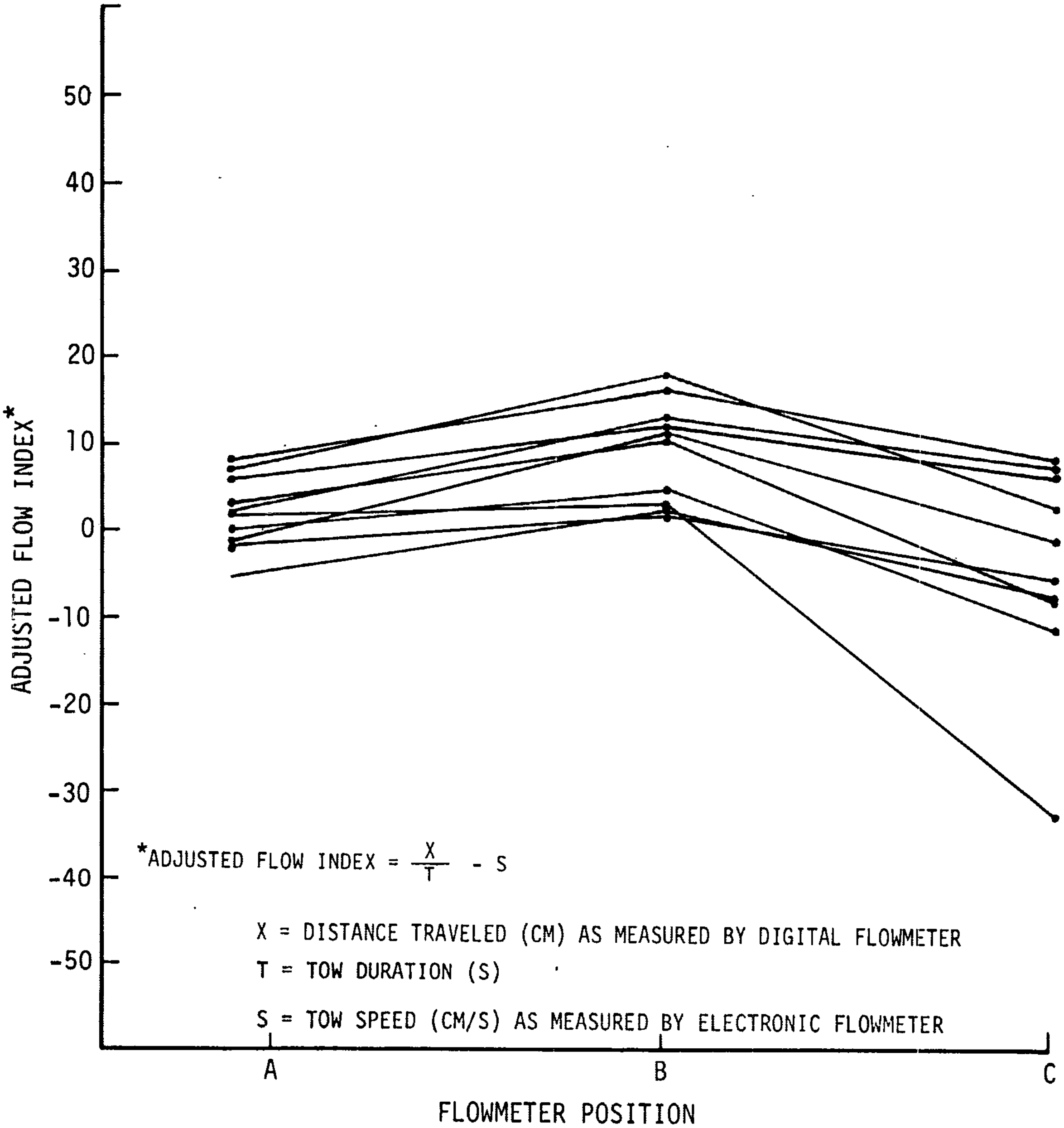


Figure D-11. Flowmeter Profiles for 17.5 Min Tows with 1.0 m^2 Epibenthic Sled, 10 September 1975

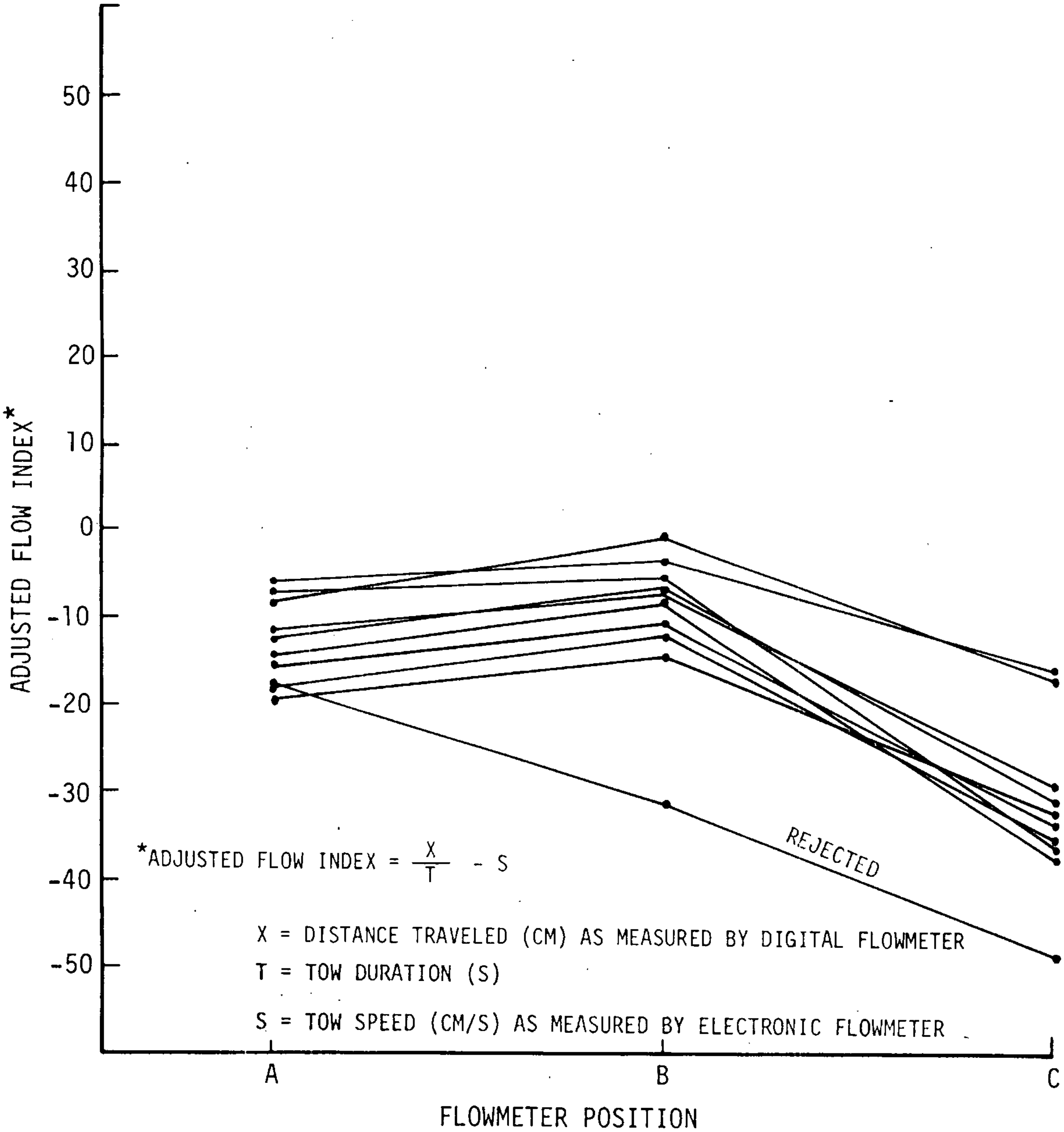


Figure D-12. Flowmeter Profiles for 20.0 Min Tows with 1.0 m^2 Epibenthic Sled, 11 September 1975

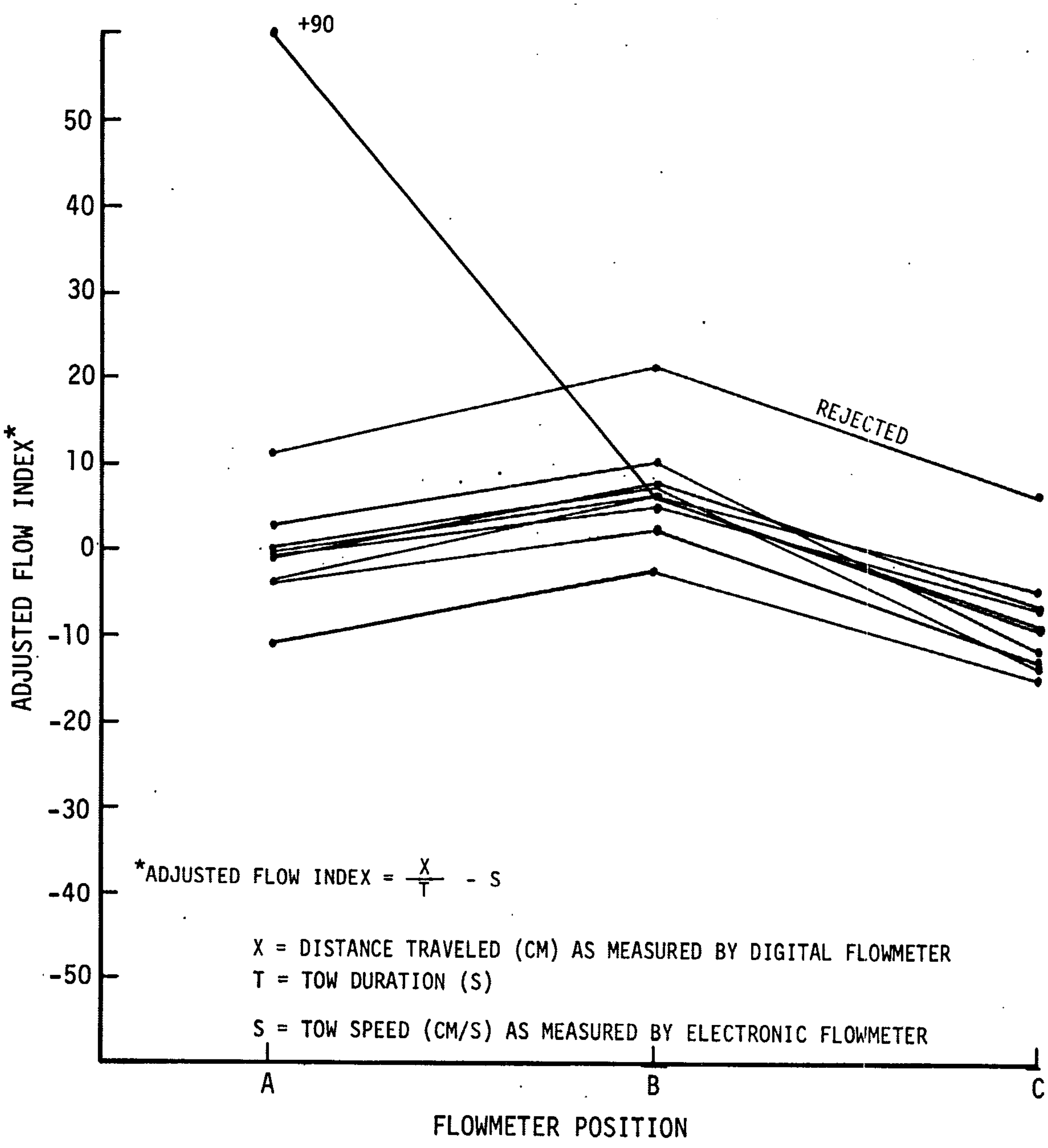


Figure D-13. Flowmeter Profiles for 2.5 Min Tows with 1.0 m^2 Tucker Trawl, 12 September 1975

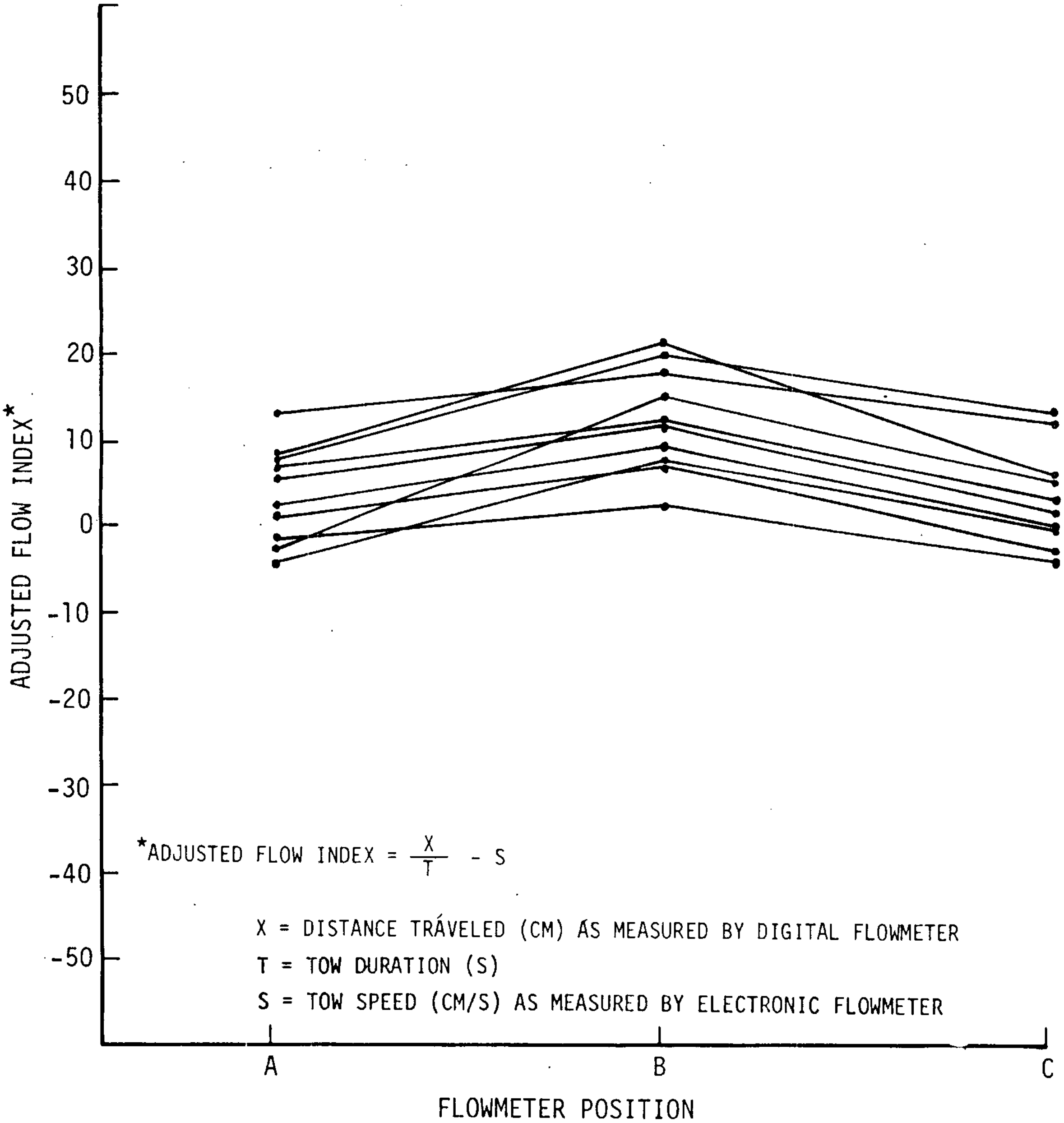


Figure D-14. Flowmeter Profiles for 5.0 Min Tows with 1.0 m^2 Tucker Trawl, 12 September 1975

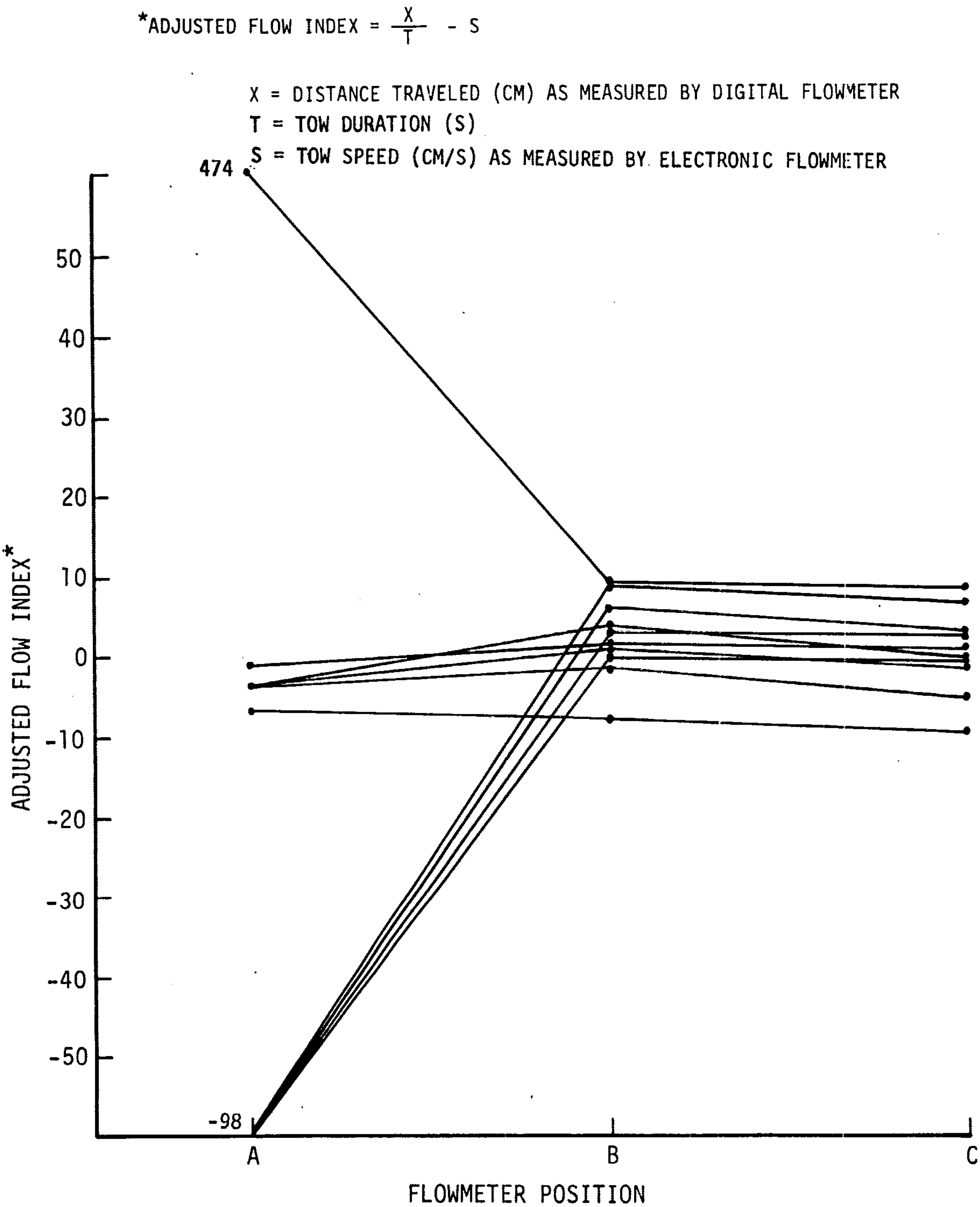


Figure D-15. Flowmeter Profiles for 7.5 Min Tows with 1.0 m^2 Tucker Trawl, 12 September 1975

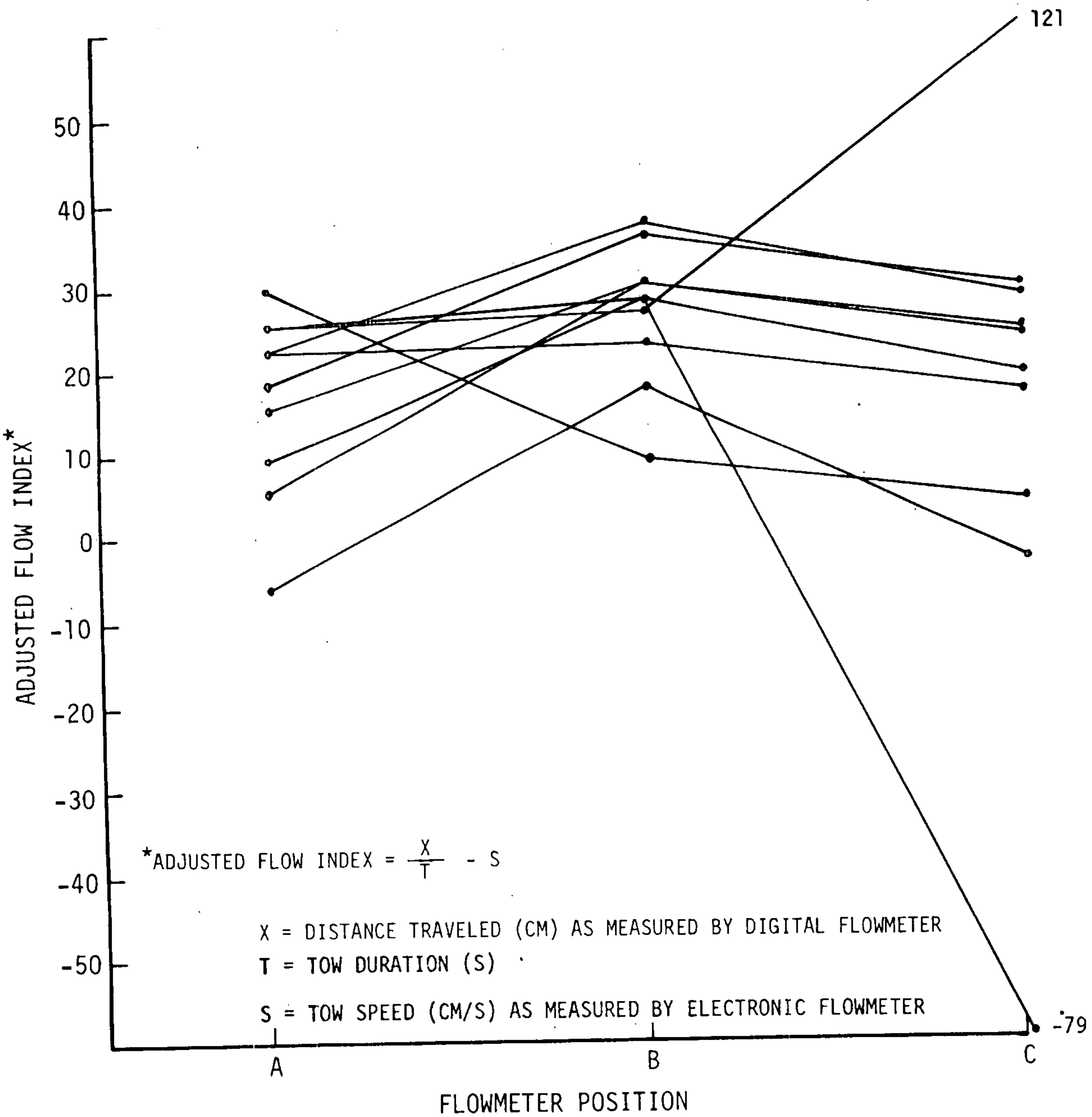


Figure D-16. Flowmeter Profiles for 10.0 Min Tows with 1.0 m^2 Tucker Trawl, 15 September 1975

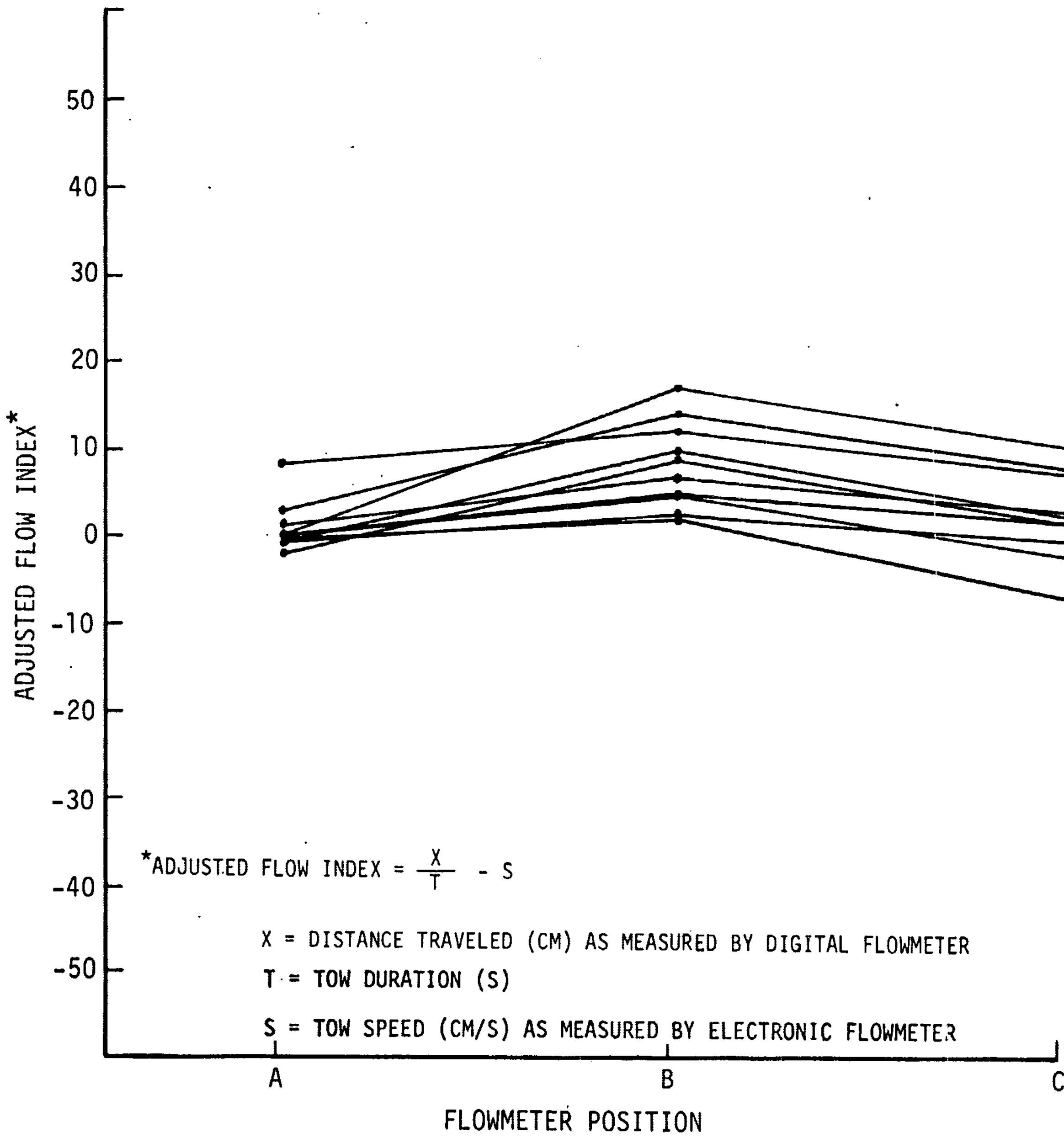


Figure D-17. Flowmeter Profiles for 12.5 Min Tows with 1.0 m^2 Tucker Trawl, 15 September 1975

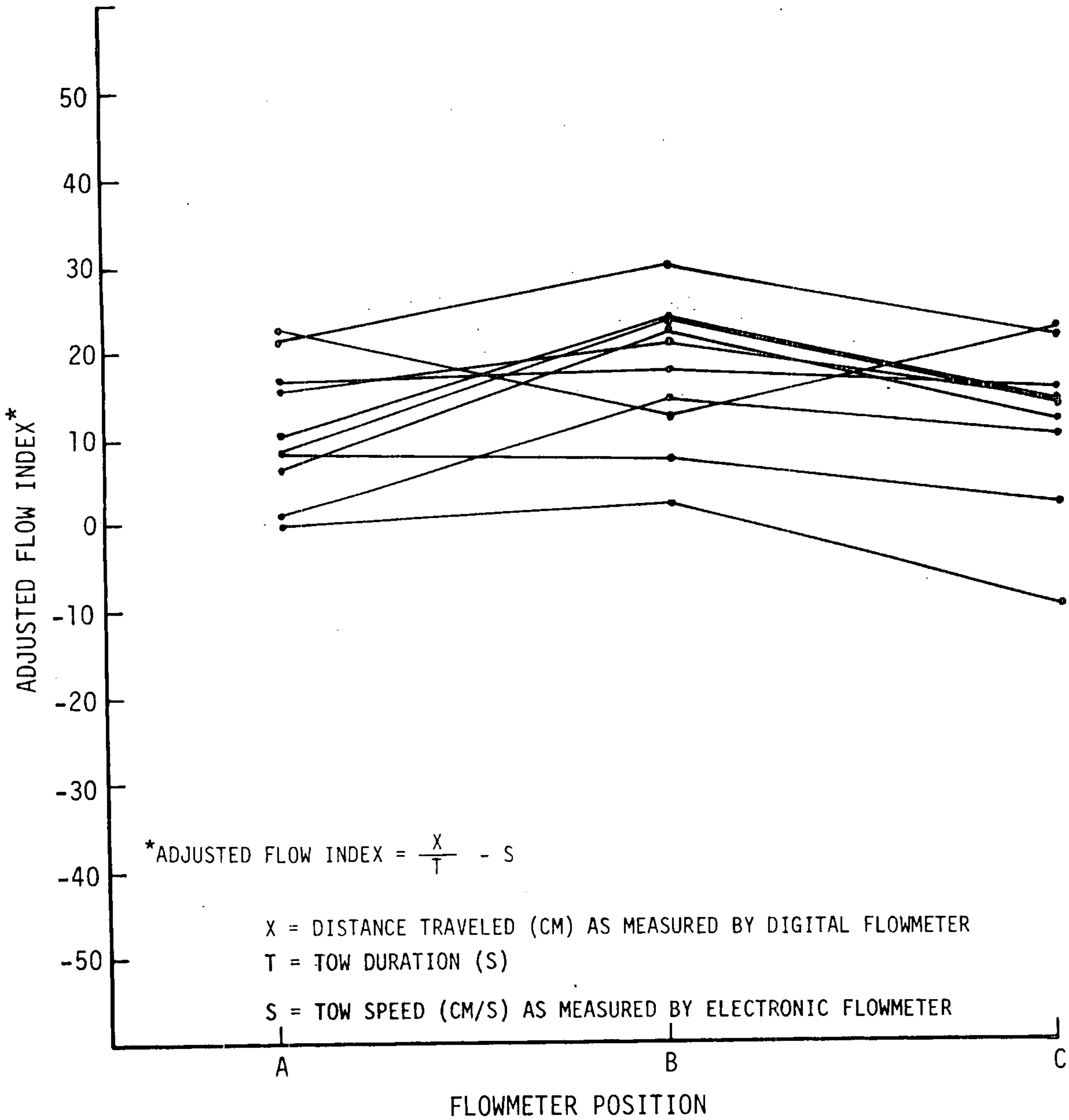


Figure D-18. Flowmeter Profiles for 15.0 Min Tows with 1.0 m^2 Tucker Trawl, 16 Sep

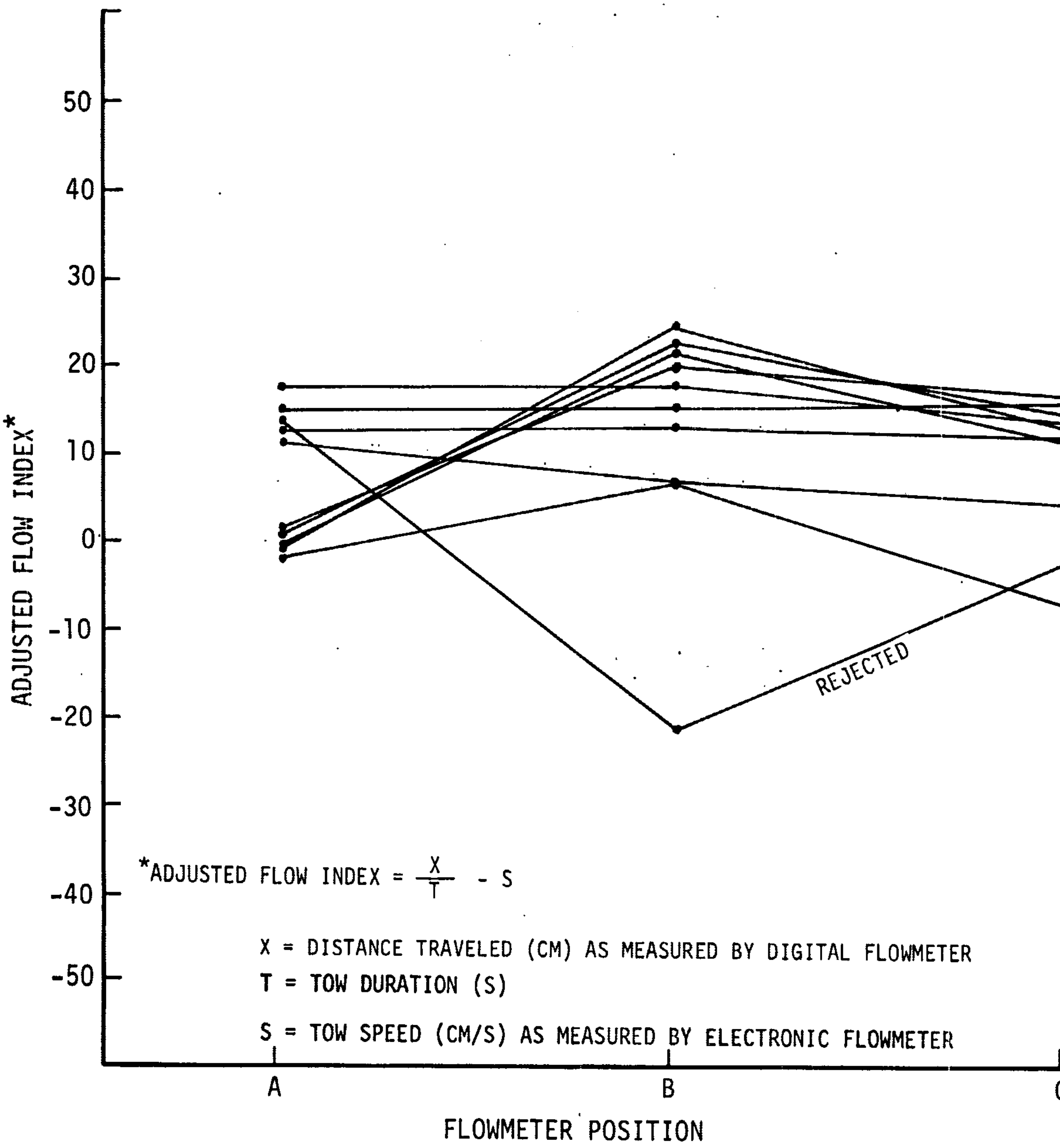


Figure D-19. Flowmeter Profiles for 17.5 Min Tows with 1.0 m^2 Tucker Trawl, 16 September 1975

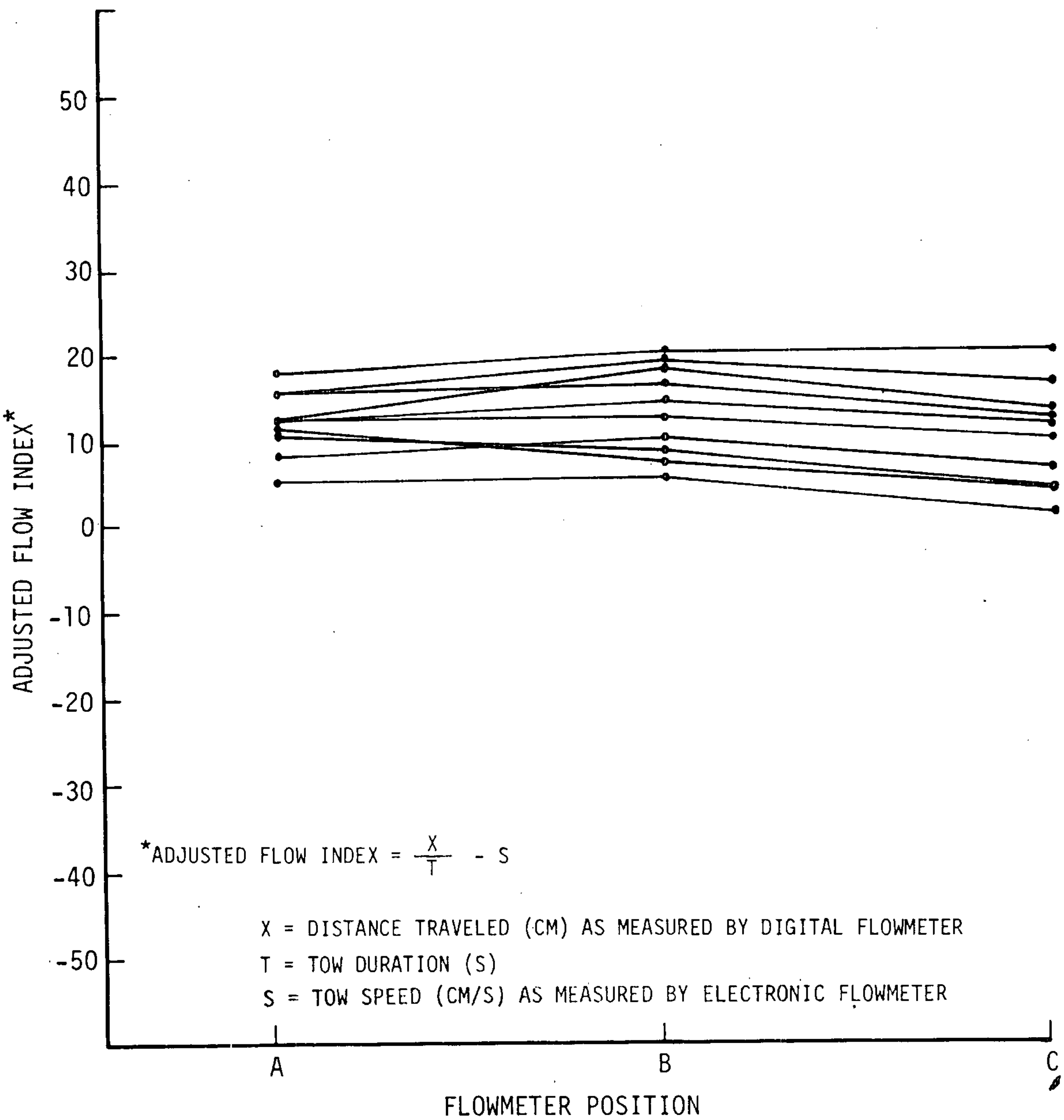


Figure D-20. Flowmeter Profiles for 20.0 Min Tows with 1.0 m^2 Tucker Trawl, 17 September 1975

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FINAL

1984 Gear Evaluation Program Standard Operating Procedures

Effective June 1984

Prepared for

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November 1984

LMS SOP 115-142

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1984 Gear Evaluation Program
Standard Operating Procedures

GEF I

OBLIQUE VERSUS DISCRETE TUCKER TRAWLS STANDARD OPERATING PROCEDURES

1. OBJECTIVE

The objectives of the oblique versus discrete Tucker trawl survey are:

- o Evaluate and statistically compare population estimates derived from oblique tows and discrete horizontal tows using a 1.0 m^2 Tucker trawl.
- o Determine and compare population parameters, including species composition, length frequency, and developmental stages between oblique and horizontal tows.
- o Through either asymptotic population density estimates or percent accuracy calculations, determine the appropriate number of samples from each technique needed to define the ichthyoplankton population.

2. STATION DESCRIPTIONS

This survey is conducted during a four week period in June and early July. Two river regions are selected each week (RM 34-61) based on high target species abundances (refer to GEFIV-1).

During two of the four weeks, 15 tows with each gear type are conducted in two regions at randomly selected stations. During the other two weeks, replicate sampling effort or 30 tows with each gear type are conducted in each of two regions. Sampling is conducted during the night for all four weeks.

3. SAMPLE SITE SELECTION

Primary and alternate channel sampling sites are randomly selected for each river run. These sites are plotted on Hudson River charts as per Con Edison Sample Site Selection SOP FS IX.

4. FIELD GEAR

The following items of equipment are required for each survey:

- o Two - 1.0 m^2 Tucker trawls with frames
- o One - Wire angle meter (inclinometer)
- o Two - Double trip mechanisms (DTRMs) with messengers

- o Three - General Oceanics digital velocity meters (Model 2030)
- o Two - General Oceanics electronic velocity meters (Model 2031)
- o Two - General Oceanics meter readouts (Model 2035 MK III)
- o Thirty - Sample containers
- o Thirty - Sample labels, data sheets, etc.
- o Five - Gallons 10% buffered formalin
- o Two - Stopwatches
- o One - Depth sensor with readout
- o Two - Hydrolab water quality meters
- o Ten - Dissolved oxygen bottles, with chemicals
- o One - Niskin water sampler
- o Ten - Conductivity bottles
- o Two - Coolers with ice
- o One - Length board and scale for sturgeon analysis in the field

5. FIELD PROCEDURES

5.1. Sample Site Location

5.1.1. Sample sites designated on allocation charts are located by landmarks, aids to navigation, and soundings.

5.1.2. Alternate sites within the same region are used if primary sites cannot be sampled.

5.2. Gear Deployment

If adequate winch power and riggings are available, simultaneous towing of the discrete and oblique nets is preferred. Both nets are initially set closed at the surface, and tripped open within one minute of each other. If the nets are set independently, the sequence of tows at each station are randomly chosen. Detailed sampling techniques are outlined in Sections 5.2.1. and 5.2.2.

5.2.1. Discrete Horizontal Tows. All discrete tows are conducted according to the protocol outlined in the Consolidated Edison Standard Operating Procedure for Longitudinal River and Fall Shoals Surveys (FS VII).

5.2.2. Oblique Tows. The Tucker net and bucket are checked thoroughly for holes and repaired if needed.

5.2.2.1. G.O. meters - The digital probe is mounted in the center of the mouth of the net. The meter is read before and after each tow. The electronic probe and readout are hand spin tested before mounting the probe on the side boom.

5.2.2.2. Station and net depth - The captain locates the station using the weekly sample site allocation chart.

The oblique tow is conducted from the surface to 10 ft from the bottom in a step-like technique consisting of 10 intervals. The intervals are calculated by determining the total cable length required to sample within 10 ft of the station bottom (refer to GEFIV-2). The total cable length is divided into 10 equal intervals, with each resultant interval sampled for 30 sec.

Example: Station is 40 ft deep. GEFIV-2 shows that the captain must let out 12.9 m of cable to fish the net at 30 ft (40'-10'). The net is set at the surface for 30 sec, then lowered to each succeeding depth interval by paying out approximately 1.3 m of cable for each 30 sec interval.

As soon as the gear is set, the messenger is released to open the net. Two stop watches are used, one to time sample duration, and the other to time the 30 sec depth intervals. Note: In 20 ft of river depth, the net may be set and retrieved open. The Tucker net cannot sample the water column any closer than 10 ft to the bottom.

The tow speed ranges from 0.9 m/sec to 1.1 m/sec. Speed must be adjusted during the tow to maintain a 45° wire angle. An electronic G.O. flowmeter is used to determine surface tow speed. If the electronic system fails, speed is estimated based on engine RPM. Both events are noted under Comments on the appropriate data form.

Net depth for the oblique tow is monitored during each tow using a pressure transducer, located on the net, with on-deck strip recorder. When the depth monitor is not scheduled to be used (as scheduled by the supervisor), net depth is maintained using the cable lengths as outlined in Table GEFIV-2.

Tow duration for oblique tows averages between 5 and 6 min. The time that it takes to lower the net to each depth interval is included in the total sample time.

A maximum of two depth intervals may be eliminated if the station depth shallows up during an oblique tow. The sample is void (use code 5) if more than two intervals are dropped.

5.2.2.3. Sample retrieval - A messenger is released to close the net; simultaneously, the stop watches are stopped.

The gear is retrieved and the net is washed down to concentrate the sample in the cod end bucket.

Simultaneously, the final flowmeter reading is recorded and the difference calculated. Acceptable ranges of flowmeter differences are outlined in Con Edison SOP FSX-28 and GEFIV-6, and are as follows:

Tow Duration (min)	Acceptable Range of Flowmeter Differences
5	3,566 to 19,007
6	4,279 to 22,808
7	4,992 to 26,610

Tow direction and sample inventory numbers are recorded on the river chart.

5.2.2.4. Use codes - All samples are either use code 1 (valid) or 5 (void) (refer to GEFIV-7).

Samples are assigned a use code 5 and new samples are taken at an alternate location if any of the following occur:

- flow meter reading is out of acceptable range of differences
- the double trip mechanism (DTRM) malfunctions
- the gear hangs down
- station shallows up to a point that more than two depth intervals are eliminated during a tow
- any other sampling problem occurs which affects the quantitative integrity of the sample

The captain may retake a sample if he feels that any other problems have prevented collection of a valid sample.

Any sample of seven or more containers composed mostly of detritus and debris is assigned a use code 5.

Use code 5 samples retain their original inventory number and the next attempt receives the next successive number. An explanation of use codes is recorded under Comments on the data sheet.

5.3. Field Processing of Samples

5.3.1. Use Code 1 Samples. The contents of the cod end bucket are poured into a sieve of equal mesh size to remove excess water. The cod end bucket is rinsed from the outside with river water to remove any residual sample. Depending on the size of sample contents, a funnel may be placed into a sample jar and the contents of the sieve washed into the jar. A pan or bucket is placed under the sample jar to catch any sample spillage.

All organisms are placed into a container preserved with 10% buffered formalin and retained for laboratory analysis. (Note: All large fish are rendered immobile before placing into the container.) The container is labeled externally with a printed label and a label containing the sample number is placed inside the container. For samples with few fish, the fish may be placed in with the ichthyoplankton sample.

5.3.2. Use Code 5 Samples. Samples do not require field or laboratory processing.

5.3.3. Special Handling. Refer to GEFIV-8.

5.3.4. Laboratory Storage. Upon return to the laboratory, samples are taken to the sample storage area.

6. WATER QUALITY SAMPLE REQUIREMENTS

Surface, mid-depth, and bottom in-situ water chemistry measurements are taken at four randomly selected channel locations for temperature (0.1°C), dissolved oxygen (0.1 ppm), and conductivity (μs/cm). Sampling protocol is outlined in the Con Edison SOP for Long River Ichthyoplankton Water Chemistry Field Sampling (FSWC). If a night's sampling schedule does not incorporate one of the water quality stations, the Captain randomly selects one channel station to sample. All results are recorded as shown in GEDC-2.

7. CAPTAIN's DAILY REPORT

A daily captain's report is filled out following each survey, as shown in Attachment GEFIV-9.

8. DATA REQUIREMENTS

Refer to GEDCI for an example of the field data sheet and appropriate data coding instructions. GEFIV-10 gives an example of the field label to be attached to each sample. GEFIV-11 outlines the field task code list to be used during the program.

9. QUALITY ASSURANCE

Field quality assurance is under the direction of quality assurance supervisor. SOP GEQCI specifies the QA procedures used during the 1984 Gear Evaluation program.

SPEED TOW EVALUATION: TUCKER TRAWL & EPIBENTHIC SLED STANDARD OPERATING PROCEDURES

1. OBJECTIVE

The objectives of the tow speed evaluation survey are to:

- o Determine the effect of tow speed on net filtration and catch efficiency of the discrete and epibenthic sled Tucker trawls.
- o Determine whether increased tow speed will increase the observed concentrations of the catches by reducing net avoidance.

2. STATION DESCRIPTIONS

This survey is conducted four times between mid-June and late-July. River regions (RM 34-61) are selected based on high abundance of post-yolk-sac through early juvenile target species (refer to GEFIV-1).

Each of the four surveys will consist of a series of tows with each gear, arranged in blocks with three tow velocities in each block. All tows of each gear will be completed within one night and are done in the same area. The area for testing is selected for high abundance of target species and life stages, available towing depth, and bottom type for the sled. The order of the three velocities in each block is randomized.

3. SAMPLE SITE SELECTION

Primary and alternate channel sampling sites are randomly selected for each river run. These sites are plotted on Hudson River charts as per Con Edison Sample Site Selection SOP FS IX.

4. FIELD GEAR

The following items of equipment are required for each survey:

- o One - epibenthic sled with Tucker trawl
- o Two - 1.0 m^2 Tucker trawls with frames
- o One - wire angle meter (inclinometer)
- o Two - Double trip mechanisms (DTRMs) with messengers
- o One - bar with 103 lb of additional weight for Tucker trawl
- o 100-lb of additional weight for epibenthic sled
- o Three - General Oceanics digital velocity meters (Model 2030)
- o Two - General Oceanics electronic velocity meters (Model 2031)
- o Two - General Oceanics meter readouts (Model 2035 MK III)
- o Thirty - sample containers

- Sixty - sample labels, data sheets, etc.
- Five - gallons 10% buffered formalin
- Three - stopwatches
- Two - Hydrolab water quality meters
- Twelve - dissolved oxygen bottles, with chemicals
- One - Niskin water sampler
- Twelve - conductivity bottles
- Two - coolers with ice
- One - length board with scale for sturgeon

5. FIELD PROCEDURES

5.1. Sample Site Location

5.1.1. Sample sites designated on allocation charts are located by landmarks, aids to navigation, and soundings.

5.1.2. Alternate sites within the same region are used if primary sites cannot be sampled.

5.2. Gear Deployment

5.2.1 Discrete Horizontal 1.0m^2 Tucker Tows. All discrete tows are conducted according to the protocol outlined in the Consolidated Edison Standard Operating Procedure for Longitudinal River and Fall Shoals Surveys (FS VII), incorporating the additions described below.

5.2.1.1. A block of three tows are conducted at each site. The desired tow velocities, as measured at the surface with a General Oceanics velocity meter, is 1.0 m/sec, 1.4 m/sec, and 1.8 m/sec. The boat velocity may be adjusted if the slowest tow velocity possible due to tidal current conditions is above 1.0 m/sec.

Example: The slowest possible tow velocity is 1.3 m/sec. The difference between this speed and 1.0 m/sec is used as the increment between the other tows at this site. The three tow velocities would then be 1.3, 1.7, and 2.1 m/sec.

5.2.1.2. Wire angles for the tows are 45° for the slowest and midspeed tows, and 50-55° for the high speed tow. The amount of wire deployed is based on the actual wire angle observed during the tow (refer to GEFIV-2 through GEFIV-5).

5.2.1.3. Tow Duration

Tow Speed (m/sec)	Duration (min)
1.0	5
1.4	4
1.8	3

5.2.1.4. To depress the wire angle on the high speed tows (1.4, 1.8 m/sec), one-hundred and three (103) pounds of additional weight are added to the bottom of the Tucker trawl frame. Observed wire angles are recorded on the field data sheet (Figure GEDC-1).

5.2.2. Epibenthic Sled Tows. All epibenthic sled tows are conducted according to the protocol outlined in the Con Edison Standard Operating Procedure for Fall Shoals Surveys (FS VII), incorporating the additions described below.

5.2.2.1. Tow Velocity. As described in 5.2.1.1.

5.2.2.2. Wire angles for all tows are 60°.

5.2.2.3. Tow Duration. As described in 5.2.1.3.

5.2.2.4. One hundred (100) pounds of additional weight are added to the sled (50 lbs to each runner, located 2/3's of the way back from the front of each runner) to ensure the proper towing position of the sled on the bottom.

5.2.2.5. Sample retrieval - A messenger is released to close the net; simultaneously, the stop watches are stopped.

The gear is retrieved and the net is washed down to concentrate the sample in the cod end bucket.

Simultaneously, the final flowmeter reading is recorded and the difference calculated. Acceptable range of flowmeter differences is outlined in Con Edison SOP FSX-28, and GEFIV-6.

Tow direction and sample inventory numbers are recorded on the river chart.

5.2.2.6. Use codes - All samples are either use code 1 (valid) or 5 (void).

Refer to GEFI, section 5.2.2.4 for use code procedures.

5.3. Field Processing of Samples

Refer to GEFI, section 5.3 for field processing procedures.

5.3.1. Special Handling. Refer to GEFIV-8.

5.3.2. Laboratory Storage. Upon return to the laboratory, samples are taken to the sample storage area.

6. WATER QUALITY SAMPLE REQUIREMENTS

Surface, mid depth, and bottom in situ water chemistry measurements are taken for temperature (0.1°C), dissolved oxygen (0.1 ppm), and conductivity (μ S/cm) according to the protocol outlined in the Con Edison SOP for Long River Ichthyoplankton Water Chemistry Field Sampling (FSWC). Three sets of chemistries are recorded each night at locations and time intervals chosen at the Captain's discretion. All results are recorded as shown in GEDCI-2.

7. CAPTAIN'S REPORT

A captain's report is filled out following each survey, as shown in GEFIV-9.

8. DATA REQUIREMENTS

Refer to GEDCI for an example of the field data sheet and appropriate data coding instrucitons. GEFIV-10 gives an example of the field label to be attached to each sample. GEFIV-11 outlines the field task code list to be used during this program.

9. QUALITY ASSURANCE

Field quality assurance is under the direction of the quality assurance supervisor. SOP GEQCI specifies the QA procedures used during the 1984 Gear Evaluation Program.

MILLER HIGH SPEED SAMPLER/TUCKER TRAWL COMPARISON STANDARD OPERATING PROCEDURES

1. OBJECTIVE

The objectives of the Tucker trawl/Miller high-speed sampler comparisons are to:

- o Evaluate the feasibility and applicability of the Miller high-speed sampler for use in Hudson River ichthyoplankton studies.
- o Determine efficiency of Miller high speed sampler (14 cm mouth opening) in comparison with the 1.0 m^2 Tucker trawl.

2. STATION DESCRIPTIONS

This survey is conducted twice in July. River regions to be sampled are selected for high abundance of target species and life stages. The safety and navigation factors of high-speed towing are also to be taken into account in selecting survey areas.

Each test period consist of a series of tows done according to a random block design. Each block of tows consists of three to four different tow speeds of the Miller sampler and one Tucker trawl at standard speed in random order. The blocks are repeated as many times as possible within the sampling period. Two nights of sampling are allotted to each period.

3. SAMPLE SITE SELECTION

Sample sites are chosen in the field to provide adequate towing distance and safety for Miller gear sampling.

4. FIELD GEAR

- o One - 1.0 m^2 Tucker trawl with frame
- o One - wire angle meter (inclinometer)
- o One - Double trip mechanisms (DTRMs) with messengers
- o One - Miller high-speed sampler (14 cm mouth opening) with 505 μ net
- o One - V-fin depressor
- o One - boat speedometer
- o Three - General Oceanics digital velocity meters (Model 2030)
- o Two - General Oceanics electronic velocity meters (Model 2031)

- Two - General Oceanics meter readouts (Model 22035 MK III)
- Sixty - sample containers
- Sixty - sample labels, data sheets, etc.
- Five - gallons 10% buffered formalin
- Two - stopwatches
- Two - Hydrolab water quality meter
- Twelve - dissolved oxygen bottles, with chemicals
- One - Niskin water sampler
- Twelve - conductivity bottles
- Two - coolers with ice
- One - length board with scale for on-board sturgeon processing

5. FIELD PROCEDURES

5.1. Sample Site Location

5.1.1. Sample sites are located by landmarks, aids to navigation, and soundings.

5.2. Gear Deployment

5.2.1 Discrete Horizontal 1.0 m^2 Tucker Trawl. All discrete tows are conducted according to the protocol outlined in the Con Edison Standard Operating Procedure for Longitudinal River and Fall Shoals Surveys (FS VII). These tows are done in the center of the 2000 m Miller high-speed sampling transect. Based on a 5-min tow, the length of these tows are approximately 300 m without allowing for tidal velocity.

5.2.2. 14 cm Miller High-Speed Sampler. The Miller sampler is deployed using the same equipment and rigging as the Tucker trawl with the following alterations:

- A General Oceanics velocity meter is attached above the Miller sampler.
- Gear is towed along a 2000-m transect at several tow speeds and time increments.
- Wire angles range from 30° at the lowest speed to 60° at the highest speed.
- A V-fin depressor hangs from a cable bridle below the sampler to provide stability and allow the meter to reach sampling depth.
- No DTRM is used with this gear; this gear is set and retrieved open.

- o Sample time begins when gear reaches sample depth and boat speed increases.

5.3.4. Gear Retrieval. The gear is retrieved and the net is washed down to concentrate the sample in the cod end bucket.

Simultaneously, the final flowmeter reading is recorded and the difference calculated. Acceptable range of flowmeter differences for Tucker trawl samples are as follows:

5 min tow 3,566-19,077 revs

5.2.4. Miller high-speed sample retrieval - At end of required sample time period the boat is slowed and the gear retrieved.

The net is washed down to concentrate the sample in the collection cup.

Simultaneously, the final flowmeter reading is recorded and the difference calculated. Acceptable range of flowmeter difference for Miller gear samples is as follows:

all tows 68,000-92,000 revs

5.2.5. Use codes - Refer to GEFI, section 5.2.2.4 for use code procedures.

5.3. Field Processing of Samples

Refer to GEFI, section 5.3 for field processing procedures.

5.3.1. Special Handling. Refer to GEFIV-8.

5.3.4. Laboratory Storage. Upon return to the laboratory, samples are taken to the sample storage area.

6. WATER QUALITY SAMPLE REQUIREMENTS

Surface, mid depth, and bottom in situ water chemistry measurements are taken for temperature (0.1°C), dissolved oxygen (0.1 ppm), and conductivity (μ S/cm), according to the protocol outlined in the Con Edison SOP for Long River Ichthyoplankton Water Chemistry Field Sampling (FSWC). Three sets of chemistries are recorded each night at locations and time intervals chosen at the Captain's discretion. All results are recorded as shown in GEDCI-2.

7. CAPTAIN'S REPORT

A captain's report is filled out following each survey, as shown in GEFIV-9.

8. DATA REQUIREMENTS

Refer to GEDCI for an example of the field data sheet and appropriate data coding instructions. GEFIV-10 gives an example of the field label to be attached to each sample. GEFIV-11 outlines the field task code list to be used during the program.

9 QUALITY ASSURANCE

Field quality assurance is under the direction of the quality assurance supervisor. SOP GEQCI specifies the QA procedures used during the 1984 Gear Evaluation Program.

GEFIV

1984 GEAR EVALUATION PROGRAM
STANDARD OPERATING PROCEDURES

FIELD APPENDIX

LMS SOP 115-142

HUDSON RIVER REGION DESIGNATIONS USED FOR
1984 GEAR EVALUATION PROGRAM

GEOGRAPHIC REGION	ABBREVIATION	REGION	RIVER MILES
Croton-Haverstraw	CH	3	34-38
Indian Point	IP	4	39-46
West Point	WP	5	47-55
Cornwall	CW	6	56-61

1984 CON EDISON GEAR EVALUATION

SAMPLE DEPTH versus CABLE LENGTH
*WIRE ANGLE = 45°

SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)
10	4.3	41	17.7	72	31.0
11	4.7	42	18.1	73	31.5
12	5.2	43	18.5	74	31.9
13	5.6	44	19.0	75	32.3
14	6.0	45	19.4	76	32.8
15	6.5	46	19.8	77	33.2
16	6.9	47	20.3	78	33.6
17	7.3	48	20.7	79	34.1
18	7.8	49	21.1	80	34.5
19	8.2	50	21.6	81	34.9
20	8.6	51	22.0	82	35.4
21	9.1	52	22.4	83	35.8
22	9.5	53	22.8	84	36.2
23	9.9	54	23.3	85	36.6
24	10.3	55	23.7	86	37.1
25	10.8	56	24.1	87	37.5
26	11.2	57	24.6	88	37.9
27	11.6	58	25.0	89	38.4
28	12.1	59	25.4	90	38.8
29	12.5	60	25.9	91	39.2
30	12.9	61	26.3	92	39.7
31	13.4	62	26.7	93	40.1
32	13.8	63	27.2	94	40.5
33	14.2	64	27.6	95	41.0
34	14.7	65	28.0	96	41.4
35	15.1	66	28.5	97	41.8
36	15.5	67	28.9	98	42.2
37	16.0	68	29.3	99	42.7
38	16.4	69	29.7	100	43.1
39	16.8	70	30.2	101	43.5
40	17.2	71	30.6	102	44.0

*Based on Con Edison SOP FSX-29

1984 CON EDISON GEAR EVALUATION

SAMPLE DEPTH versus CABLE LENGTH
*WIRE ANGLE = 50°

SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)
10	4.8	41	19.5	72	34.3
11	5.2	42	20.0	73	34.7
12	5.7	43	20.5	74	35.2
13	6.2	44	21.0	75	35.7
14	6.7	45	21.4	76	36.2
15	7.1	46	21.9	77	36.6
16	7.6	47	22.3	78	37.1
17	8.1	48	22.8	79	37.6
18	8.6	49	23.3	80	38.1
19	9.0	50	23.8	81	38.6
20	9.5	51	24.3	82	39.0
21	10.0	52	24.8	83	39.5
22	10.5	53	25.2	84	40.0
23	10.9	54	25.7	85	40.5
24	11.4	55	26.2	86	41.0
25	11.9	56	26.7	87	41.4
26	12.4	57	27.1	88	41.9
27	12.8	58	27.6	89	42.3
28	13.3	59	28.1	90	42.8
29	13.8	60	28.6	91	43.3
30	14.3	61	29.0	92	43.8
31	14.7	62	29.5	93	44.3
32	15.2	63	30.0	94	44.7
33	15.7	64	30.5	95	45.2
34	16.2	65	30.9	96	45.7
35	16.7	66	31.4	97	46.2
36	17.1	67	31.9	98	46.6
37	17.6	68	32.4	99	47.1
38	18.1	69	32.8	100	47.6
39	18.6	70	33.3	101	48.1
40	19.0	71	33.8	102	48.6

*Based on Con Edison SOP FSX-29

1984 CON EDISON GEAR EVALUATION

SAMPLE DEPTH versus CABLE LENGTH
*WIRE ANGLE = 55°

SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)
10	5.3	41	21.8	72	38.2
11	5.8	42	22.3	73	38.8
12	6.4	43	22.8	74	39.3
13	6.9	44	23.4	75	39.8
14	7.4	45	23.9	76	40.4
15	8.0	46	24.4	77	40.9
16	8.5	47	25.0	78	41.4
17	9.0	48	25.5	79	41.9
18	9.6	49	26.0	80	42.5
19	10.1	50	26.6	81	43.0
20	10.6	51	27.1	82	43.5
21	11.2	52	27.6	83	44.1
22	11.7	53	28.1	84	44.6
23	12.2	54	28.7	85	45.1
24	12.7	55	29.2	86	45.7
25	13.3	56	29.7	87	46.2
26	13.8	57	30.3	88	46.7
27	14.3	58	30.8	89	47.3
28	14.9	59	31.3	90	47.8
29	15.4	60	31.9	91	48.3
30	15.9	61	32.4	92	48.9
31	16.5	62	32.9	93	49.4
32	17.0	63	33.5	94	49.9
33	17.5	64	34.0	95	50.4
34	18.1	65	34.5	96	51.0
35	18.6	66	35.0	97	51.5
36	19.1	67	35.6	98	52.0
37	19.6	68	36.1	99	52.6
38	20.2	69	36.6	100	53.1
39	20.7	70	37.2	101	53.6
40	21.2	71	37.7	102	54.2

*Based on Con Edison SOP FSX-29

1984 CON EDISON GEAR EVALUATION

SAMPLE DEPTH versus CABLE LENGTH
*WIRE ANGLE = 60°

SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)	SAMPLE DEPTH (ft)	WIRE LENGTH (m)
10	6.1	41	25.0	72	43.9
11	6.7	42	25.6	73	44.5
12	7.3	43	26.2	74	45.1
13	7.9	44	26.8	75	45.8
14	8.5	45	27.4	76	46.4
15	9.2	46	28.1	77	47.0
16	9.8	47	28.7	78	47.6
17	10.4	48	29.3	79	48.2
18	11.0	49	29.9	80	48.8
19	11.6	50	30.5	81	49.4
20	12.2	51	31.1	82	50.0
21	12.8	52	31.7	83	50.6
22	13.4	53	32.3	84	51.2
23	14.0	54	32.9	85	51.8
24	14.6	55	33.6	86	52.5
25	15.2	56	34.2	87	53.1
26	15.9	57	34.8	88	53.7
27	16.5	58	35.4	89	54.3
28	17.1	59	36.0	90	54.9
29	17.7	60	36.6	91	55.5
30	18.3	61	37.2	92	56.1
31	18.9	62	37.8	93	56.7
32	19.5	63	38.4	94	57.3
33	20.1	64	39.0	95	58.0
34	20.7	65	39.6	96	58.6
35	21.4	66	40.3	97	59.2
36	22.0	67	40.9	98	59.8
37	22.6	68	41.5	99	60.4
38	23.2	69	42.1	100	61.0
39	23.8	70	42.7	101	61.6
40	24.4	71	43.3	102	62.2

*Based on Con Edison SOP FSX-29

ACCEPTABLE RANGE OF FLOWMETER DIFFERENCE
PER TOW DURATION IN MINUTES
1984 GEAR EVALUATION PROGRAM

1.0 m^2 Tucker Trawl

TOW DURATION (min)	ACCEPTABLE RANGE OF DIFFERENCE
2	1,426 - 7,603
3	2,140 - 11,404
4	2,853 - 15,206
5	3,566 - 19,007
6	4,279 - 22,808
7	4,992 - 26,610

USE AND SAMPLE NARRATIVE CODE DEFINITIONS

USE CODES

1	Assigned to samples when there are no sampling problems.
5	Assigned to samples when sampling problems are encountered and no markable fish or unusual species are caught (i.e. void).

SAMPLE NARRATIVE CODES

1	Fish caught (field) or processed (lab) as appropriate.
2	No fish caught.
3	Lab processing problems; sample spilled, deteriorated, misplaced sample not processed.

STURGEON SPECIAL HANDLING
REQUIRED BY DEC

Live Sturgeon - Record number caught, location, date and time. Fish will be measured (mm TL), weighed (nearest gram), examined for marks, and released as quickly as possible.

Dead Sturgeon - Obtain the same information as for live sturgeon, The fish will be brought back to the laboratory, individually labeled with date of capture and measurement information, and frozen for salvage by the NYSDEC. Con Edison will be informed of each sturgeon brought to the laboratory for notification of the NYSDEC. Specimens will be retained for up to one year after capture. They will be disposed of in a sanitary landfill if NYSDEC does not request the fish.

LAWLER MATUSKY & SKELLY ENGINEERS
CREW CHIEF REPORT & INCIDENT SHEET

CREW CHIEF:____________________ SURVEY(s):____________________________________

SURVEY DATE(s):________________ CREW MEMBER(s):______________________________

BOAT USED:_____________________ VEHICLE USED:________________________________

1. Survey start/end time ______

2. Equipment prepared for survey/safety equipment present? ______

3. Sampling gear working properly? ______

4. Physical/chemical meters functioned properly/ID numbers recorded? ______

5. Any incidents or mishaps? ______

6. Any unusual or important observations/time lost? ______

7. Weather observations/marine radiotelephone log/boat and vehicle logs/ incident sheet completed? ______

COMMENTS (INCLUDE NUMBER AND EXPLANATION):______________________________________

(Use other side of sheet if additional space is needed)

Boat(s) Used:__________________ Engine Hours__________to______________

Radio Log: Boat__________________ From_________ __to__________Location:__________

BOAT CHECK

Boat Fuel: Full__, 3/4 full__, 1/2 full__, 1/4 full__, Empty__ (Check which applies)

Boat Oil: OK __, Low __

Depth Finder: OK __, Needs repair __

Transmission Fluid: OK __, Low __

Navigation Light: OK __, Needs repair __

Engine Coolant: OK __, Low __

Safety Equipment: OK __, List safety equip needed __

COMMENTS:____

GEFIV-9

FIELD LABEL EXAMPLE
1984 GEAR EVALUATION PROGRAM

Date: 6/25/84
Location:
Time: 2100-2105
Tide:
Tow Direction:
RPM: # 54-0012
Sample Type:
Depth:
Meter Reading:
Mesh Size:
Temperature:
Collectors: Cm, DH, JC

FIELD CODE LIST
1984 GEAR EVALUATION PROGRAM

CODE	
09	Woody I
11	Heather M II
54	Oblique vs Discrete Tucker Trawls
55	Speed Tow Evaluation - Tucker Trawl and Epibenthic Sled
56	Miller High Speed Sampler/Tucker Trawl Comparison
64	Epibenthic Sled
65	Tucker Trawl (discrete)
67	Tucker Trawl (oblique)
71	Miller High Speed Sampler
72	Tucker Trawl (discrete weighted)

ICHTHYOPLANKTON SORTING PROGRAM
STANDARD OPERATING PROCEDURES

1. OBJECTIVE

The objective of ichthyoplankton sorting is to remove fish eggs and larvae from sample detritus in preparation for identification. Ichthyoplankton sorting for the 1984 Con Edison Gear Evaluation Program will be conducted at Lawler, Matusky & Skelly Engineers' (LMS) Nyack, New York laboratory. During sorting of ichthyoplankton samples, fish eggs and larvae are removed, the sample correctly preserved, and the vials accurately labeled. Ichthyoplankton sorting quality control procedures (GEQCII) are implemented to ensure a certain degree of accuracy in the sorting process.

2. STANDARD OPERATING PROCEDURES FOR SORTING

2.1. Samples are transported to LMS' Nyack Laboratory where they are inventoried, organized by inventory number, and stained with rose bengal.

2.2. Upon obtaining a sample for sorting, the Sample Status Log is initialed and the date and time recorded on the appropriate sample number line. Multiple container samples may be processed by more than one person with approval of the Laboratory Supervisor. However, each container must be processed by one person only and will be considered a separate sample for QC evaluation.

2.3. The sample content is poured through a No. 45 (355 μ) sieve and rinsed with water to remove formalin. Any yearling and/or older fish are removed from the sample and presented to the Lab Supervisor for confirmation. Species codes and numbers of yearling and/or older fish are recorded on the Laboratory Form 91 (Figure GEDC-6).

2.4. <u>Sample Splitting</u>[a]

A Folsom Plankton Splitter is employed to obtain a subsample from individual samples where more than 2000 <u>Morone</u> spp. larvae are estimated. The subsampling split protocol is presented below:

[a]Due to low sample volumes, Miller High Speed samples will not be split for any organisms.

Estimated No. of Morone spp. Larvae	Sample Split Analyzed
<2000	All larvae analyzed
2000-3000	1/2 of sample analyzed for Morone spp. larvae
3000-4000	1/4 of sample analyzed for Morone spp. larvae
>4000	1/8 of sample analyzed for Morone spp. larvae

A total of 5% of the samples in which Morone spp. are analyzed as split samples will be analyzed completely to evaluate the subsampling procedure.

Samples containing fish eggs or bay anchovy larvae in numbers estimated to be greater than 4,000 are be split to not less than one-eighth using a Folsom plankton splitter. The split portion is analyzed in its entirety and subject to quality control. The appropriate split code is designated on Data Form II (Figure GEDC-3).

2.5. Sample contents are carefully washed back into the original container making certain that nothing remains in the sieve. Small portions of the sample are removed from the container and placed in a sorting tray.

2.6. Fish eggs, larvae, and juveniles are removed from the sample using forceps, eye droppers, and probes.

2.7. Organisms are placed in separate vials containing 5% formalin according to body shape (i.e., long slender; short stout).

2.8. When sorting is completed, the sample is rechecked for organisms.

2.9. After the sample has been rechecked, vials containing the ichthyoplankton are labeled, placed in a box designated for samples to be identified and the sorting results, date, and time completed recorded in the Sample Status Log.

2.10. Remaining sample contents are carefully washed back into the original sample container which is preserved with 10% formalin and returned to the storage area.

2.11. If a sample is not completed by the end of the work day, the sorter will add formalin to the unpicked and picked portions of the sample. Upon resumption of sample sorting, the formalin is rinsed from the unpicked portion of the sample and is prepared for sorting as described in Sections 2.3 and 2.5.

3. QUALITY CONTROL

Quality control procedures for ichthyoplankton sorting are described in SOP GEQCII. All QC documentation is reviewed and retained by the Quality Assurance Section (QAS).

ICHTHYOPLANKTON IDENTIFICATION PROGRAM
STANDARD OPERATING PROCEDURES

1. OBJECTIVE

The objective is to properly classify and identify ichthyoplankton found in samples from the 1984 Gear Evaluation Program.

2. STANDARD OPERATING PROCEDURES FOR IDENTIFICATION

2.1. Sample vials are obtained by an identifier in numerical order from the storage area and signed for by initialing the Status Log.

2.2. The pertinent upper total length limits for YOY and yearling Hudson River fish list is consulted to be certain no specimens are yearlings or older. These limits are provided by Con Edison. If yearling or older fish are encountered, they are recorded on Form 91 (Figure GEDC-6).

2.3. Specimens are rinsed free of formalin and submerged in water in a petri dish.

2.4. A binocular microscope with a stage calibrated ocular micrometer is used to examine specimens, which are identified by referring to the literature, the reference collections, and by consulting with fellow identifiers.

2.5. Eggs and/or larvae are separated into distinct taxonomical groups. Groups are sorted and identified to the lowest taxon practical.

2.6. Each species (or lowest taxon) is identified to a distinct life stage. Pertinent life stages are defined and identified as follows:

Egg: The embryonic developmental stage, from spawning until hatching. Eggs frequently become damaged during collection and sample processing. Damaged eggs are counted only if an embryo can be matched to an egg capsule (chorion).

Yolk-sac larva: The transition stage from hatching through the development of a complete, functional digestive system (regardless of the degree of yolk and/or oil globule retention).

Post-yolk-sac-larva: The transition stage from development of a complete, functional digestive system to transformation to juvenile form (regardless of the degree of yolk and/or oil globule retention).

Juvenile: The stage from completed transformation to Age 1. A juvenile has a full complement of adult fin rays.

2.7. Specimens of each life stage are counted and, when in doubt, recounted by the identifier prior to recording of data on Figure GEDC-3 (Form II) and Figure GEDC-5 (Form II-B).

2.8. The length measurements for yolk-sac, post-yolk-sac, and juvenile fish are recorded on Figure GEDC-4 (Form II-A). Life stage codes for measured larvae are recorded in the appropriate columns on the same form.

2.8.1. A maximum of 30 striped bass, 30 white perch, and 30 American shad per sample are measured.

2.8.2. If possible, at least 10 organisms per life stage (i.e., yolk-sac larvae, post-yolk-sac larvae, and juveniles) should be measured. Organisms are chosen at random from each life stage group until the required number are obtained. If a life stage is absent or there are less than 10 specimens of a life stage, the remaining portion of the quota (30) should be apportioned between the other life stages (if possible).

Yolk-sac and post-yolk-sac larvae are measured to the nearest 0.1 mm and juveniles to the nearest 1.0 mm.

2.8.3. In addition, length measurements are taken on up to thirty (30) individuals of species which are found in high numbers in speed tows and Miller high speed tows. Procedures followed are the same as described above.

2.9. Identified organisms are placed in vials with an adequate amount of 5 percent formalin for storage.

2.10. If a sample contains no fish eggs, larvae or juveniles, "No Catch" is written in large script on Form II.

2.11. Specimens may be removed for inclusion in the reference collection. For those removed, the species, life stage, and numbers are listed on the comments section of Form II and on a tag retained inside the appropriate vial.

2.12. Upon completion of the identification process:

2.12.1. All vials (for a single sample) are labeled, initialed, and banded together.

2.12.2. The number of the vials for the sample is recorded on the Form II.

2.12.3. Vials are returned to the area designated for complete samples.

2.12.4. Status Log is initialed and dated in the appropriate space for the sample number.

3. DATA REQUIREMENTS

SOP GEDCI provides examples of and coding instructions for all laboratory data sheets.

4. QUALITY CONTROL

Quality control procedures for ichthyoplankton identification are described in SOP GEQCIII. All QC documentation is reviewed and retained by QAS.

GEDCI

DATA SHEET AND CODING INSTRUCTIONS

1. OBJECTIVE

This SOP provides examples of and coding instructions for all data sheets used in the 1984 Gear Evaluation Field and Laboratory Standard Operating Procedures.

2. FIELD OPERATION DATA SHEETS

2.1. Data Sheet Description

The field data sheet consists of four card types incorporated onto the front of an 8-1/2 x 11 in sheet of waterproof paper (Figure GEDC-1). All field data that occurs during a survey is recorded on a data sheet of this type.

2.2. Coding Instructions

2.2.1. Field Data Sheet (Figure GEDC-1)

Coding instructions for the field data sheet are given in Attachment GEDC-1.

2.2.2. Water Quality Field Data Sheet (Figure GEDC-2)

Coding instructions for the field data sheet are given in Con Ed SOP FSWC, page 6. All entries are to be neatly made with only one symbol per data block. The individuals whose initials are entered on the data sheet is responsible for assuring the legibility of all entries.

3. LABORATORY OPERATIONS DATA SHEETS

3.1. Data Sheet Description

There are four individual data sheets for laboratory operations, each represented in Figures GEDC-3 through GEDC-6. Specific coding instructions for each of the sheets are outlined in Attachment GEDC-2 through GEDC-5.

ATTACHMENT GEDC-1

1984 GEAR EVALUATION STUDY FIELD DATA SHEET CODING INSTRUCTIONS

CARD TYPE	DATA POINT	ENTRY	DESCRIPTION
--	1. TASK CD	54	84 Gear Evaluation - Oblique vs. Discrete
		55	84 Gear Evaluation - Speed Tows
		56	84 Gear Evaluation - Miller Tows
	2. SAMPLE	----	Four digit inventory number - issued by laboratory coordinator
	3. GEAR	64	Epibenthic sled
		65	Tucker trawl (discrete)
		67	Tucker trawl (oblique)
		71	Miller high speed sampler
		72	Tucker trawl (discrete weighted)
	4. YEAR	84	1984
S1	1. DATE MO/DAY	Ex: 06/10	Enter two digit no. for month (Ex: June = 06) Enter two digit no. for day (Ex: 10)
	2. TIME	Ex: 2020 2025	Start Time - Use 24 hr clock (Ex: 2020 hrs) End Time - Use 24 hr clock (Ex: 2025 hrs)
	3. LOCATION a. RIV MILE	Ex: 52	A river mile extends from the river mile line to the next successive river mile line
	b. SITE	05	Channel >20 ft depth
	c. STATION	--	No data entry
	4. N-S	--	No data entry
	5. DURATION	Ex: 5.0	Enter total minutes of tow. For oblique tows enter tow duration in summary at the bottom of the data sheet
	6. FLO_N INSIDE a. FLO-END b. FLO-STRT c. FLO-DIF	4/6	Enter first G.O. digital serial numbers after BO_ _. Flowmeter end minus flowmeter start equals flowmeter difference
	7. DEPTH a. RIV b. SAM	--	Enter actual river depth in ft. Enter depth in ft from which sample was collected. For oblique tows, leave this section blank. Enter information on Card Type 01
	8. TOW a. SPD	meters/sec	Enter boat speed (meters per second) relative to water
	b. DIR		Enter code for direction gear was lowered
		1	North
		2	South
		3	East
		4	West
	9. WAVE_HT		Code describing the condition of the surface of the water:
		1	Calm 0 to 1/2 ft
		2	Light Chip >1/2 ft to 1 ft
		3	Heavy Chip >1 ft to 2 ft
		4	Large Waves >2 ft
	10. BTM-TYPE	--	No data entry
	11. VESL-CD		Enter boat code
		09	Woody I
		11	Heather M II
		12	Whaler
	12. BEACH	--	No data entry
	13. USE CODE	1	Valid: Assigned to samples when there are no sampling problems
		5	Void: Assigned to samples when sampling problems are encountered and no markable fish or unusual species are caught
	14. GEAR-NAR	--	No data entry
	15. SAM-NAR	1	Fish caught (field) or processed (lab) as appropriate
		2	No fish caught
		3	Lab processing problems, sample spilled, deteriorated, misplaced. Sample not processed
	16. INITIALS	---	Enter up to three initials for crew chief
	17. COMMENTS		Check if you have comments on the back of the data sheet
	18. ELECTRONIC G.O. No.		Record the special number of the electronic meter used to record boat speed.
	19. READOUT No.		Record the serial number of the G.O. readout unit used to record boat speed.
	20. FLO_N OUTSIDE a. FLO-END b. FLO-START c. FLO-DIF		Enter first two G.O. digital serial numbers after BO Flowmeter end minus flowmeter start equals flowmeter differences
R1	1. SUS RECP		Enter number of containers brought back with suspected recaps (i.e., tomcod, hatchery striped bass). Enter 0 if no containers brought back to lab
	2. LW		No data entry
	3. ID		No data entry
	4. NYRL STOM		No data entry
C1	Length Class Data		For 1984 Gear Evaluation Study all fish collected in the field WILL BE RETURNED TO THE LAB. Do not field process any fish .
01	Cable Length, Wire Angle, Net Depth, Tow Direction		Oblique Tucker trawls: enter amount of cable in water, wire angle, net depth and sample duration at each depth in oblique sampling sequence.

FIGURE GEDC-1

GEAR EVALUATION

PAGE___ OF___

TASK CD	SAMPLE	GEAR	YEAR
		0 6	8 4

S1

DATE		TIME	LOCATION			N_S	DURATION
MO	DAY		RIV__ MILE	SITE	STA-TION		

Inside Meter

	FLO_N		DEPTH		TOW__		WAVE_HT	BTM_TYPE	VESL_CD	BEACH	USE CODE	GEAR_NAR	SAM_NAR	INITIALS	COM-MENTS
			RIV	SAM	SPD	DIR									
FLO__ END															
FLO_STRT															
FLO__ DIF															

Outside Meter

tronic 60.# ___

1out # ___

	FLO_N	
FLO__ END		
FLO_STRT		
FLO__ DIF		

R1

N__JARS			N YRL STOM
SUS RECP	LW	ID	

C1

TAXON	DIV__1	DIV__2	CT__LC1 (0-DIV1)	CT__LC2 (DIV1+1-DIV2)	CT__LC3 (DIV2+1-250)	CT__LC4 (251+)

O1

Cbl Lgth*	Wire Angl	Net Dpth	Tow Dur.	Cbl Lgth*	Wire Angl	Net Dpth	Tow Dur.

* m

QC ______

FIGURE GEDC-2
REAR EVALUATION WATER QUALITY DATA

INSTRUMENTS:
Temp. ____________
D.O. ____________
Cond. ____________

CREW CHIEF ____________

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	QC Bottle NO. Comment
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comment:
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comment:
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comments
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comments
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comment:
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comments
		MO	DAY		RIV _ MILE	SITE					

TASK CD	SAMPLE	DATE		TIME	LOCATION		H_2O _ TEMP	DO	COND	DEPTH_WQ	Comment:
		MO	DAY		RIV _ MILE	SITE					

ATTACHMENT GEDC-2

1984 GEAR EVALUATION PROGRAM
LABORATORY DATA CODING INSTRUCITONS

FORM II - CARD IMAGE: LI

ITEM	FIELD NAME	CARD COLUMNS	FIELD FORMAT	DESCRIPTION
1	LI	1-2	LI	Card identification
2	Inventory number	3-9	XXXXXXX	Unique number for particular sample
3	Sequence number	10-13	0001	Indicates first page of Format II
4	Date analyzed	14-19	YYMMDD	Enter year, month, day sample analyzed
5	Analyzer employee number	20-23	XXXX	Enter employee number
6	No. larvae counted	24-29	XXXXXX	Enter total no. larvae counted. Include UID and mutilated larvae in count
7	No. larvae analyzed	30-35	XXXXXX	Enter total no. larvae that are measured and length recorded on Form II-A
8	No. larvae species	36-38	XXX	Enter number of species counted. Include UID and mutilated larvae in count
9	Subsample fraction	39-45	X.XXXXXX	Enter fraction used in sub-sampling for larvae
10	No. eggs counted	46-51	XXXXXX	Enter total number of eggs counted
11	No. egg species	52-54	XXX	Enter number of egg species counted
12	Subsample fraction	55-61	X.XXXXXX	Enter fraction used in sub-sampling for eggs
13	Samp	79	X	Enter "0" for void sample
14	Trans	80	X	Leave blank

DATE ______________
TIME ______________
PLANT ______________
PROJECT ______________
RUN # ______________
UNIT # ______________

FIGURE GEDC-3

LARVAE FORM II

PAGE _____ OF _____
APPROVED BY ______________
DATE APPROVED ______________
KEYPUNCHED BY ______________
DATE PUNCHED ______________

CARD ID	INVENTORY NUMBER	SEQ. NO.	DATE ANAL. YYMMDD	EMP. NO.	NUMBER OF LARVAE COUNTED	NUMBER OF LARVAE ANALYZED	NO. SPEC.	SUBSAMPLE FRACTION	NO. EGGS COUNTED	NO. SPEC.	SUBSAMPLE FRACTION		SAMP	TRANS
L I		0 0 0 1												

CARD ID	INVENTORY NUMBER	SEQ. NO.	SPECIES CODE	NUMBER OF LARVAE COUNTED	NUMBER OF LARVAE ANALYZED	SUB	SPECIES CODE	NUMBER OF LARVAE COUNTED	NUMBER OF LARVAE ANALYZED	SUB	SPECIES CODE	NO. EGGS COUNTED	SUB
L T		0 1											
L T		0 2											
L T		0 3											
L T		0 4											
L T		0 5											
L T		0 6											
L T		0 7											
L T		0 8											
L T		0 9											
L T		1 0											

ATTACHMENT GEDC-3

1984 GEAR EVALUATION PROGRAM
LABORATORY DATA CODING INSTRUCITONS

CARD IMAGE: LT

ITEM	FIELD NAME	CARD COLUMNS	FIELD FORMAT	DESCRIPTION
1	LI	1-2	LI	Card identification
2	Inventory number	3-9	XXXXXXX	Unique number for assigned to individual sample
3	Sequence number	10-13	0001	Indicates first page of Format II
4	Species code[1, 2]	14-19 36-46	XXXXXXXXXXX	See additional codes: FISH
5	No. larvae counted	25-29 47-51	XXXXXX	Enter number of larvae counted. for each species
6.	No. larvae analyzed	30-34	XXXXX	Enter number of larvae measured and recorded on Form II-A for each species
7	Sub.	35-57	X	Enter appropriate code: 0 - Total number of larvae in sample identified - do not divide by subsample 1 - Subsample occurs - divide by subsample fraction
8	Species code (eggs[2])	56-68	XXXXXXXXXXX	See species list: Fish
9	No. eggs counted	69-74	XXXXXX	Enter number of eggs counted for each species
10	Sub.	75	X	Enter appropriate code: 0 - Total number of eggs in sample identified - DO NOT divide by subsample fraction 1 - Subsample occurs - divide by subsample fraction

[1]Larvae species data should be filled out horizontally as opposed to vertically. This permits two species entries per card.

[2]Alpha species codes may be substituted for numeric codes for those on the attached list.

ATTACHMENT GEDC-4

1984 GEAR EVALUATION PROGRAM
LABORATORY DATA CODING INSTRUCITONS

FORM II-A - CARD IMAGE: LA

ITEM	FIELD NAME	CARD COLUMNS	FIELD FORMAT	DESCRIPTION
1	LA	1-2	LA	Card identification
2	Inventory number	3-9	XXXXXXX	Unique number for a particular sample
3	Sequence number			
	Page	10-11	XX	Page number for format II-A starts as page 00
	Serial	12-13	Xx	Serial number for format starts with 01 for first line
4	Species code[1, 2]	14-24 36-46	XXXXXXXXXXX	See additional codes
5	Length	25-29 47-51	XXX.XX	Enter length in millimeters for each larvae measured
6	Life stage	30-31	XX	Enter appropriate code: 00 - Life stage cannot be determined 01 - Egg 02 - Yolk-sac stage 03 - Post yolk-sac stage 04 - Juvenile
8	Samp			Enter "0" for void sample
9	Trans			Leave blank

[1]Larvae species data should be filled out horizontally as opposed to vertically. This permits two species entries per card.

[2]Alpha species codes may be substituted for numeric codes for those on the attached list.

DATE ____________
TIME ____________
PLANT ____________
PROJECT ____________
RUN # ____________
UNIT # ____________

FIGURE GEDC-4

LARVAE FORM II-A

PAGE ______ OF ______
APPROVED BY ____________
DATE APPROVED ____________
KEYPUNCHED BY ____________
DATE PUNCHED ____________

CARD ID	INVENTORY NUMBER	SEQ. NO.	SPECIES CODE	LENGTH (mm)	LIFE STAGE	SPECIES CODE	LENGTH (mm)	LIFE STAGE	SPECIES CODE	LENGTH (mm)	LIFE STAGE		SAMP	TRANS
L A		0 1		.			.			.				
L A		0 2		.			.			.				
L A		0 3		.			.			.				
L A		0 4		.			.			.				
L A		0 5		.			.			.				
L A		0 6		.			.			.				
L A		0 7		.			.			.				
L A		0 8		.			.			.				
L A		0 9		.			.			.				
L A		1 0		.			.			.				
L A		1 1		.			.			.				
L A		1 2		.			.			.				
L A		1 3		.			.			.				
L A		1 4		.			.			.				
L A		1 5		.			.			.				
L A		1 6		.			.			.				
L A		1 7		.			.			.				
L A		1 8		.			.			.				
L A		1 9		.			.			.				
L A		2 0		.			.			.				
L A		2 1		.			.			.				
L A		2 2		.			.			.				
L A		2 3		.			.			.				
L A		2 4		.			.			.				
L A		2 5		.			.			.				

ATTACHMENT GEDC-5

1984 GEAR EVALUATION PROGRAM
LABORATORY DATA CODING INSTRUCITONS

FORM II-B - CARD IMAGE: LS

ITEM	FIELD NAME	CARD COLUMNS	FIELD FORMAT	DESCRIPTION
1	LS	1-2	LS	Card identification
2	Inventory number	3-9	XXXXXXX	Unique number for a particular sample
3	Species code[1, 2]	10-20 33-43 56-66	XXXXXXXXXXX	See fish species code list
4	Yolk-sac	21-24 44-47 67-70	XXXX	Enter number of yolk-sac larvae counted for each species
5	Post-yolk sac	25-28 48-51 71-74	XXXX	Enter number of post-yolk-sac larvae counted for each species
6	Juvenile	29-33 52-55 75-78	XXXX	Enter number of juveniles counted for each species
7	Samp	79	X	Enter "0" for valid sample
16	Trans	80	X	Leave blank

[1]Larvae species data should be filled out horizontally as opposed to vertically. This permits two species entries per card.

[2]Alpha species codes may be substituted for numeric codes for those on the attached list.

FIGURE GEDC-5

DATE ______________
TIME ______________
PLANT ______________
PROJECT ______________
RUN # ______________
UNIT # ______________

LARVAE FORM II-B

PAGE _____ OF _____
APPROVED BY __________
DATE APPROVED __________
KEYPUNCHED BY __________
DATE PUNCHED __________

CARD ID.		INVENTORY NUMBER	SPECIES CODE	YOLK SAC	P. YOLK SAC	JUVNL	SPECIES CODE	YOLK SAC	P. YOLK SAC	JUVNL	SPECIES CODE	YOLK SAC	P. YOLK SAC	JUVNL	SAMP.	TRANS.
L	S															
L	S															
L	S															
L	S															
L	S															
L	S															
L	S															
L	S															
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ATTACHMENT GEDC-5

1984 GEAR EVALUATION PROGRAM
LABORATORY DATA CODING INSTRUCITONS

FORM 91

ITEM	FIELD NAME	CARD COLUMNS	FIELD FORMAT	DESCRIPTION
1	Sample number	1-6	XXXXXX	Unique number for a particular sample
2	Taxon	7-9	XXX	See fish species code list
3	Div-1	10-12	XXX	Length limit for this division
4	Div-2	13-15	XXX	Length limit for this division
5	CT-LC 1 (0-Div 1)	16-20	XXXXX	Left blank - no data input
6	CT-LC 2 (Div 1+1 - Div 2)	21-24	XXXX	Number of individuals in this division
7	CT-LC 3 (Div 2+1 - 250)	25-28	XXXX	Number of individuals in this division
8	CT-LC4 (251 +)	29-32	XXXX	Number of individuals in this division

Figure GEDC-6

1984 Gear Evaluation Form 91

Task Type ________ Sample Date ________

Sample Number	TAXON	DIV_1	DIV_2	CT_LC1 (0-DIV1)	CT_LC2 (DIV1+1-DIV2)	CT_LC3 (DIV2+1-250)	CT_LC4 (251+)

QUALITY CONTROL PROGRAM FOR FIELD & LABORATORY PROGRAMS STANDARD OPERATING PROCEDURES

1. OBJECTIVE

This SOP describes the quality control plans and procedures used for the inspection of field and laboratory operations. The field monitoring efforts have been designed to assure that the work efforts are consistent with established procedures (SOPs) for the duration of the project. The laboratory program is established to assure the specified average outgoing quality limits (AOQL) for each task.

2. FIELD OPERATIONS QC

Accurate and reliable sample collection depends on the application of standard operating procedures, adequately trained crews, consistency of technique, and dependable equipment. Field QC measures for this project are designed to monitor and support these factors and are outlined as follows:

2.1. Standard Operating Procedures

Due to the experimental nature of this project, SOPs are generated after techniques are established by the project team, then refined in the field. Each SOP outlines a detailed account of equipment and techniques utilized for each specific task. SOPs are used in training programs, to maintain consistency of techniques, as documentation of work performed, and as a concise reference for field crews. The facility supervisor is responsible for generation of the field SOPs. Input is solicited from the project team, field coordinator and crew chiefs, and QAS before the final generation of plans is completed. At that point revisions to the SOPs are made only with prior client approval.

2.2. Field Training

Preoperational training meetings between the supervisory staff and crew chiefs are used to translate SOPs into a workable and practical field program. Techniques are discussed in detail with all personnel chosen to work on the project.

Once in the field, qualified crew chief trainers work closely with the crews to ensure SOP compliance. A qualified trainer must have at least one year of experience with LMS as a field crew chief or coordinator. Trainers are selected at the discretion of the facility supervisor.

2.3.1. Performance Monitoring

The performance of all field sampling crews is monitored periodically through error entry checks, crew chief reports and incident sheets, and observation reports. These performance monitoring tools are tailored to evaluate the consistency and accuracy of field crew chiefs and crews.

2.3.1.1. Error Entry Checks. The sampling techniques of the crew chief and crew are evaluated at least two times during the Gear Evaluation Program. The error entry check form (GEQCI-6 and 7) is based on the procedural requirements outlined in the project SOP. If a crew chief fails to score $\geq$90%, a debriefing is scheduled as soon as practical between the supervisor, field coordinator, and crew chief to review the audit forms. Reinstatement of the crew chief to active duty is determined by his responses to the questions reviewed in the meeting and is at the discretion of the facility supervisor.

2.3.1.2. Crew Chief Report & Incident Sheet (GEQCI-8). After completion of each survey, the crew chief is required to complete a field report that outlines information pertinent to the survey. Any unusual incidents or important observations are noted. The crew chief is also required to include his recommendations for SOP or equipment modifications. This information is relayed to the facility supervisor for consultation and discussion with the project team.

2.3.2. Documentation

The results of all audits, field equipment reports and error entry checks are documented and retained on file by QAS and the facility supervisor.

All deficiencies are addressed as soon as practical (i.e. retraining, equipment replacement, etc.) under the direction of the facility supervisor.

2.4. Equipment Dependability - Maintenance & Calibration

Regularly scheduled maintenance and calibration of equipment assures both reliability of use and compliance with project equipment specifications. The frequency of these checks are outlined below.

2.4.1. Nets

Visual inspections of Miller, Tucker and epibenthic sled nets, sample buckets, clamps and riggings are made prior to each survey. Any problems (i.e. holes in nets) are corrected by the crew chief before the equipment is used.

Major equipment problems or malfunctions are included on the crew chief report and are forwarded to the facility supervisor.

2.4.2. Flowmeters

The General Oceanics (G.O.) electronic and digital flowmeters are calibrated prior to each survey using a G.O. Model 2030CF flowmeter calibration frame (refer to GEQCI-9 and 10). Results are recorded on GEQCI-11. Meters that fail to read $\geq$80 revolutions are removed from service and remain inoperative until repair or retesting by trained personnel at LMS or G.O.

Once during the Gear Evaluation Program the G.O. meters are shipped to Johns Hopkins University (Chesapeake Bay Institute) for flume calibration according to Con Edison SOPs IFI thruogh IFII. Calibration results are reviewed by the facility supervisor. Failed meters are removed from service for repair and recalibration.

The G.O. electronic readout units are calibrated once during the Gear Evaluation Program following Con Edison SOP IFIV. Results are recorded on GEQCI-12. Readout units that fail the test are removed from service and shipped to G.O. for repair and calibration.

All flowmeter calibration data are documented and retained by QAS.

2.4.3. Water Quality Monitoring

2.4.3.1. In-situ Meter Readings. Daily calibrations of the Hydrolab 4041 water quality analyzer for temperature, conductivity, and dissolved oxygen are conducted according to procedures outlined in Con Edison SOP FSWC. Operation and calibration manuals for this unit are available on each boat and from the facility supervisor. An additional Hydrolab 4041 is taken into the field as a backup unit. The calibration log is maintained by QAS at all times (refer to GEQCI-13).

2.4.3.2. Accuracy of In-situ Field Readings. To verify the accuracy of water quality meter readings, 10% of the samples analyzed for conductivity and dissolved oxygen are returned to the laboratory for wet analysis. The results of the wet samples are compared to the metered readings. The wet and metered readings must be within 15% of each other. QC analysis of the wet conductivity samples follow the CSP-1 program outlined in GEQCII-1, sections 2.2 and 2.3. Conductivity results are recorded on GEQCI-14.

3. LABORATORY QC

The QC procedures employed in the biological laboratory for the Gear Evaluation Program are designed to ensure accuracy and consistency of techniques, as well as a high degree of analyzer proficiency. The following procedures are established to maintain an average outgoing quality level (AOQL) of $\leq$0.1.

3.1. General Instructions (Refer to Con Edison SOP LOXIV)

3.1.1. Plan application is on an individual processor basis.

3.1.2. New processors without a prior QC inspection history for a task are inspected at the 100% start level.

3.1.3. All QC/QA determinations are performed by a second observer, independent from the original determination.

3.2. Standard Operating Procedures

SOPs provide procedural documentation, a source of reference for laboratory personnel, an aid in the maintenance of technique consistency, and a training tool for new or inexperienced individuals. All personnel are required to review the SOPs before beginning analysis. SOP review and training is conducted by the laboratory coordinator.

3.3. Accuracy of Analysis

3.3.1. In addition to the training of laboratory staff, the accuracy of analysis of each analyzer is monitored by using a continuous sample plan (CSP-1) inspection program to ensure that the AOQL is $\leq$0.1 The number of samples to be inspected is based on our laboratory process average (97%), as determined by past performance.

3.3.2. Ichthyoplankton soring QC procedures are outlined in SOP GEQCII.

3.3.3. Ichthyoplankton identification QC procedures are outlined in SOP GEQCIII.

All quality control documentation of the laboratory CSP-1 program is maintained by the laboratory coordinator and is reviewed by QAS.

3.4. Performance Monitoring - Clear Trail Audits

The performance of all laboratory personnel is monitored periodically through QAS clear trail audits of sample documentation in the laboratory. The audits are conducted daily for a minimum of a two week period. These audits include inspection of data sheets, inventory and QC logs and sample vials. The analyst and laboratory coordinator are notified of errors and followup corrections in sample documentation.

4. DATA PROCEDURES

Quality control procedures for data at the facility level involve 100% inspection of field data and 10% laboratory data for completion and accuracy. All QC'd data are released from the laboratory to the Data Processing Section (DPS) by QAS. Data are keypunched and key verified. This verification requires that discrepancies be rectified before data are processed further. Error checking software are then used to ensure that each SAS variable falls within a reasonable range, as determined by LMS and Con Edison.

The system ensures that not more than one incorrect variable value in 100 occurs in any of the finalized data files generated from this study. This applies to all biological and water quality data. Final SAS data sets will be complete, except those containing water quality information, for any variable for which raw data were recorded, or any associated vaiable for which data can be generated for recorded information. QAS will inspect printouts of the error checking software QC to assure that all corrections have been made to the data files.

FIELD ERROR ENTRY CHECK
1984 GEAR EVALUATION PROGRAM

DATE: ____________________ CREW CHIEF: ____________________

SURVEY: ____________________ CREW: ____________________

OUTSIDE OBSERVERS: ____________________ AUDITOR: ____________________

	Yes	No	Comments
A. GENERAL			
1. Gear properly prepared and calibrated for survey?	___	___	________
2. Crew Chief prepared:			
a) updated site allocation chart	___	___	________
b) workplans	___	___	________
c) data sheets, labels	___	___	________
d) tidal currents	___	___	________
e) scientific collectors license	___	___	________
3. Deployment of crew members efficient?	___	___	________
4. Organization of work load efficient?	___	___	________
5. Crew Chief aware of river conditions and safety procedures followed?	___	___	________
6. Crew and Crew Chief presents good image of LMS to outside observers?	___	___	________
B. SAMPLING			
1. Crew Chief able to locate sampling stations and position boat?	___	___	________
2. Crew Chief familiar with survey techniques and sampling procedures?	___	___	________
3. Sampling gear rigged properly?	___	___	________
4. Nets checked for holes before each sample?	___	___	________
5. Gear deployed correctly and efficiently?	___	___	________
6. Gear towed at correct depth and speed?	___	___	________
7. G.O. velocity probe checked and set up correctly?	___	___	________

FIELD ERROR ENTRY CHECK
1984 GEAR EVALUATION PROGRAM

	Yes	No	Comments
B. SAMPLING (Contd.)			
8. Nets checked completely for organisms and washed down correctly?	___	___	___
9. Samples preserved and labeled correctly?	___	___	___
10. Completion of data sheets correct?	___	___	___
11. Hydrolab meter set up correctly?	___	___	___
12. Water chemistry samples taken at correct depth?	___	___	___
13. Sufficient QC samples collected?	___	___	___
14. Proper care of equipment taken, including cleanup:			
a) meters	___	___	___
b) sampling gear	___	___	___
c) boat	___	___	___

C. AUDITOR'S RATINGS

1. Crew Chief ______________________

2. Crew Members ______________________

D. ADDITIONAL COMMENTS

____

____

____

____

____

____

____

____

____

LAWLER MATUSKY & SKELLY ENGINEERS
NYACK CREW CHIEF REPORT & INCIDENT SHEET

CREW CHIEF:________________ SURVEY(s):____________________________

SURVEY DATE(s):______________ CREW MEMBER(s):________________________

BOAT USED:_________________ VEHICLE USED:___________________________

1. Survey start/end time ______
2. Equipment prepared for survey/safety equipment present? ______
3. Sampling gear working properly? ______
4. Physical/chemical meters functioned properly/ID numbers recorded? ______
5. Any incidents or mishaps? ______
6. Any unusual or important observations/time lost? ______
7. Weather observations/marine radiotelephone log/boat and vehicle logs/ incident sheet completed? ______

COMMENTS (INCLUDE NUMBER AND EXPLANATION):______________________________

(Use other side of sheet if additional space is needed)

Boat(s) Used:_______________ Engine Hours________to____________

Radio Log: Boat_______________ From________ __to________Location:________

BOAT CHECK

Boat Fuel: Full__, 3/4 full__, 1/2 full__, 1/4 full__, Empty__ (Check which applies)

Boat Oil: OK __, Low __

Transmission Fluid: OK __, Low __

Engine Coolant: OK __, Low __

Depth Finder: OK __, Needs repair __

Navigation Light: OK __, Needs repair __

Safety Equipment: OK __, List safety equip needed __

COMMENTS:____

GEQCI-8

5535 N.W. 7th Avenue
Miami, Florida 33127 U.S.A.
Telephone: (305) 754-6358
Cable: GENOC-MIAMI
Telex: 51-9727

INSTRUCTIONS

FLOWMETER CALIBRATION FRAME

MODEL 2030CF

The General Oceanics, Inc. Model 2030CF Calibration Frame provides a check on the proper operation of your Model 2030 and 2031 flowmeters.

The Frame imparts a torsionally precise spin to the rotor and a count difference is noted in the flowmeter window. A minimum count is necessary for the flowmeter to be within calibration. If it is not, the flowmeter should be returned to the factory for repair.

Step 1. Clip the flowmeter into the frame with the count window up, Fig. 1.

Step 2. Leave a gap of approximately 1/4 inch between the rotor end and the frame spinner disk, Fig. 2.

Step 3. Rotate the frame spinner disk until it is cocked.

Step 4. Rotate the flowmeter rotor until the blades which is in the direction of motion of the spinner comes against the stop, Fig. 1.

Important - If the correct rotor blade does not touch the stop, damage to the flowmeter could result, and an incorrect reading will be indicated.

Step 5. Record the flowmeter reading.

Step 6. Press the release button on the frame.

Step 7. Record the flowmeter reading.

Step 8. The difference of the two readings should be at least 80.

i.e.	009377	2nd reading
	009243	1st reading
	134	difference

The difference of 134 is much greater than 80 so this flowmeter is in excellent shape.

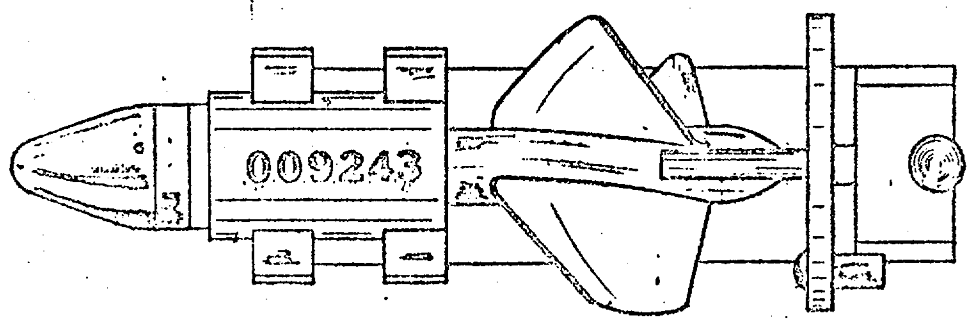

FIG #1

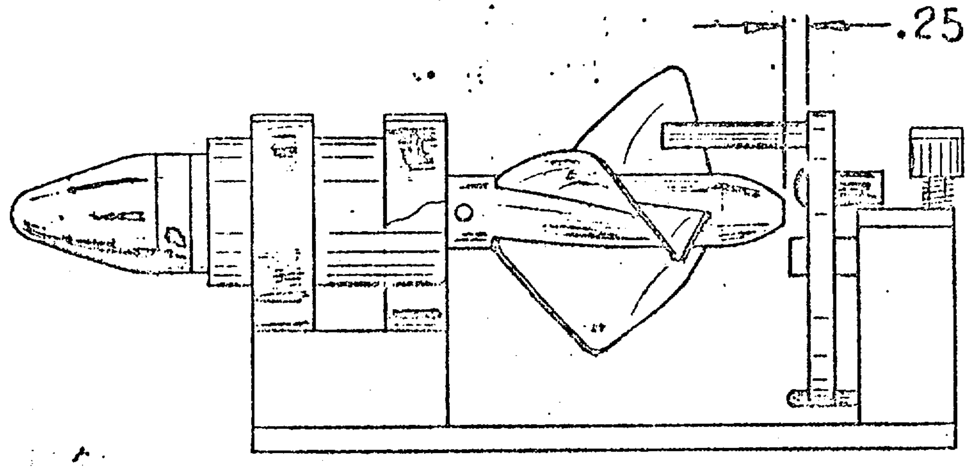

FIG # 2

1984 GEAR EVALUATION PROGRAM
GENERAL OCEANICS (G.O.) SPIN TEST CALIBRATION*

PROBE SERIAL #	SPIN TEST TRIAL 1	SPIN TEST TRIAL 2	SPIN TEST TRIAL 3	AVERAGE REVS	PASS	FAIL	COMMENTS

*G.O. Model 2030CF Flowmeter Calibration Frame

1984 GEAR EVALUATION PROGRAM
GENERAL OCEANICS ELECTRONIC READOUT CALIBRATION

G.O. READOUT No.	DATE	ZERO CHECK	BATTERY CHECK	CALIBRATION	INITIALS

1984 GEAR EVALUATION PROGRAM

LAWLER, MATUSKY & SKELLY ENGINEERS
HYDROLAB WATER QUALITY ANALYZER
CALIBRATION DOCUMENTATION
MODEL 4041

Calibration Date:__________ Calibrated By:__________

Time:__________

PARAMETER	METER #	TEMP (°C)	EXPECTED VALUE	OBSERVED VALUE	DIFFERENCE	Adjust to
I. Temperature						
ASTM #____						
II. Dissolved Oxygen (ppm)						
III. pH						
IV. Conductivity (μS/cm)						
KCL Lot# ____						

V. Comments __________

1984 GEAR EVALUATION PROGRAM

LMS NYACK LABORATORY
QUALITY CONTROL SUMMARY

Mode: ____________

Lot #: ____________

Lot Size: __________

Sample # QC'd: ______

Analyzer: __________

SAMPLE NO.	CORRECT. COND.	QC'd CORRECT. COND.	% DIFF.	QC ANALYZER/ DATE	Sample date
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

GEQCII

ICHTHYOPLANKTON SORTING QUALITY CONTROL (QC) PROCEDURES STANDARD OPERATING PROCEDURES

1. OBJECTIVE

A continuous sampling plan (CSP) is used to insure that the defective rate (AQL) in sorting of ichthyoplankton will be ≤10 percent. A defect is defined as the occurrence of a sorter missing (failing to remove) >10 percent of the total ichthyoplankton present in the sample.

2. STANDARD OPERATING PROCEDURES FOR QUALITY CONTROL OF SORTING

2.1. All samples sorted by an individual are listed by order of analysis using each sample number and assigned consecutive QC numbers, beginning with the number "one." QC sorting is performed by a qualified person other than the original sorter.

2.2. The CSP program is conducted in two modes, as follows:

2.2.1. CSP Mode 1

The first 14 samples sorted by an individual are subject to 100 percent QC reinspection. If all 14 samples pass the reinspection (i.e., ≤10 percent of the ichthyoplankton are missed per sample), the individual is placed in CSP Mode 2. If any sample fails Mode 1 (i.e., >10 percent of ichthyoplankton missed), then Mode 1 is continued until 14 consecutive samples pass. For example, if a sample with QC number 10 fails, the samples with QC numbers 11 through 24 will be subject to QC resorting.

2.2.2. CSP Mode 2

Lots of 20 consecutive samples per individual are assigned. One sample from each lot is randomly chosen for QC reinspection. If a sample fails (>10 percent of organisms missed) CSP Mode 2, that individual sorter is placed back into CSP Mode 1. For example, if sample with QC number 17 fails in a lot of 20 samples, then samples with QC number 18 through 31 are subject to quality control resorting. If samples 18 through 31 pass, the individual is again placed in Mode 2.

2.3. A resolution (third person) value is determined for any sample found defective during Mode 1 or Mode 2 of the continuous sampling plan.

2.4. Results of the quality control program is presented to all sorters and help is made available to anyone failing a QC check.

GEQCIII

ICHTHYOPLANKTON IDENTIFICATION QUALITY CONTROL (QC) STANDARD OPERATING PROCEDURES

1. OBJECTIVES

A continuous sampling plan (CSP-1) is used to insure that no more than 10 percent of the ichthyoplankton are misidentified (plan provides an AOQL 10 percent).

2. STANDARD OPERATING PROCEDURES FOR QUALITY CONTROL OF IDENTIFICATION

2.1. A sample is considered defective if an error >10 percent is made in identifying, assigning a life stage, or counting any species. Identification errors are considered <u>cumulative by life stage</u>.

2.2. All samples identified by a person are listed by order of analysis and assigned consecutive QC numbers starting with one. Quality control identification is conducted by a qualified person other than the original identifier. Samples are chosen for reidentification as follows: The CSP-1 program is divided into two modes.

2.2.1. <u>Mode 1 CSP-1</u>

The first 14 samples identified by an individual are subject to 100 percent quality control reidentification. If the individual passes all 14 samples (non-defective, see Section 2.1.), then that individual is placed in Mode 2.

If any sample during Mode 1 CSP-1 fails (defective, see Section 2.1.), then Mode 1 is continued until 14 consecutive samples pass. For example, if sample number 10 fails, then samples 11 through 24 is reinspected for quality control.

2.2.2. <u>Mode 2 CSP-1</u>

Lots containing 20 samples are assigned to the identifier. One sample from each lot is chosen for reinspection.

If any sample during the Mode 2 CSP-1 procedure fails (defective, see Section 2.1.), the individual repeats Mode 1. For example, if sample number 17 fails in a lot of 20 samples, then samples 18 through 31 are reinspected for quality control. If samples 18 through 31 pass, the identifier is again placed in Mode 2.

2.3. A resolution (third person) value is determined for any sample found defective during rework of a lot from Mode 1 or 2.

2.4. A person whose identification is defective is advised of his/her errors and provided with help, if necessary, to eliminate the source of error.

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ENVIRONMENTAL AFFAIRS DIVISION

EFFECTS OF FORMALIN AND FREEZING AS PRESERVATION METHODS ON LENGTH AND WEIGHT MEASUREMENTS OF MAJOR HUDSON RIVER FISH POPULATIONS

June 1989

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Project No. 176-250/251

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1. INTRODUCTION

Samples collected as part of biological surveys in many cases are not analyzed at the time of collection, but are preserved for analysis at a later date. Commonly used preservation methods for fish samples include freezing and treatment with chemicals such as formaldehyde and alcohol. Freezing and chemical preservation have been the primary preservation techniques for samples collected as part of environmental studies conducted on the Hudson River.

Several investigations have been conducted to determine the effects of preservation on the morphometry and biomass of aquatic organisms. These studies have been primarily concerned with changes that might occur in length or weight, parameters that are used in population growth studies, and determination of condition factor. In general, the studies have concluded that small, yet significant, changes occur in both length and weight for preserved fish specimens. Studies of the effects of formalin on preserved fish (Parker 1963; Stobo 1972; Engel 1974; Johnson and Swanson 1974) found that length generally decreased and weight generally increased. Studies of freezing effects on preserved fish (Engel 1974; Sayers 1987) indicated a general decrease in length similar to that found in formalin preservation, but variable influence on weight.

A special study was conducted as part of the 1987-1988 Central Hudson Gas & Electric Corporation (CHGE) impingement abundance monitoring program with the objective of determining the effect of freezing and formalin preservation on length and weight of three major fish taxa. Adults and young-of-year of Alosa spp. (alewife, blueback herring) and white perch and adults of Atlantic tomcod were used in the evaluation to represent major groups impinged at the Roseton and Danskammer Point generating stations. The fish preservation study had the following specific objectives:

- Determine the effect of freezing on fish length and weight measurements over four time intervals (one week, one month, six months, and one year).

- Determine the effect of formalin on fish length and weight measurements over four time intervals (one week, one month, six months, and one year).

2. MATERIALS AND METHODS

Specimens used in the preservation study were obtained from impingement monitoring samples collected at the Danskammer Point and Roseton generating stations. Fish for each test group were measured for total length and weight immediately following separation from debris and within 1 hr of collection. Each fish was marked using numbered tags to permit tracking over the one-year study period.

A total of 10 test groups were used in the study. Information on the test groups for the preservation evaluation study is presented in Table 2-1. Tests were initiated at different times over the first year of the two-year study due to the seasonal occurrence of the different life stages scheduled for analysis.

Following the determination of initial length and weight, fish were preserved as follows:

- Freezing. One hundred individuals of each taxa and life stage were separated into four groups of 25 fish each. One of the 25 fish groups was checked at each of the four observation periods. After measurement for total length and weight the fish were disposed of properly. Tissue deterioration from repeated freezing and thawing, especially for the soft-bodied *Alosa* spp. and Atlantic tomcod, would not permit the tracking of the same fish over the four observation periods.

- Formalin. Twenty-five fish from each taxa and life stage were placed in plastic bags containing 10% buffered formalin. The plastic bags were

TABLE 2-1

TEST GROUP INFORMATION

Fish Preservation Study

TEST GROUP No.	TEST GROUP COMPOSITION SPECIES	LIFE STAGE	TEST START DATE	No. OF SPECIMENS TESTED	PRESERVATION METHOD
1	Atlantic tomcod	Adult	16 Jan 1987	100	Freezing
2	Atlantic tomcod	Adult	16 Jan 1987	25	Formalin
3	White perch	Adult	23 Jan 1987	25	Formalin
4	White perch	Adult	13 Apr 1987	100	Freezing
5	*Alosa* spp.	Adult	14 Apr 1987	25	Formalin
6	*Alosa* spp.	Adult	29 May 1987	101	Freezing
7	White perch	YOY	1 Sep 1987	25	Formalin
8	White perch	YOY	1 Sep 1987	100	Freezing
9	*Alosa* spp.	YOY	3 Sep 1987	25	Formalin
10	*Alosa* spp.	YOY	24 Sep 1987	100	Freezing

YOY - Young-of-year.

placed in a sealed container for the duration of the study. The same 25 individuals were tracked for the entire study period.

Following the initial preservation, each group of 25 fish was evaluated at 1, 4, 24, and 52 weeks. Frozen fish were allowed to thaw at room temperature, measured for total length, gently wiped to remove excess moisture, and weighed. Formalin-preserved fish were rinsed in fresh water, gently wiped to remove excess moisture, and measured for total length and weight. All formalin-preserved fish were re-preserved in the original 10% buffered formalin solution at each evaluation interval except at 52 weeks. Following the 52-week measurement, both the fish and formalin were disposed of properly.

Length and weight data were recorded and input on a personal computer. Changes in length (C_L) and weight (C_W), the differences between the value recorded at each observation and the initial value, were recorded at each observation. A positive C_L or C_W was obtained when length or weight increased during the preservation period, and a negative value indicated a decrease in length or weight due to the preservative. Percent difference was calculated using the following formula:

$$\text{Percent difference} = 1 - \frac{C_L \text{ (or } C_W)}{\text{Initial length (or weight)}} \times 100$$

3. RESULTS

3.1 FREEZING

The average length and weight data recorded initially and at each observation interval for each fish taxa and age class preserved by freezing are presented in Table 3-1. Overall fish length decreased consistently for each taxa and life stage following freezing; some variability was noted for weight measurements following freezing, but, generally, weight decreased after freezing.

TABLE 3-1

MEAN TOTAL LENGTH AND WEIGHT FOR FISH PRESERVED THROUGH FREEZING

TAXA	AGE CLASS	PRESERVATION PERIOD	MEAN TOTAL LENGTH (mm) NUMBER TESTED	INITIAL LENGTH	END LENGTH	CHANGE (C_L)	PERCENT CHANGE (%)	MEAN TOTAL BIOMASS (g) NUMBER TESTED	INITIAL WEIGHT	END WEIGHT	CHANGE (C_W)	PERCENT CHANGE (%)
Atlantic tomcod	Adult	1 week	25	168.4	164.4	-4.0	97.6	25	36.16	35.14	-1.02	97.2
		4 weeks	25	151.6	150.2	-1.4	99.1	21[a]	23.50	22.98	-0.52	97.8
		24 weeks	25	171.6	166.0	-5.6	96.7	25	38.73	40.00	+1.27	103.3
		52 weeks	25	145.2	142.5	-2.7	98.1	25	23.47	21.91	-1.56	93.4
Alosa spp.	YOY	1 week	25	95.4	93.9	-1.5	98.4	25	6.70	6.72	+0.02	100.3
		4 weeks	25	74.4	74.2	-0.2	99.7	25	2.83	2.77	-0.06	97.9
		24 weeks	25	75.3	74.5	-0.8	98.9	25	3.04	2.96	-0.08	97.4
		52 weeks	15	73.9	72.1	-1.8	97.6	23	2.69	2.40	-0.29	89.2
Alosa spp.	Adult	1 week	25	274.3	269.6	-4.7	98.3	25	150.45	150.28	-0.17	99.9
		4 weeks	25	254.9	251.6	-3.3	98.7	25	109.32	107.96	-1.36	98.8
		24 weeks	25	256.8	253.5	-3.3	98.7	25	112.90	108.65	-4.25	96.2
		52 weeks	26	280.1	273.1	-7.0	97.5	26	191.79	190.57	-1.22	99.4
White perch	YOY	1 week	25	70.7	69.7	-1.0	98.6	25	4.39	4.25	-0.14	96.8
		4 weeks	25	66.2	63.4	-2.8	95.8	25	3.48	3.74	+0.26	107.5
		24 weeks	25	76.1	74.6	-1.5	98.0	25	5.32	5.03	-0.29	94.5
		52 weeks	25	77.8	74.6	-3.2	95.9	25	5.74	5.52	-0.22	96.2
White perch	Adult	1 week	25	138.6	136.0	-2.6	98.1	25	38.54	38.00	-0.54	98.6
		4 weeks	25	156.6	153.1	-3.5	97.8	25	51.25	50.54	-0.71	98.6
		24 weeks	25	144.1	140.2	-3.9	97.3	25	40.66	39.09	-1.57	96.1
		52 weeks	25	151.4	150.7	-0.7	99.5	25	47.35	44.78	-2.57	94.6

[a]Four females eliminated due to observed egg loss during analysis.

For the evaluation of freezing on fish length and weight, it must be emphasized that, due to the breakdown of tissue from repeated freezing and thawing, the same specimens could not be tracked over the 52-week study period. The problem with tissue breakdown necessitated the use of separate groups for each observation that may have introduced some bias in the determination of long-term trends.

Each taxa and age class are presented and discussed separately in the following sections. Information on individual fish is presented in Appendix A.

3.1.1 Atlantic Tomcod: Adult

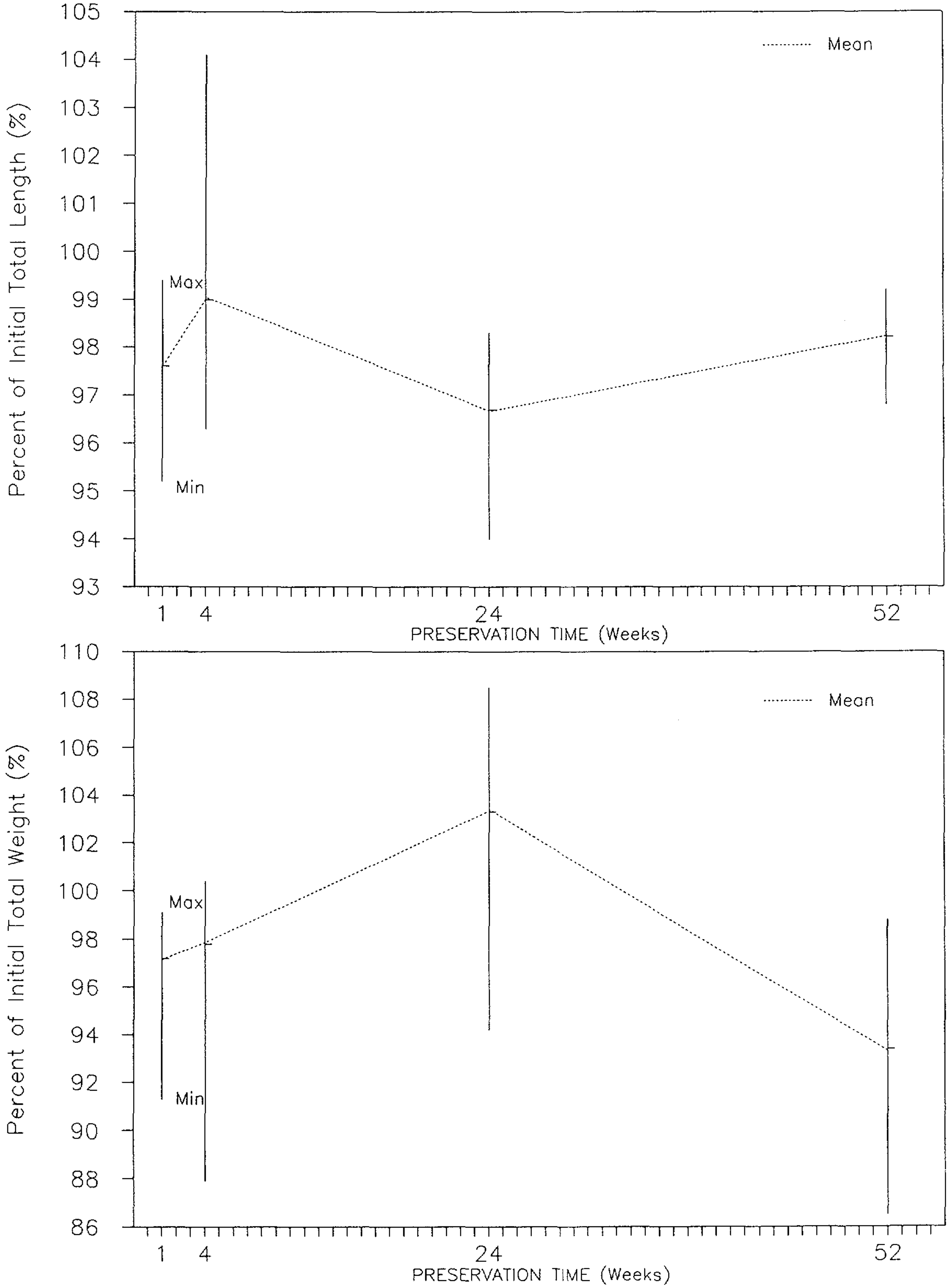
A total of 100 Atlantic tomcod were evaluated for the influence of freezing as a preservation technique on length and weight. The average length of the Atlantic tomcod tested was 15.9 cm (range 10.5 to 23.8 cm), and the average weight was 30.8 g (range 8.6 to 90.5 g).

The mean total length was less than the initial mean length at each of the four observations (Figure 3-1). Ninety-two of the 100 specimens measured decreased in length following preservation. Of the eight fish that did not decrease in length (all from the group preserved for four weeks), four fish were the same length and four fish increased in length an average of 2.0 mm (range 1.0 to 5.0 mm).

The influence of freezing on weight varied with time: an initial weight loss was noted at one week, less of a weight loss at four weeks, a weight gain was recorded at 24 weeks, followed by a weight loss at 52 weeks (Figure 3-1). The weight gain at 24 weeks showed a consistent pattern with 24 of the 25 fish increasing in weight by an average of 1.3 g.

FIGURE 3-1

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF ADULT ATLANTIC TOMCOD PRESERVED THROUGH FREEZING



3.1.2 Alosa spp.: Young-of-Year

One hundred young-of-year Alosa spp. were evaluated for the effects of freezing on length and weight. At the conclusion of the study, length information for 90 specimens and weight information for 98 specimens were available. Even with the use of separate groups for each observation, the breakdown of tissue due to freezing was evident on the fragile young-of-year Alosa spp. with loss of length and weight information on several specimens observed at 52 weeks (Table 3-1). The overall mean length for the young-of-year Alosa spp. was 8.4 cm (range 6.6 to 10.8 cm), and the overall mean weight was 3.8 g (range 1.7 to 9.0 g).

The mean length for each group decreased from the initial mean length at each observation; the lowest percent change was recorded at four weeks and the maximum percent change at 52 weeks (Figure 3-2). Biomass exhibited a small increase at one week averaging 100.3% of the initial weight, a 2.1% decrease (from the initial mean biomass) at four weeks that remained fairly constant through 24 weeks, and a substantial decrease in weight recorded at 52 weeks, 89.2% of the initial value (Figure 3-2).

3.1.3 Alosa spp.: Adult

Overall, 101 adult Alosa spp. (alewife, blueback herring) were evaluated under the freezing preservation study (Table 3-1). The range in total length extended from 21.1 to 32.2 cm and averaged 26.7 cm, and the range in total weight extended from 66.3 to 269.4 g and averaged 141.6 g.

The same trend noted for young-of-year Alosa spp. was noted for adults (Figure 3-3) an overall decrease in mean length during the one-year study period with the least change recorded at four and 24 weeks followed by a gradual decrease to the greatest difference at

FIGURE 3-2

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF YOUNG-OF-YEAR *ALOSA* SPP. PRESERVED THROUGH FREEZING

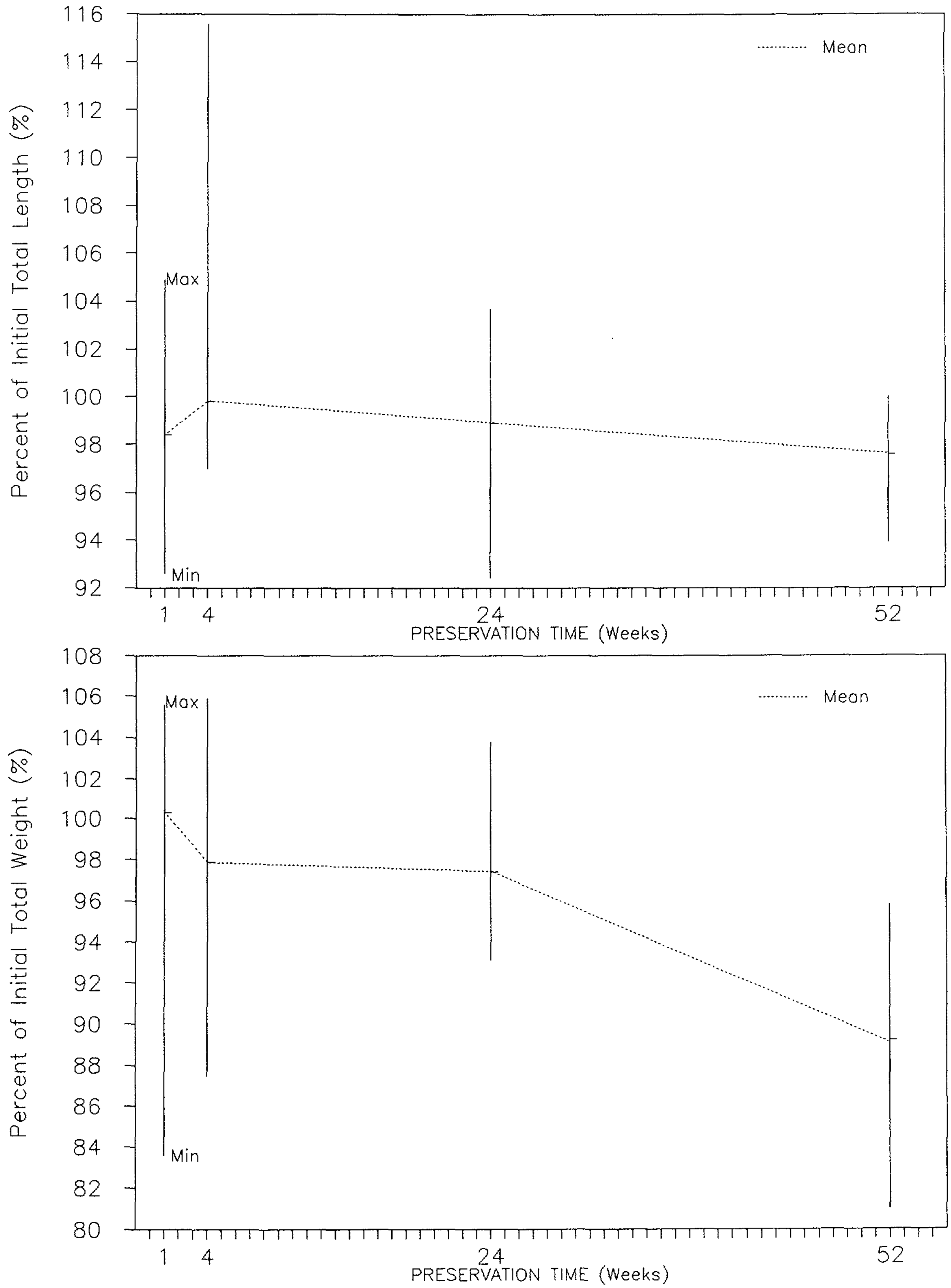
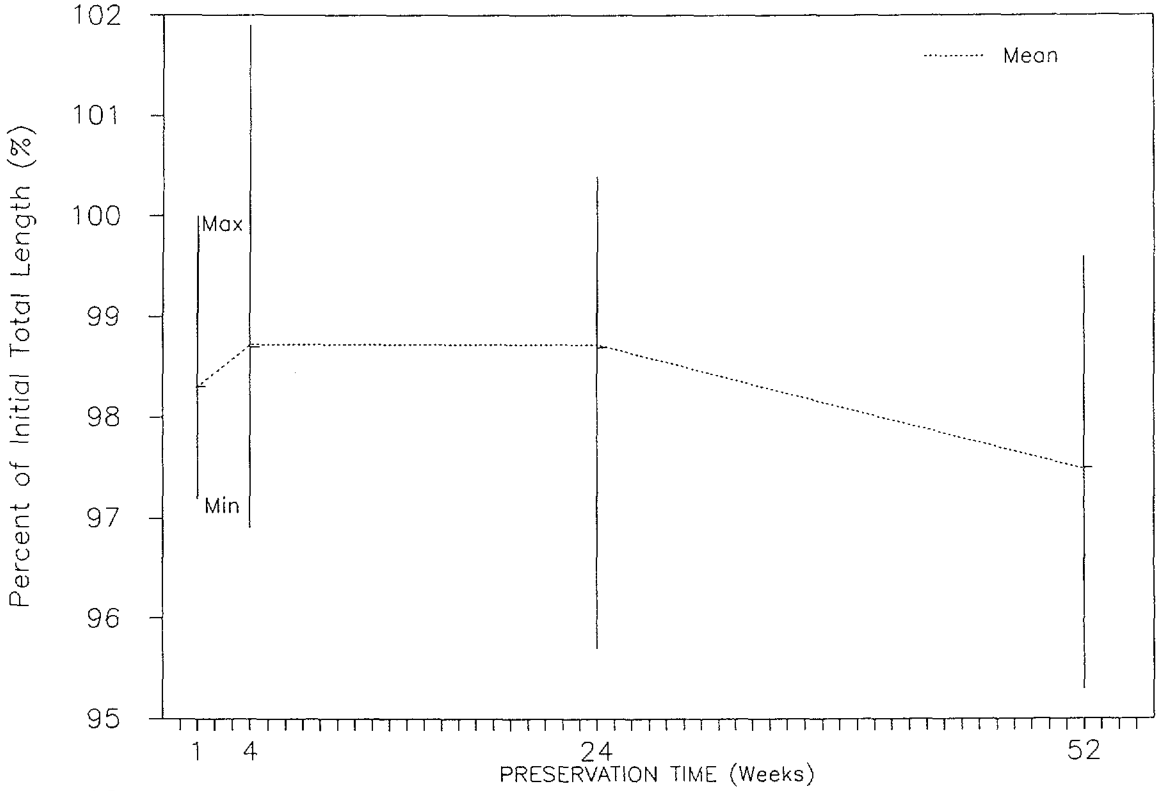
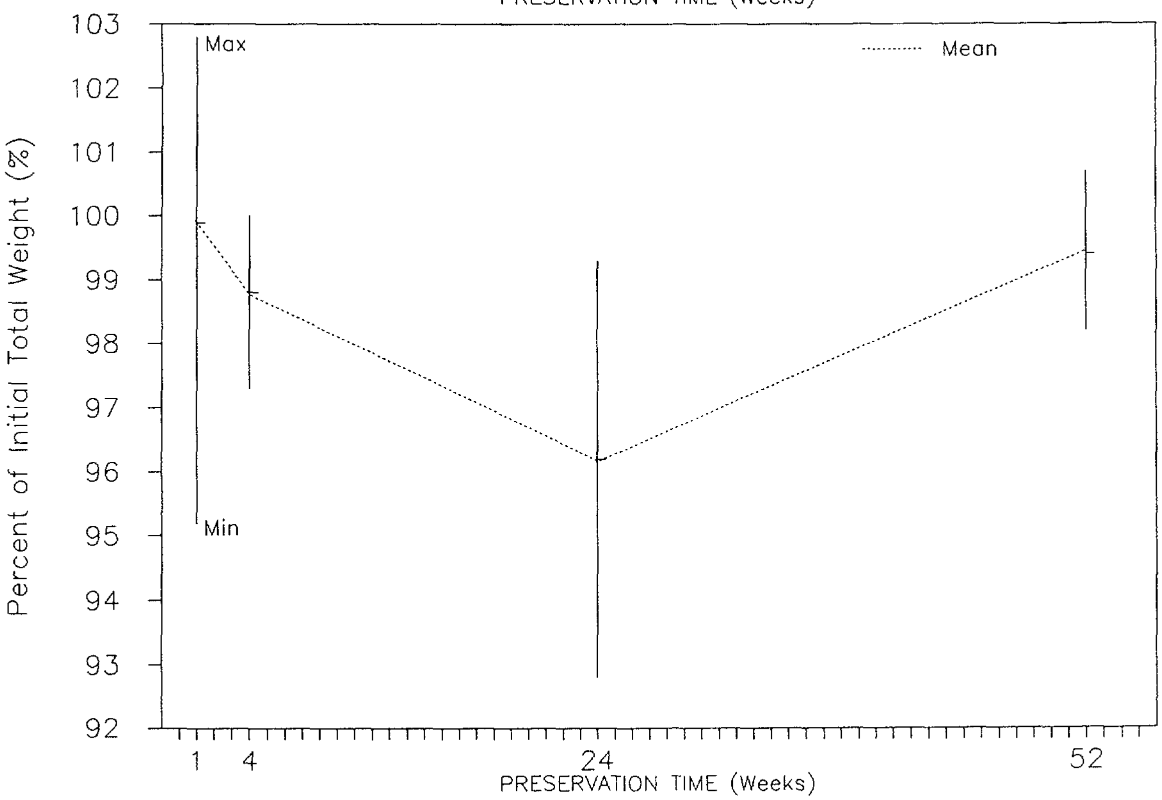


FIGURE 3-3

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF ADULT ALOSA SPP. PRESERVED THROUGH FREEZING





52 weeks. Biomass steadily decreased through 24 weeks, reached 96.2% of the initial value, and then increased so that at 52 weeks the preserved weight was 99.4% of the initial value (Figure 3-3).

3.1.4 White Perch: Young-of-Year

The mean length for 100 young-of-year white perch used in the freezing preservation study was 7.3 cm and ranged from 5.9 to 8.6 cm; the mean weight was 4.7 g and ranged from 2.2 to 8.2 g.

Mean length was less than the initial length at each observation (Figure 3-4): the greatest decrease was recorded at four weeks, a slight increase occurred at 24 weeks, and the decrease in length equaled the four-week value at 52 weeks. Length measurements showed relatively little variation except for the 52-week observation in which one specimen decreased 1.2 cm in total length. Following an initial weight loss recorded at the one-week observation, young-of-year white perch gained weight at four weeks with the average value 107.5% of the initial weight. A dramatic weight loss was recorded between the four-week and 24-week observation with an average difference in initial and observation period weight of 0.6 g recorded. At the 52-week observation period the mean weight was slightly higher than noted at 24 weeks and averaged 96.2% of the initial mean weight.

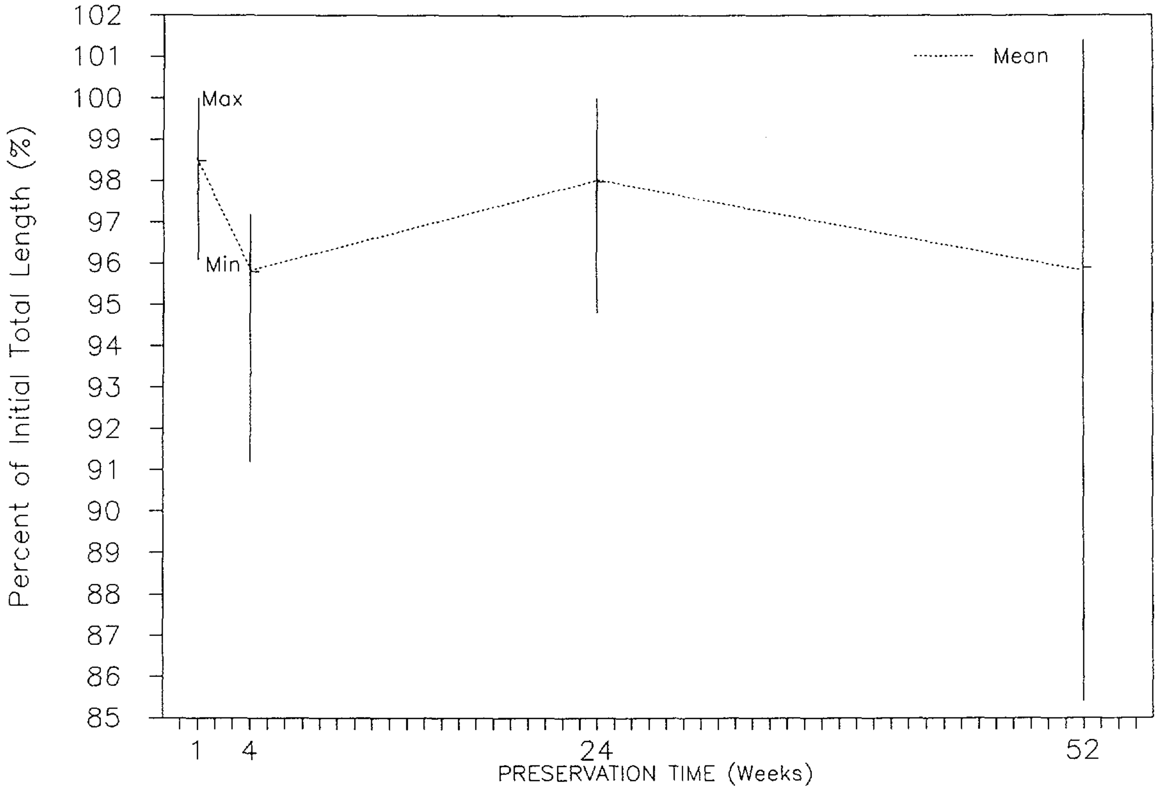
3.1.5 White Perch: Adult

Four groups of 25 adult white perch were tested under the freezing preservation study; the overall mean length was 14.8 cm (range 7.9 to 20.3 cm) and the mean weight was 44.4 g (range 5.1 to 107.4 g).

Freezing resulted in an overall decrease in length evident at each observation (Figure 3-5). The greatest decrease in length was recorded at the 24-week observation, averaging 97.3% of the initial

FIGURE 3-4

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF YOUNG-OF-YEAR WHITE PERCH PRESERVED THROUGH FREEZING



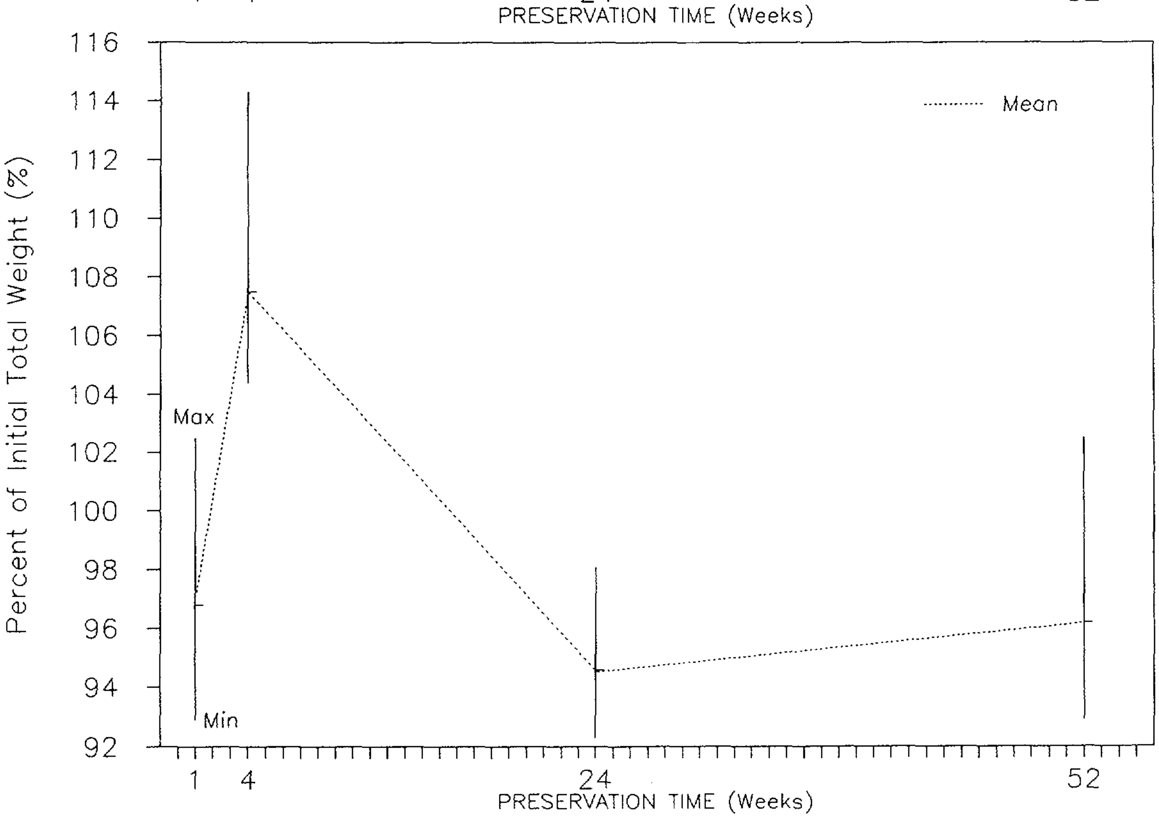
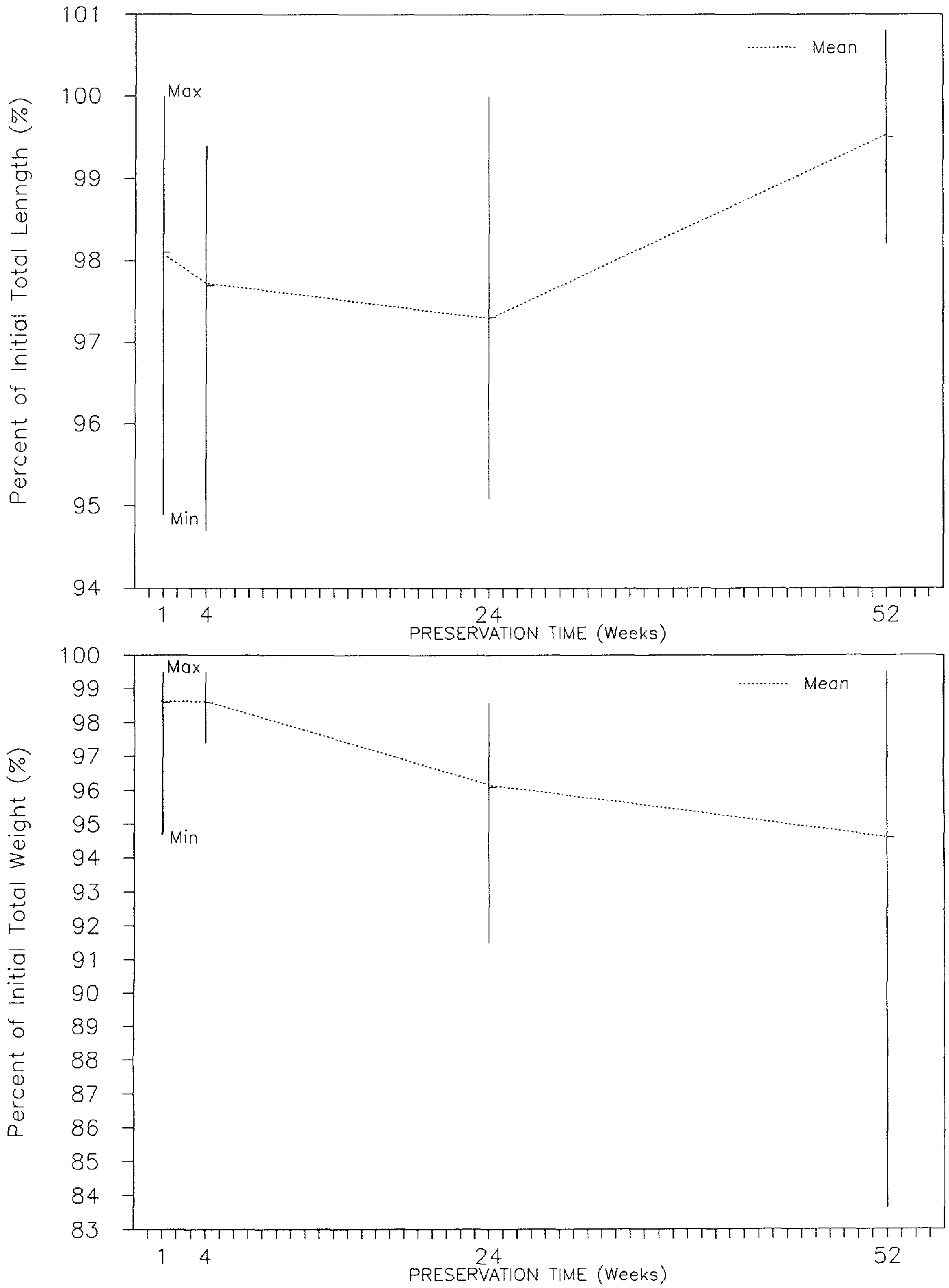


FIGURE 3-5

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF ADULT WHITE PERCH PRESERVED THROUGH FREEZING



length. At one year, very little change in length was noted with no change noted for 12 of the 25 fish, and an increase in length noted for one fish. Biomass decreased at each observation (Figure 3-5); the initial weight loss was approximately 2% followed by a gradual decline through 52 weeks. Percent change was highly variable at the 52-week observation.

3.2 FORMALIN

Mean total length and weight information for the 25 specimens of each selected taxa and age class recorded initially and at each of the four observation points during the one-year evaluation of formalin are presented in Table 3-2. In general, for all fish taxa evaluated, total length decreased, and total weight increased. All taxa and life stages, with the exception of young-of-year white perch, exhibited a decrease in total length at each observation period. For all fish preserved in formalin, there was an immediate gain in weight that remained relatively stable for the remainder of the preservation period.

Specific information for each taxa and life stage are presented in the following sections. Information on individual specimens is presented in Appendix B.

3.2.1 Atlantic Tomcod: Adult

The adult Atlantic tomcod monitored for the effects of formalin on length and weight ranged in total length from 11.1 to 24.5 cm and averaged 16.2 cm, and ranged in weight from 11.9 to 100.5 g and averaged 34.4 g. The percent change in total length and weight over the 52-week study period is plotted in Figure 3-6.

One week following preservation the mean total length was 98.3% of the initial value with 21 of the 25 specimens exhibiting a de-

TABLE 3-2

MEAN TOTAL LENGTH AND WEIGHT FOR FISH PRESERVED WITH FORMALIN

			LENGTH EVALUATION			WEIGHT EVALUATION		
TAXA	LIFE STAGE	OBSERVATION PERIOD (WEEKS)	GROUP MEAN (mm)	PERCENT OF INITIAL LENGTH	CHANGE IN LENGTH (C_L) (mm)	GROUP MEAN (g)	PERCENT OF INITIAL WEIGHT	CHANGE IN WEIGHT (C_W) (g)
Atlantic tomcod	Adult	0	161.8			34.4		
		1	159.1	98.3	-2.7	40.0	116.3	+5.6
		4	159.0	98.3	-2.8	39.4	114.5	+5.0
		24	158.8	98.1	-3.0	38.5	111.9	+4.1
		52	158.8	98.1	-3.0	38.7	112.5	+4.3
Alosa spp.	YOY	0	79.1			4.1		
		1	79.0	99.9	-0.1	4.5	109.8	+0.4
		4	78.5	99.2	-0.6	4.5	109.8	+0.4
		24	78.1	98.7	-1.0	4.5	109.8	+0.4
		52	77.0	97.3	-2.1	4.4	107.3	+0.3
Alosa spp.	Adult	0	289.1			235.2		
		1	287.9	99.6	-1.2	248.9	105.8	+13.7
		4	287.5	99.4	-1.6	248.0	105.4	+12.8
		24	286.0	98.9	-3.1	246.0	104.6	+10.8
		52	284.8	98.5	-4.3	246.3	104.7	+11.1
White perch	YOY	0	76.0			5.4		
		1	75.8	99.7	-0.2	5.8	107.4	+0.4
		4	76.2	100.3	+0.2	5.9	109.3	+0.5
		24	76.0	100.0	0.0	5.8	107.4	+0.4
		52	74.8	98.4	-1.2	5.8	107.4	+0.4
White perch	Adult	0	109.8			25.0		
		1	109.2	99.5	-0.6	27.7	110.8	+2.7
		4	109.0	99.3	-0.8	27.9	111.6	+2.9
		24	108.4	98.7	-1.4	27.8	111.2	+2.8
		52	108.3	98.6	-1.5	28.4	113.6	+3.4

YOY - Young-of-year.

FIGURE 3-6
PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF ADULT ATLANTIC TOMCOD PRESERVED WITH FORMALIN

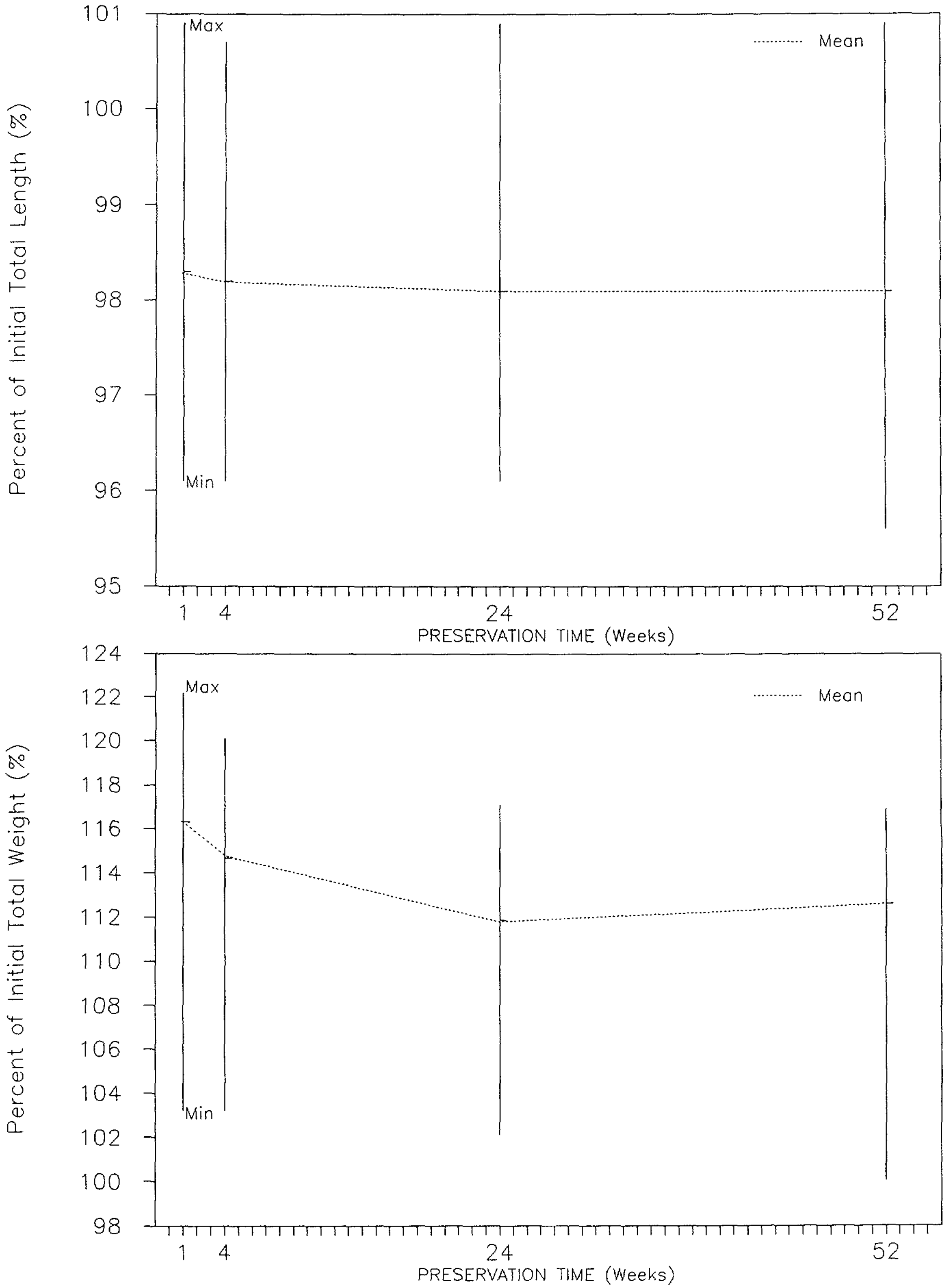
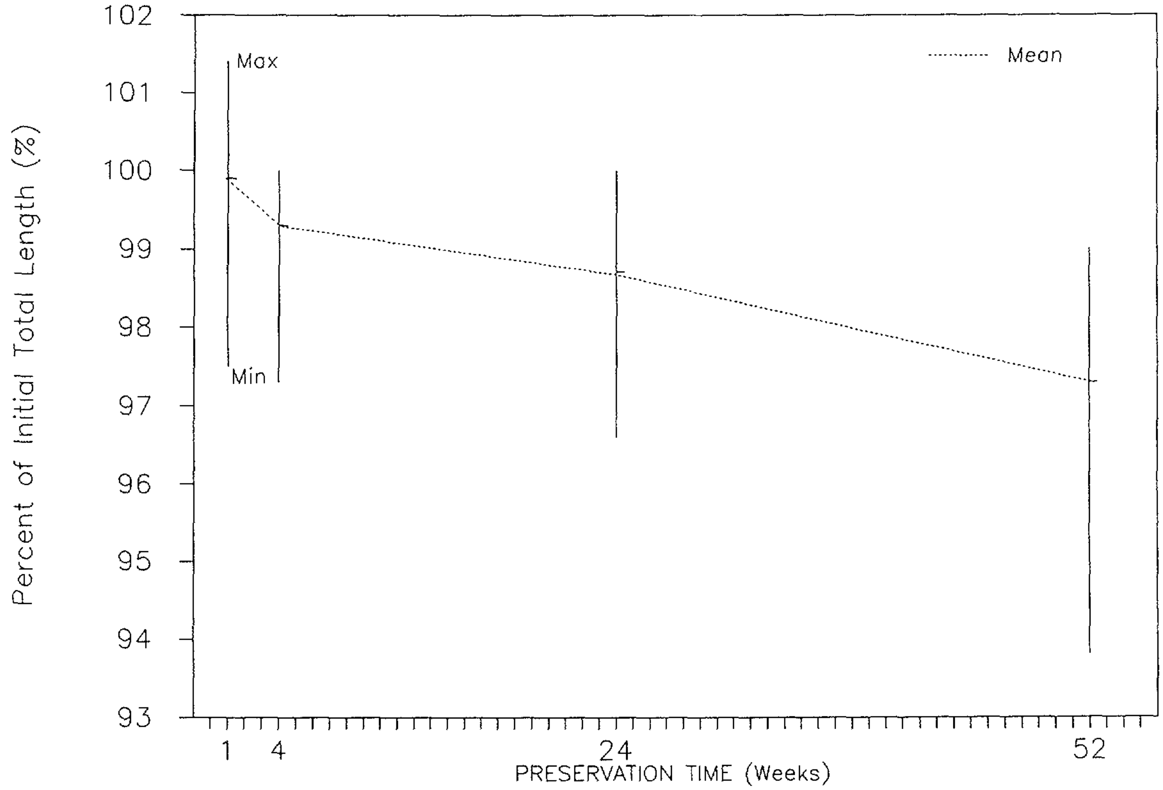


FIGURE 3-7

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF YOUNG-OF-YEAR ALOSA SPP. PRESERVED WITH FORMALIN



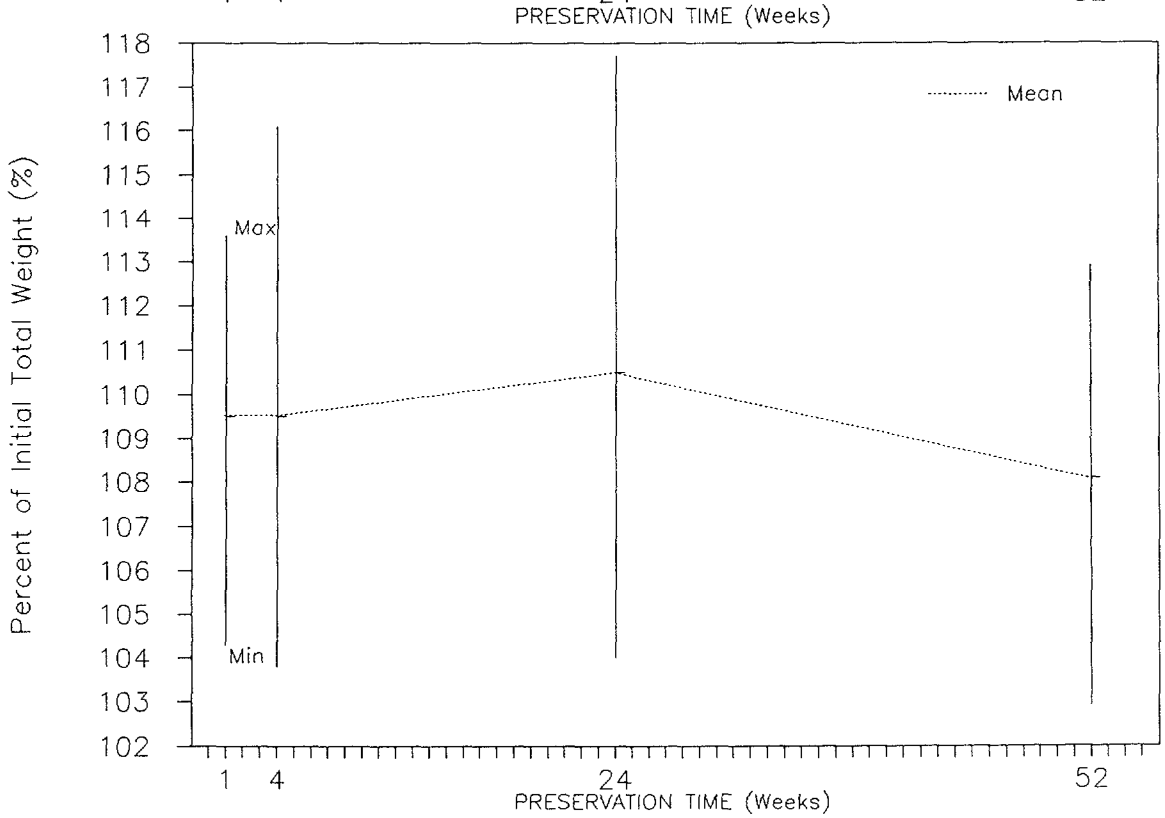


FIGURE 3-8

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF ADULT *ALOSA* SPP. PRESERVED WITH FORMALIN

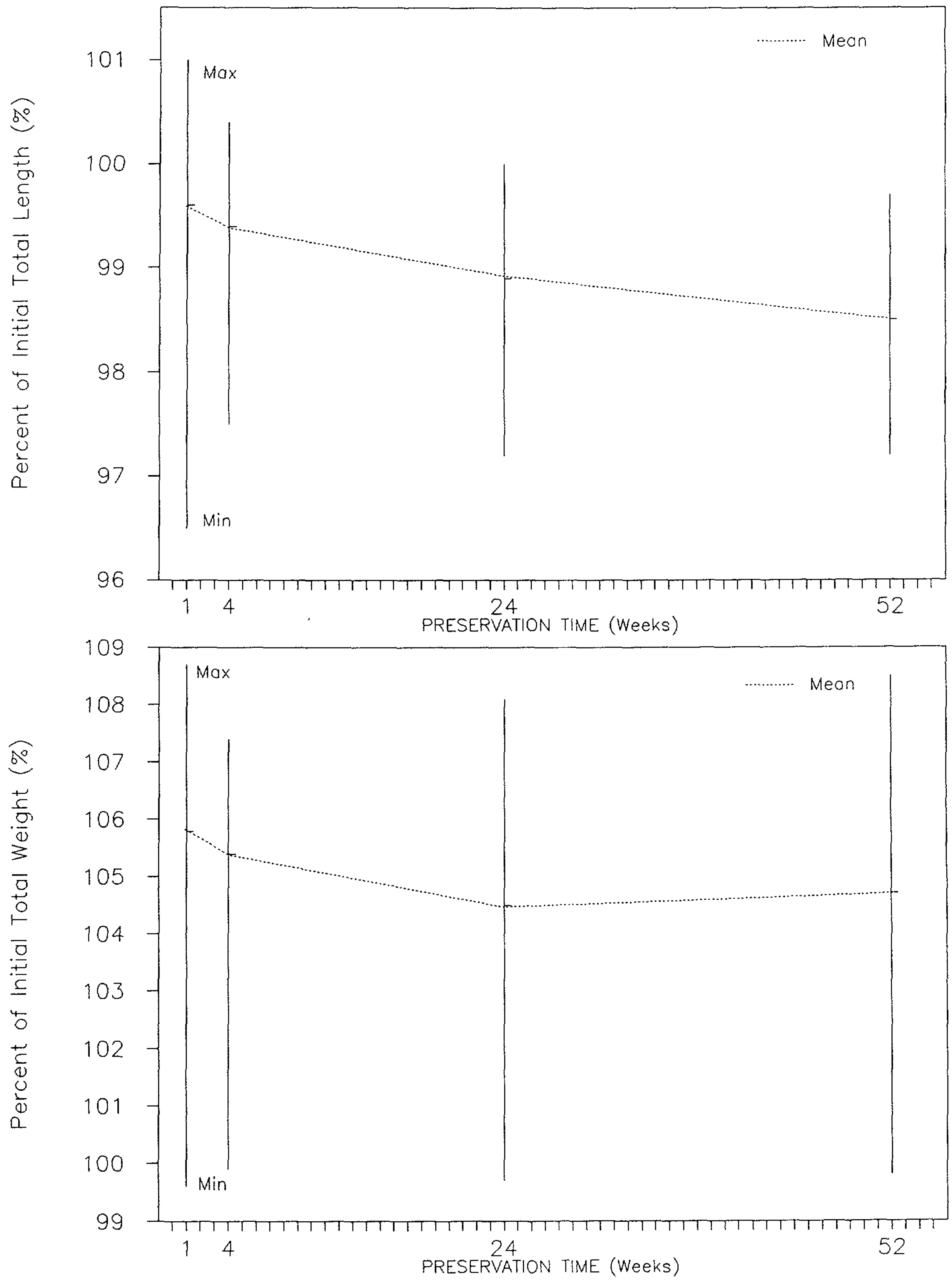


FIGURE 3-9

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF YOUNG-OF-YEAR WHITE PERCH PRESERVED WITH FORMALIN

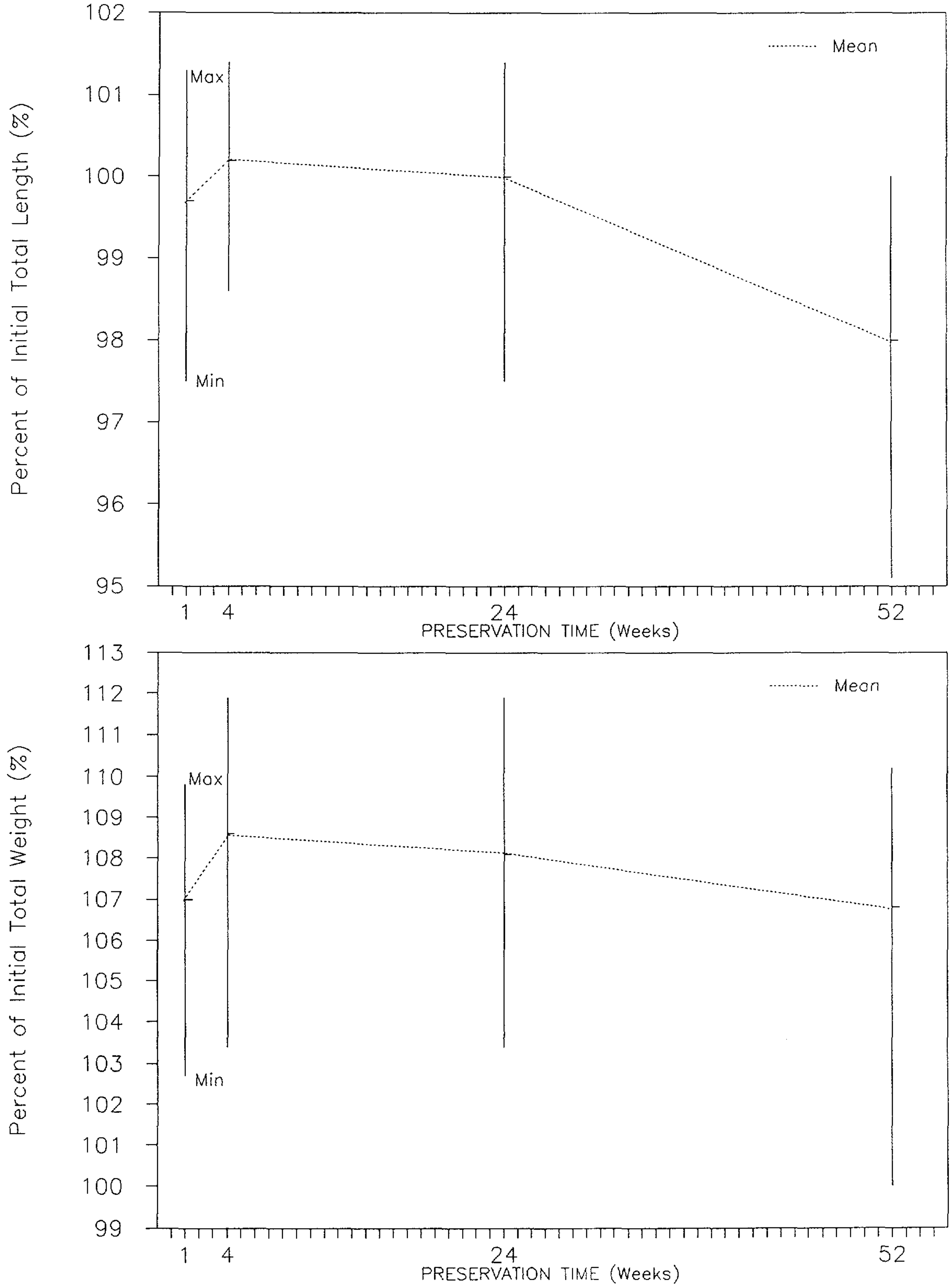
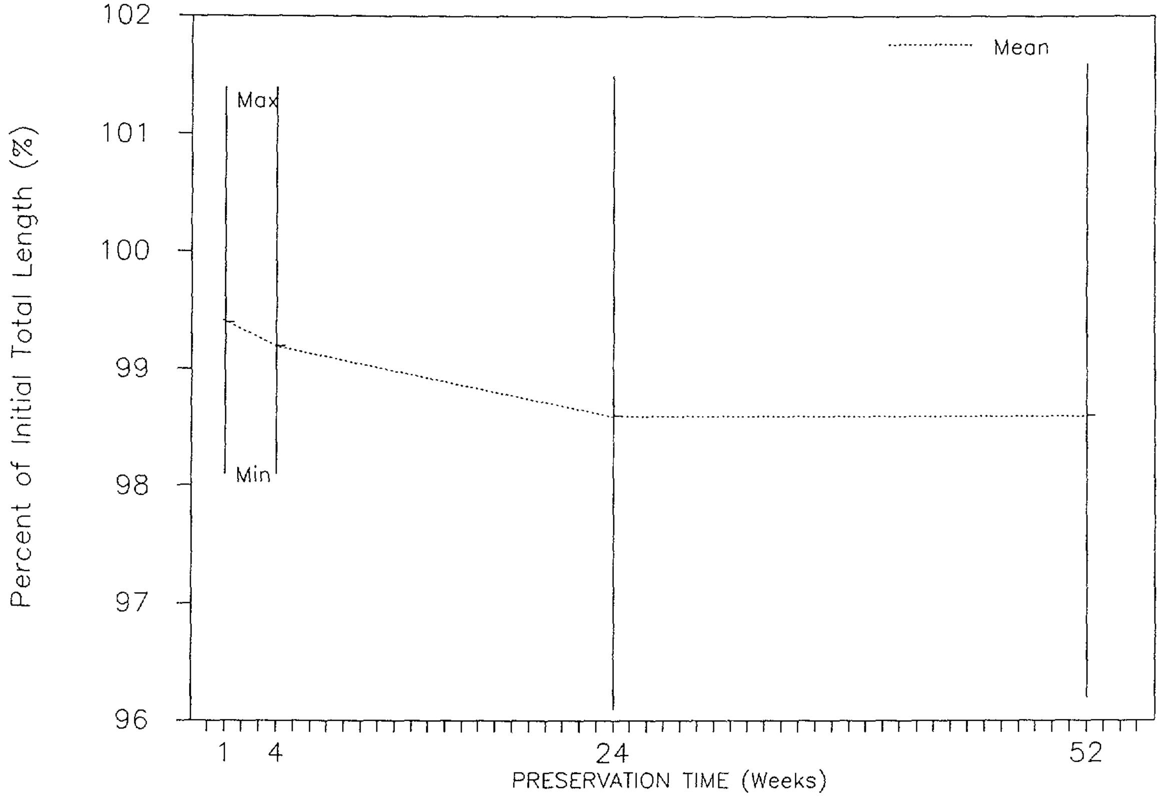
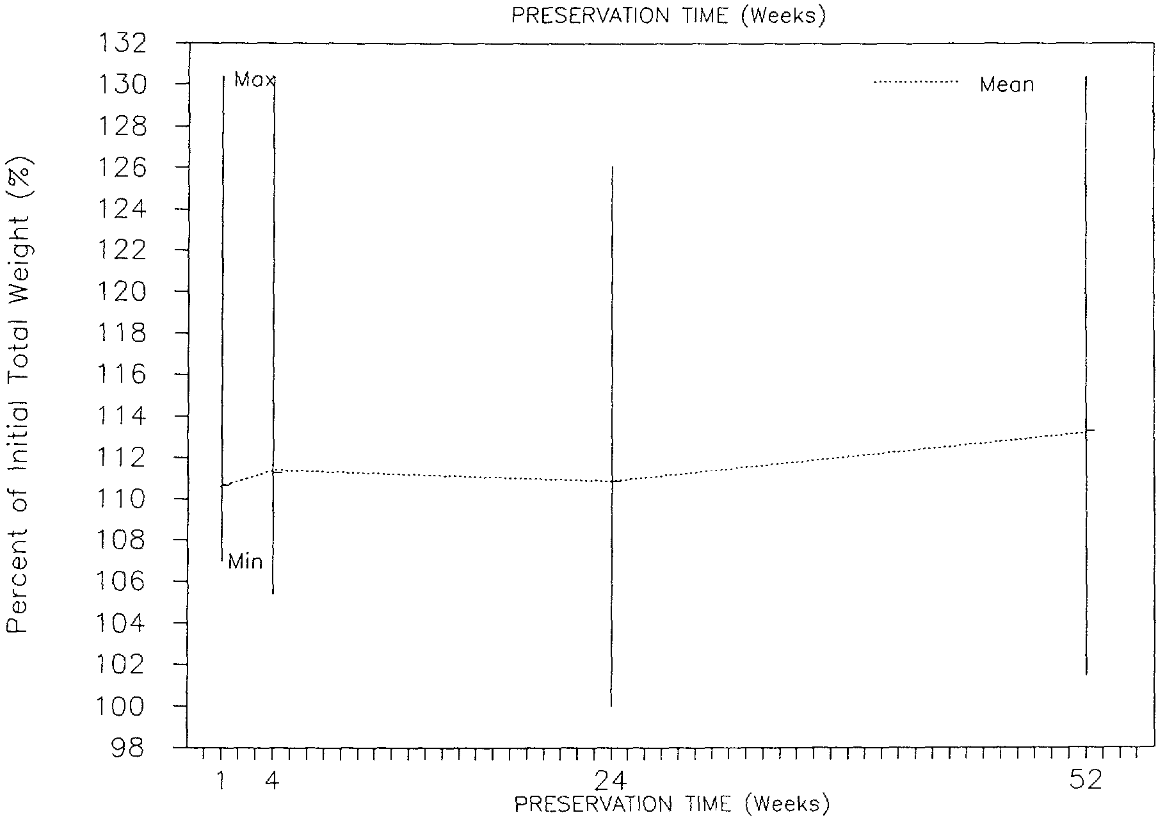


FIGURE 3-10

PERCENT CHANGE (MEAN AND RANGE) IN TOTAL LENGTH AND WEIGHT OF ADULT WHITE PERCH PRESERVED WITH FORMALIN





and Sayers (1987), the influence of freezing on weight was somewhat variable; at various observation periods three taxa, Atlantic tomcod, young-of-year *Alosa* spp., and young-of-year white perch, actually exhibited a weight increase.

The influence of formalin on length and weight was more consistent resulting in lower lengths and higher weights. Formalin's effect on length was similar to that observed for freezing with a consistent, generally small, decrease in total length progressing over the 52-week study period. The greatest initial influence was observed for Atlantic tomcod; however, the long-term effects were generally similar for all taxa tested. Weight for formalin-preserved fish increased substantially during the first week, accounting for almost all of the total increase, and then remained fairly constant for the remainder of the study period.

In addition to the changes in length and weight noted as a result of freezing, the detrimental influence of freezing (and thawing) on body tissue must be taken into consideration. The study results indicate substantial tissue breakdown directly related to preservation time with the greatest influence determined for the soft-rayed species. No detrimental influence on body tissue was observed for formalin.

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APPENDIX A

RESULTS OF FREEZING PRESERVATION STUDY

Table A-1.1
Adult Atlantic Tomcod

Preservation Technique: Freezing
Perservation Duration: One Week

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
210	173	170	98.3	40.3	39.0	96.8
212	179	176	98.3	42.6	41.2	96.7
209	138	134	97.1	18.8	18.0	95.7
208	169	167	98.8	32.9	31.6	96.0
207	167	166	99.4	36.2	35.4	97.8
996	197	191	97.0	52.8	52.2	98.9
221	184	181	98.4	63.9	62.8	98.3
219	184	178	96.7	42.1	41.2	97.9
211	161	155	96.3	28.7	27.5	95.8
997	171	167	97.7	35.6	34.7	97.5
994	187	183	97.9	43.4	42.7	98.4
995	149	143	96.0	24.2	23.4	96.7
693	145	138	95.2	24.2	22.1	91.3
214	154	152	98.7	27.9	26.6	95.3
202	156	155	99.4	26.7	25.8	96.6
220	166	164	98.8	38.8	37.7	97.2
201	154	149	96.8	23.1	22.9	99.1
223	143	141	98.6	19.0	18.3	96.3
200	154	152	98.7	27.8	27.5	98.9
204	143	141	98.6	23.6	22.6	95.8
203	187	183	97.9	45.5	44.7	98.2
206	160	154	96.3	26.1	25.4	97.3
215	195	188	96.4	50.8	49.2	96.9
222	181	174	96.1	40.7	39.4	96.8
205	212	207	97.6	68.2	66.5	97.5
Number Analyzed	25			25		
Summation	4209.00	4109.00		903.90	878.40	
Mean	168.36	164.36	97.62	36.16	35.14	97.18
Standard Deviation	19.31	18.83		13.16	13.03	

Table A-1.2
Adult Atlantic Tomcod

Preservation Technique: Freezing
Perservation Duration: Four Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
216	164	158	96.3	28.4	28.5	100.4
691	152	149	98.0	24.3	23.8	97.9
917*	206	203	98.5	66.3	65.0	98.0
690	150	149	99.3	24.2	23.8	98.3
217	153	149	97.4	25.5	25.3	99.2
213	152	151	99.3	23.8	23.8	100.0
915*	123	128	104.1	14.4	12.6	87.5
689	140	140	100.0	17.6	17.2	97.7
692	145	144	99.3	22.9	22.7	99.1
913	147	146	99.3	19.1	18.6	97.4
923	125	121	96.8	11.9	11.7	98.3
916	169	164	97.0	32.3	31.7	98.1
999	154	151	98.1	27.8	26.1	93.9
921	169	169	100.0	35.9	34.5	96.1
218	146	147	100.7	21.4	20.8	97.2
919	135	135	100.0	17.3	16.8	97.1
914	150	148	98.7	26.4	25.8	97.7
910	130	127	97.7	15.5	15.4	99.4
918*	156	155	99.4	31.3	27.5	87.9
688	153	154	100.7	25.8	25.3	98.1
998	143	143	100.0	18.8	18.2	96.8
694	149	146	98.0	21.9	21.5	98.2
920	183	184	100.5	34.5	33.3	96.5
922*	157	156	99.4	28.7	26.3	91.6
911	140	138	98.6	18.1	17.8	98.3
Number Analyzed	25			21		
Summation	3791.00	3755.00		493.40	482.60	
Mean	151.64	150.20	99.05	23.50	22.98	97.79
Standard Deviation	17.66	17.22		6.18	5.95	

*Egg loss observed at time of analysis.

Table A-1.3
Adult Atlantic Tomcod

Preservation Technique: Freezing
Perservation Duration: 24 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
973	212	206	97.2	60.5	64.2	106.1
986	167	162	97.0	34.2	36.0	105.3
990	238	234	98.3	90.5	93.2	103.0
989	172	168	97.7	33.3	34.6	103.9
912	144	139	96.5	18.7	19.9	106.4
984	165	160	97.0	33.8	35.7	105.6
970	167	161	96.4	35.9	37.3	103.9
982	157	152	96.8	27.8	29.6	106.5
985	177	172	97.2	39.7	41.0	103.3
974	221	213	96.4	79.9	83.4	104.4
980	208	203	97.6	59.6	62.1	104.2
971	146	140	95.9	26.7	27.6	103.4
988	167	164	98.2	37.4	38.5	102.9
983	144	140	97.2	19.9	21.6	108.5
972	161	155	96.3	30.3	31.1	102.6
976	150	145	96.7	21.3	22.2	104.2
987	167	164	98.2	34.2	35.5	103.8
993	198	191	96.5	75.9	71.5	94.2
981	164	159	97.0	30.5	30.8	101.0
992	217	208	95.9	68.8	69.7	101.3
977	131	125	95.4	13.9	15.5	111.5
978	155	150	96.8	24.8	25.4	102.4
979	149	140	94.0	19.8	21.2	107.1
991	131	128	97.7	15.1	15.7	104.0
975	183	172	94.0	35.7	36.7	102.8
Number Analyzed	25			25		
Summation	4291.00	4151.00		968.20	1000.00	
Mean	171.64	166.04	96.74	38.73	40.00	103.28
Standard Deviation	28.84	28.36		21.29	21.42	

Table A-1.4
Adult Atlantic Tomcod

Preservation Technique: Freezing
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
825	139	137	98.6	18.3	17.6	96.2
826	192	186	96.9	58.8	55.2	93.9
827	225	222	98.7	76.6	71.7	93.6
828	151	148	98.0	25.5	23.6	92.5
829	149	146	98.0	20.1	18.6	92.5
830	148	146	98.6	22.0	20.0	90.9
831	105	104	99.0	8.6	7.8	90.7
832	135	132	97.8	17.4	15.7	90.2
833	127	126	99.2	14.7	13.0	88.4
834	124	123	99.2	14.4	13.1	91.0
835	163	160	98.2	30.5	29.0	95.1
836	116	114	98.3	11.8	11.1	94.1
837	138	136	98.6	17.0	14.7	86.5
838	129	126	97.7	13.4	13.0	97.0
839	204	201	98.5	56.4	54.3	96.3
840	184	181	98.4	38.4	35.6	92.7
841	117	115	98.3	13.0	11.8	90.8
842	141	137	97.2	18.3	17.2	94.0
843	126	122	96.8	13.0	12.0	92.3
844	124	121	97.6	15.1	14.1	93.4
845	150	147	98.0	18.5	17.3	93.5
846	134	132	98.5	16.4	16.2	98.8
847	142	139	97.9	19.5	18.4	94.4
848	136	133	97.8	14.6	13.8	94.5
849	131	129	98.5	14.4	13.0	90.3
Number Analyzed	25			25		
Summation	3630.00	3563.00		586.70	547.80	
Mean	145.20	142.52	98.15	23.47	21.91	93.35
Standard Deviation	28.63	28.11		16.75	15.87	

Table A-1.5
Young-of-Year Alosa spp.

Preservation Technique: Freezing
Perservation Duration: One Week

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
374	92	90	97.8	5.8	6.1	105.2
371	97	96	99.0	7.0	6.8	97.1
380	89	87	97.8	5.2	5.1	98.1
382	97	95	97.9	6.2	6.2	100.0
348	102	100	98.0	8.3	8.1	97.6
350	100	98	98.0	7.4	7.7	104.1
399	96	95	99.0	6.9	7.1	102.9
347	85	85	100.0	4.7	4.9	104.3
381	90	87	96.7	5.7	6.0	105.3
353	108	100	92.6	8.5	8.7	102.4
357	100	97	97.0	7.2	7.6	105.6
373	92	89	96.7	6.2	6.5	104.8
351	89	89	100.0	5.6	5.5	98.2
384	81	85	104.9	5.5	4.6	83.6
376	104	100	96.2	9.0	8.9	98.9
372	94	96	102.1	6.4	6.2	96.9
352	101	100	99.0	7.9	7.8	98.7
385	104	103	99.0	8.2	8.1	98.8
354	97	95	97.9	6.7	7.0	104.5
370	98	94	95.9	6.8	7.1	104.4
367	100	102	102.0	7.5	7.4	98.7
375	95	90	94.7	6.7	6.8	101.5
355	89	91	102.2	5.2	5.2	100.0
369	100	100	100.0	7.9	7.9	100.0
299	84	83	98.8	4.9	4.8	98.0

Number Analyzed	25			25		
Summation	2384.00	2347.00		167.40	168.10	
Mean	95.36	93.88	98.45	6.70	6.72	100.30
Standard Deviation	6.78	5.89		1.24	1.24	

Table A-1.6
Young-of-Year Alosa spp.

Preservation Technique: Freezing
Perservation Duration: Four Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
298	76	75	98.7	2.8	2.9	103.6
297	69	68	98.6	2.0	2.1	105.0
296	76	75	98.7	2.9	2.9	100.0
295	76	77	101.3	2.9	2.8	96.6
294	75	74	98.7	3.0	3.0	100.0
293	75	73	97.3	2.8	2.7	96.4
292	71	71	100.0	2.5	2.5	100.0
291	71	69	97.2	2.3	2.3	100.0
290	80	81	101.3	3.5	3.6	102.9
289	73	72	98.6	2.6	2.6	100.0
288	69	68	98.6	2.1	2.1	100.0
287	67	65	97.0	1.7	1.8	105.9
286	72	72	100.0	2.4	2.4	100.0
285	79	79	100.0	3.2	3.2	100.0
284	77	89	115.6	3.1	3.2	103.2
283	70	70	100.0	2.4	2.4	100.0
282	71	71	100.0	2.7	2.6	96.3
281	73	73	100.0	2.9	2.7	93.1
280	70	70	100.0	2.4	2.1	87.5
279	79	78	98.7	3.1	3.0	96.8
278	75	74	98.7	3.2	2.9	90.6
277	83	82	98.8	4.1	3.8	92.7
276	75	73	97.3	3.1	2.9	93.5
275	74	74	100.0	3.2	3.1	96.9
274	83	82	98.8	3.9	3.6	92.3
Number Analyzed	25			25		
Summation	1859.00	1855.00		70.80	69.20	
Mean	74.36	74.20	99.78	2.83	2.77	97.88
Standard Deviation	4.25	5.37		0.56	0.50	

Table A-1.7
Young-of-Year Alosa spp.

Preservation Technique: Freezing
Perservation Duration: 24 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
273	85	84	98.8	4.7	4.6	97.9
272	92	89	96.7	5.9	5.7	96.6
271	90	89	98.9	5.7	5.6	98.2
270	82	85	103.7	4.2	4.1	97.6
269	75	74	98.7	2.9	2.7	93.1
268	70	69	98.6	2.4	2.3	95.8
267	67	67	100.0	2.1	2.1	100.0
266	79	73	92.4	2.6	2.5	96.2
265	75	75	100.0	3.0	2.9	96.7
264	75	75	100.0	2.8	2.7	96.4
263	73	72	98.6	2.8	2.8	100.0
262	67	67	100.0	2.2	2.2	100.0
261	71	72	101.4	2.5	2.4	96.0
260	88	87	98.9	4.3	4.0	93.0
259	69	68	98.6	2.1	2.0	95.2
258	76	76	100.0	3.2	3.1	96.9
257	70	70	100.0	2.7	2.7	100.0
256	69	68	98.6	2.3	2.2	95.7
255	70	70	100.0	2.1	2.1	100.0
254	71	72	101.4	2.5	2.4	96.0
253	72	71	98.6	2.5	2.5	100.0
252	73	72	98.6	2.5	2.4	96.0
251	74	73	98.6	2.6	2.5	96.2
250	75	71	94.7	2.6	2.7	103.8
249	74	73	98.6	2.8	2.7	96.4
Number Analyzed	25			25		
Summation	1882.00	1862.00		76.00	73.90	
Mean	75.28	74.48	98.94	3.04	2.96	97.37
Standard Deviation	6.99	6.78		1.07	1.03	

Table A-1.8
Young-of-Year Alosa spp.

Preservation Technique: Freezing
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
248	82	77	93.9	3.9	3.7	94.9
247	72			2.4	2.3	95.8
246	70			2.1	1.9	90.5
295	66	66	100.0	1.9	1.7	89.5
244	71			2.4	2.2	91.7
243	75			2.6	2.4	92.3
292	67	65	97.0	2.2	2.0	90.9
241	70	70	100.0	2.3	2.1	91.3
240	84	81	96.5	4.0	3.7	92.5
239	74	71	95.9	2.7	2.3	85.2
238	74	71	95.9	2.8	2.4	85.7
237	83	82	98.8	3.9	3.2	82.1
236	74	71	95.9	2.7	2.3	85.2
235	74	72	97.3	2.9	2.6	89.7
234	70			2.3	2.1	91.3
233	74			2.6	2.3	88.5
232	76	75	98.7	3.0	2.7	90.0
231	69			2.2		
230	67	67	100.0	2.1	1.8	85.7
229	70	69	98.6	2.3	2.1	91.3
228	77	75	97.4	2.7	2.3	85.2
227	77			2.3		
226	70			2.2	1.9	86.4
225	80			3.7	3.5	94.6
224	70	69	98.6	2.1	1.7	81.0
Number Analyzed	15			23		
Summation	1108.00	1081.00		16.80	55.20	
Mean	73.87	72.07	97.56	2.69	2.40	89.22
Standard Deviation	5.78	5.06		0.63	0.59	

Table A-1.9
Adult Alosa spp.

Preservation Technique: Freezing
Perservation Duration: One Week

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
700	261	255	97.7	128.4	127.1	99.0
701	305	300	98.4	196.2	190.1	96.9
702	270	267	98.9	122.4	119.9	98.0
703	287	282	98.3	143.4	143.2	99.9
704	257	254	98.8	130.7	129.9	99.4
705	285	277	97.2	167.1	165.3	98.9
706	273	267	97.8	162.2	161.4	99.5
707	259	252	97.3	142.5	143.0	100.4
708	277	271	97.8	142.5	143.0	100.4
709	299	293	98.0	198.9	200.3	100.7
710	276	269	97.5	165.8	168.4	101.6
711	266	262	98.5	142.7	144.1	101.0
712	275	273	99.3	153.1	154.4	100.8
713	262	257	98.1	145.9	146.2	100.2
714	291	283	97.3	181.8	186.9	102.8
715	308	304	98.7	197.6	199.8	101.1
716	237	236	99.6	107.2	104.1	97.1
717	267	261	97.8	126.9	127.9	100.8
718	286	281	98.3	178.9	180.2	100.7
719	260	257	98.8	126.0	127.1	100.9
720	285	280	98.2	164.2	163.7	99.7
721	270	270	100.0	127.7	121.6	95.2
771	265	260	98.1	146.2	144.1	98.6
772	281	278	98.9	144.3	145.2	100.6
773	255	252	98.8	118.6	120.2	101.3
Number Analyzed	25			25		
Summation	6857.00	6741.00		3761.20	3757.10	
Mean	274.28	269.64	98.31	150.45	150.28	99.89
Standard Deviation	16.62	15.98		25.69	26.38	

Table A-1.10
Adult Alosa spp.

Preservation Technique: Freezing
Perservation Duration: Four Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
728	261	258	98.9	121.1	118.4	97.8
749	244	241	98.8	98.4	97.2	98.8
752	275	270	98.2	129.6	127.4	98.3
733	268	264	98.5	125.1	123.2	98.5
736	266	271	101.9	117.7	117.0	99.4
729	240	238	99.2	86.7	85.6	98.7
744	251	248	98.8	105.8	103.3	97.6
743	257	253	98.4	114.7	112.6	98.2
745	235	234	99.6	91.0	91.0	100.0
742	244	242	99.2	100.1	99.0	98.9
739	254	246	96.9	99.3	97.6	98.3
730	246	242	98.4	104.3	102.9	98.7
748	256	253	98.8	104.8	102.0	97.3
750	211	209	99.1	66.3	65.1	98.2
724	268	262	97.8	122.8	120.4	98.0
741	258	255	98.8	119.3	117.5	98.5
738	273	267	97.8	120.5	118.8	98.6
735	245	240	98.0	87.8	87.7	99.9
740	237	232	97.9	82.7	81.0	97.9
746	257	253	98.4	101.9	100.9	99.0
747	247	245	99.2	94.0	93.5	99.5
734	253	252	99.6	111.3	110.9	99.6
387	272	266	97.8	131.8	131.2	99.5
732	293	290	99.0	178.8	178.0	99.6
737	261	258	98.9	117.3	116.9	99.7
Number Analyzed	25			25		
Summation	6372.00	6289.00		2733.10	2699.10	
Mean	254.88	251.56	98.70	109.32	107.96	98.76
Standard Deviation	16.33	16.08		21.63	21.53	

Table A-1.11
Adult Alosa spp.

Preservation Technique: Freezing
Perservation Duration: 24 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
766	231	226	97.8	83.4	80.9	97.0
765	257	252	98.1	126.0	118.0	93.7
764	242	242	100.0	96.7	91.0	94.1
763	236	230	97.5	84.0	81.7	97.3
762	242	239	98.8	97.7	95.9	98.2
761	241	239	99.2	96.0	89.1	92.8
760	254	254	100.0	104.0	101.6	97.7
759	265	263	99.2	124.8	120.3	96.4
758	272	265	97.4	141.2	138.5	98.1
757	267	266	99.6	122.5	116.5	95.1
756	260	258	99.2	123.7	117.5	95.0
755	261	262	100.4	115.2	108.6	94.3
753	232	226	97.4	84.9	82.2	96.8
754	256	251	98.0	107.5	104.7	97.4
722	277	277	100.0	155.4	149.9	96.5
751	274	268	97.8	128.2	123.5	96.3
767	287	285	99.3	154.1	147.9	96.0
768	257	253	98.4	111.1	108.8	97.9
723	260	256	98.5	106.0	103.2	97.4
727	272	271	99.6	130.7	124.0	94.9
726	254	243	95.7	98.8	98.1	99.3
725	258	258	100.0	109.5	107.2	97.9
770	258	255	98.8	101.8	98.5	96.8
769	245	239	97.6	92.7	88.3	95.3
731	262	259	98.9	126.5	120.3	95.1
Number Analyzed	25			25		
Summation	6420.00	6337.00		2822.40	2716.20	
Mean	256.80	253.48	98.71	112.90	108.65	96.24
Standard Deviation	14.25	15.19		20.14	19.22	

Table A-1.12
Adult Alosa spp.

Preservation Technique: Freezing
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
786	299	293	98.0	260.0	258.6	99.5
785	257	252	98.1	161.8	162.1	100.2
784	277	272	98.2	164.2	164.0	99.9
783	260	257	98.8	149.5	150.3	100.5
782	276	272	98.6	167.2	168.5	100.4
781	292	282	96.6	222.9	221.1	99.2
780	257	252	98.1	154.1	152.0	98.6
779	267	258	96.6	154.9	155.6	100.5
778	280	279	99.6	201.7	201.4	99.9
777	281	274	97.5	240.1	238.2	99.2
776	283	275	97.2	192.0	190.7	99.3
775	280	273	97.5	184.3	182.8	99.2
774	288	279	96.9	178.4	177.0	99.2
799	276	263	95.3	169.7	167.8	98.9
798	280	268	95.7	200.7	198.4	98.9
797	257	249	96.9	140.2	137.7	98.2
796	322	317	98.4	269.4	265.3	98.5
795	270	263	97.4	151.1	152.1	100.7
794	288	278	96.5	196.5	195.2	99.3
793	294	286	97.3	230.1	226.8	98.6
792	285	274	96.1	201.8	199.1	98.7
791	281	275	97.9	212.1	211.4	99.7
790	270	269	99.6	176.9	176.5	99.8
789	290	281	96.9	206.6	206.9	100.1
788	298	293	98.3	227.0	223.7	98.5
787	275	267	97.1	172.7	171.6	99.4
Number Analyzed	26			26		
Summation	7283.00	7101.00		4986.50	4954.80	
Mean	280.12	273.12	97.50	191.79	190.57	99.36
Standard Deviation	14.80	14.66		34.67	33.90	

Table A-1.13
Young-of-Year White Perch

Preservation Technique: Freezing
Perservation Duration: One Week

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
347	67	66	98.5	3.3	3.2	97.0
348	74	72	97.3	4.6	4.5	97.8
349	73	72	98.6	5.0	4.8	96.0
350	67	66	98.5	4.0	4.0	100.0
351	74	73	98.6	5.1	5.0	98.0
352	74	72	97.3	4.9	4.6	93.9
353	77	74	96.1	5.6	5.2	92.9
354	70	69	98.6	4.7	4.4	93.6
385	73	73	100.0	4.9	4.7	95.9
373	73	72	98.6	4.7	4.6	97.9
357	71	70	98.6	4.5	4.3	95.6
382	71	71	100.0	4.3	4.3	100.0
356	71	70	98.6	4.3	4.1	95.3
355	72	71	98.6	4.4	4.3	97.7
371	71	71	100.0	4.9	4.7	95.9
370	69	68	98.6	3.8	3.6	94.7
369	68	67	98.5	3.9	3.8	97.4
384	71	70	98.6	4.4	4.2	95.5
372	66	65	98.5	3.6	3.5	97.2
380	67	66	98.5	3.7	3.6	97.3
375	68	67	98.5	3.9	3.8	97.4
381	67	66	98.5	3.8	3.7	97.4
374	69	68	98.6	4.0	4.1	102.5
376	78	77	98.7	5.8	5.7	98.3
367	67	66	98.5	3.6	3.5	97.2
Number Analyzed	25			25		
Summation	1768.00	1742.00		109.70	106.20	
Mean	70.72	69.68	98.53	4.39	4.25	96.81
Standard Deviation	3.26	3.11		0.64	0.60	

Table A-1.14
Young-of-Year White Perch

Preservation Technique: Freezing
Perservation Duration: Four Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
379	64	61	95.3	3.3	3.6	109.1
378	59	57	96.6	2.2	2.3	104.5
389	69	66	95.7	3.8	4.0	105.3
368	72	69	95.8	4.3	4.6	107.0
366	77	74	96.1	5.2	5.6	107.7
383	70	66	94.3	3.9	4.2	107.7
365	68	62	91.2	3.1	3.4	109.7
358	61	59	96.7	2.6	2.9	111.5
359	72	70	97.2	4.5	4.7	104.4
360	66	64	97.0	3.4	3.6	105.9
364	67	65	97.0	3.8	4.0	105.3
362	60	58	96.7	2.8	3.2	114.3
361	62	58	93.5	2.8	3.0	107.1
363	67	65	97.0	3.8	4.0	105.3
600	70	68	97.1	4.2	4.4	104.8
601	63	60	95.2	3.1	3.4	109.7
602	65	63	96.9	3.4	3.6	105.9
603	63	60	95.2	3.0	3.3	110.0
604	71	69	97.2	4.2	4.5	107.1
605	68	66	97.1	3.8	4.1	107.9
606	67	64	95.5	3.6	3.9	108.3
607	64	60	93.8	3.0	3.3	110.0
608	62	60	96.8	3.0	3.2	106.7
610	61	57	93.4	2.7	3.0	111.1
609	66	64	97.0	3.5	3.8	108.6
Number Analyzed	25			25		
Summation	1654.00	1585.00		87.00	93.60	
Mean	66.16	63.40	95.83	3.48	3.74	107.47
Standard Deviation	4.39	4.47		0.69	0.70	

Table A-1.15
Young-of-Year White Perch

Preservation Technique: Freezing
Perservation Duration: 24 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
636	77	73	94.8	5.2	5.1	98.1
637	80	78	97.5	6.1	5.7	93.4
638	76	76	100.0	4.9	4.7	95.9
639	78	76	97.4	5.3	5.0	94.3
640	81	78	96.3	6.1	5.8	95.1
641	80	78	97.5	5.9	5.6	94.9
642	81	79	97.5	6.2	6.0	96.8
643	73	71	97.3	4.3	4.1	95.3
644	85	83	97.6	7.1	6.6	93.0
645	72	71	98.6	5.1	4.8	94.1
646	70	69	98.6	4.3	4.0	93.0
647	84	82	97.6	7.1	6.7	94.4
648	80	79	98.8	6.0	5.7	95.0
649	81	78	96.3	6.9	6.4	92.8
650	77	76	98.7	5.4	5.1	94.4
651	82	81	98.8	6.2	5.8	93.5
652	73	72	98.6	4.7	4.5	95.7
653	81	80	98.8	6.2	6.0	96.8
654	82	80	97.6	6.7	6.5	97.0
655	67	66	98.5	3.6	3.4	94.4
656	76	75	98.7	5.3	5.0	94.3
657	61	61	100.0	2.7	2.5	92.6
658	66	65	98.5	3.3	3.1	93.9
659	64	63	98.4	3.1	2.9	93.5
660	75	74	98.7	5.2	4.8	92.3
Number Analyzed	25			25		
Summation	1902.00	1864.00		132.90	125.80	
Mean	76.08	74.56	98.00	5.32	5.03	94.59
Standard Deviation	6.43	6.01		1.24	1.18	

Table A-1.16
Young-of-Year White Perch

Preservation Technique: Freezing
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
611	79	75	94.9	6.0	5.6	93.3
612	81	78	96.3	6.3	5.9	93.7
613	86	81	94.2	7.4	7.0	94.6
614	81	77	95.1	6.3	5.9	93.7
615	77	73	94.8	5.8	5.6	96.6
616	75	72	96.0	5.0	4.8	96.0
617	82	73	89.0	6.7	6.5	97.0
618	80	78	97.5	6.1	5.8	95.1
619	77	75	97.4	5.6	5.2	92.9
620	83	80	96.4	6.7	6.4	95.5
621	75	73	97.3	5.5	5.2	94.5
622	78	75	96.2	5.7	5.5	96.5
623	79	76	96.2	6.4	6.1	95.3
624	82	79	96.3	7.2	6.8	94.4
625	77	73	94.8	5.3	5.1	96.2
626	73	72	98.6	4.4	4.2	95.5
627	77	75	97.4	5.6	5.6	100.0
628	70	67	95.7	4.0	4.1	102.5
629	74	72	97.3	4.6	4.4	95.7
630	86	82	95.3	8.2	8.1	98.8
631	82	70	85.4	6.2	5.8	93.5
632	76	74	97.4	5.2	5.1	98.1
633	70	71	101.4	4.1	4.1	100.0
634	72	72	100.0	4.6	4.6	100.0
635	73	72	98.6	4.7	4.7	100.0
Number Analyzed	25			25		
Summation	1945.00	1865.00		143.60	138.10	
Mean	77.80	74.60	95.89	5.74	5.52	96.24
Standard Deviation	4.47	3.61		1.05	0.97	

Table A-1.17
Adult White Perch

Preservation Technique: Freezing
Perservation Duration: One Week

	Length Analysis (mm)			Weight Analysis (g)		
Tag Identification	Start	End	Percent Change	Start	End	Percent Change
550	161	157	97.5	57.6	57.3	99.5
551	164	162	98.8	52.9	52.4	99.1
552	191	186	97.4	100.9	100.1	99.2
553	185	181	97.8	89.9	88.7	98.7
554	131	128	97.7	25.9	25.7	99.2
555	134	130	97.0	27.1	26.7	98.5
556	85	83	97.6	5.8	5.5	94.8
557	180	177	98.3	77.1	75.9	98.4
558	168	164	97.6	52.5	51.7	98.5
559	123	122	99.2	23.2	22.8	98.3
560	169	169	100.0	63.8	62.2	97.5
561	143	141	98.6	36.9	36.4	98.6
562	145	144	99.3	37.2	36.7	98.7
563	156	154	98.7	45.1	44.4	98.4
564	163	160	98.2	55.8	55.5	99.5
565	88	84	95.5	7.1	6.8	95.8
566	81	80	98.8	5.7	5.4	94.7
567	156	152	97.4	47.3	46.6	98.5
568	116	114	98.3	17.0	16.9	99.4
569	79	75	94.9	5.1	4.9	96.1
570	158	157	99.4	48.7	48.0	98.6
571	131	126	96.2	23.5	23.2	98.7
572	125	122	97.6	23.1	22.6	97.8
573	123	121	98.4	20.2	19.8	98.0
574	110	110	100.0	14.2	13.9	97.9
Number Analyzed	25			25		
Summation	3465.00	3399.00		963.60	95.01	
Mean	138.60	135.96	98.10	38.54	38.00	98.61
Standard Deviation	32.68	32.42		26.29	26.02	

Table A-1.18
Adult White Perch

Preservation Technique: Freezing
Perservation Duration: Four Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
525	189	185	97.9	83.5	82.1	98.3
526	172	167	97.1	67.5	66.9	99.1
527	164	162	98.8	60.1	59.7	99.3
528	192	190	99.0	86.4	84.8	98.1
529	160	156	97.5	47.6	46.7	98.1
530	149	146	98.0	42.6	42.0	98.6
531	165	161	97.6	66.3	65.2	98.3
532	171	162	94.7	66.8	65.8	98.5
533	154	151	98.1	45.6	44.9	98.5
534	155	153	98.7	45.0	44.5	98.9
535	151	145	96.0	43.2	42.7	98.8
536	165	162	98.2	56.8	56.1	98.8
537	157	155	98.7	45.8	44.6	97.4
538	172	171	99.4	64.6	63.8	98.8
539	136	131	96.3	29.1	28.7	98.6
540	157	153	97.5	51.2	50.4	98.4
541	177	173	97.7	68.4	67.5	98.7
542	140	133	95.0	33.3	32.7	98.2
543	166	161	97.0	65.6	64.7	98.6
544	148	147	99.3	43.7	43.0	98.4
545	144	142	98.6	42.8	42.2	98.6
546	131	129	98.5	25.5	25.3	99.2
547	144	143	99.3	37.3	37.1	99.5
548	166	162	97.6	54.8	54.4	99.3
549	91	87	95.6	7.7	7.6	98.7
Number Analyzed	25			25		
Summation	3916.00	3827.00		1281.20	1263.40	
Mean	156.64	153.08	97.73	51.25	50.54	98.61
Standard Deviation	20.34	20.38		17.98	17.70	

Table A-1.19
Adult White Perch

Preservation Technique: Freezing
Perservation Duration: 24 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
500	87	87	100.0	6.9	6.8	98.6
501	154	148	96.1	49.0	47.8	97.6
502	122	120	98.4	20.5	19.3	94.1
503	174	166	95.4	64.3	61.4	95.5
504	154	149	96.8	45.9	44.1	96.1
505	150	147	98.0	41.6	40.2	96.6
506	203	196	96.6	107.4	104.4	97.2
507	115	113	98.3	17.3	16.4	94.8
508	170	165	97.1	73.5	71.5	97.3
509	122	120	98.4	20.5	19.1	93.2
510	124	120	96.8	21.1	19.3	91.5
511	186	180	96.8	74.9	71.9	96.0
512	146	142	97.3	37.3	35.8	96.0
513	189	185	97.9	85.2	82.7	97.1
514	163	162	99.4	48.4	46.7	96.5
515	116	115	99.1	18.4	17.4	94.6
516	134	132	98.5	31.0	30.0	96.8
517	122	116	95.1	19.8	19.1	96.5
518	150	146	97.3	44.4	42.8	96.4
519	116	113	97.4	18.6	17.2	92.5
520	132	128	97.0	25.9	25.0	96.5
521	160	156	97.5	46.7	45.0	96.4
522	127	123	96.9	23.9	23.0	96.2
523	159	153	96.2	47.9	45.5	95.0
524	127	124	97.6	26.2	24.9	95.0
Number Analyzed	25			25		
Summation	3602.00	3506.00		1016.60	977.30	
Mean	144.08	140.24	97.33	40.66	39.09	96.14
Standard Deviation	27.61	26.32		24.68	24.05	

Table A-1.20
Adult White Perch

Preservation Technique: Freezing
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	End	Percent Change	Weight Analysis (g) Start	End	Percent Change
875	114	114	100.0	17.0	15.2	89.4
876	196	196	100.0	102.1	99.6	97.6
877	152	152	100.0	43.2	40.2	93.1
878	150	150	100.0	42.1	39.2	93.1
879	109	107	98.2	15.6	14.6	93.6
880	153	151	98.7	48.2	46.7	96.9
881	153	153	100.0	42.4	38.2	90.1
882	181	181	100.0	79.8	79.4	99.5
883	147	147	100.0	37.2	35.0	94.1
884	146	144	98.6	36.7	34.0	92.6
885	141	141	100.0	33.4	32.3	96.7
886	146	146	100.0	39.6	37.9	95.7
887	178	176	98.9	68.9	65.2	94.6
888	116	116	100.0	18.3	15.3	83.6
889	138	136	98.6	32.8	30.0	91.5
890	187	186	99.5	89.1	84.4	94.7
891	152	152	100.0	43.0	39.9	92.8
892	164	163	99.4	61.7	57.8	93.7
893	159	159	100.0	50.7	47.9	94.5
894	122	123	100.8	22.0	20.7	94.1
895	150	148	98.7	41.5	38.6	93.0
896	193	192	99.5	103.5	100.7	97.3
897	161	159	98.8	51.2	48.7	95.1
898	138	137	99.3	31.3	28.4	90.7
899	139	138	99.3	32.4	29.5	91.0

Number Analyzed	25			25		
Summation	3785.00	3767.00		1183.70	1119.40	
Mean	151.40	150.68	99.52	47.35	44.78	94.56
Standard Deviation	23.19	23.13		24.45	24.19	

APPENDIX B

RESULTS OF FORMALIN PRESERVATION STUDY

Table B-1.1

Adult Atlantic Tomcod

Preservation Technique: Formalin

Perservation Duration: 52 Weeks

	Length Analysis (mm)									Weight Analysis (g)								
Tag Identification	Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %	Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %
800	215	212	98.6	212	98.6	212	98.6	212	98.6	98.9	110.3	111.5	109.5	110.7	109.4	110.6	109.9	111.1
801	245	240	98.0	240	98.0	240	98.0	240	98.0	100.5	122.8	122.2	119.9	119.3	117.7	117.1	118.2	117.6
802	225	222	98.7	221	98.2	220	97.8	221	98.2	70.2	81.4	116.0	79.9	113.8	78.3	111.5	78.2	111.4
803	158	156	98.7	156	98.7	156	98.7	156	98.7	25.0	30.1	120.4	28.8	115.2	28.9	115.6	29.0	116.0
804	111	112	100.9	111	100.0	112	100.9	112	100.9	11.9	12.6	105.9	12.4	104.2	12.3	103.4	12.5	105.0
805	215	211	98.1	211	98.1	210	97.7	211	98.1	65.6	78.3	119.4	76.5	116.6	73.5	112.0	74.3	113.3
806	147	148	100.7	148	100.7	148	100.7	148	100.7	20.1	23.4	116.4	23.2	115.4	22.3	110.9	22.4	111.4
807	185	183	98.9	182	98.4	182	98.4	182	98.4	34.2	41.2	120.5	40.7	119.0	39.1	114.3	39.5	115.5
808	160	155	96.9	154	96.3	155	96.9	153	95.6	32.9	38.8	117.9	38.4	116.7	37.4	113.7	37.8	114.9
809	161	159	98.8	159	98.8	158	98.1	158	98.1	28.3	32.7	115.5	32.1	113.4	28.9	102.1	30.4	107.4
810	146	145	99.3	145	99.3	145	99.3	145	99.3	21.2	24.7	116.5	24.6	116.0	23.8	112.3	23.9	112.7
811	171	166	97.1	166	97.1	165	96.5	166	97.1	44.8	51.0	113.8	50.5	112.7	50.7	113.2	50.7	113.2
812	134	131	97.8	130	97.0	130	97.0	130	97.0	16.4	19.5	118.9	19.6	119.5	18.8	114.6	18.9	115.2
813	131	131	100.0	131	100.0	131	100.0	131	100.0	20.2	21.0	104.0	21.1	104.5	20.9	103.5	20.8	103.0
814	137	135	98.5	135	98.5	135	98.5	135	98.5	16.4	19.8	120.7	19.7	120.1	18.7	114.0	18.8	114.6
815	148	146	98.6	146	98.6	146	98.6	145	98.0	21.1	24.0	113.7	23.9	113.3	23.3	110.4	23.3	110.4
816	155	149	96.1	149	96.1	149	96.1	149	96.1	23.4	27.8	118.8	27.2	116.2	26.8	114.5	26.3	112.4
817	116	113	97.4	113	97.4	112	96.6	113	97.4	13.7	15.5	113.1	15.2	110.9	15.1	110.2	15.0	109.5
818	127	127	100.0	127	100.0	127	100.0	126	99.2	13.6	16.2	119.1	16.0	117.6	15.5	114.0	15.9	116.9
819	167	163	97.6	163	97.6	162	97.0	163	97.6	29.9	35.9	120.1	35.7	119.4	33.6	112.4	34.2	114.4
820	155	152	98.1	152	98.1	152	98.1	151	97.4	22.2	25.4	114.4	25.5	114.9	24.7	111.3	24.8	111.7
821	119	115	96.6	116	97.5	116	97.5	116	97.5	16.3	19.0	116.6	19.0	116.6	18.9	116.0	18.8	115.3
822	220	216	98.2	216	98.2	216	98.2	216	98.2	69.9	81.0	115.9	79.7	114.0	77.5	110.9	78.3	112.0
823	153	148	96.7	147	96.1	147	96.1	148	96.7	23.9	27.9	116.7	27.6	115.5	27.1	113.4	27.6	115.5
824	144	142	98.6	144	100.0	143	99.3	142	98.6	18.7	19.3	103.2	19.3	103.2	19.1	102.1	18.7	100.0
Number Analyzed	25									25								
Summation	4045.00	3977.00		3974.00		3969.00		3969.00		859.30	999.40		986.20		962.30		96.77	
Mean	161.80	159.08	98.3	158.96	98.2	158.76	98.1	158.76	98.1	34.37	39.98	116.3	39.45	114.7	38.49	111.9	38.71	112.6
Standard Deviation	36.42	35.61		35.53		35.40		35.56		25.84	30.42		29.83		29.42		29.58	

Table B-1.2
Young-of-Year Alosa spp.

Preservation Technique: Formalin
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %	Weight Analysis (g) Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %
661	81	81	100.0	81	100.0	81	100.0	80	98.8	4.5	5.0	111.1	5.1	113.3	5.1	113.3	4.9	108.9
662	77	76	98.7	76	98.7	76	98.7	75	97.4	3.2	3.5	109.4	3.6	112.5	3.5	109.4	3.5	109.4
663	92	91	98.9	90	97.8	89	96.7	90	97.8	6.2	7.0	112.9	7.2	116.1	7.3	117.7	7.0	112.9
664	94	95	101.1	94	100.0	93	98.9	92	97.9	6.5	7.3	112.3	7.2	110.8	7.3	112.3	7.1	109.2
665	85	86	101.2	85	100.0	85	100.0	84	98.8	5.0	5.6	112.0	5.6	112.0	5.7	114.0	5.6	112.0
666	78	78	100.0	78	100.0	78	100.0	76	97.4	3.9	4.2	107.7	4.3	110.3	4.3	110.3	4.2	107.7
667	81	82	101.2	80	98.8	80	98.8	79	97.5	4.3	4.8	111.6	4.7	109.3	4.7	109.3	4.7	109.3
668	79	79	100.0	79	100.0	78	98.7	77	97.5	3.9	4.2	107.7	4.2	107.7	4.2	107.7	4.1	105.1
669	89	88	98.9	87	97.8	86	96.6	85	95.5	6.1	6.7	109.8	6.5	106.6	6.6	108.2	6.5	106.6
670	84	84	100.0	83	98.8	83	98.8	82	97.6	5.0	5.3	106.0	5.2	104.0	5.2	104.0	5.2	104.0
671	75	76	101.3	75	100.0	75	100.0	73	97.3	3.4	3.6	105.9	3.7	108.8	3.7	108.8	3.5	102.9
672	90	90	100.0	89	98.9	88	97.8	87	96.7	5.8	6.2	106.9	6.5	112.1	6.5	112.1	6.4	110.3
673	96	96	100.0	96	100.0	95	99.0	95	99.0	7.8	8.4	107.7	8.5	109.0	8.5	109.0	8.4	107.7
674	83	82	98.8	82	98.8	82	98.8	80	96.4	4.6	4.8	104.3	4.9	106.5	5.0	108.7	4.8	104.3
675	80	78	97.5	78	97.5	78	97.5	77	96.3	3.3	3.7	112.1	3.7	112.1	3.7	112.1	3.6	109.1
676	69	69	100.0	69	100.0	68	98.6	67	97.1	2.6	2.8	107.7	2.7	103.8	2.8	107.7	2.7	103.8
677	76	76	100.0	76	100.0	76	100.0	74	97.4	3.4	3.8	111.8	3.6	105.9	3.7	108.8	3.6	105.9
678	79	80	101.3	79	100.0	79	100.0	77	97.5	3.6	3.9	108.3	3.8	105.6	3.9	108.3	3.8	105.6
679	70	71	101.4	70	100.0	70	100.0	68	97.1	2.8	3.0	107.1	3.1	110.7	3.1	110.7	3.0	107.1
680	73	72	98.6	71	97.3	71	97.3	70	95.9	2.9	3.2	110.3	3.2	110.3	3.2	110.3	3.2	110.3
681	74	74	100.0	74	100.0	73	98.6	72	97.3	3.2	3.6	112.5	3.6	112.5	3.6	112.5	3.6	112.5
682	66	66	100.0	66	100.0	66	100.0	65	98.5	2.2	2.5	113.6	2.4	109.1	2.4	109.1	2.4	109.1
683	65	64	98.5	64	98.5	63	96.9	61	93.8	2.0	2.2	110.0	2.1	105.0	2.1	105.0	2.1	105.0
684	66	66	100.0	66	100.0	65	98.5	65	98.5	2.2	2.5	113.6	2.4	109.1	2.5	113.6	2.4	109.1
685	76	76	100.0	75	98.7	74	97.4	75	98.7	3.4	3.7	108.8	3.7	108.8	3.8	111.8	3.7	108.8
Number Analyzed	25																	
Summation	1978.00	1976.00		1963.00		1952.00		1926.00		101.80	111.50		111.50		112.40		110.00	
Mean	79.12	79.04	99.9	78.52	99.2	78.08	98.6	77.04	97.3	4.07	4.46	109.5	4.46	109.5	4.50	110.5	4.40	108.1
Standard Deviation	8.68	8.72		8.52		8.45		8.69		1.50	1.64		1.67		1.68		1.65	

Table B-1.3
Adult Alosa spp.

Preservation Technique: Formalin
Perservation Duration: 52 Weeks

		Length Analysis (mm)									Weight Analysis (g)							
Tag Identification	Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %	Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %
575	281	282	100.4	281	100.0	280	99.6	278	98.9	232.2	245.1	105.6	242.4	104.4	237.4	102.2	236.4	101.8
576	292	290	99.3	290	99.3	288	98.6	287	98.3	247.8	259.3	104.6	257.8	104.0	258.8	104.4	261.5	105.5
577	289	285	98.6	286	99.0	283	97.9	281	97.2	226.9	240.1	105.8	239.5	105.6	243.2	107.2	241.9	106.6
578	283	281	99.3	281	99.3	277	97.9	277	97.9	201.2	215.1	106.9	213.3	106.0	207.0	102.9	209.2	104.0
579	282	280	99.3	280	99.3	277	98.2	276	97.9	198.6	209.1	105.3	209.7	105.6	207.7	104.6	207.1	104.3
580	297	295	99.3	296	99.7	294	99.0	292	98.3	250.6	265.8	106.1	263.6	105.2	259.6	103.6	260.5	104.0
581	292	289	99.0	289	99.0	286	97.9	286	97.9	259.9	276.9	106.5	271.6	104.5	273.5	105.2	274.7	105.7
582	291	287	98.6	286	98.3	286	98.3	285	97.9	232.2	243.9	105.0	241.7	104.1	242.3	104.3	238.1	102.5
583	309	307	99.4	308	99.7	307	99.4	304	98.4	283.4	298.4	105.3	300.0	105.9	298.1	105.2	299.8	105.8
584	289	292	101.0	289	100.0	288	99.7	286	99.0	228.6	244.7	107.0	243.4	106.5	238.7	104.4	238.4	104.3
585	294	294	100.0	292	99.3	292	99.3	292	99.3	216.7	230.6	106.4	228.4	105.4	223.2	103.0	223.1	103.0
586	286	288	100.7	288	100.7	284	99.3	284	99.3	221.3	240.1	108.5	237.0	107.1	232.2	104.9	232.5	105.1
587	295	294	99.7	293	99.3	292	99.0	291	98.6	264.3	278.2	105.3	276.9	104.8	275.8	104.4	276.3	104.5
588	290	293	101.0	291	100.3	288	99.3	287	99.0	265.0	276.0	104.2	277.4	104.7	276.5	104.3	279.0	105.3
589	297	297	100.0	297	100.0	296	99.7	296	99.7	250.0	263.1	105.2	263.9	105.6	262.9	105.2	262.5	105.0
590	283	285	100.7	283	100.0	282	99.6	280	98.9	206.0	217.1	105.4	216.5	105.1	215.3	104.5	212.4	103.1
591	276	274	99.3	272	98.6	272	98.6	272	98.6	214.1	213.2	99.6	213.8	99.9	213.4	99.7	213.6	99.8
592	279	281	100.7	280	100.4	279	100.0	277	99.3	200.3	213.5	106.6	211.9	105.8	211.4	105.5	211.1	105.4
593	290	289	99.7	289	99.7	288	99.3	287	99.0	232.8	249.2	107.0	248.5	106.7	250.4	107.6	252.5	108.5
594	277	275	99.3	275	99.3	274	98.9	273	98.6	215.2	234.0	108.7	231.2	107.4	225.7	104.9	227.3	105.6
595	300	299	99.7	299	99.7	299	99.7	297	99.0	257.2	272.4	105.9	272.7	106.0	268.3	104.3	270.0	105.0
596	283	282	99.6	281	99.3	280	98.9	277	97.9	220.7	237.0	107.4	235.4	106.7	230.5	104.4	231.1	104.7
597	278	279	100.4	278	100.0	277	99.6	275	98.9	214.0	225.2	105.2	225.4	105.3	221.6	103.6	223.2	104.3
598	276	273	98.9	273	98.9	273	98.9	272	98.6	212.8	225.2	105.8	226.9	106.6	230.1	108.1	229.0	107.6
599	318	307	96.5	310	97.5	309	97.2	309	97.2	329.1	349.2	106.1	349.8	106.3	346.3	105.2	347.4	105.6
Number Analyzed	25																	
Summation	7227.00	7198.00		7187.00		7151.00		7121.00		5880.90	6222.40		6198.70		6149.90		6158.60	
Mean	289.08	287.92	99.6	287.48	99.4	286.04	98.9	284.84	98.5	235.24	248.90	105.8	247.95	105.4	246.00	104.5	246.34	104.7
Standard Deviation	10.22	9.17		9.70		9.77		9.78		30.16	31.84		32.10		32.31		104.72	

Table B-1.4
Young-of-Year White Perch

Preservation Technique: Formalin
Perservation Duration: 52 Weeks

Tag Identification	Length Analysis (mm) Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %	Weight Analysis (g) Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %
388	85	85	100.0	86	101.2	85	100.0	83	97.6	7.5	7.7	102.7	8.0	106.7	8.0	106.7	7.8	104.0
386	71	70	98.6	70	98.6	70	98.6	68	95.8	4.3	4.6	107.0	4.6	107.0	4.5	104.7	4.5	104.7
394	75	76	101.3	76	101.3	76	101.3	75	100.0	5.1	5.5	107.8	5.6	109.8	5.5	107.8	5.5	107.8
325	80	80	100.0	80	100.0	80	100.0	78	97.5	6.1	6.7	109.8	6.7	109.8	6.8	111.5	6.6	108.2
326	66	66	100.0	66	100.0	66	100.0	65	98.5	3.6	3.7	102.8	3.9	108.3	3.8	105.6	3.8	105.6
327	82	83	101.2	83	101.2	82	100.0	81	98.8	6.9	7.4	107.2	7.4	107.2	7.5	108.7	7.3	105.8
328	75	74	98.7	75	100.0	75	100.0	74	98.7	5.1	5.6	109.8	5.7	111.8	5.6	109.8	5.5	107.8
329	75	76	101.3	76	101.3	76	101.3	75	100.0	4.9	5.2	106.1	5.2	106.1	5.2	106.1	5.2	106.1
330	62	62	100.0	62	100.0	62	100.0	62	100.0	2.9	3.0	103.4	3.0	103.4	3.0	103.4	2.9	100.0
331	83	83	100.0	83	100.0	83	100.0	82	98.8	7.1	7.5	105.6	7.6	107.0	7.6	107.0	7.5	105.6
332	81	79	97.5	81	100.0	79	97.5	77	95.1	5.9	6.4	108.5	6.6	111.9	6.6	111.9	6.5	110.2
333	88	88	100.0	88	100.0	87	98.9	86	97.7	8.2	8.8	107.3	9.1	111.0	9.1	111.0	8.9	108.5
334	80	79	98.8	80	100.0	80	100.0	78	97.5	6.3	6.7	106.3	6.9	109.5	6.9	109.5	6.7	106.3
335	74	74	100.0	74	100.0	75	101.4	74	100.0	4.9	5.2	106.1	5.3	108.2	5.2	106.1	5.2	106.1
336	75	75	100.0	76	101.3	76	101.3	75	100.0	5.2	5.6	107.7	5.7	109.6	5.6	107.7	5.5	105.8
337	71	71	100.0	71	100.0	71	100.0	70	98.6	4.4	4.8	109.1	4.9	111.4	4.8	109.1	4.8	109.1
338	82	81	98.8	81	98.8	81	98.8	80	97.6	6.8	7.3	107.4	7.5	110.3	7.5	110.3	7.3	107.4
339	75	75	100.0	76	101.3	75	100.0	74	98.7	5.1	5.5	107.8	5.6	109.8	5.5	107.8	5.4	105.9
340	72	72	100.0	72	100.0	72	100.0	71	98.6	4.6	4.9	106.5	4.9	106.5	4.9	106.5	5.0	108.7
341	73	73	100.0	73	100.0	73	100.0	72	98.6	4.5	4.9	108.9	4.9	108.9	4.9	108.9	4.9	108.9
342	69	68	98.6	68	98.6	69	100.0	67	97.1	4.2	4.4	104.8	4.4	104.8	4.4	104.8	4.5	107.1
343	80	80	100.0	81	101.3	80	100.0	79	98.8	5.8	6.3	108.6	6.4	110.3	6.3	108.6	6.2	106.9
344	75	75	100.0	75	100.0	76	101.3	73	97.3	5.2	5.7	109.6	5.7	109.6	5.7	109.6	5.7	109.6
345	77	77	100.0	77	100.0	77	100.0	76	98.7	5.5	5.9	107.3	5.9	107.3	5.9	107.3	5.8	105.5
346	77	74	100.0	75	101.4	75	101.4	74	100.0	5.2	5.4	103.8	5.6	107.7	5.5	105.8	5.5	105.8
Number Analyzed	25																	
Summation	1900.00	1896.00		1905.00		1901.00		1869.00		135.30	144.70		147.10		146.30		144.50	
Mean	76.00	75.84	99.7	76.20	100.2	76.04	100.0	74.76	98.4	5.41	5.79	107.0	5.88	108.6	5.85	108.1	5.78	106.8
Standard Deviation	5.96	5.98		6.13		5.79		5.67		1.23	1.32		1.37		1.40		1.33	

Table B-1.5

Adult White Perch

Preservation Technique: Formalin

Perservation Duration: 52 Weeks

	Length Analysis (mm)									Weight Analysis (g)								
Tag Identification	Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %	Start	One Week	Percent Change %	Four Weeks	Percent Change %	24 Weeks	Percent Change %	52 Weeks	Percent Change %
850	84	84	100.0	83	98.8	84	100.0	84	100.0	6.4	7.5	117.2	7.4	115.6	7.3	114.1	7.4	115.6
851	180	182	101.1	181	100.6	180	100.0	179	99.4	80.6	89.9	111.5	89.1	110.5	90.9	112.8	92.5	114.8
852	131	131	100.0	131	100.0	130	99.2	130	99.2	27.9	31.6	113.3	31.5	112.9	30.7	110.0	31.2	111.8
853	110	109	99.1	109	99.1	107	97.3	107	97.3	14.7	17.0	115.6	17.1	116.3	16.5	112.2	17.1	116.3
854	114	114	100.0	114	100.0	114	100.0	112	98.2	16.6	18.7	112.7	19.0	114.5	18.7	112.7	19.1	115.1
855	70	71	101.4	71	101.4	71	101.4	71	101.4	3.6	4.3	119.4	4.2	116.7	4.1	113.9	4.3	119.4
856	82	82	100.0	82	100.0	81	98.8	83	101.2	5.5	6.5	118.2	6.5	118.2	6.4	116.4	6.6	120.0
857	79	78	98.7	78	98.7	78	98.7	78	98.7	5.1	5.8	113.7	5.8	113.7	5.8	113.7	5.9	115.7
858	160	157	98.1	158	98.8	155	96.9	155	96.9	55.9	61.9	110.7	62.6	112.0	61.7	110.4	63.0	112.7
859	175	176	100.6	176	100.6	176	100.6	174	99.4	71.7	80.5	112.3	80.7	112.0	80.1	111.7	81.7	113.9
860	147	146	99.3	145	98.6	144	98.0	144	98.0	37.4	40.0	107.0	40.1	107.2	39.5	105.6	39.9	106.7
861	142	140	98.6	140	98.6	139	97.9	139	97.9	33.7	36.8	109.2	36.8	109.2	37.5	111.3	38.0	112.8
862	214	214	100.0	212	99.1	211	98.6	210	98.1	120.5	129.8	107.7	133.6	110.9	135.1	112.1	139.9	116.1
863	118	117	99.2	116	98.3	115	97.5	116	98.3	20.3	21.8	107.4	21.4	105.4	20.3	100.0	20.6	101.5
864	63	63	100.0	63	100.0	63	100.0	64	101.6	2.7	3.0	111.1	3.0	111.1	2.9	107.4	3.0	111.1
865	59	57	96.6	58	98.3	58	98.3	58	98.3	1.9	2.2	115.8	2.2	115.8	2.1	110.5	2.2	115.8
866	65	64	98.5	64	98.5	63	96.9	63	96.9	2.3	3.0	130.4	3.0	130.4	2.9	126.1	3.0	130.4
867	149	148	99.3	147	98.7	146	98.0	146	98.0	45.7	50.8	111.2	50.4	110.3	50.9	111.4	51.1	111.8
868	156	154	98.7	153	98.1	152	97.4	150	96.2	48.1	52.6	109.4	53.2	110.6	53.0	110.2	53.7	111.6
869	77	76	98.7	77	100.0	74	96.1	76	98.7	4.5	5.3	117.8	5.4	120.0	5.0	111.1	5.3	117.8
870	82	81	98.8	81	98.8	80	97.6	81	98.8	5.6	6.5	116.1	6.6	117.9	6.5	116.1	6.6	117.9
871	66	66	100.0	66	100.0	67	101.5	67	101.5	2.9	3.3	113.8	3.3	113.8	3.3	113.8	3.5	120.7
872	76	75	98.7	75	98.7	75	98.7	75	98.7	4.6	5.4	117.4	5.3	115.2	5.0	108.7	5.2	113.0
873	75	74	98.7	74	98.7	75	100.0	74	98.7	4.4	5.1	115.9	5.0	113.6	4.8	109.1	4.9	111.4
874	72	71	98.6	71	98.6	71	98.6	72	100.0	3.6	4.1	113.9	4.1	113.9	3.9	108.3	4.0	111.1
Number Analyzed	25																	
Summation	2746.00	2730.00		2725.00		2709.00		2708.00		626.20	693.40		697.30		694.90		709.70	
Mean	109.84	109.20	99.4	109.00	99.2	108.36	98.6	108.32	98.6	25.05	27.74	110.7	27.89	111.3	27.80	110.9	28.39	113.3
Standard Deviation	44.48	44.60		44.21		43.84		43.27		30.59	33.39		33.87		34.20		35.08	

1979 BOTTOM TRAWL COMPARABILITY STUDY FOR THE INTERREGIONAL TRAWL SURVEY

January 1981

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SECTION I

CONCLUSIONS

The primary objective of the late fall 1979 trawl comparability study was to evaluate the feasibility of replacing the larger Interregional Trawl Survey (IRT) gear with the smaller try trawl and thereby streamline the long river studies. The conceptual framework for the comparability study and potential alternative recommendations are presented in Figure II-1. The try trawl was previously shown to be an effective sampling gear in shallow areas (3 to 6 m deep) of the Hudson River estuary during the fall of 1978. The 1979 comparability study demonstrated that in areas less than 10 m deep the try trawl was as good as the IRT gear in collecting Atlantic tomcod (*Microgadus tomcod*) (all ages), and better than the IRT gear in collecting yearling and older white perch (*Morone americana*). However, for young-of-the-year white perch in shallow water (<10 m) and for all species and age groups in deep water (≥10 m), the try trawl was not as effective as the IRT gear. Therefore, the answer to study question 2, relative catch effectiveness (see Figure II-1), is "no" for young-of-the-year white perch and "yes or no", depending upon sample depth, for the other two species groups.

The answer to study question 3, size selectivity (see Figure II-1), also differs among species and age groups and is again neither a clear yes or no for those species analyzed. For Atlantic tomcod (all ages) and young-of-the-year white perch, the two trawls did not exhibit differences in size selectivity. For yearling and older white perch, however, size selectivity differences were apparent between the two gear, but the direction of the size selectivity differences varied depending upon the depth where the fish were collected. Compared to the large trawl, the small trawl caught more larger individuals in shallow areas (<10 m) but apparently fewer larger individuals in deep areas (≥10 m).

Study question 4, adjustment factors, was difficult to answer because of the lack of a clear yes answer to question 2 and the lack of a clear no answer to question 3 (see Figure II-1). For the November-December time period when the comparability study was conducted, the results indicated that several rather than a few catch adjustment factors would be required for different species, ages, and depths to account for differences in catch effectiveness and size selectivity between the large IRT gear and small try trawl. The use of several catch adjustment factors would undesirably complicate analysis of these trawl data.

Whether these catch adjustment factors would be appropriate for other seasons could not be evaluated from the 1979 comparability study results. Hence, an even larger number of adjustment factors may be required to make the try trawl catches directly comparable to IRT catches throughout a sampling period spanning spring, summer, and fall. Therefore, based on these results, Texas Instruments (TI) cannot recommend that it is currently feasible to replace the IRT gear with the try trawl.

SECTION II

INTRODUCTION

During the fall of 1978, TI evaluated a small (6.1 m long with a 3.7 m head rope) otter trawl equipped with Vigneron-Dahl modifications (Bagenal 1964) to sample shore zone and shoal areas of the Hudson River estuary less than 6 m in depth. This stratum lies outside of the reach of the 30.5-m beach seine used in the Beach Seine Survey but is too close to shore to be sampled effectively by the Interregional Trawl (IRT) and Fall Shoal Surveys. This small trawl proved to be very effective in sampling the shallow offshore areas and was incorporated into TI's Long River Survey Program in 1979 [TI 1981 (in preparation)]. The small trawl is currently used in the Try Trawl Survey which is primarily designed as a recapture program for marked individuals of the three key fish species [striped bass (Morone saxatilis), white perch, and Atlantic tomcod]. The data from this survey are also used to describe the distribution, movements, and relative abundance of several selected species.

In order to integrate the data from the Try Trawl Survey with the long-term data base from the Interregional Trawl Survey (the lower and middle estuary have been sampled since 1973 in the IRT survey), TI compared the IRT and Try Trawl Survey gears during the late fall of 1979. The primary objective of this comparability study was to evaluate the feasibility of replacing the larger IRT gear with the smaller, more easily deployed try trawl and thereby streamline the long river studies. Since the feasibility of such a gear replacement is contingent upon an assessment of differences in catch effectiveness and size selectivity of the two trawls, the comparability study had two secondary or interim objectives: (1) to determine if the two trawls selectively caught different-sized individuals from the fish population in the study area, and (2) to determine if adjustment factors could be calculated so that the small trawl catches could be directly compared to the IRT catches. The conceptual framework for the comparability study and potential alternative recommendations are presented in Figure II-1. The description of the study results, discussion, and conclusions are guided by this conceptual framework.

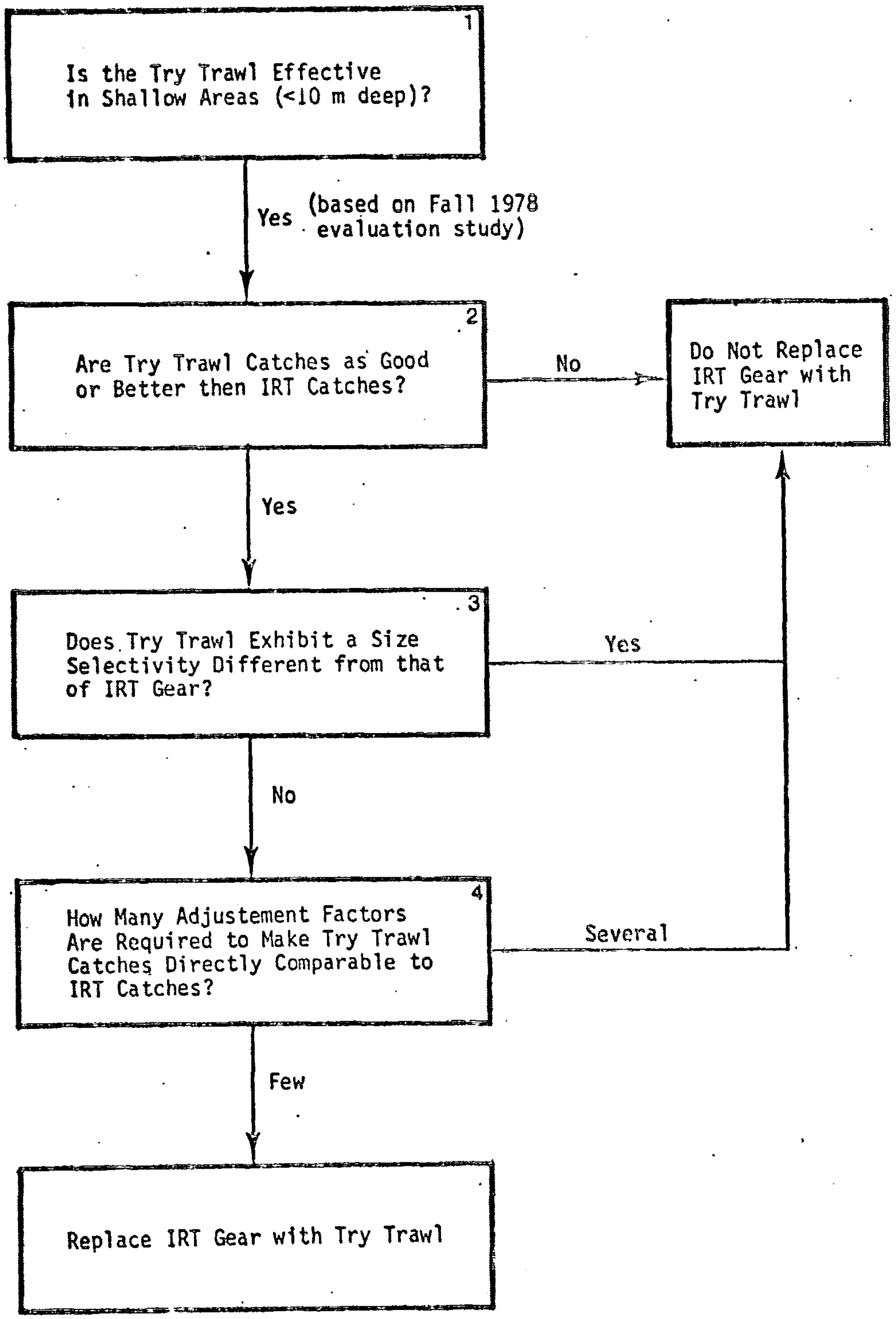

Figure II-1. Conceptual Framework of Fall 1979 Study Designed to Compare Gear Used in TI's Interregional Trawl and Try Trawl Surveys

SECTION III

METHODS

The gear tested in the comparability study were bottom trawls which differed in dimensions, type of towing vessel used, and size of crew required for deployment (Table III-1). The two trawls have similar mesh sizes in their first sections (3.8-cm versus 3.3-cm stretch mesh for large and small trawls, respectively). The large trawl has a 1.3-cm stretch mesh cover over a 3.3-cm stretch mesh cod end, whereas the small trawl has a 0.6-cm stretch mesh liner inside the cod end.

To compare the two trawls under similar conditions, 36 of the 38 sites normally used for the IRT Survey were sampled by both gear. These sites are located between the Tappan Zee (RM 27) and the Mid-Hudson (RM 75) bridges (Figure III-1). Eighteen sites were in shallow water (<10 m in depth) and 18 were in deep water (≥10 m in depth). At each site, the two trawls were towed simultaneously on parallel courses, approximately 16 m apart against the prevailing current and using standard operating procedures appropriate to each gear and its respective survey. A single pair of tows at each of the 36 sites was collected during each of the following periods: 5 through 9 November, 19 through 21 November, and 3 through 7 December 1979. A total of 54 tows were made with each gear in each depth stratum (for a study total of 216 tows).

The small trawl was towed for 10 min at 1.5 $m \cdot sec^{-1}$ and the large trawl was towed for 5 min at 1.3 $m \cdot sec^{-1}$; tow speeds were measured relative to the water. These deployment procedures resulted in approximately equal areas of the bottom swept per each set (pair) of tows with the two trawls. Approximations of area swept per tow are useful for comparing the two trawls on a relative basis. The actual area swept per tow by the two trawls will vary among different sets (pairs) of tows as the actual distances towed (relative to the bottom) vary due to the influences of tidal currents and wind conditions. During each tow, the small trawl swept approximately 3330 m^2 (3.7-m head

Table III-1

Gear Dimensions, Towing Vessel Descriptions, and Crew Size for Large and Small Otter Trawls Used in Trawl Comparability Study, Hudson River Estuary, November-December 1979

	Large Trawl	Small Trawl
Total length	13.5 m (44.3 ft)	6.1 m (20 ft)
Head rope length	7.8 m (25.6 ft)	3.7 m (12 ft)
Head rope diameter	1 cm (0.4 in)	0.94 cm (0.375 in)
Head rope float size	4 x 8 cm (1.6 x 3.2 in.)	3.3 x 6.0 cm (1.3 x 2.4 in)
float number	10	5
float material	Spongex	Spongex
Foot rope length	9.3 m (30.5 ft)	3.7 m (12 ft)
Foot rope diameter	1 cm (0.4 in)	0.95 cm (0.375 in)
Foot rope weights	13.2 m (43.3 ft) of 0.5 cm (0.2 in) galvanized chain	6.1 m (20 ft) of 0.6 cm (0.25 in) galvanized chain
First section length	10 m (32.8 ft)	NA
First section mesh (stretch)	3.8 cm (1.5 in)	3.3 cm (1.3 in)
Cod-end length	3.5 m (11.5 ft)	1.8 m (6 ft)
Cod-end mesh (stretch)	3.3 cm (1.3 in)	NA
Trawl doors	0.8 x 1.2 m (2.5 x 4.0 ft)	0.3 x 0.6 m (1 x 2 ft)
Cod-end cover mesh (stretch)	1.3 cm (0.5 in)	NA
Chafing cloth	3.0 x 6.7 m (9.8 x 22.0 ft)	NA
Cod-end liner mesh stretch	NA	0.6 cm (0.25 in)
Towing vessel	12-m boat powered with diesel engine	7-m boat powered with outboard engine
Crew size	3	2

NA = not applicable

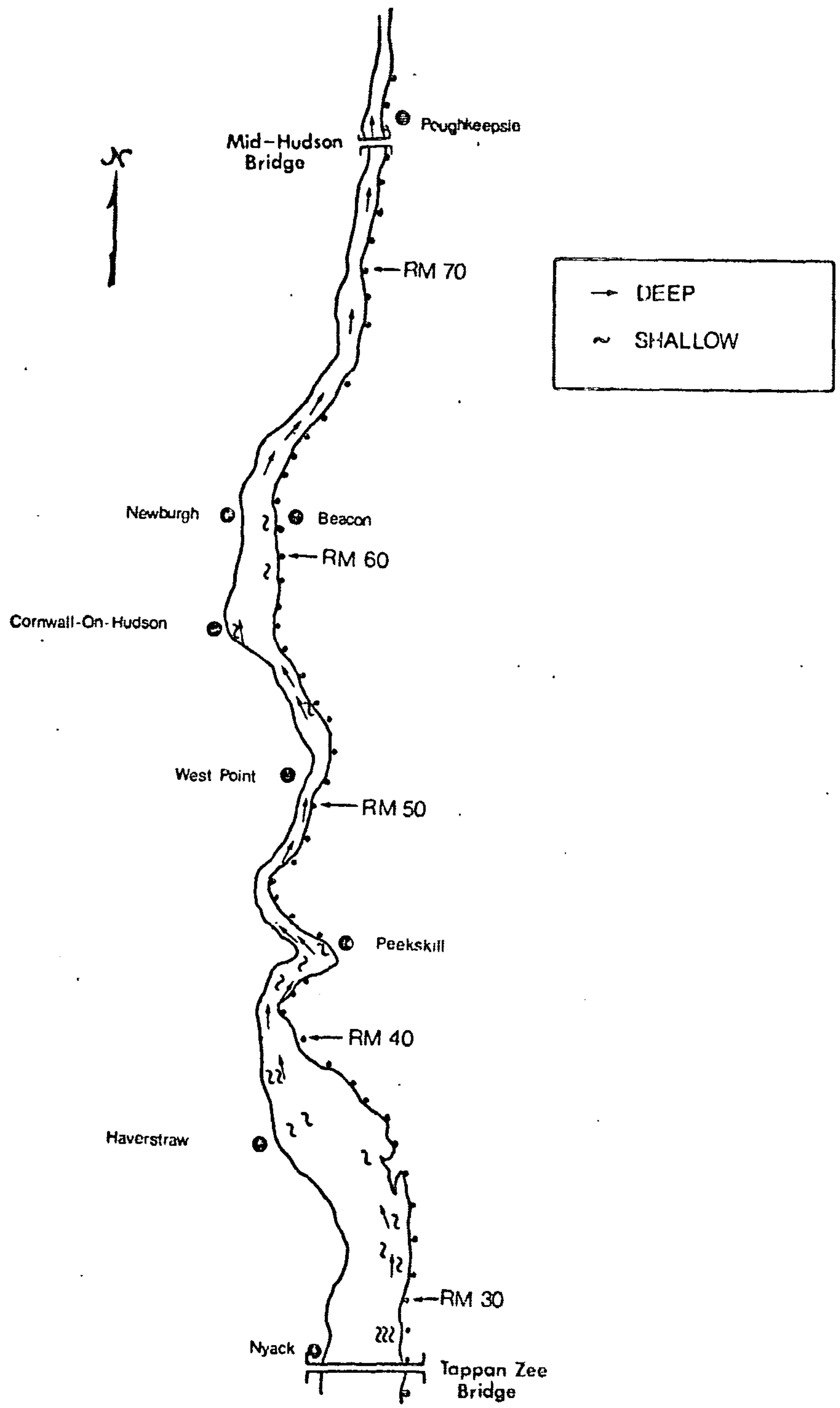

Figure III-1 Deep (≥10 m) and Shallow (<10 m) Sampling Sites Used in Trawl Comparability Study, Hudson River Estuary (RM 27 to RM 75), November-December 1979 rope length x 1.5 $m \cdot sec^{-1}$ tow speed x 60 $sec \cdot min^{-1}$ x 10 min tow duration) and the large trawl swept approximately 3042 m^2 (7.8-m head rope length x 1.3 $m \cdot sec^{-1}$ tow speed x 60 $sec \cdot min^{-1}$ x 5 min tow duration). These estimates of area swept assume that the tow speed relative to the water is the same as the tow speed relative to the bottom. The parallel tows were begun simultaneously with the large trawl vessel located 100 to 150 m ahead of the small trawl vessel.

All fish caught were identified to species and counted. The total lengths (TL) of white perch, striped bass, and Atlantic tomcod were measured to the nearest millimeter. The catches of striped bass were very low during the study period (only 27 young-of-the-year were collected); therefore only the catches of Atlantic tomcod (all ages combined) and white perch in the two trawls could be analyzed statistically. White perch were further separated into two age categories, young-of-the-year versus yearling and older, to compare the length frequencies of fish caught in the two trawls and evaluate any differences in size selectivity.

SECTION IV
RESULTS AND DISCUSSION

A. COMPARISONS OF OVERALL CATCH EFFECTIVENESS

Catches from the two trawls were compared to determine if the small trawl catch was as good or better than the large trawl catch (answer to question 2, Figure II-1). Differences in total catch were observed and these differences appeared to be influenced by at least three variables: fish size, fish species, and sampling depth. To check for the relationship of fish size to differences in relative effectiveness of the two trawls, white perch were separated into two age classes, young-of-the-year versus yearling and older. The differences among the catch totals were analyzed using a three dimensional [trawl, depth, and fish category (age and species)] contingency table (Sokal and Rohlf 1969).

The trawl x depth x fish interaction was highly significant (Figure IV-1). In deep water, the large trawl caught greater numbers of all species than the small trawl. In shallow water, the large trawl caught more young-of-the-year white perch. The small trawl caught more yearling and older white perch and the two gear caught comparable numbers of Atlantic tomcod (Table IV-1). Therefore, the answer to study question 2 (relative catch effectiveness - see Figure II-1), is neither a clear yes or no for those species analyzed. Rather, the answer differs among species and the depth of the sampling site.

B. COMPARISONS OF LENGTH FREQUENCY DISTRIBUTIONS

In order to determine whether the differences in catch totals were also associated with any evidence of differential size selectivity by the two trawls (question 3, Figure II-1), length frequency data were analyzed and compared. The length frequency distribution for each fish category x depth x trawl combination are presented in the Figures IV-2, IV-3, and IV-4, but only the samples for young-of-the-year white perch (from both deep and shallow sites) and yearling and older white perch (from shallow sites only) were large enough (Sokal and Rohlf 1969) to warrant a statistical analysis of the differences in mean length. The other fish species, fish age, and sample depth combinations are discussed qualitatively.

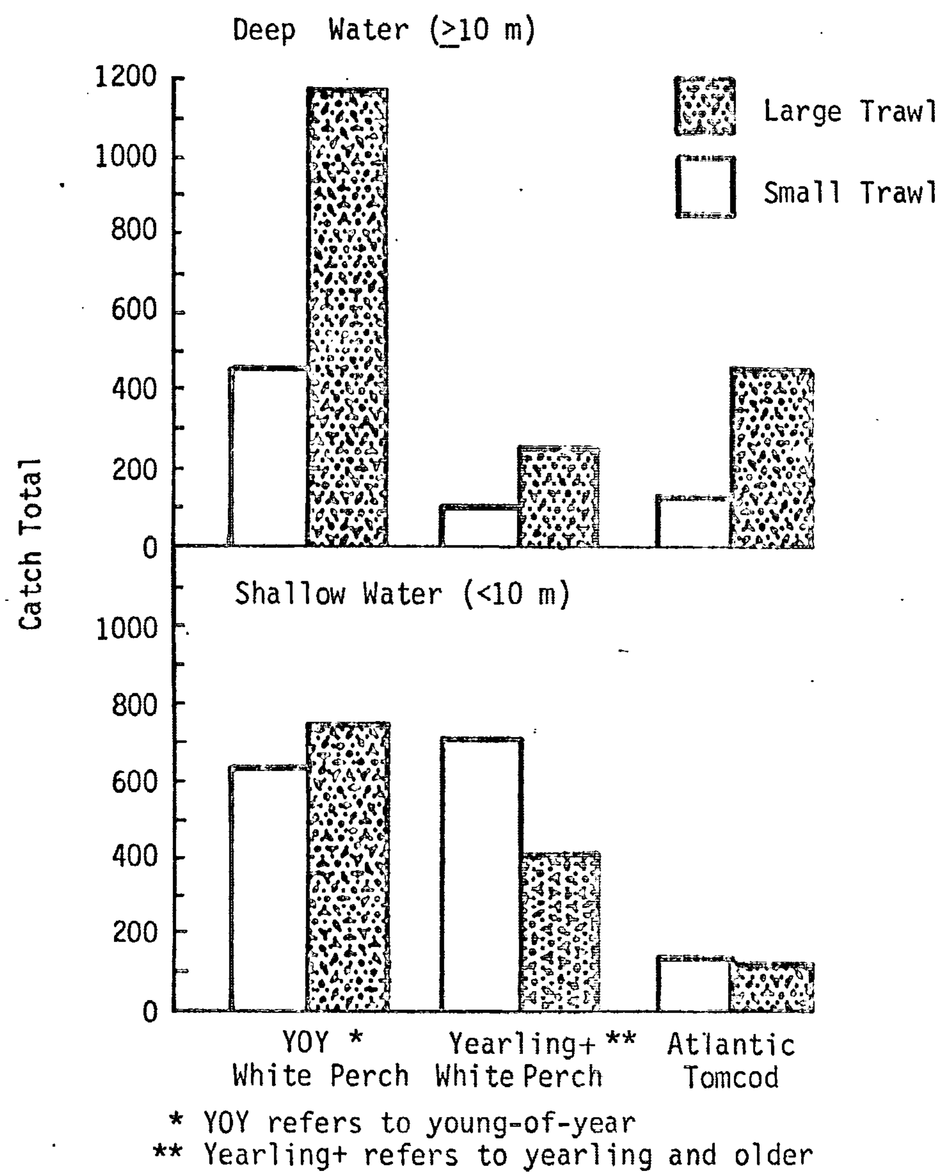

Figure IV-1. Catch Totals for Small and Large Trawls in Deep and Shallow Water Sampling Sites, Hudson River Estuary, November-December 1979 (Trawl X Depth X Fish Interaction: $X^2_{(2)} = 490.756$; $p << 0.005$)

Table IV-1

Examination of Differences in Catch Totals at Shallow Water Sampling Sites, Hudson River Estuary, November-December 1979

	Small Trawl	Large Trawl
Young-of-the-Year White Perch	635	749
	$\chi^2_{(1)} = 9.390;\ p<0.005$	
Yearling and Older White Perch	704	406
	$\chi^2_{(1)} = 80.004;\ p<<0.005$	
Atlantic Tomcod (all ages combined)	140	122
	$\chi^2_{(1)} = 1.237;\ 0.50>p>0.25$	

1. Atlantic Tomcod (all ages combined)

There were no obvious differences in the size frequency distribution of Atlantic tomcod caught by the two trawls. In deep water, each trawl caught similarly sized tomcod (Figure IV-2). In shallow water, no tomcod over approximately 190 mm (TL) were caught by the small trawl. This result probably reflects the relatively low abundance of tomcod in shallow water during the study period rather than size selectivity since few large tomcod were caught in the large trawl.

2. Yearling and Older White Perch

In deep water, the small trawl appeared to catch fewer large white perch than the large trawl (Figure IV-3). However, since the sample sizes did not permit a statistical analysis, this apparent difference may not be real. In shallow water, catches of yearling and older white perch were sufficiently large in both trawls such that size differences could be tested. The results of a t-test (Appendix Table C-1) showed the means to be significantly different. An examination of the third (skewness) and fourth (kurtosis) moments (Table IV-2) for the

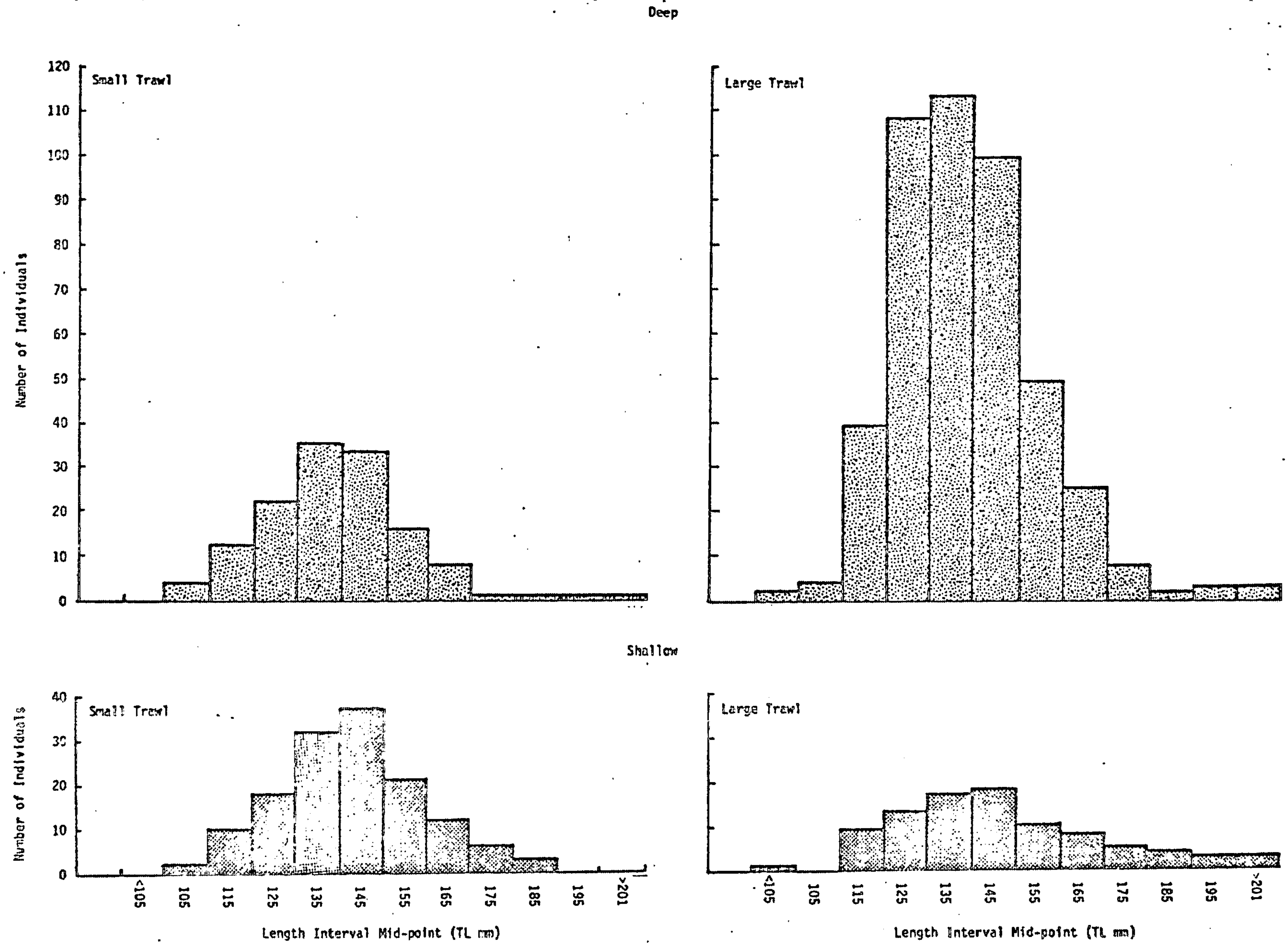

Figure IV-2. Length Frequency Distributions for Atlantic Tomcod (all ages) Caught by Large and Small Trawls in Deep (≥10 m) and Shallow (<10 m) Sampling Sites, Hudson River Estuary, November-December 1979

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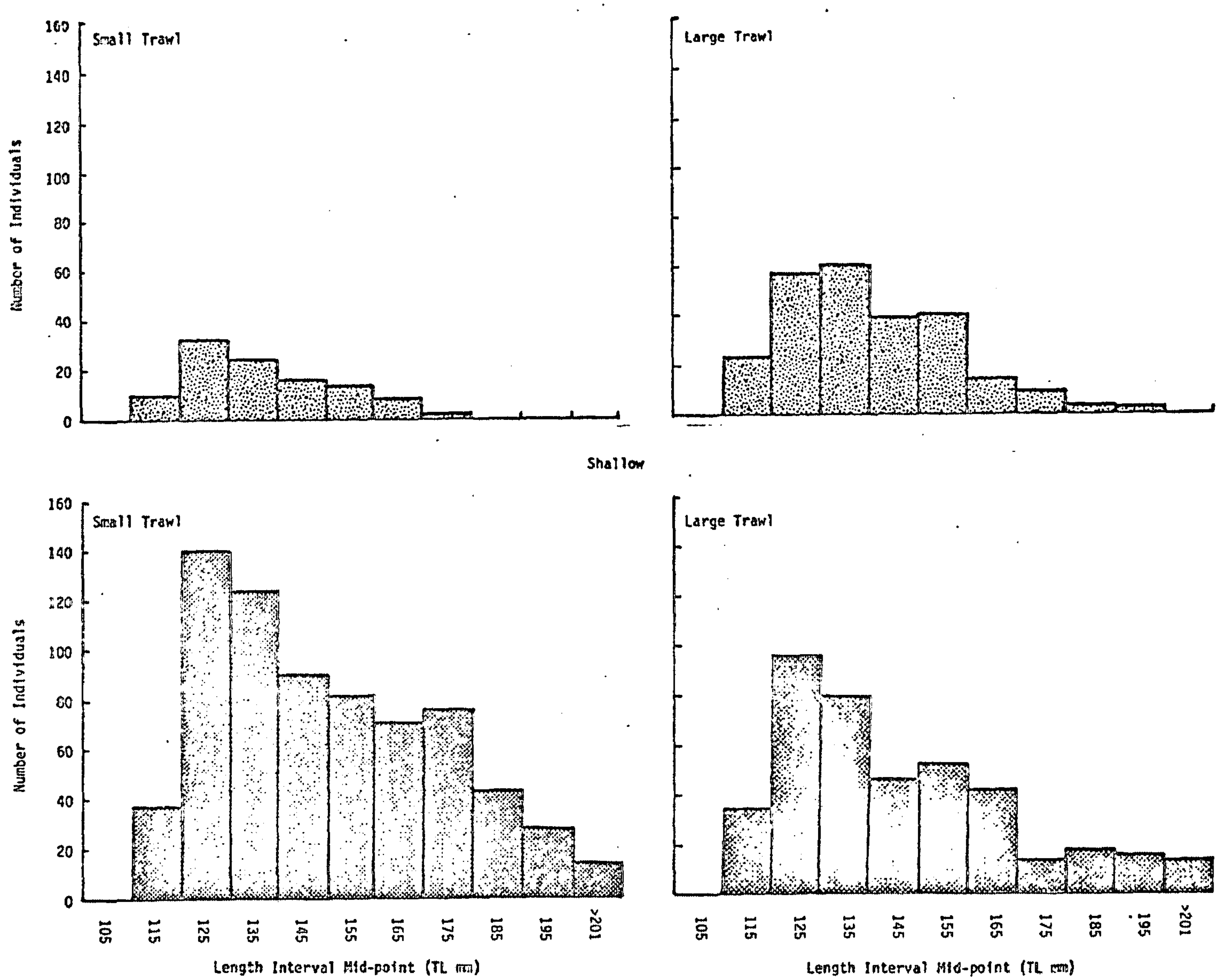

Figure IV-3. Length Frequency Distributions for Yearling and Older White Perch Caught by Large and Small Trawls in Deep (≥10 m) and Shallow (<10 m) Sampling Sites, Hudson River Estuary, November-December 1979

science services division

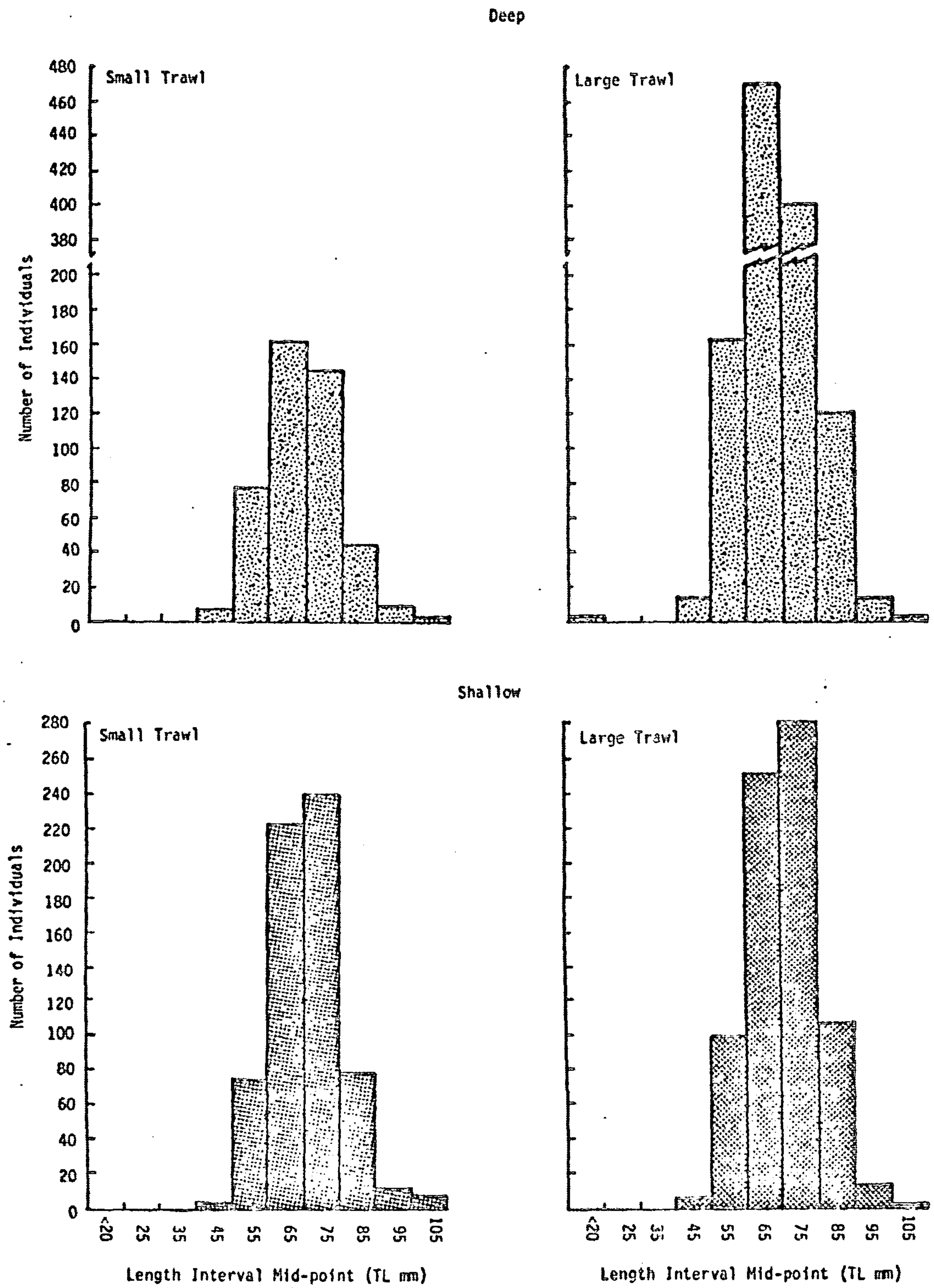

Figure IV-4. Length Frequency Distributions for Young-of-the-Year White Perch Caught by Large and Small Trawls in Deep (≥10 m) and Shallow (<10 m) Sampling Sites, Hudson River Estuary, November-December 1979

Table IV-2

Moment Statistics for Length Frequency Distributions of Yearling and Older White Perch Collected at Shallow (<10 m) Sampling Sites, Hudson River Estuary, November-December 1979

Statistic	Large Trawl	Small Trawl
Mean	147.26	150.20
Standard Deviation	24.92	23.74
Skewness	1.12	0.60
Kurtosis	1.13	-0.24

length frequency distributions demonstrated that the small trawl caught more of the larger fish than did the large trawl. The length frequency distribution of the small trawl catch was also less skewed and more platykurtotic than the length frequency distribution of the large trawl catch (Table IV-2).

3. Young-of-the-Year White Perch

The catches of young-of-the-year white perch were large in both trawls at both sampling depths so a 2-way analysis of variance (Appendix Table C-2) was used to compare the length frequency distributions. The gear x depth interaction and the gear main effect were not significant ($p > 0.05$). The depth main effect was significant; i.e., the mean lengths of fish collected in both trawls at the shallow sites (71.3 mm TL) were greater than the mean lengths of fish collected in both trawls at the deep water sites (69.7 mm TL). These results suggest that the larger young-of-the-year white perch were distributed closer to shore during the November-December 1979 study period. The length frequency distributions (Figure IV-4) and the moment statistics (Table IV-3) indicate, however, that there were no differences in the size selectivities of the two trawls for young-of-the-year white perch.

Table IV-3

Moment Statistics for Length Frequency Distributions of Young-of-the-Year White Perch Collected at Shallow (<10 m) and Deep (≥10 m) Sampling Sites, Hudson River Estuary, November-December 1979

Sampling Site	Small Trawl	Large Trawl
Shallow		
Mean	71.53	71.20
Standard Deviation	9.26	9.35
Skewness	0.38	0.15
Kurtosis	0.62	-0.24
Deep		
Mean	69.56	60.72
Standard Deviation	9.38	9.10
Skewness	0.19	0.07
Kurtosis	0.21	0.61

Thus, the answer to study question 3 (size selectivity - see Figure II-1), also differs among species and age groups and is again neither a clear yes or no for those species analyzed. For Atlantic tomcod (all ages) and young-of-the-year white perch, the two trawls did not exhibit differences in size selectivity. For yearling and older white perch, however, size selectivity differences were apparent between the two gear, but the direction of the size selectivity differences varied depending upon the depth where the fish were collected.

SECTION V

LITERATURE CITED

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APPENDIX A

White Perch and Atlantic Tomcod
Catch Data

Definitions of codes appearing in this Appendix are as follows:

GEAR:	17 = 12 FOOT TRY TRAWL 01+04 = IRT (COD END AND COD END COVER CATCHES COMBINED)
USE_CODE:	1 = NO SAMPLING PROBLEMS ENCOUNTERED
TC:	79 = 12 FOOT TRY TRAWL SURVEY 13 = INTERREGIONAL BOTTOM TRAWL (IRT) SURVEY
SAMPLE:	FIELD COLLECTION SAMPLE NUMBER
DATE:	MONTH, DAY AND YEAR THE SAMPLE WAS COLLECTED
TIME:	TIME OF DAY GEAR WAS DEPLOYED (USING 24 HOUR CLOCK)
RIV_MILE:	RIVER MILE WHERE SAMPLE WAS COLLECTED
SITE:	SIDE OF RIVER WHERE SAMPLE WAS COLLECTED (1=WEST, 2=CENTER, 3=EAST)
TOW_DUR:	TOW DURATION (AMOUNT OF TIME GEAR WAS DEPLOYED, IN MINUTES)
TOW_SPD:	SPEED THAT GEAR WAS TOWED RELATIVE TO WATER (METERS/SEC)
SAM_DPTH:	DEPTH WHERE SAMPLE WAS COLLECTED (IN FEET)
LC1_CT:	TOTAL # OF FISH CAUGHT IN LENGTH CLASS 1 (0 TO DIV_1)
LC2_CT:	TOTAL # OF FISH CAUGHT IN LENGTH CLASS 2 (DIV_1+1MM TO 150 MM)
LC3_CT:	TOTAL # OF FISH CAUGHT IN LENGTH CLASS 3 (151MM TO 250MM)
LC4_CT:	TOTAL # OF FISH CAUGHT IN LENGTH CLASS 4 (251MM+)
TOTAL_CT:	TOTAL # OF FISH CAUGHT IN SAMPLE

Table A-1

Catch Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

WEEK OF 11/5/79 TO 11/9/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	1	11/05/79	13:14	39	1	10	1.5	12	15	6	1	0	22
01+04 IRT	1	13	588	11/05/79	13:12	39	1	5	1.3	10	0	0	0	0	0
TRY	1	79	2	11/05/79	13:44	39	2	10	1.5	35	6	0	0	0	6
01+04 IRT	1	13	589	11/05/79	13:42	39	2	5	1.3	30	56	10	11	0	77
TRY	1	79	6	11/05/79	16:03	42	1	10	1.5	20	18	6	5	0	29
01+04 IRT	1	13	593	11/05/79	16:00	42	1	5	1.3	20	16	7	2	0	25
TRY	1	79	8	11/06/79	9:45	43	1	10	1.5	30	4	1	1	0	6
01+04 IRT	1	13	594	11/06/79	9:05	43	1	5	1.3	30	30	4	2	0	36
TRY	1	79	9	11/06/79	10:17	43	3	10	1.5	20	1	2	0	0	3
01+04 IRT	1	13	595	11/06/79	10:15	43	3	5	1.3	15	0	0	0	0	0
TRY	1	79	16	11/06/79	15:07	54	3	10	1.5	30	28	10	4	0	42
01+04 IRT	1	13	603	11/06/79	15:05	54	3	5	1.3	30	19	14	5	0	38
TRY	1	79	27	11/08/79	13:00	57	1	10	1.5	20	26	0	0	0	26
01+04 IRT	1	13	614	11/08/79	12:55	57	1	5	1.3	15	0	0	0	0	0
TRY	1	79	25	11/08/79	12:02	59	3	10	1.5	30	1	9	4	0	14
01+04 IRT	1	13	612	11/08/79	12:01	59	3	5	1.3	25	1	0	0	0	1
TRY	1	79	23	11/08/79	10:25	61	2	10	1.5	30	7	3	2	0	12
01+04 IRT	1	13	610	11/08/79	10:24	61	2	5	1.3	30	0	1	1	0	2
TRY	1	79	38	11/09/79	13:15	29	1	10	1.5	20	30	12	23	0	65
01+04 IRT	1	13	625	11/09/79	13:14	29	1	5	1.3	20	15	2	11	0	28
TRY	1	79	39	11/09/79	13:43	29	2	10	1.5	30	8	1	0	0	9
01+04 IRT	1	13	626	11/09/79	13:41	29	2	5	1.3	30	9	0	0	0	9
TRY	1	79	40	11/09/79	14:10	29	3	10	1.5	30	4	1	1	0	6
01+04 IRT	1	13	627	11/09/79	14:07	29	3	5	1.3	25	5	2	0	0	7
TRY	1	79	37	11/09/79	12:47	31	1	10	1.5	25	13	4	0	0	17
01+04 IRT	1	13	624	11/09/79	12:45	31	1	5	1.3	25	30	1	0	0	31
TRY	1	79	35	11/09/79	10:41	31	3	10	1.5	30	2	0	0	0	2
01+04 IRT	1	13	622	11/09/79	10:37	31	3	5	1.3	20	0	0	0	0	0
TRY	1	79	34	11/09/79	10:14	33	3	10	1.5	25	13	7	0	0	20
01+04 IRT	1	13	621	11/09/79	10:10	33	3	5	1.3	25	24	2	0	0	26
TRY	1	79	32	11/09/79	9:10	35	3	10	1.5	8	2	11	35	0	48
01+04 IRT	1	13	619	11/09/79	9:06	35	3	5	1.3	11	0	0	1	0	1
TRY	1	79	30	11/09/79	8:10	37	2	10	1.5	25	11	1	0	0	12
01+04 IRT	1	13	617	11/09/79	8:10	37	2	5	1.3	30	27	1	1	0	29
TRY	1	79	31	11/09/79	8:45	37	3	10	1.5	10	0	2	7	0	9
01+04 IRT	1	13	618	11/09/79	8:42	37	3	5	1.3	11	0	0	1	0	1

Table A-2

Catch Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

WEEK OF 11/19/79 TO 11/23/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	41	11/19/79	7:45	39	1	10	1.5	15	23	75	43	0	141
01+04 IRT	1	13	628	11/19/79	7:43	39	1	5	1.3	10	0	0	0	0	0
TRY	1	79	42	11/19/79	8:25	39	2	10	1.5	30	103	16	8	0	127
01+04 IRT	1	13	629	11/19/79	8:19	39	2	5	1.3	30	38	9	6	0	53
TRY	1	79	46	11/19/79	11:15	42	1	10	1.5	25	8	5	5	0	18
01+04 IRT	1	13	633	11/19/79	11:15	42	1	5	1.3	20	7	2	18	0	27
TRY	1	79	47	11/19/79	11:45	43	1	10	1.5	30	0	1	1	0	2
01+04 IRT	1	13	634	11/19/79	11:40	43	1	5	1.3	30	34	9	4	0	47
TRY	1	79	48	11/19/79	12:20	43	3	10	1.5	15	46	63	4	0	113
01+04 IRT	1	13	635	11/19/79	12:15	43	3	5	1.3	15	0	1	0	0	1
TRY	1	79	55	11/19/79	16:30	54	3	10	1.5	25	3	0	0	0	3
01+04 IRT	1	13	642	11/19/79	16:25	54	3	5	1.3	30	47	23	2	0	72
TRY	1	79	58	11/20/79	9:45	57	1	10	1.5	15	6	16	3	0	25
01+04 IRT	1	13	645	11/20/79	9:45	57	1	5	1.3	15	0	1	0	0	1
TRY	1	79	60	11/20/79	10:35	59	3	10	1.5	25	3	3	2	0	8
01+04 IRT	1	13	647	11/20/79	10:30	59	3	5	1.3	25	10	18	7	0	35
TRY	1	79	61	11/20/79	11:05	61	2	10	1.5	30	3	4	0	0	7
01+04 IRT	1	13	648	11/20/79	11:00	61	2	5	1.3	30	22	14	5	0	41
TRY	1	79	76	11/21/79	11:50	29	1	10	1.5	15	16	12	39	0	67
01+04 IRT	1	13	663	11/21/79	11:46	29	1	5	1.3	20	7	0	19	0	26
TRY	1	79	77	11/21/79	12:20	29	2	10	1.5	25	1	0	2	0	3
01+04 IRT	1	13	664	11/21/79	12:17	29	2	5	1.3	30	3	0	0	0	3
TRY	1	79	78	11/21/79	12:45	29	3	10	1.5	30	8	2	1	0	11
01+04 IRT	1	13	665	11/21/79	12:45	29	3	5	1.3	25	0	0	1	0	1
TRY	1	79	75	11/21/79	11:20	31	1	10	1.5	25	60	0	2	0	62
01+04 IRT	1	13	662	11/21/79	11:20	31	1	5	1.3	25	1	0	0	0	1
TRY	1	79	73	11/21/79	1[illegible]:32	31	3	10	1.5	15	7	11	23	0	41
01+04 IRT	1	13	660	11/21/79	10:30	31	3	5	1.3	20	1	1	5	0	7
TRY	1	79	72	11/21/79	10:05	33	3	10	1.5	25	10	4	3	0	17
01+04 IRT	1	13	659	11/21/79	10:05	33	3	5	1.3	25	3	0	3	0	6
TRY	1	79	70	11/21/79	9:08	35	3	10	1.5	10	0	5	10	0	15
01+04 IRT	1	13	657	11/21/79	9:05	35	3	5	1.3	11	0	0	0	0	0
TRY	1	79	68	11/21/79	8:10	37	2	10	1.5	25	6	0	1	0	7
01+04 IRT	1	13	655	11/21/79	8:00	37	2	5	1.3	30	44	6	4	0	54
TRY	1	79	69	11/21/79	8:40	37	3	10	1.5	11	2	8	2	0	12
01+04 IRT	1	13	656	11/21/79	8:35	37	3	5	1.3	11	0	0	0	0	0

Table A-3

Catch Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

WEEK OF 12/3/79 TO 12/7/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	79	12/03/79	13:08	39	1	10	1.5	10	1	0	0	0	1
01+04 IRT	1	13	666	12/03/79	13:00	39	1	5	1.3	10	0	0	0	0	0
TRY	1	79	80	12/03/79	13:28	39	2	10	1.5	35	36	15	0	0	51
01+04 IRT	1	13	667	12/03/79	13:25	39	2	5	1.3	30	104	40	14	0	158
TRY	1	79	92	12/04/79	12:37	29	1	10	1.5	18	5	1	3	0	9
01+04 IRT	1	13	679	12/04/79	12:40	29	1	5	1.3	20	6	1	0	0	7
TRY	1	79	93	12/04/79	13:00	29	2	10	1.5	30	13	0	0	0	13
01+04 IRT	1	13	680	12/04/79	13:00	29	2	5	1.3	30	2	1	0	0	3
TRY	1	79	94	12/04/79	13:20	29	3	10	1.5	20	14	1	3	0	18
01+04 IRT	1	13	681	12/04/79	13:30	29	3	5	1.3	25	0	0	1	0	1
TRY	1	79	91	12/04/79	12:22	31	1	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	678	12/04/79	12:20	31	1	5	1.3	25	5	3	0	0	8
TRY	1	79	89	12/04/79	11:38	31	3	10	1.5	17	15	21	9	0	45
01+04 IRT	1	13	676	12/04/79	11:35	31	3	5	1.3	20	3	4	0	0	7
TRY	1	79	88	12/04/79	11:12	33	3	10	1.5	22	12	16	14	0	42
01+04 IRT	1	13	675	12/04/79	11:05	33	3	5	1.3	25	12	11	10	0	33
TRY	1	79	86	12/04/79	10:20	35	3	10	1.5	10	2	8	21	0	31
01+04 IRT	1	13	673	12/04/79	10:20	35	3	5	1.3	11	0	0	0	0	0
TRY	1	79	84	12/04/79	9:25	37	2	10	1.5	30	11	3	1	0	15
01+04 IRT	1	13	671	12/04/79	9:22	37	2	5	1.3	30	91	44	4	0	139
TRY	1	79	85	12/04/79	9:48	37	3	10	1.5	11	16	22	20	0	58
01+04 IRT	1	13	672	12/04/79	9:55	37	3	5	1.3	11	2	0	5	0	7
TRY	1	79	95	12/05/79	12:43	42	1	10	1.5	20	3	3	2	0	8
01+04 IRT	1	13	682	12/05/79	12:46	42	1	5	1.3	20	0	4	5	0	9
TRY	1	79	96	12/05/79	13:04	43	1	10	1.5	30	3	2	0	0	5
01+04 IRT	1	13	683	12/05/79	13:00	43	1	5	1.3	30	30	2	2	0	34
TRY	1	79	97	12/05/79	13:28	43	3	10	1.5	15	1	1	0	0	2
01+04 IRT	1	13	684	12/05/79	13:25	43	3	5	1.3	15	0	2	0	0	2
TRY	1	79	109	12/06/79	13:50	59	3	10	1.5	25	8	4	0	0	12
01+04 IRT	1	13	696	12/06/79	13:50	59	3	5	1.3	25	0	1	0	0	1
TRY	1	79	108	12/06/79	13:32	61	2	10	1.5	30	1	0	0	0	1
01+04 IRT	1	13	695	12/06/79	13:25	61	2	5	1.3	30	22	6	2	0	30
TRY	1	79	113	12/07/79	12:21	54	3	10	1.5	30	0	1	0	0	1
01+04 IRT	1	13	702	12/07/79	12:15	54	3	5	1.3	30	14	1	2	0	17
TRY	1	79	115	12/07/79	13:03	57	1	10	1.5	20	0	0	0	0	0
01+04 IRT	1	13	697	12/07/79	13:00	57	1	5	1.3	15	9	3	1	0	13

Table A-4

Catch Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

WEEK OF 11/5/79 TO 11/9/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	3	11/05/79	14:33	39	3	10	1.5	65	0	0	0	0	0
01+04 IRT	1	13	590	11/05/79	14:30	39	3	5	1.3	75	11	2	1	0	14
TRY	1	79	4	11/05/79	15:06	41	2	10	1.5	45	1	0	0	0	1
01+04 IRT	1	13	591	11/05/79	15:05	41	2	5	1.3	45	16	0	0	0	16
TRY	1	79	5	11/05/79	15:39	42	3	10	1.5	45	1	0	0	0	1
01+04 IRT	1	13	592	11/05/79	15:36	42	3	5	1.3	50	1	0	0	0	1
TRY	1	79	11	11/06/79	11:16	44	1	10	1.5	35	28	0	3	0	31
01+04 IRT	1	13	597	11/06/79	11:13	44	1	5	1.3	45	32	1	0	0	33
TRY	1	79	10	11/06/79	10:43	44	2	10	1.5	70	0	0	0	0	0
01+04 IRT	1	13	596	11/06/79	10:40	44	2	5	1.3	75	9	0	0	0	9
TRY	1	79	13	11/06/79	13:05	48	3	10	1.5	40	10	1	1	0	12
01+04 IRT	1	13	600	11/06/79	13:02	48	3	5	1.3	45	40	14	5	0	59
TRY	1	79	14	11/06/79	13:38	49	1	10	1.5	80	1	0	0	0	1
01+04 IRT	1	13	601	11/06/79	13:32	49	1	5	1.3	80	0	0	0	0	0
TRY	1	79	15	11/06/79	15:47	54	2	10	1.5	50	0	0	0	0	0
01+04 IRT	1	13	602	11/06/79	15:43	54	2	5	1.3	60	3	0	1	0	4
TRY	1	79	22	11/07/79	14:05	63	2	10	1.5	45	28	2	0	0	30
01+04 IRT	1	13	609	11/07/79	14:00	63	2	5	1.3	45	25	4	2	0	31
TRY	1	79	21	11/07/79	13:36	65	2	10	1.5	55	18	2	0	0	20
01+04 IRT	1	13	608	11/07/79	13:32	65	2	5	1.3	60	23	3	0	0	26
TRY	1	79	20	11/07/79	12:57	66	2	10	1.5	50	0	2	0	0	2
01+04 IRT	1	13	607	11/07/79	12:55	66	2	5	1.3	60	5	5	3	0	13
TRY	1	79	19	11/07/79	12:26	67	2	10	1.5	40	7	5	1	0	13
01+04 IRT	1	13	606	11/07/79	12:22	67	2	5	1.3	45	42	10	3	0	55
TRY	1	79	18	11/07/79	11:52	72	2	10	1.5	55	2	2	0	0	4
01+04 IRT	1	13	605	11/07/79	11:50	72	2	5	1.3	50	8	2	0	0	10
TRY	1	79	17	11/07/79	11:19	74	2	10	1.5	60	1	0	0	0	1
01+04 IRT	1	13	604	11/07/79	11:16	74	2	5	1.3	60	3	4	0	0	7
TRY	1	79	29	11/08/79	13:55	55	3	10	1.5	45	1	0	0	0	1
01+04 IRT	1	13	616	11/08/79	13:50	55	3	5	1.3	45	3	1	0	0	4
TRY	1	79	28	11/08/79	13:30	57	2	10	1.5	35	5	1	0	0	6
01+04 IRT	1	13	615	11/08/79	13:24	57	2	5	1.3	35	29	7	2	0	38
TRY	1	79	36	11/09/79	11:38	31	2	10	1.5	30	65	1	0	0	66
01+04 IRT	1	13	623	11/09/79	11:40	31	2	5	1.3	35	13	0	0	0	13
TRY	1	79	33	11/09/79	9:45	33	2	10	1.5	35	0	0	0	0	0
01+04 IRT	1	13	620	11/09/79	9:40	33	2	5	1.3	40	23	0	0	0	23

Table A-5

Catch Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

WEEK OF 11/19/79 TO 11/23/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	43	11/19/79	9:00	39	3	10	1.5	70	20	0	0	0	20
01+04 IRT	1	13	630	11/19/79	8:55	39	3	5	1.3	75	94	3	4	0	101
TRY	1	79	44	11/19/79	10:07	41	2	10	1.5	45	8	4	0	0	12
01+04 IRT	1	13	631	11/19/79	10:00	41	2	5	1.3	45	202	7	0	0	209
TRY	1	79	45	11/19/79	10:50	42	3	10	1.5	50	2	2	0	0	4
01+04 IRT	1	13	632	11/19/79	10:45	42	3	5	1.3	50	11	1	1	0	13
TRY	1	79	50	11/19/79	14:00	44	1	10	1.5	45	29	5	4	0	38
01+04 IRT	1	13	637	11/19/79	13:55	44	1	5	1.3	45	57	15	3	0	75
TRY	1	79	49	11/19/79	12:55	44	2	10	1.5	70	5	1	0	0	6
01+04 IRT	1	13	636	11/19/79	12:50	44	2	5	1.3	75	13	0	1	0	14
TRY	1	79	52	11/19/79	15:05	48	3	10	1.5	45	9	1	0	0	10
01+04 IRT	1	13	639	11/19/79	15:00	48	3	5	1.3	45	34	7	4	0	45
TRY	1	79	53	11/19/79	15:30	49	1	10	1.5	75	3	1	0	0	4
01+04 IRT	1	13	640	11/19/79	15:37	49	1	5	1.3	80	19	6	0	0	25
TRY	1	79	54	11/19/79	16:10	54	2	10	1.5	55	6	1	0	0	7
01+04 IRT	1	13	641	11/19/79	16:05	54	2	5	1.3	60	35	1	0	0	36
TRY	1	79	56	11/20/79	8:55	55	3	10	1.5	40	49	7	2	0	58
01+04 IRT	1	13	643	11/20/79	8:50	55	3	5	1.3	45	70	11	6	0	87
TRY	1	79	57	11/20/79	9:22	57	2	10	1.5	35	28	11	4	0	43
01+04 IRT	1	13	644	11/20/79	9:20	57	2	5	1.3	35	26	5	1	0	32
TRY	1	79	62	11/20/79	11:30	63	2	10	1.5	40	8	1	0	0	9
01+04 IRT	1	13	649	11/20/79	11:25	63	2	5	1.3	45	19	4	3	0	26
TRY	1	79	63	11/20/79	11:57	65	2	10	1.5	55	6	0	0	0	6
01+04 IRT	1	13	650	11/20/79	11:55	65	2	5	1.3	60	19	3	1	0	23
TRY	1	79	64	11/20/79	12:30	66	2	10	1.5	60	1	0	0	0	1
01+04 IRT	1	13	651	11/20/79	12:25	66	2	5	1.3	60	22	6	2	0	30
TRY	1	79	65	11/20/79	12:52	67	2	10	1.5	45	28	5	0	0	33
01+04 IRT	1	13	652	11/20/79	12:50	67	2	5	1.3	45	45	6	5	0	56
TRY	1	79	66	11/20/79	13:25	72	2	10	1.5	50	3	4	0	0	7
01+04 IRT	1	13	653	11/20/79	13:21	72	2	5	1.3	50	3	5	1	0	9
TRY	1	79	67	11/20/79	14:00	74	2	10	1.5	60	1	0	0	0	1
01+04 IRT	1	13	654	11/20/79	13:50	74	2	5	1.3	60	2	0	0	0	2
TRY	1	79	74	11/21/79	10:55	31	2	10	1.5	35	6	0	0	0	6
01+04 IRT	1	13	661	11/21/79	10:50	31	2	5	1.3	35	2	0	2	0	4
TRY	1	79	71	11/21/79	9:30	33	2	10	1.5	40	15	1	0	0	16
01+04 IRT	1	13	658	11/21/79	9:30	33	2	5	1.3	40	29	5	5	0	39

Table A-6

Catch Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

WEEK OF 12/3/79 TO 12/7/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	81	12/03/79	14:15	39	3	10	1.5	70	0	0	0	0	0
01+04 IRT	1	13	668	12/03/79	14:05	39	3	5	1.3	75	20	1	1	0	22
TRY	1	79	82	12/03/79	14:48	41	2	10	1.5	45	1	0	0	0	1
01+04 IRT	1	13	669	12/03/79	14:40	41	2	5	1.3	45	17	0	1	0	18
TRY	1	79	83	12/03/79	15:16	42	3	10	1.5	50	1	1	0	0	2
01+04 IRT	1	13	670	12/03/79	15:15	42	3	5	1.3	50	6	6	3	0	15
TRY	1	79	90	12/04/79	11:59	31	2	10	1.5	40	14	0	0	0	14
01+04 IRT	1	13	677	12/04/79	11:55	31	2	5	1.3	35	4	1	1	0	6
TRY	1	79	87	12/04/79	10:45	33	2	10	1.5	42	4	0	0	0	4
01+04 IRT	1	13	674	12/04/79	10:40	33	2	5	1.3	40	12	2	0	0	14
TRY	1	79	99	12/05/79	14:20	44	1	10	1.5	45	9	11	5	0	25
01+04 IRT	1	13	686	12/05/79	14:20	44	1	5	1.3	45	8	5	0	0	13
TRY	1	79	98	12/05/79	13:52	44	2	10	1.5	75	0	0	0	0	0
01+04 IRT	1	13	685	12/05/79	13:50	44	2	5	1.3	75	0	1	1	0	2
TRY	1	79	101	12/05/79	15:31	48	3	10	1.5	45	1	3	0	0	4
01+04 IRT	1	13	688	12/05/79	15:30	48	3	5	1.3	45	26	9	4	0	39
TRY	1	79	107	12/06/79	13:06	63	2	10	1.5	45	2	2	1	0	5
01+04 IRT	1	13	694	12/06/79	13:00	63	2	5	1.3	45	3	1	0	0	4
TRY	1	79	106	12/06/79	12:45	65	2	10	1.5	60	2	0	0	0	2
01+04 IRT	1	13	693	12/06/79	12:40	65	2	5	1.3	60	5	1	1	0	7
TRY	1	79	105	12/06/79	12:22	66	2	10	1.5	60	2	0	0	0	2
01+04 IRT	1	13	692	12/06/79	12:20	66	2	5	1.3	60	7	1	0	0	8
TRY	1	79	104	12/06/79	11:57	67	2	10	1.5	50	0	0	1	0	1
01+04 IRT	1	13	691	12/06/79	11:55	67	2	5	1.3	45	3	2	0	0	5
TRY	1	79	103	12/06/79	11:25	72	2	10	1.5	55	1	1	0	0	2
01+04 IRT	1	13	690	12/06/79	11:21	72	2	5	1.3	50	5	2	1	0	8
TRY	1	79	102	12/06/79	10:56	74	2	10	1.5	60	0	1	0	0	1
01+04 IRT	1	13	689	12/06/79	10:55	74	2	5	1.3	60	1	0	0	0	1
TRY	1	79	110	12/07/79	9:38	49	1	10	1.5	80	2	0	0	0	2
01+04 IRT	1	13	700	12/07/79	9:35	49	1	5	1.3	80	1	1	0	0	2
TRY	1	79	112	12/07/79	12:00	54	2	10	1.5	60	2	0	0	0	2
01+04 IRT	1	13	701	12/07/79	12:00	54	2	5	1.3	60	1	0	2	0	3
TRY	1	79	114	12/07/79	12:42	55	3	10	1.5	45	5	2	0	0	7
01+04 IRT	1	13	703	12/07/79	12:40	55	3	5	1.3	45	12	1	0	0	13
TRY	1	79	116	12/07/79	13:17	57	2	10	1.5	35	6	3	1	0	10
01+04 IRT	1	13	698	12/07/79	13:15	57	2	5	1.3	35	64	6	0	0	70

Table A-7

Catch Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

WEEK OF 11/5/79 TO 11/9/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	1	11/05/79	13:14	39	1	10	1.5	12	0	0	0	0	0
01+04 IRT	1	13	583	11/05/79	13:12	39	1	5	1.3	10	0	0	0	0	0
TRY	1	79	2	11/05/79	13:44	39	2	10	1.5	35	1	0	0	0	1
01+04 IRT	1	13	589	11/05/79	13:42	39	2	5	1.3	30	11	0	0	0	11
TRY	1	79	6	11/05/79	16:03	42	1	10	1.5	20	5	0	0	0	5
01+04 IRT	1	13	593	11/05/79	16:00	42	1	5	1.3	20	1	0	0	0	1
TRY	1	79	8	11/06/79	9:45	43	1	10	1.5	30	10	0	0	0	10
01+04 IRT	1	13	594	11/06/79	9:05	43	1	5	1.3	30	9	0	0	0	9
TRY	1	79	9	11/06/79	10:17	43	3	10	1.5	20	0	0	0	0	0
01+04 IRT	1	13	595	11/06/79	10:15	43	3	5	1.3	15	0	0	0	0	0
TRY	1	79	16	11/06/79	15:07	54	3	10	1.5	30	1	0	0	0	1
01+04 IRT	1	13	603	11/06/79	15:05	54	3	5	1.3	30	2	0	0	0	2
TRY	1	79	27	11/08/79	13:00	57	1	10	1.5	20	0	0	0	0	0
01+04 IRT	1	13	614	11/08/79	12:55	57	1	5	1.3	15	0	0	0	0	0
TRY	1	79	25	11/08/79	12:02	59	3	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	612	11/08/79	12:01	59	3	5	1.3	25	0	0	0	0	0
TRY	1	79	23	11/08/79	10:25	61	2	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	610	11/08/79	10:24	61	2	5	1.3	30	1	0	0	0	1
TRY	1	79	38	11/09/79	13:15	29	1	10	1.5	20	4	1	0	0	5
01+04 IRT	1	13	625	11/09/79	13:14	29	1	5	1.3	20	3	0	0	0	3
TRY	1	79	39	11/09/79	13:43	29	2	10	1.5	30	11	0	0	0	11
01+04 IRT	1	13	626	11/09/79	13:41	29	2	5	1.3	30	5	0	0	0	5
TRY	1	79	40	11/09/79	14:10	29	3	10	1.5	30	2	0	0	0	2
01+04 IRT	1	13	627	11/09/79	14:07	29	3	5	1.3	25	1	0	0	0	1
TRY	1	79	37	11/09/79	12:47	31	1	10	1.5	25	4	0	0	0	4
01+04 IRT	1	13	624	11/09/79	12:45	31	1	5	1.3	25	2	0	0	0	2
TRY	1	79	35	11/09/79	10:41	31	3	10	1.5	30	8	0	0	0	8
01+04 IRT	1	13	622	11/09/79	10:37	31	3	5	1.3	20	0	0	0	0	0
TRY	1	79	34	11/09/79	10:14	33	3	10	1.5	25	4	0	0	0	4
01+04 IRT	1	13	621	11/09/79	10:10	33	3	5	1.3	25	0	0	0	0	0
TRY	1	79	32	11/09/79	9:10	35	3	10	1.5	8	0	0	0	0	0
01+04 IRT	1	13	619	11/09/79	9:06	35	3	5	1.3	11	0	0	0	0	0
TRY	1	79	30	11/09/79	8:10	37	2	10	1.5	25	4	0	0	0	4
01+04 IRT	1	13	617	11/09/79	8:10	37	2	5	1.3	30	2	0	0	0	2
TRY	1	79	31	11/09/79	8:45	37	3	10	1.5	10	0	0	0	0	0
01+04 IRT	1	13	618	11/09/79	8:42	37	3	5	1.3	11	0	0	0	0	0

Table A-8

Catch Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

WEEK OF 11/19/79 TO 11/23/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	41	11/19/79	7:45	39	1	10	1.5	15	0	0	0	0	0
01+04 IRT	1	13	628	11/19/79	7:43	39	1	5	1.3	10	0	0	0	0	0
TRY	1	79	42	11/19/79	8:25	39	2	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	629	11/19/79	8:19	39	2	5	1.3	30	2	0	0	0	2
TRY	1	79	46	11/19/79	11:15	42	1	10	1.5	25	6	0	0	0	6
01+04 IRT	1	13	633	11/19/79	11:15	42	1	5	1.3	20	0	0	0	0	0
TRY	1	79	47	11/19/79	11:45	43	1	10	1.5	30	2	0	0	0	2
01+04 IRT	1	13	634	11/19/79	11:40	43	1	5	1.3	30	4	0	0	0	4
TRY	1	79	48	11/19/79	12:20	43	3	10	1.5	15	0	0	0	0	0
01+04 IRT	1	13	635	11/19/79	12:15	43	3	5	1.3	15	0	0	0	0	0
TRY	1	79	55	11/19/79	16:30	54	3	10	1.5	25	1	0	0	0	1
01+04 IRT	1	13	642	11/19/79	16:25	54	3	5	1.3	30	4	0	0	0	4
TRY	1	79	58	11/20/79	9:45	57	1	10	1.5	15	0	0	0	0	0
01+04 IRT	1	13	645	11/20/79	9:45	57	1	5	1.3	15	0	0	0	0	0
TRY	1	79	60	11/20/79	10:35	59	3	10	1.5	25	0	0	0	0	0
01+04 IRT	1	13	647	11/20/79	10:30	59	3	5	1.3	25	1	0	0	0	1
TRY	1	79	61	11/20/79	11:05	61	2	10	1.5	30	3	0	0	0	3
01+04 IRT	1	13	648	11/20/79	11:00	61	2	5	1.3	30	1	0	0	0	1
TRY	1	79	76	11/21/79	11:50	29	1	10	1.5	15	8	0	0	0	8
01+04 IRT	1	13	663	11/21/79	11:46	29	1	5	1.3	20	4	0	0	0	4
TRY	1	79	77	11/21/79	12:20	29	2	10	1.5	25	1	0	0	0	1
01+04 IRT	1	13	664	11/21/79	12:17	29	2	5	1.3	30	5	0	0	0	5
TRY	1	79	78	11/21/79	12:45	29	3	10	1.5	30	19	0	0	0	19
01+04 IRT	1	13	665	11/21/79	12:45	29	3	5	1.3	25	1	0	0	0	1
TRY	1	79	75	11/21/79	11:20	31	1	10	1.5	25	1	0	0	0	1
01+04 IRT	1	13	662	11/21/79	11:20	31	1	5	1.3	25	0	0	0	0	0
TRY	1	79	73	11/21/79	10:32	31	3	10	1.5	15	4	0	0	0	4
01+04 IRT	1	13	660	11/21/79	10:30	31	3	5	1.3	20	0	0	0	0	0
TRY	1	79	72	11/21/79	10:05	33	3	10	1.5	25	8	0	0	0	8
01+04 IRT	1	13	659	11/21/79	10:05	33	3	5	1.3	25	0	1	25	4	30
TRY	1	79	70	11/21/79	9:08	35	3	10	1.5	10	0	0	0	0	0
01+04 IRT	1	13	657	11/21/79	9:05	35	3	5	1.3	11	0	0	0	0	0
TRY	1	79	68	11/21/79	8:10	37	2	10	1.5	25	1	0	0	0	1
01+04 IRT	1	13	655	11/21/79	8:00	37	2	5	1.3	30	0	0	0	0	0
TRY	1	79	69	11/21/79	8:40	37	3	10	1.5	11	0	0	0	0	0
01+04 IRT	1	13	656	11/21/79	8:35	37	3	5	1.3	11	0	0	0	0	0

Table A-9

Catch Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

WEEK OF 12/3/79 TO 12/7/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	79	12/03/79	13:08	39	1	10	1.5	10	0	0	0	0	0
01+04 IRT	1	13	666	12/03/79	13:00	39	1	5	1.3	10	0	0	0	0	0
TRY	1	79	80	12/03/79	13:28	39	2	10	1.5	35	3	0	0	0	3
01+04 IRT	1	13	667	12/03/79	13:25	39	2	5	1.3	30	12	0	5	1	18
TRY	1	79	92	12/04/79	12:37	29	1	10	1.5	18	0	0	0	0	0
01+04 IRT	1	13	679	12/04/79	12:40	29	1	5	1.3	20	0	0	0	0	0
TRY	1	79	93	12/04/79	13:00	29	2	10	1.5	30	6	0	0	0	6
01+04 IRT	1	13	680	12/04/79	13:00	29	2	5	1.3	30	1	0	0	0	1
TRY	1	79	94	12/04/79	13:20	29	3	10	1.5	20	9	0	0	0	9
01+04 IRT	1	13	681	12/04/79	13:30	29	3	5	1.3	25	0	0	0	0	0
TRY	1	79	91	12/04/79	12:22	31	1	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	678	12/04/79	12:20	31	1	5	1.3	25	0	0	0	0	0
TRY	1	79	89	12/04/79	11:38	31	3	10	1.5	17	2	0	0	0	2
01+04 IRT	1	13	676	12/04/79	11:35	31	3	5	1.3	20	0	0	0	0	0
TRY	1	79	88	12/04/79	11:12	33	3	10	1.5	22	5	0	0	0	5
01+04 IRT	1	13	675	12/04/79	11:05	33	3	5	1.3	25	6	0	1	0	7
TRY	1	79	86	12/04/79	10:20	35	3	10	1.5	10	2	0	0	0	2
01+04 IRT	1	13	673	12/04/79	10:20	35	3	5	1.3	11	0	0	0	0	0
TRY	1	79	84	12/04/79	9:25	37	2	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	671	12/04/79	9:22	37	2	5	1.3	30	2	0	0	0	2
TRY	1	79	85	12/04/79	9:48	37	3	10	1.5	11	0	0	0	0	0
01+04 IRT	1	13	672	12/04/79	9:55	37	3	5	1.3	11	0	0	0	0	0
TRY	1	79	95	12/05/79	12:43	42	1	10	1.5	20	0	0	0	0	0
01+04 IRT	1	13	682	12/05/79	12:46	42	1	5	1.3	20	0	0	0	0	0
TRY	1	79	96	12/05/79	13:04	43	1	10	1.5	30	4	0	0	0	4
01+04 IRT	1	13	683	12/05/79	13:00	43	1	5	1.3	30	3	0	0	0	3
TRY	1	79	97	12/05/79	13:28	43	3	10	1.5	15	0	0	0	0	0
01+04 IRT	1	13	684	12/05/79	13:25	43	3	5	1.3	15	0	0	0	0	0
TRY	1	79	109	12/06/79	13:50	59	3	10	1.5	25	0	0	0	0	0
01+04 IRT	1	13	696	12/06/79	13:50	59	3	5	1.3	25	0	0	0	0	0
TRY	1	79	108	12/06/79	13:32	61	2	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	695	12/06/79	13:25	61	2	5	1.3	30	0	0	0	0	0
TRY	1	79	113	12/07/79	12:21	54	3	10	1.5	30	0	0	0	0	0
01+04 IRT	1	13	702	12/07/79	12:15	54	3	5	1.3	30	2	0	0	0	2
TRY	1	79	115	12/07/79	13:03	57	1	10	1.5	20	0	0	0	0	0
01+04 IRT	1	13	697	12/07/79	13:00	57	1	5	1.3	15	0	0	0	0	0

science services division

Table A-10

Catch Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

WEEK OF 11/5/79 TO 11/9/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	3	11/05/79	14:33	39	3	10	1.5	65	0	0	0	0	0
01+04 IRT	1	13	590	11/05/79	14:30	39	3	5	1.3	75	7	0	0	0	7
TRY	1	79	4	11/05/79	15:06	41	2	10	1.5	45	0	0	0	0	0
01+04 IRT	1	13	591	11/05/79	15:05	41	2	5	1.3	45	13	0	0	0	13
TRY	1	79	5	11/05/79	15:39	42	3	10	1.5	45	4	0	0	0	4
01+04 IRT	1	13	592	11/05/79	15:36	42	3	5	1.3	50	7	0	0	0	7
TRY	1	79	11	11/06/79	11:16	44	1	10	1.5	35	10	0	0	0	10
01+04 IRT	1	13	597	11/06/79	11:13	44	1	5	1.3	45	19	0	0	0	19
TRY	1	79	10	11/06/79	10:43	44	2	10	1.5	70	1	0	0	0	1
01+04 IRT	1	13	596	11/06/79	10:40	44	2	5	1.3	75	16	0	0	0	16
TRY	1	79	13	11/06/79	13:05	48	3	10	1.5	40	0	0	0	0	0
01+04 IRT	1	13	600	11/06/79	13:02	48	3	5	1.3	45	3	0	0	0	3
TRY	1	79	14	11/06/79	13:38	49	1	10	1.5	80	1	0	0	0	1
01+04 IRT	1	13	601	11/06/79	13:32	49	1	5	1.3	80	6	0	0	0	6
TRY	1	79	15	11/06/79	15:47	54	2	10	1.5	50	0	0	0	0	0
01+04 IRT	1	13	602	11/06/79	15:43	54	2	5	1.3	60	8	0	0	0	8
TRY	1	79	22	11/07/79	14:05	63	2	10	1.5	45	2	0	0	0	2
01+04 IRT	1	13	609	11/07/79	14:00	63	2	5	1.3	45	0	0	0	0	0
TRY	1	79	21	11/07/79	13:36	65	2	10	1.5	55	1	0	0	0	1
01+04 IRT	1	13	608	11/07/79	13:32	65	2	5	1.3	60	5	0	0	0	5
TRY	1	79	20	11/07/79	12:57	66	2	10	1.5	50	2	0	0	0	2
01+04 IRT	1	13	607	11/07/79	12:55	66	2	5	1.3	60	19	0	0	0	19
TRY	1	79	19	11/07/79	12:26	67	2	10	1.5	40	1	0	0	0	1
01+04 IRT	1	13	606	11/07/79	12:22	67	2	5	1.3	45	5	0	0	0	5
TRY	1	79	18	11/07/79	11:52	72	2	10	1.5	55	0	0	0	0	0
01+04 IRT	1	13	605	11/07/79	11:50	72	2	5	1.3	50	2	0	0	0	2
TRY	1	79	17	11/07/79	11:19	74	2	10	1.5	60	0	0	0	0	0
01+04 IRT	1	13	604	11/07/79	11:16	74	2	5	1.3	60	5	0	0	0	5
TRY	1	79	29	11/08/79	13:55	55	3	10	1.5	45	4	0	0	0	4
01+04 IRT	1	13	616	11/08/79	13:50	55	3	5	1.3	45	1	0	0	0	1
TRY	1	79	28	11/08/79	13:30	57	2	10	1.5	35	4	0	0	0	4
01+04 IRT	1	13	615	11/08/79	13:24	57	2	5	1.3	35	11	0	0	0	11
TRY	1	79	36	11/09/79	11:38	31	2	10	1.5	30	4	0	0	0	4
01+04 IRT	1	13	623	11/09/79	11:40	31	2	5	1.3	35	0	0	0	0	0
TRY	1	79	33	11/09/79	9:45	33	2	10	1.5	35	1	0	0	0	1
01+04 IRT	1	13	620	11/09/79	9:40	33	2	5	1.3	40	4	0	6	0	10

science services division

Table A-11

Catch Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

WEEK OF 11/19/79 TO 11/23/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	43	11/19/79	9:00	39	3	10	1.5	70	5	0	0	0	5
01+04 IRT	1	13	630	11/19/79	8:55	39	3	5	1.3	75	5	0	1	0	6
TRY	1	79	44	11/19/79	10:07	41	2	10	1.5	45	0	0	0	0	0
01+04 IRT	1	13	631	11/19/79	10:00	41	2	5	1.3	45	27	0	0	0	27
TRY	1	79	45	11/19/79	10:50	42	3	10	1.5	50	1	0	0	0	1
01+04 IRT	1	13	632	11/19/79	10:45	42	3	5	1.3	50	1	0	0	0	1
TRY	1	79	50	11/19/79	14:00	44	1	10	1.5	45	0	0	0	0	0
01+04 IRT	1	13	637	11/19/79	13:55	44	1	5	1.3	45	1	0	0	0	1
TRY	1	79	49	11/19/79	12:55	44	2	10	1.5	70	5	0	0	0	5
01+04 IRT	1	13	636	11/19/79	12:50	44	2	5	1.3	75	6	0	0	0	6
TRY	1	79	52	11/19/79	15:05	48	3	10	1.5	45	0	0	0	0	0
01+04 IRT	1	13	639	11/19/79	15:00	48	3	5	1.3	45	6	0	0	0	6
TRY	1	79	53	11/19/79	15:30	49	1	10	1.5	75	0	0	0	0	0
01+04 IRT	1	13	640	11/19/79	15:37	49	1	5	1.3	80	8	0	0	0	8
TRY	1	79	54	11/19/79	16:10	54	2	10	1.5	55	13	0	0	0	13
01+04 IRT	1	13	641	11/19/79	16:05	54	2	5	1.3	60	16	0	0	0	16
TRY	1	79	56	11/20/79	8:55	55	3	10	1.5	40	2	0	0	0	2
01+04 IRT	1	13	643	11/20/79	8:50	55	3	5	1.3	45	10	0	0	0	10
TRY	1	79	57	11/20/79	9:22	57	2	10	1.5	35	2	0	0	0	2
01+04 IRT	1	13	644	11/20/79	9:20	57	2	5	1.3	35	1	0	0	0	1
TRY	1	79	62	11/20/79	11:30	63	2	10	1.5	40	0	0	0	0	0
01+04 IRT	1	13	649	11/20/79	11:25	63	2	5	1.3	45	0	0	0	0	0
TRY	1	79	63	11/20/79	11:57	65	2	10	1.5	55	0	0	0	0	0
01+04 IRT	1	13	650	11/20/79	11:55	65	2	5	1.3	60	1	0	0	0	1
TRY	1	79	64	11/20/79	12:30	66	2	10	1.5	60	0	0	0	0	0
01+04 IRT	1	13	651	11/20/79	12:25	66	2	5	1.3	60	31	0	0	0	31
TRY	1	79	65	11/20/79	12:52	67	2	10	1.5	45	2	0	0	0	2
01+04 IRT	1	13	652	11/20/79	12:50	67	2	5	1.3	45	6	0	0	0	6
TRY	1	79	66	11/20/79	13:25	72	2	10	1.5	50	0	0	0	0	0
01+04 IRT	1	13	653	11/20/79	13:21	72	2	5	1.3	50	21	0	0	0	21
TRY	1	79	67	11/20/79	14:00	74	2	10	1.5	60	1	0	0	0	1
01+04 IRT	1	13	654	11/20/79	13:50	74	2	5	1.3	60	24	0	0	0	24
TRY	1	79	74	11/21/79	10:55	31	2	10	1.5	35	17	0	1	0	18
01+04 IRT	1	13	661	11/21/79	10:50	31	2	5	1.3	35	3	0	0	0	3
TRY	1	79	71	11/21/79	9:30	33	2	10	1.5	40	4	0	0	0	4
01+04 IRT	1	13	658	11/21/79	9:30	33	2	5	1.3	40	3	0	0	0	3

Table A-12

Catch Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

WEEK OF 12/3/79 TO 12/7/79

GEAR	USE_CODE	TC	SAMPLE	DATE	TIME	RIV_MILE	SITE	DURATION	TOW_SPD	SAM_DPTH	LC1_CT	LC2_CT	LC3_CT	LC4_CT	TOTAL_CT
TRY	1	79	81	12/03/79	14:15	39	3	10	1.5	70	0	0	0	0	0
01+04 IRT	1	13	668	12/03/79	14:05	39	3	5	1.3	75	25	0	0	0	25
TRY	1	79	82	12/03/79	14:48	41	2	10	1.5	45	7	0	0	0	7
01+04 IRT	1	13	669	12/03/79	14:40	41	2	5	1.3	45	24	0	0	0	24
TRY	1	79	83	12/03/79	15:16	42	3	10	1.5	50	4	0	0	0	4
01+04 IRT	1	13	670	12/03/79	15:15	42	3	5	1.3	50	14	0	0	0	14
TRY	1	79	90	12/04/79	11:59	31	2	10	1.5	40	6	0	0	0	6
01+04 IRT	1	13	677	12/04/79	11:55	31	2	5	1.3	35	1	0	0	0	1
TRY	1	79	87	12/04/79	10:45	33	2	10	1.5	42	5	0	0	0	5
01+04 IRT	1	13	674	12/04/79	10:40	33	2	5	1.3	40	1	0	0	0	1
TRY	1	79	99	12/05/79	14:20	44	1	10	1.5	45	6	0	1	0	7
01+04 IRT	1	13	686	12/05/79	14:20	44	1	5	1.3	45	3	0	1	0	4
TRY	1	79	98	12/05/79	13:52	44	2	10	1.5	75	0	0	0	0	0
01+04 IRT	1	13	685	12/05/79	13:50	44	2	5	1.3	75	33	0	0	0	33
TRY	1	79	101	12/05/79	15:31	48	3	10	1.5	45	0	0	0	0	0
01+04 IRT	1	13	688	12/05/79	15:30	48	3	5	1.3	45	0	0	0	0	0
TRY	1	79	107	12/06/79	13:06	63	2	10	1.5	45	2	0	0	0	2
01+04 IRT	1	13	694	12/06/79	13:00	63	2	5	1.3	45	0	0	0	0	0
TRY	1	79	106	12/06/79	12:45	65	2	10	1.5	60	0	0	0	0	0
01+04 IRT	1	13	693	12/06/79	12:40	65	2	5	1.3	60	1	0	0	0	1
TRY	1	79	105	12/06/79	12:22	66	2	10	1.5	60	1	0	0	0	1
01+04 IRT	1	13	692	12/06/79	12:20	66	2	5	1.3	60	27	0	0	0	27
TRY	1	79	104	12/06/79	11:57	67	2	10	1.5	50	3	0	0	0	3
01+04 IRT	1	13	691	12/06/79	11:55	67	2	5	1.3	45	1	0	0	0	1
TRY	1	79	103	12/06/79	11:25	72	2	10	1.5	55	3	0	0	0	3
01+04 IRT	1	13	690	12/06/79	11:21	72	2	5	1.3	50	0	0	0	0	0
TRY	1	79	102	12/06/79	10:56	74	2	10	1.5	60	0	0	0	0	0
01+04 IRT	1	13	689	12/06/79	10:55	74	2	5	1.3	60	1	0	0	0	1
TRY	1	79	110	12/07/79	9:38	49	1	10	1.5	80	0	0	0	0	0
01+04 IRT	1	13	700	12/07/79	9:35	49	1	5	1.3	80	8	0	0	0	8
TRY	1	79	112	12/07/79	12:00	54	2	10	1.5	60	0	0	0	0	0
01+04 IRT	1	13	701	12/07/79	12:00	54	2	5	1.3	60	0	0	0	0	0
TRY	1	79	114	12/07/79	12:42	55	3	10	1.5	45	0	0	0	0	0
01+04 IRT	1	13	703	12/07/79	12:40	55	3	5	1.3	45	0	0	0	0	0
TRY	1	79	116	12/07/79	13:17	57	2	10	1.5	35	8	0	0	0	8
01+04 IRT	1	13	698	12/07/79	13:15	57	2	5	1.3	35	5	0	0	0	5

APPENDIX B

White Perch and Atlantic Tomcod
Length Data

Definitions of codes appearing in this Appendix are as follows:

GEAR:	TRY	= 12 FOOT TRY TRAWL
	01+04 IRT	= COD END AND COD END COVER CATCHES COMBINED
USE_CODE:	1	= NO SAMPLING PROBLEMS ENCOUNTERED
TC:	79	= 12 FOOT TRY TRAWL SURVEY
	13	= INTERREGIONAL BOTTOM TRAWL (IRT) SURVEY
SAMPLE:	FIELD COLLECTION SAMPLE NUMBER	
DATE:	MONTH, DAY AND YEAR THE SAMPLE WAS COLLECTED	
TIME:	TIME OF DAY GEAR WAS DEPLOYED (USING 24 HOUR CLOCK)	
RIV_MILE:	RIVER MILE WHERE SAMPLE WAS COLLECTED	
SITE:	SIDE OF RIVER WHERE SAMPLE WAS COLLECTED (1=WEST, 2=CENTER, 3=EAST)	

Table B-1

Length Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

GEAR	USE_CODE	TC	SAMPLE	DATE	RIV_MILE	SITE	LE_20	21_30	31_40	41_50	51_60	61_70	71_80	81_90	91_100	101_110	111_120	121_130	131_140	141_150	151_160	161_170	171_180	181_190	191_200	GE_201
TRY	1	79	1	11/05/79	39	1	0	0	0	0	0	6	6	2	1	0	1	0	4	1	1	0	0	0	0	0
TRY	1	79	2	11/05/79	39	2	0	0	0	0	2	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	6	11/05/79	42	1	0	0	0	0	6	2	5	4	1	1	0	3	1	1	0	0	3	2	0	0
TRY	1	79	8	11/06/79	43	1	0	0	0	0	1	0	3	0	0	0	0	0	1	0	0	0	0	0	1	0
TRY	1	79	9	11/06/79	43	3	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
TRY	1	79	16	11/06/79	54	3	0	0	0	0	3	6	1[illegible]	3	1	0	0	7	2	1	1	2	1	0	0	0
TRY	1	79	27	11/08/79	57	1	0	0	0	0	2	9	14	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	25	11/08/79	59	3	0	0	0	0	0	0	0	1	0	0	2	5	0	2	1	1	1	0	1	0
TRY	1	79	23	11/08/79	61	2	0	0	0	0	1	0	3	3	0	0	0	0	0	3	2	0	0	0	0	0
TRY	1	79	38	11/09/79	29	1	0	0	0	0	6	6	14	3	1	0	2	3	2	5	3	2	6	6	3	3
TRY	1	79	39	11/09/79	29	2	0	0	0	0	1	2	2	3	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	40	11/09/79	29	3	0	0	0	0	1	2	0	1	0	0	0	1	0	0	0	1	0	0	0	0
TRY	1	79	37	11/09/79	31	1	0	0	0	0	2	3	4	4	0	0	1	1	1	0	1	0	0	0	0	0
TRY	1	79	35	11/09/79	31	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	34	11/09/79	33	3	0	0	0	0	1	9	2	1	0	0	0	2	3	2	0	0	0	0	0	0
TRY	1	79	32	11/09/79	35	3	0	0	0	0	1	1	0	0	0	0	1	2	5	3	7	5	12	7	3	1
TRY	1	79	30	11/09/79	37	2	0	0	0	0	1	5	3	2	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	31	11/09/79	37	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	1	2	0
TRY	1	79	41	11/19/79	39	1	0	0	0	0	1	[illegible]	10	4	1	2	5	19	28	22	23	11	6	1	1	0
TRY	1	79	42	11/19/79	39	2	0	0	0	0	12	46	35	9	1	1	1	2	5	7	2	5	1	0	0	0
TRY	1	79	46	11/19/79	42	1	0	0	0	0	4	2	2	0	0	0	0	2	1	2	3	0	2	0	0	0
TRY	1	79	47	11/19/79	43	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
TRY	1	79	48	11/19/79	43	3	0	0	0	0	1	19	20	6	0	1	9	31	16	6	2	1	1	0	0	0
TRY	1	79	55	11/19/79	54	3	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	58	11/20/79	57	1	0	0	0	0	1	1	3	1	0	0	1	11	2	2	2	1	0	0	0	0
TRY	1	79	60	11/20/79	59	3	0	0	0	0	0	0	2	1	0	0	0	2	1	0	0	1	0	0	0	1
TRY	1	79	61	11/20/79	61	2	0	0	0	0	0	2	1	0	0	0	0	3	0	1	0	0	0	0	0	0
TRY	1	79	76	11/21/79	29	1	0	0	0	0	3	8	5	0	0	0	1	1	8	2	4	6	7	9	8	5
TRY	1	79	77	11/21/79	29	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
TRY	1	79	78	11/21/79	29	3	0	0	0	0	1	2	4	1	0	0	0	0	0	2	0	0	1	0	0	0
TRY	1	79	75	11/21/79	31	1	0	0	0	0	5	29	20	6	0	0	0	0	0	0	1	0	1	0	0	0
TRY	1	79	73	11/21/79	31	3	0	0	0	0	0	2	3	1	1	1	0	6	2	2	4	7	6	4	2	0
TRY	1	79	72	11/21/79	33	3	0	0	0	0	1	3	5	1	0	0	1	1	0	2	2	1	0	0	0	0
TRY	1	79	70	11/21/79	35	3	0	0	0	0	0	0	0	0	0	0	0	3	1	1	1	4	3	2	0	0
TRY	1	79	68	11/21/79	37	2	0	0	0	0	1	3	2	0	0	0	0	0	0	0	0	0	1	0	0	0
TRY	1	79	69	11/21/79	37	3	0	0	0	0	0	0	2	0	0	0	2	1	1	4	1	0	0	0	1	0
TRY	1	79	79	12/03/79	39	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	80	12/03/79	39	2	0	0	0	0	4	11	11	7	1	1	1	7	5	2	4	4	1	0	0	0
TRY	1	79	92	12/04/79	29	1	0	0	0	0	1	1	1	2	0	0	0	0	1	0	1	0	2	0	0	0
TRY	1	79	93	12/04/79	29	2	0	0	0	0	2	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	94	12/04/79	29	3	0	0	0	1	1	10	1	1	0	0	0	0	1	0	0	1	2	0	0	0
TRY	1	79	89	12/04/79	31	3	0	0	0	1	1	4	5	4	0	0	3	6	9	3	6	2	1	0	0	0
TRY	1	79	88	12/04/79	33	3	0	0	0	0	2	2	5	3	0	0	1	6	6	3	3	5	1	2	3	0
TRY	1	79	86	12/04/79	35	3	0	0	0	0	0	0	2	0	0	0	0	2	5	1	2	3	9	3	2	2
TRY	1	79	84	12/04/79	37	2	0	0	0	0	2	2	6	1	0	0	0	1	2	0	1	0	0	0	0	0
TRY	1	79	85	12/04/79	37	3	0	0	0	1	0	2	12	0	0	1	4	9	3	6	3	4	6	5	0	2
TRY	1	79	95	12/05/79	42	1	0	0	0	0	0	0	2	0	1	0	0	0	3	0	0	1	0	0	1	0
TRY	1	79	96	12/05/79	43	1	0	0	0	0	0	1	2	0	0	0	0	0	1	1	0	0	0	0	0	0
TRY	1	79	97	12/05/79	43	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
TRY	1	79	109	12/06/79	59	3	0	0	0	0	3	3	2	0	0	0	0	1	1	2	0	0	0	0	0	0

Table B-1 (contd)

GEAR	USE CODE	TC	SAMPLE	DATE	RIV MILE	SITE	LE 20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	GE 201
TRY	1	79	108	12/06/79	61	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	113	12/07/79	54	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	589	11/05/79	39	2	0	0	0	1	6	19	20	9	1	0	2	4	3	1	1	4	1	2	2	1
01+04 IRT	1	13	593	11/05/79	42	1	0	0	0	0	2	7	3	4	0	0	2	3	2	1	0	1	0	0	0	0
01+04 IRT	1	13	594	11/06/79	43	1	0	0	0	0	6	13	11	0	0	0	0	2	2	0	2	0	0	0	0	0
01+04 IRT	1	13	603	11/06/79	54	3	0	0	0	0	1	4	14	5	0	1	3	4	5	1	3	0	2	0	0	0
01+04 IRT	1	13	612	11/08/79	59	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	610	11/08/79	61	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
01+04 IRT	1	13	625	11/09/79	29	1	0	0	0	0	2	1	8	4	0	0	0	0	1	1	0	0	1	1	3	6
01+04 IRT	1	13	626	11/09/79	29	2	0	0	0	0	0	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	627	11/09/79	29	3	0	0	0	0	0	1	4	0	0	0	0	1	1	0	0	0	0	0	0	0
01+04 IRT	1	13	624	11/09/79	31	1	0	0	0	1	4	15	8	1	0	0	0	0	1	0	0	0	0	0	0	0
01+04 IRT	1	13	621	11/09/79	33	3	0	0	0	0	4	11	4	4	0	0	0	0	2	0	0	0	0	0	0	0
01+04 IRT	1	13	619	11/09/79	35	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
01+04 IRT	1	13	617	11/09/79	37	2	0	0	0	0	6	12	7	2	0	0	0	1	0	0	1	0	0	0	0	0
01+04 IRT	1	13	629	11/19/79	39	2	0	0	0	0	6	15	15	2	0	0	2	5	2	0	4	2	0	0	0	0
01+04 IRT	1	13	633	11/19/79	42	1	0	0	0	0	2	4	1	0	0	0	0	0	2	0	7	10	0	1	0	0
01+04 IRT	1	13	634	11/19/79	43	1	0	0	0	1	5	8	17	1	2	0	1	3	2	3	2	1	0	1	0	0
01+04 IRT	1	13	635	11/19/79	43	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	642	11/19/79	54	3	0	0	0	0	6	14	19	7	1	0	1	11	5	6	2	0	0	0	0	0
01+04 IRT	1	13	645	11/20/79	57	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	647	11/20/79	59	3	0	0	0	0	0	1	6	1	2	0	4	7	4	3	2	2	1	0	1	1
01+04 IRT	1	13	648	11/20/79	61	2	0	0	0	0	0	7	11	4	0	0	2	5	6	1	4	1	0	0	0	0
01+04 IRT	1	13	663	11/21/79	29	1	0	0	0	0	0	4	2	2	1	0	0	0	0	0	1	2	2	6	3	5
01+04 IRT	1	13	664	11/21/79	29	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	665	11/21/79	29	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
01+04 IRT	1	13	662	11/21/79	31	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	660	11/21/79	31	3	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	3	2	0
01+04 IRT	1	13	659	11/21/79	33	3	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	1	1	0
01+04 IRT	1	13	655	11/21/79	37	2	0	0	0	0	4	16	14	9	1	0	0	1	3	2	2	2	0	0	0	0
01+04 IRT	1	13	667	12/03/79	39	2	0	0	0	0	9	34	39	21	1	0	3	13	13	12	7	4	2	1	1	0
01+04 IRT	1	13	679	12/04/79	29	1	0	0	0	0	0	2	3	1	0	0	1	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	680	12/04/79	29	2	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	681	12/04/79	29	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01+04 IRT	1	13	678	12/04/79	31	1	0	0	0	0	2	3	0	0	0	0	1	0	1	1	0	0	0	0	0	0
01+04 IRT	1	13	676	12/04/79	31	3	0	0	0	0	1	0	2	0	0	0	0	1	3	0	0	0	0	0	0	0
01+04 IRT	1	13	675	12/04/79	33	3	0	0	0	0	1	1	4	4	2	0	0	7	5	1	4	5	1	1	1	0
01+04 IRT	1	13	671	12/04/79	37	2	0	0	0	0	18	23	33	15	2	0	7	18	13	8	2	1	1	0	0	0
01+04 IRT	1	13	672	12/04/79	37	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	1	0	1	0
01+04 IRT	1	13	682	12/05/79	42	1	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	2	2	0	0	0
01+04 IRT	1	13	683	12/05/79	43	1	0	0	0	0	6	10	11	3	0	0	1	1	0	0	0	2	0	0	0	0
01+04 IRT	1	13	684	12/05/79	43	3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	696	12/06/79	59	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	695	12/06/79	61	2	0	0	0	2	3	9	6	2	0	0	2	4	0	0	1	0	0	1	0	0
01+04 IRT	1	13	702	12/07/79	54	3	0	0	0	0	2	9	3	0	0	0	0	0	1	0	1	0	0	0	1	0
01+04 IRT	1	13	697	12/07/79	57	1	0	0	0	0	2	0	4	3	0	0	1	0	1	1	1	0	0	0	0	0

Table B-2

Length Data for White Perch Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water >10 m), Hudson River Estuary, 1979

GEAR	USE CODE	TC	SAMPLE	DATE	RIV MILE	SITE	LE 20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	GE 201
TRY	1	79	4	11/05/79	41	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	5	11/05/79	42	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	11	11/06/79	44	1	0	0	0	1	10	12	4	1	0	0	0	0	0	0	1	2	0	0	0	0
TRY	1	79	13	11/06/79	43	3	0	0	0	1	2	2	5	0	0	0	0	1	0	0	1	0	0	0	0	0
TRY	1	79	14	11/06/79	49	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	22	11/07/79	63	2	0	0	0	0	2	10	6	9	1	0	0	1	0	1	0	0	0	0	0	0
TRY	1	79	21	11/07/79	65	2	0	0	0	1	2	8	5	2	0	0	0	2	0	0	0	0	0	0	0	0
TRY	1	79	20	11/07/79	66	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
TRY	1	79	19	11/07/79	67	2	0	0	0	0	1	3	3	0	0	0	0	3	1	1	1	0	0	0	0	0
TRY	1	79	18	11/07/79	72	2	0	0	0	0	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0
TRY	1	79	17	11/07/79	74	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	29	11/08/79	55	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	28	11/08/79	57	2	0	0	0	0	0	1	4	0	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	36	11/09/79	31	2	0	0	0	0	10	24	23	7	1	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	43	11/19/79	39	3	0	0	0	0	3	9	7	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	44	11/19/79	41	2	0	0	0	0	1	3	2	2	0	0	0	0	3	1	0	0	0	0	0	0
TRY	1	79	45	11/19/79	42	3	0	0	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0
TRY	1	79	50	11/19/79	44	1	0	0	0	1	7	11	10	0	0	0	0	1	2	2	1	3	0	0	0	0
TRY	1	79	49	11/19/79	44	2	0	0	0	0	1	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0
TRY	1	79	52	11/19/79	48	3	0	0	0	0	5	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0
TRY	1	79	53	11/19/79	49	1	0	0	0	0	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	54	11/19/79	54	2	0	0	0	0	5	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	56	11/20/79	55	3	0	0	0	1	12	19	14	3	0	0	0	1	5	1	1	1	0	0	0	0
TRY	1	79	57	11/20/79	57	2	0	0	0	0	0	8	13	4	3	0	0	7	3	1	2	1	1	0	0	0
TRY	1	79	62	11/20/79	63	2	0	0	0	0	1	1	2	3	1	1	0	0	0	0	0	0	0	0	0	0
TRY	1	79	63	11/20/79	65	2	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	64	11/20/79	66	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	65	11/20/79	67	2	0	0	0	0	7	11	8	2	0	1	0	2	2	0	0	0	0	0	0	0
TRY	1	79	66	11/20/79	72	2	0	0	0	0	0	0	2	1	0	1	0	1	1	1	0	0	0	0	0	0
TRY	1	79	67	11/20/79	74	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	74	11/21/79	31	2	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	71	11/21/79	33	2	0	0	0	1	1	5	7	1	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	83	12/03/79	42	3	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	90	12/04/79	31	2	0	0	0	0	1	7	5	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	87	12/04/79	33	2	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	99	12/05/79	44	1	0	0	0	0	2	1	4	1	1	0	1	4	3	3	4	1	0	0	0	0
TRY	1	79	101	12/05/79	48	3	0	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0
TRY	1	79	107	12/06/79	63	2	0	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
TRY	1	79	106	12/06/79	65	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	105	12/06/79	66	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	104	12/06/79	67	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TRY	1	79	103	12/06/79	72	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	102	12/06/79	74	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TRY	1	79	110	12/07/79	49	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	112	12/07/79	54	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TRY	1	79	114	12/07/79	55	3	0	0	0	0	1	1	2	1	0	0	0	1	0	1	0	0	0	0	0	0

Table B-2 (contd)

GEAR	USE CODE	TC	SAMPLE	DATE	RIV MILE	SITE	LE 20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	GE 201
TRY	1	79	116	12/07/79	57	2	0	0	0	0	0	2	2	2	0	0	2	1	0	0	1	0	0	0	0	0
01+04 IRT	1	13	590	11/05/79	39	3	0	0	0	0	3	5	2	1	0	0	1	0	0	1	1	0	0	0	0	0
01+04 IRT	1	13	591	11/05/79	41	2	0	0	0	1	5	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	592	11/05/79	42	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	597	11/06/79	44	1	0	0	0	1	4	12	12	2	1	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	596	11/06/79	44	2	0	0	0	0	2	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	600	11/06/79	48	3	0	0	0	0	6	17	14	3	0	1	1	3	5	4	3	1	1	0	0	0
01+04 IRT	1	13	602	11/06/79	54	2	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01+04 IRT	1	13	609	11/07/79	63	2	0	0	0	0	0	9	12	4	0	0	0	1	1	2	2	0	0	0	0	0
01+04 IRT	1	13	608	11/07/79	65	2	0	0	0	0	0	9	11	3	0	0	0	0	3	0	0	0	0	0	0	0
01+04 IRT	1	13	607	11/07/79	66	2	0	0	0	0	0	3	1	0	1	0	1	1	2	1	2	0	1	0	0	0
01+04 IRT	1	13	606	11/07/79	67	2	0	0	0	0	4	13	14	6	0	0	3	5	1	1	3	0	0	0	0	0
01+04 IRT	1	13	605	11/07/79	72	2	0	0	0	0	0	5	3	0	0	0	0	2	0	0	0	0	0	0	0	0
01+04 IRT	1	13	604	11/07/79	74	2	0	0	0	0	0	0	2	1	0	0	0	1	2	1	0	0	0	0	0	0
01+04 IRT	1	13	616	11/08/79	55	3	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	615	11/08/79	57	2	0	0	0	0	0	10	13	4	2	0	2	2	2	1	2	0	0	0	0	0
01+04 IRT	1	13	623	11/09/79	31	2	0	0	0	1	3	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	620	11/09/79	33	2	0	0	0	0	0	11	10	2	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	630	11/19/79	39	3	0	0	0	1	12	37	32	12	0	0	1	0	1	1	1	1	0	1	1	0
01+04 IRT	1	13	631	11/19/79	41	2	0	0	0	4	40	92	52	13	1	0	1	5	1	0	0	0	0	0	0	0
01+04 IRT	1	13	632	11/19/79	42	3	0	0	0	0	0	6	3	2	0	0	0	0	0	1	0	1	0	0	0	0
01+04 IRT	1	13	637	11/19/79	44	1	0	0	0	0	5	23	18	11	0	0	2	4	7	2	2	0	0	0	1	0
01+04 IRT	1	13	636	11/19/79	44	2	0	0	0	0	3	5	3	2	0	0	0	0	0	0	1	0	0	0	0	0
01+04 IRT	1	13	639	11/19/79	48	3	0	0	0	0	4	12	15	3	0	0	0	4	3	0	0	1	3	0	0	0
01+04 IRT	1	13	640	11/19/79	49	1	0	0	0	1	3	6	9	0	0	0	1	1	2	2	0	0	0	0	0	0
01+04 IRT	1	13	641	11/19/79	54	2	0	0	0	0	5	15	11	3	1	0	1	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	643	11/20/79	55	3	0	0	0	1	7	31	23	8	0	0	1	5	4	1	4	1	1	0	0	0
01+04 IRT	1	13	644	11/20/79	57	2	0	0	0	0	1	9	14	1	0	0	1	2	2	0	1	0	0	0	0	0
01+04 IRT	1	13	649	11/20/79	63	2	0	0	0	0	2	9	7	1	0	0	0	0	1	3	2	0	1	0	0	0
01+04 IRT	1	13	650	11/20/79	65	2	0	0	0	0	6	6	5	2	0	0	0	2	1	0	0	1	0	0	0	0
01+04 IRT	1	13	651	11/20/79	66	2	0	0	0	0	0	9	10	3	0	0	0	3	0	3	2	0	0	0	0	0
01+04 IRT	1	13	652	11/20/79	67	2	0	0	0	1	13	14	10	6	1	0	2	2	1	2	3	0	0	0	1	0
01+04 IRT	1	13	653	11/20/79	72	2	0	0	0	0	0	1	1	1	0	0	0	2	3	0	1	0	0	0	0	0
01+04 IRT	1	13	654	11/20/79	74	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	661	11/21/79	31	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0
01+04 IRT	1	13	658	11/21/79	33	2	0	0	0	0	3	9	13	3	1	0	0	0	2	3	1	3	0	1	0	0
01+04 IRT	1	13	668	12/03/79	39	3	0	0	0	1	4	9	4	2	0	0	0	0	0	1	1	0	0	0	0	0
01+04 IRT	1	13	669	12/03/79	41	2	0	0	0	0	5	6	5	0	1	0	0	0	0	0	1	0	0	0	0	0
01+04 IRT	1	13	670	12/03/79	42	3	0	0	0	0	0	3	2	1	0	0	1	3	2	0	1	1	1	0	0	0
01+04 IRT	1	13	677	12/04/79	31	2	0	0	0	0	1	2	0	1	0	0	0	1	0	0	1	0	0	0	0	0
01+04 IRT	1	13	674	12/04/79	33	2	1	0	0	0	2	1	7	1	0	0	1	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	686	12/05/79	44	1	0	0	0	0	1	3	3	0	1	0	0	1	2	2	0	0	0	0	0	0
01+04 IRT	1	13	685	12/05/79	44	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04 IRT	1	13	688	12/05/79	48	3	0	0	0	0	1	11	6	6	1	1	0	4	3	2	2	1	1	0	0	0
01+04 IRT	1	13	694	12/06/79	63	2	0	0	0	0	0	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	693	12/06/79	65	2	0	0	0	1	0	0	2	2	0	0	0	0	1	0	1	0	0	0	0	0
01+04 IRT	1	13	692	12/06/79	66	2	0	0	0	0	3	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	691	12/06/79	67	2	0	0	0	0	1	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	690	12/06/79	72	2	0	0	0	1	1	1	2	0	0	0	0	1	1	1	0	0	0	0	0	0
01+04 IRT	1	13	689	12/06/79	74	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	700	12/07/79	49	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
01+04 IRT	1	13	701	12/07/79	54	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
01+04 IRT	1	13	703	12/07/79	55	3	0	0	0	0	2	4	6	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04 IRT	1	13	698	12/07/79	57	2	0	0	0	0	6	22	26	6	2	0	1	1	4	0	0	0	0	0	0	0

Table B-3

Length Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water <10 m), Hudson River Estuary, 1979

GEAR	USE CODE	TC	SAMPLE	DATE	RIV MILE	SITE	LE 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 150	151 160	161 170	171 180	181 190	191 200	GE 201
TRY	1	79	2	11/05/79	39	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TRY	1	79	6	11/05/79	42	1	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0
TRY	1	79	8	11/06/79	43	1	0	0	0	0	0	0	0	0	0	1	2	3	3	1	0	0	0	0	0	0
TRY	1	79	16	11/06/79	54	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	23	11/08/79	61	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	38	11/09/79	29	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	1	0	0
TRY	1	79	39	11/09/79	29	2	0	0	0	0	0	0	0	0	0	1	1	0	3	3	2	1	0	0	0	0
TRY	1	79	40	11/09/79	29	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
TRY	1	79	37	11/09/79	31	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0
TRY	1	79	35	11/09/79	31	3	0	0	0	0	0	0	0	0	0	0	0	3	1	1	3	0	0	0	0	0
TRY	1	79	34	11/09/79	33	3	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0
TRY	1	79	30	11/09/79	37	2	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	0
TRY	1	79	46	11/19/79	42	1	0	0	0	0	0	0	0	0	0	0	1	0	3	1	1	0	0	0	0	0
TRY	1	79	47	11/19/79	43	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
TRY	1	79	55	11/19/79	54	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	61	11/20/79	61	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
TRY	1	79	76	11/21/79	29	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	0	0	0
TRY	1	79	77	11/21/79	29	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TRY	1	79	78	11/21/79	29	3	0	0	0	0	0	0	0	0	0	0	2	0	3	7	3	3	1	0	0	0
TRY	1	79	75	11/21/79	31	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	73	11/21/79	31	3	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0
TRY	1	79	72	11/21/79	33	3	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	0	1	0	0	0
TRY	1	79	68	11/21/79	37	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	80	12/03/79	39	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
TRY	1	79	93	12/04/79	29	2	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	0	0	0	0	0
TRY	1	79	94	12/04/79	29	3	0	0	0	0	0	0	0	0	0	0	0	1	0	4	2	2	0	0	0	0
TRY	1	79	89	12/04/79	31	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
TRY	1	79	83	12/04/79	33	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2	0	0
TRY	1	79	86	12/04/79	35	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
TRY	1	79	96	12/05/79	43	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	1	0	0	0
01+04 IRT	1	13	589	11/05/79	39	2	0	0	0	0	0	0	0	0	1	0	2	2	3	2	0	0	1	0	0	0
01+04 IRT	1	13	593	11/05/79	42	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	594	11/06/79	43	1	0	0	0	0	0	0	0	0	0	0	2	1	3	1	2	0	0	0	0	0
01+04 IRT	1	13	603	11/06/79	54	3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	610	11/08/79	61	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01+04 IRT	1	13	625	11/09/79	29	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
01+04 IRT	1	13	626	11/09/79	29	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2	0	0	0	0	0
01+04 IRT	1	13	627	11/09/79	29	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
01+04 IRT	1	13	624	11/09/79	31	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
01+04 IRT	1	13	617	11/09/79	37	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
01+04 IRT	1	13	629	11/19/79	39	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
01+04 IRT	1	13	634	11/19/79	43	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0
01+04 IRT	1	13	642	11/19/79	54	3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0
01+04 IRT	1	13	647	11/20/79	59	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04 IRT	1	13	648	11/20/79	61	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	653	11/21/79	29	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0
01+04 IRT	1	13	664	11/21/79	29	2	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0	0	0	0	0	0
01+04 IRT	1	13	665	11/21/79	29	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04 IRT	1	13	667	12/03/79	39	2	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	2	3	3	3	2
01+04 IRT	1	13	680	12/04/79	29	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04 IRT	1	13	675	12/04/79	33	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	0	0	1
01+04 IRT	1	13	671	12/04/79	37	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
01+04 IRT	1	13	683	12/05/79	43	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
01+04 IRT	1	13	702	12/07/79	54	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0

Table B-4

Length Data for Atlantic Tomcod Collected in Small (3.7-m head rope) and Large (7.8-m head rope) Trawls (in water ≥10 m), Hudson River Estuary, 1979

GEAR	USE CODE	TC	SAMPLE	DATE	RIV MILE	SITE	LE 20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	GE 201
TRY	1	79	5	11/05/79	42	3	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0
TRY	1	79	11	11/06/79	44	1	0	0	0	0	0	0	0	0	0	2	1	2	3	2	0	0	0	0	0	0
TRY	1	79	10	11/06/79	44	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TRY	1	79	14	11/06/79	49	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TRY	1	79	22	11/07/79	63	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
TRY	1	79	21	11/07/79	65	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TRY	1	79	20	11/07/79	66	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
TRY	1	79	19	11/07/79	67	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRY	1	79	29	11/08/79	55	3	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	0
TRY	1	79	28	11/08/79	57	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0	0
TRY	1	79	36	11/09/79	31	2	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0
TRY	1	79	33	11/09/79	33	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TRY	1	79	43	11/19/79	39	3	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0
TRY	1	79	45	11/19/79	42	3	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	0	0
TRY	1	79	49	11/19/79	44	2	0	0	0	0	0	0	0	0	0	0	1	1	1	2	0	0	0	0	0	0
TRY	1	79	54	11/19/79	54	2	0	0	0	0	0	0	0	0	0	0	3	2	8	0	0	0	0	0	0	0
TRY	1	79	56	11/20/79	55	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
TRY	1	79	57	11/20/79	57	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
TRY	1	79	65	11/20/79	67	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
TRY	1	79	67	11/20/79	74	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
TRY	1	79	74	11/21/79	31	2	0	0	0	0	0	0	0	0	0	0	1	6	3	2	1	3	1	0	0	1
TRY	1	79	71	11/21/79	33	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0
TRY	1	79	82	12/03/79	41	2	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2	2	0	0	0	0
TRY	1	79	83	12/03/79	42	3	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0
TRY	1	79	90	12/04/79	31	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0
TRY	1	-79	87	12/04/79	33	2	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	1	0	0	0	0
TRY	1	79	99	12/05/79	44	1	0	0	0	0	0	0	0	0	0	0	0	2	3	1	0	0	0	0	1	0
TRY	1	79	107	12/06/79	63	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
TRY	1	79	105	12/06/79	66	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TRY	1	79	104	12/06/79	67	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
TRY	1	79	103	12/06/79	72	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0
TRY	1	79	116	12/07/79	57	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	0	0	1	0	0
01+04 IRT	1	13	590	11/05/79	39	3	0	0	0	0	0	0	0	0	0	0	2	2	1	2	0	0	0	0	0	0
01+04 IRT	1	13	591	11/05/79	41	2	0	0	0	0	0	0	0	0	0	0	2	3	5	3	0	0	0	0	0	0
01+04 IRT	1	13	592	11/05/79	42	3	0	0	0	0	0	0	0	0	0	0	2	3	2	0	0	0	0	0	0	0
01+04 IRT	1	13	597	11/06/79	44	1	0	0	0	0	0	0	0	0	0	1	3	8	8	2	0	2	0	0	0	0
01+04 IRT	1	13	596	11/06/79	44	2	0	0	0	0	0	0	0	0	0	0	2	5	4	4	0	0	1	0	0	0
01+04 IRT	1	13	600	11/06/79	48	3	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0
01+04 IRT	1	13	601	11/06/79	49	1	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0
01+04 IRT	1	13	602	11/06/79	54	2	0	0	0	0	0	0	0	0	0	0	1	2	2	1	1	0	0	0	0	0
01+04 IRT	1	13	608	11/07/79	65	2	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0
01+04 IRT	1	13	607	11/07/79	66	2	0	0	0	0	0	0	0	0	0	3	5	4	3	3	1	0	0	0	0	0
01+04 IRT	1	13	606	11/07/79	67	2	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0
01+04 IRT	1	13	605	11/07/79	72	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
01+04 IRT	1	13	604	11/07/79	74	2	0	0	0	0	0	0	0	0	0	0	2	0	1	1	1	0	0	0	0	0
01+04 IRT	1	13	616	11/08/79	55	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Table B-4 (contd)

GEAR		USE CODE	TC	SAMPLE	DATE	RIV MILE	SITE	LE 20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	GE 201
01+04	IRT	1	13	615	11/08/79	57	2	0	0	0	0	0	0	0	0	0	0	3	4	3	1	0	0	0	0	0	0
01+04	IRT	1	13	620	11/09/79	33	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	1	2	3
01+04	IRT	1	13	630	11/19/79	39	3	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	1	1	0
01+04	IRT	1	13	631	11/19/79	41	2	0	0	0	0	0	0	0	0	1	0	2	9	8	4	3	0	0	0	0	0
01+04	IRT	1	13	632	11/19/79	42	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04	IRT	1	13	637	11/19/79	44	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04	IRT	1	13	636	11/19/79	44	2	0	0	0	0	0	0	0	0	0	0	1	3	1	0	1	0	0	0	0	0
01+04	IRT	1	13	639	11/19/79	48	3	0	0	0	0	0	0	0	0	0	0	2	0	1	2	0	1	0	0	0	0
01+04	IRT	1	13	640	11/19/79	49	1	0	0	0	0	0	0	0	0	0	0	0	4	3	0	1	0	0	0	0	0
01+04	IRT	1	13	641	11/19/79	54	2	0	0	0	0	0	0	0	0	0	0	0	2	4	7	2	1	0	0	0	0
01+04	IRT	1	13	643	11/20/79	55	3	0	0	0	0	0	0	0	0	0	0	0	3	3	3	0	1	0	0	0	0
01+04	IRT	1	13	644	11/20/79	57	2	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04	IRT	1	13	650	11/20/79	65	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01+04	IRT	1	13	651	11/20/79	66	2	0	0	0	0	0	0	0	0	0	0	3	15	7	4	1	1	0	0	0	0
01+04	IRT	1	13	652	11/20/79	67	2	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	2	0	0	0	0
01+04	IRT	1	13	653	11/20/79	72	2	0	0	0	0	0	0	0	0	0	0	2	8	9	2	0	0	0	0	0	0
01+04	IRT	1	13	654	11/20/79	74	2	0	0	0	0	0	0	0	0	0	0	1	5	4	7	4	3	0	0	0	0
01+04	IRT	1	13	661	11/21/79	31	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0
01+04	IRT	1	13	658	11/21/79	33	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
01+04	IRT	1	13	668	12/03/79	39	3	0	0	0	0	0	0	0	0	0	0	1	2	4	7	7	4	0	0	0	0
01+04	IRT	1	13	669	12/03/79	41	2	0	0	0	0	0	0	0	0	0	0	1	3	4	8	5	2	1	0	0	0
01+04	IRT	1	13	670	12/03/79	42	3	0	0	0	0	0	0	0	0	0	0	0	2	2	8	1	1	0	0	0	0
01+04	IRT	1	13	677	12/04/79	31	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
01+04	IRT	1	13	674	12/04/79	33	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04	IRT	1	13	685	12/05/79	44	2	0	0	0	0	0	0	0	0	0	0	0	3	10	10	7	1	2	0	0	0
01+04	IRT	1	13	693	12/05/79	65	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01+04	IRT	1	13	692	12/06/79	66	2	0	0	0	0	0	0	0	0	0	0	0	6	7	4	5	4	1	0	0	0
01+04	IRT	1	-13	691	12/06/79	67	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04	IRT	1	13	690	12/06/79	72	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01+04	IRT	1	13	689	12/06/79	74	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
01+04	IRT	1	13	700	12/07/79	49	1	0	0	0	0	0	0	0	0	0	0	0	0	1	4	3	0	0	0	0	0
01+04	IRT	1	13	698	12/07/79	57	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0

APPENDIX C

STATISTICAL ANALYSES FOR WHITE PERCH LENGTH DATA

Table C-1

Results of t-Test on Length Data of Yearling and Older White Perch from Shallow Water Sampling Sites, Hudson River Estuary, November-December 1979

Gear	Sample Size	Mean	Standard Error
Small Trawl	712	150.20	0.880
Large Trawl	413	147.26	1.226

$t_{0.05,1123} = 1,966$; $p \doteq 0.0495$

Table C-2

Results of Analysis of Variance on Length Data of Young-of-the-Year White Perch from Deep and Shallow Water Sampling Sites, Hudson River Estuary, November-December 1979

Source	df	MS	F Value	p>F
Stratum*	1	2102.14	24.62	0.0001
Gear	1	124.31	1.46	0.2276
Stratum X Gear	1	0.00	0.00	1.0000
Error	3013	85.37		

*Differences between stratum means: shallow 71.35
deep 69.68

Errata to the Report Entitled:

Efficiency of the 1.0 m^2 Epibenthic Sled for Collecting Young-of-the-Year Striped Bass, White Perch, and Atlantic Tomcod in the Hudson River Estuary, 1978

1. Page 13, Paragraph 1, line 5, - Table 3 should read Table 2.

2. The following two references were omitted from the Literature Cited section.

Hatch R.W. 1978. Minimum estimates of alewife biomass in Lake Michigan, 1973-1977. Oral presentation (with program abstract) at 40th Midwest Fish and Wildlife Conference, Columbus, Ohio, December 10-13, 1978.

Kjelson, M.A. and G.N. Johnson. 1978. Catch efficiencies of a 6.1 meter otter trawl for estuarine fish populations. Trans. Amer. Fish. Soc. 107(2):246-254.

SUMMARY

During September and October 1978, Texas Instruments (TI) conducted a study to assess the efficiency of the 1.0 m^2 epibenthic sled used in the Fall Shoals Survey for collecting young-of-the-year striped bass, white perch, and Atlantic tomcod in the Hudson River estuary. Catch efficiency of the gear equipped with a 3000μ mesh net and towed at 1.5 m sec^{-1} at night was as follows:

- approximately 50% for young-of-the-year striped bass
- approximately 30% for young-of-the-year white perch
- low densities and consequently few non-zero catches of young-of-the-year tomcod precluded any estimate of catch efficiency.

INTRODUCTION

Escapement of organisms from towed nets (via avoidance or extrusion through the meshes) results in gear inefficiency and subsequent minimum estimates of species densities. Minimum estimates become a serious problem in the analysis of fisheries data when the catches are used to calculate estimates of absolute population size. Thus far, actual studies to estimate gear efficiency are still scarce (Kjelson and Colby 1977, TI 1978c), but fisheries scientists have recognized the obvious negative bias in the catches and have begun considering calculated densities as "minimal" estimates (e.g. Hatch 1978). Gear avoidance generally decreases as tow speed or net diameter increases; it is higher for larger organisms. In contrast, extrusion through meshes is higher at high speeds and for small organisms. Both types of sampling inefficiency are common in plankton sampling (Clutter and Anraku 1968, Vannucci 1968) and fisheries sampling (Kjelson and Colby 1977).

Empirical estimates of catch efficiency are difficult to obtain because of confounding by the extreme variability among catches related to the patchy distribution of the fish (Clutter and Anraku 1968). Additionally, variability of towed net catch efficiency may be size and/or species related as evident from several studies. Kjelson and Johnson (1978) reported the catch efficiency of a 6.1 m otter trawl to be 48% for juvenile pinfish and 32% for juvenile spot; the standard error ranged between 9 and 58% of the means. Kuipers (1975) reported efficiency of a 2 m beam trawl for plaice to decrease from 100% (plaice <7 cm length) to 15 to 30% (plaice >15 cm length). Loesch et al. (1976) reported that the catch efficiency of 4.9 m otter trawl was 25% for Atlantic croaker, 6% for spot, and 30 to 50% for brown shrimp. Loesch et al. hypothesized that these species were "probably more susceptible to capture than are most others because they are slow-moving demersal forms." In summary, estimates of catch efficiency are gear and species specific and are quite variable.

This report presents the results and conclusions of a study designed to estimate the catch (gear) efficiency of a 1.0 m^2 epibenthic sled towed at 1.5 m sec^{-1} at night for young-of-the-year striped bass, white perch, and Atlantic tomcod in the Hudson River estuary with respect to only the avoidance component of escapement. The size of the mesh, 3000 , and the size of the fish, generally 50 to 100 mm in total length, justify the assumption that extrusion through the mesh is negligible, thereby allowing sample densities to be related directly to avoidance without confounding with extrusion. This study had three objectives:

- to fit empirical data on catches of the three selected species to a model of catch efficiency,
- to estimate catch efficiency of the 1.0 m^2 epibenthic sled deployed under Standard Operating Procedures for the three selected species, and
- to recommend catch efficiency adjustment factors to be applied to standing crop estimates for the three selected species based on catches in the epibenthic sled.

The model developed for this study has intuitive appeal because of its simplicity and because it requires the estimation of only one parameter. It is well documented that catch by a gear increases as tow speed increases (Clutter and Anraku 1968). Our model assumes that catch increases with the tow speed of the sampling gear and can be described by a model of exponential approach to an asymptote. The model is described in the Methods Section.

Distributional patchiness of fish specified the sampling design. Differences in catch across several tow speeds provided an empirical estimate of catch efficiency where fish behavior (avoidance) is a random variable.

METHODS

Field and Laboratory

Samples of young-of-the-year fishes, collected at night from the Croton-Haverstraw and Tappan Zee regions of the Hudson River, were taken in paired tows of the 1.0 m^2 epibenthic sled equipped with a 3000μ mesh net (from two boats towing side by side approximately 10 to 15 m apart). Gear deployment and sample handling followed Standard Operating Procedures for the Fall Shoals Survey (TI 1978a) except that tow speeds of the boats were different. One boat always towed at 1.5 m sec^{-1} (standard) and the other at 0.7, 1.1, 1.9, or 2.3 m sec^{-1} (experimental). Tow durations were different over speeds so that each net was towed approximately 450 m.

Samples (paired tows) were taken from 11 through 15 September and 9 through 13 October (Table 1). Experimental tow speed and position relative to the shore were randomly assigned to one of the boats (the other boat was then assigned to the standard speed and other position), except for the highest and lowest speeds which were fixed by boat engine capabilities. Laboratory processing of young-of-the-year fishes followed TI's Standard Operating Procedures for the Fall Shoals Survey (TI 1978a).

Prior to taking samples to determine collection efficiency, it was necessary to determine whether filtration efficiency of the epibenthic sled changed over the range of experimental speeds. An appreciable change (>10%) would require an adjustment of tow speed in the analyses, as water speed through the gear mouth is the effective tow speed. Therefore, filtration efficiency was determined as the ratio of water velocity through the gear mouth to the velocity of the tow boat through water (Tranter 1968). Water velocity through the gear mouth was determined from an electronic flowmeter mounted in the gear mouth; boat speed was determined with an electronic flowmeter suspended in the water from the side of the boat. Observations were taken simultaneously over the range of speed from 1.2 to 2.4 m sec^{-1} and used to develop the following linear regression equations describing filtration:

Table 1

Number of Sample Pairs Collected at Experimental Tow Speeds and Number of Pairs Used in Analyses*

	Experimental Tow Speed	Number of Sample Pairs Taken	Number of Sample Pairs Used in Analyses		
			SB	WP	ATC
September	0.7 m sec^{-1}	23	15	7	7
	1.1 m sec^{-1}	20	14	9	8
	1.9 m sec^{-1}	20	17	7	8
	2.3 m sec^{-1}	23	14	5	7
	Total	86	60	28	30
October	0.7 m sec^{-1}	19	12	15	2
	1.1 m sec^{-1}	22	9	16	0
	1.9 m sec^{-1}	22	12	14	1
	2.3 m sec^{-1}	22	13	13	0
	Total	85	46	58	3

*A sample pair could be used in the analysis only if at least one of the pair was a non-zero catch
SB = striped bass
WP = white perch
ATC = Atlantic tomcod

$$\text{Est. Speed Out} = 0.0846 + 0.0019705\ X$$

and

$$\text{Est. Speed In} = 0.1294 + 0.0017552\ X$$

where

X = boat engine in revolutions min^{-1}

Est. Speed Out (or In) = estimated speed (relative to the water) in m sec^{-1} outside or inside the mouth of the epibenthic sled

Slopes on these regressions lines were significantly different ($t = 2.00$, $df = 36$), but estimated reduction in filtration efficiency was slight over the speed range 0.7 to 2.3 m sec^{-1}; estimated filtration efficiency was approximately 96.7% at 0.7 m sec^{-1}, approximately 91.4%, at 2.3 m sec^{-1}, and approximately 92.6% at 1.5 m sec^{-1} (the standard tow speed). These slight changes in filtration efficiency do not affect the analysis of catch efficiency.

Analyses

Catches of young-of-the-year striped bass, white perch, and Atlantic tomcod in paired tows were converted to densities (number • 1000 m^{-3}) to be directly comparable. Catch data of towed gear are not normally distributed (often they are a Poisson distribution) and there are at least two components of variation affecting their distribution, the number of schools within a region and the number of fish in a school. Pairing tows can reduce both components of variation by increasing the probabilty that a single school is exposed to both gear and ensuring that both gear are towed through an area containing a fixed number of schools. The variable to be analyzed, then, is a measure of the difference between the catches of the tows within a pair. A ratio provides the best measure of catch difference because it is free of variation due to regional density differences; e.g.

the ratio of 1 to 3 is comparable to the ratio of 10 to 30 although their absolute differences are not comparable. Ratios (r_{ijm}) of catches from paired tows were calculated as:

$$r_{ijm} = \frac{(d_{ijm} + 1)}{(d_{ism} + 1)} \qquad (1)$$

Natural logarithmic mean monthly ratios ($\bar{r}_{jm}$) (geometric means) were calculated as:

$$\bar{r}_{jm} = \sum_{i=1}^{n} \ell n \left[\frac{(d_{ijm} + 1)}{(d_{ism} + 1)}\right] \Big/ n \qquad (2)$$

where

d_{ijm} = density estimate of experimental speed in tow pair i in month m

d_{ism} = density estimate of the standard speed in tow in month m

n = number of paired tows at experimetal speed j for the month m

The value, one, was added to each density to circumvent the problem of division by zero (Southwood 1966). One was the appropriate value to add as it is the smallest unit of animal that can exist, and its addition to both the numerator and the denominator affects the variance of the ratio less than a smaller number. This allowed use of all pairs in which at least one sample had a non-zero catch. Pairs in which both catches were zero were excluded from efficiency analyses as these provided no estimate of how gear efficiency changed with speed. Had the intent of the study been to estimate densities, then inclusion of zero estimates would have been required. But in catch efficiency analysis zero versus zero does not mean no change; it means no information can be derived concerning change.

The accuracy and precision of the above ratio calculations will be affected by the population density with better estimates occurring at higher population densities (Sokal and Rohlf 1969). Therefore, the population densities from September and October will allow qualitative assessment of which month's ratios yield more accurate efficiency estimates. Natural logarithmic mean monthly densities ($\bar{a}_m$) (geometric means) from the standard speed (1.5 m sec^{-1}) were calculated (zeros included) as:

$$\bar{a}_m = \sum_{i=1}^{n} \ell n\ (d_{ism} + 1)/n \qquad (3)$$

Catch efficiency of the epibenthic sled was estimated with non-linear regression by fitting catch ratios (r_{ijm}) to the asymptotic model:

$$\hat{D}_j = D_o - D_o e^{kj} \qquad (4)$$

where

$\hat{D}_j$ = density estimated at speed j

D_o = true population density (unknown)

e = natural logarithm base

k = rate constant

j = tow speed

This is a model of exponential approach to an asymptote (Figure 1) in which D_o is the true density of the population or the density estimate when the gear is 100% efficient. The quantity, $D_o e^{kj}$, is the density of fish not caught (gear inefficiency) at speed j, and the quantity decreases exponentially (the stippled area in Figure 1) as speed increases; this is an assumption inherent to the model. In substituting the catch ratio (r_{ijm}) for $\hat{D}_j$, D_o becomes R_o (or D_o/D_s), the ratio of the true population density to the estimate of the population density obtained from the epibenthic sled towed at 1.5 m sec^{-1}. Equation (4) can be rearranged as:

$$\hat{D}_j = D_o\ (1 - e^{kj})$$

and

$$\hat{D}_j/D_o = 1 - e^{kj}$$

where D_j/D_o is the proportion of the true population density caught in the epibenthic sled towed at speed j. Non-linear regression was used to estimate k, the rate constant by which gear efficiency increases with speed (j) in Equation 4. The convergence criterion and algorithm of the non-linear regression program are described in Barr et al. (1976).

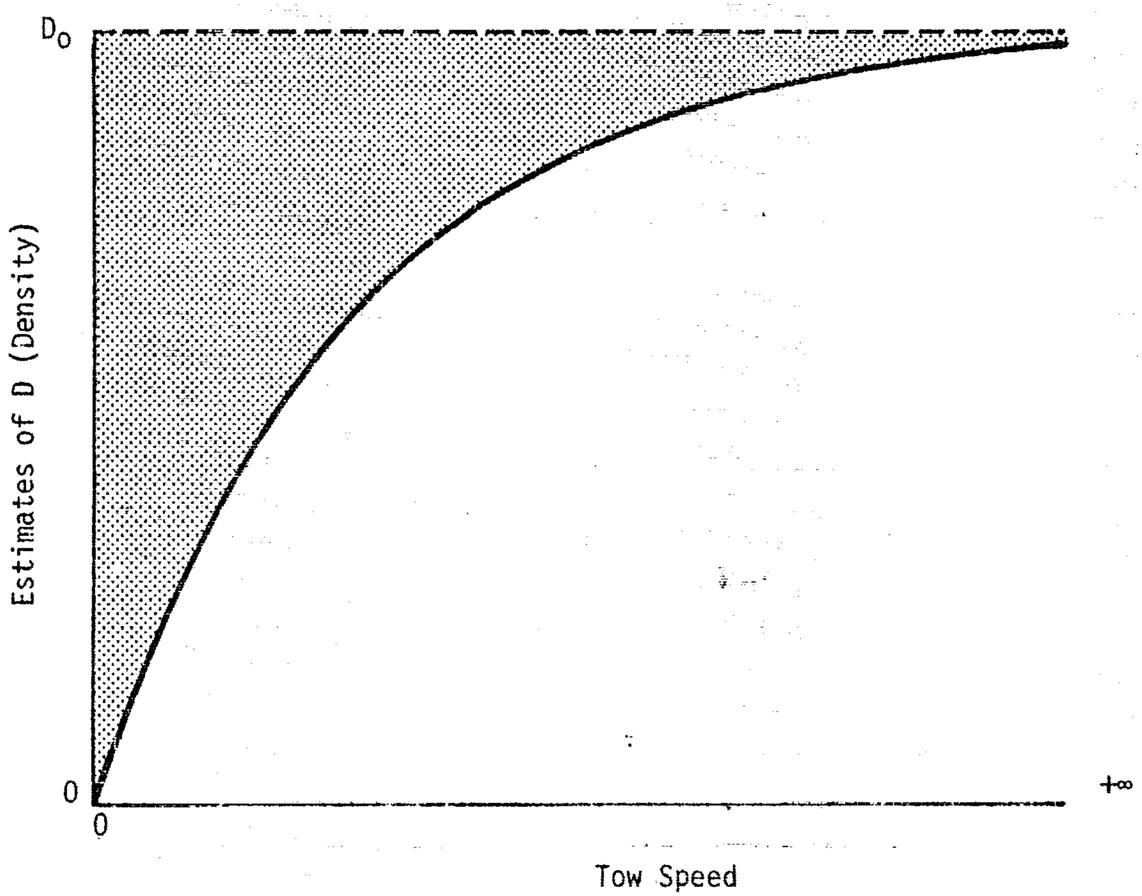

Figure 1. Graph of Asymptotic Model of Catch Efficiency ($D = D_o - D_o e^{kj}$ for k = 0.5) for 1.0 m^2 Epibenthic Sled. Density Estimates Approach True Population Density (D_o) as Tow Speed Increases.

RESULTS AND DISCUSSION

Only paired tows in which at least one non-zero catch occurred were used in analyses to estimate gear efficiency. Experimental to standard ratios ($\bar{r}_{jm}$'s) for the experimental tow speed 2.3 m sec^{-1} in September were the lowest observed for all three species (Table 2) and were significantly ($\alpha = 0.05$) lower than zero, indicating a significant deviation from the theory of gear avoidance. Therefore, catch data from the highest speed (2.3 m sec^{-1}) taken in September were discarded from analyses of gear efficiency of catch.

For striped bass, non-linear regression analysis of experimental to standard ratios (r_{ijm}), resulted in estimates of catch efficiency in September of 7.8% (k = -0.054) and 61.4% in October (k = -0.635). Density estimates were significantly higher in September, (t = 5.58) than in October (Table 3) as is past years (TI 1977, 1978a, 1978b). September data, therefore, may provide more accurate catch ratios than October data. October estimates comprised catch ratios from four tow speeds, while only tow speeds of 0.7, 1.1 and 1.9 m sec^{-1} were available for September. Therefore, October ratios may estimate the asymptote more accurately. Experimental to standard ratios were pooled across the two months; the resulting estimate of catch efficiency from non-linear regression was 45.8% (k = -0.408 with and asymptotic standard error of 0.78).

For white perch, ratios of experimental to standard tow speed catch densities from September did not follow the theory underlying our model of gear avoidance; i.e. catch at speed 1.9 m sec^{-1} was less than at the standard speed, perhaps due to low densities (Table 3) and/or small sample sizes (Table 1) in September; therefore, no estimate of catch efficiency could be made from the study results. Young-of-the-year white perch densities are usually lower in the Croton-Haverstraw and Tappan Zee regions during September than in October (TI 1977, 1978a, 1978b). Ratios of experimental to standard tow speed catches from October increased linearly and the criterion for convergence in non-linear regression was not met;

Table 2

Natural Logarithmic Means ($\bar{r}_{jm}$) and Variances (S^2) of Experimental to Standard Tow Speed Catch Ratios in 1.0m[2] Epibenthic Sled (Eq. 2) for Young-of-the-Year Striped Bass, White Perch, and Atlantic Tomcod

	Experimental Tow Speed	Striped Bass (n)	Striped Bass $\bar{r}_{jm}$	Striped Bass (S^2)	White Perch (n)	White Perch $\bar{r}_{jm}$	White Perch (S^2)	Atlantic Tomcod (n)	Atlantic Tomcod $\bar{r}_{jm}$	Atlantic Tomcod (S^2)
September	0.7m sec^{-1}	(15)	-1.121	(2.709)	(7)	+0.953	(0.495)	(7)	-0.241	(1.336)
	1.1m sec^{-1}	(14)	-0.276	(1.352)	(9)	+0.267	(1.956)	(8)	+0.380	(2.594)
	1.9m sec^{-1}	(17)	-0.276	(2.834)	(7)	-0.343	(1.945)	(8)	-0.370	(3.704)
	2.3m sec^{-1}	(14)	-1.764	(1.816)	(5)	-1.146	(0.614)	(7)	-1.187	(0.770)
October	0.7m sec^{-1}	(12)	-0.529	(1.110)	(15)	-0.803	(0.999)			
	1.1m sec^{-1}	(9)	+0.150	(1.787)	(16)	+0.299	(0.618)			
	1.9m sec^{-1}	(12)	-0.405	(1.685)	(14)	+1.046	(1.120)			
	2.3m sec^{-1}	(13)	+0.580	(1.739)	(13)	+1.173	(1.346)			

(n) = sample size

Table 3

Monthly Mean Densities (Arithmetic) and 95% Confidence Intervals of Young-of-the-Year Striped Bass, White Perch, and Atlantic Tomcod from Standard Speed Tows with 1.0m^2 Epibenthic Sled

	September		October	
	Mean	(n)	Mean	(n)
Striped Bass	3.87	(86)	0.80	(85)
95% CI	2.60 - 5.59		0.49 - 1.17	
White Perch	0.30	(86)	1.80	(85)
95% CI	0.15 - 0.46		1.21 - 2.55	
Atlantic Tomcod	0.44	(86)	0.04	(85)
95% CI	0.25 - 0.66		0.00 - 0.09	

(n) = sample size

hence the asymptote could not be accurately estimated. Since the asymptote cannot be less than the density estimated by the 2.3 m sec^{-1} speed, the catch efficiency of the epibenthic sled cannot be greater than the reciprocal of the ratio of experimental to standard catch for the tow speed 2.3 m sec^{-1}. Converting the geometric mean from Table 3 to the linear scale and taking its reciprocal results in a maximum estimate of catch efficiency of 31% for young-of-the-year white perch.

For young-of-the-year Atlantic tomcod, ratios of experimental to standard tow speed catch densities from September did not follow the theory underlying our model of gear avoidance. Catch at tow speed of 1.9 m sec^{-1} was less than at the standard speed, perhaps due to low densities (Table 3) and/or small sample sizes (Table 1). Densities (Table 3) and sample sizes (Table 1) were even lower in October. Therefore no estimate of catch efficiency for Atlantic tomcod could be made from the study results.

CONCLUSIONS AND RECOMMENDATIONS

For striped bass, the catch efficiency of the 1.0 m^2 epibenthic sled was best estimated from non-linear regression of pooled catch ratios from September and October; catch efficiency was about 50%. Standing crop estimates of young-of-the-year striped bass* based on catches in the epibenthic sled should be doubled to adjust for gear efficiency before being used to obtain estimates of absolute abundance by a density-volume method.

For white perch, the catch efficiency of the epibenthic sled (estimated from October data) probably was not greater than 31%. Although non-linear regression could not be used to estimate the true population density, it was at least as high as the density estimated by the fastest tow speed. Standing crop estimates of white perch young-of-the-year* should be multiplied by a minimum value of 3.23 to adjust for gear efficiency before being used to obtain estimates of absolute abundance.

For young-of-the-year Atlantic tomcod, the catch efficiency of the epibenthic sled could not be estimated because differences in catches across tow speeds were not detected due to low densities and, consequently, few non-zero catches.

*Estimates of standing crops not adjusted for this catch efficiency factor appeared in several previous reports, including TI (1975, 1977, 1978a, 1978b), McFadden (1977), McFadden and Lawler (1977) and McFadden et al. (1978).

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KJM

Efficiency of the 1.0 m^2 Epibenthic Sled for Collecting Young-of-the-Year Striped Bass, White Perch, and Atlantic Tomcod in the Hudson River Estuary, 1978

June 1979

Prepared for

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REPORT ON 1978-1979 STUDIES TO EVALUATE CATCH EFFICIENCY OF THE 1.0-m^2 EPIBENTHIC SLED

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SECTION I

SUMMARY

An asymptotic approach to 100% efficiency was hypothesized as the relationship between catch (i.e., density) and increasing speed of a towed net sampler. This study was designed to use a model of this relationship to empirically estimate the catch efficiency of a 1.0-m^2 epibenthic sled when deployed to sample young-of-the-year (YOY) white perch (*Morone americana*), striped bass (*Morone saxatilis*), and Atlantic tomcod (*Microgadus tomcod*) in the Hudson River estuary. During the months the study was conducted white perch were most abundant in the catch in October 1978, and November and December 1979. Striped bass were most abundant in September 1978. Few Atlantic tomcod were caught in either year. Consequently, the above species-month data sets could be used to investigate catch efficiency for white perch and striped bass only.

Contrary to expectations, mean density was not found to increase with increasing towing speed either for YOY white perch or for YOY striped bass. Scatter plots suggested a boat effect may have obscured this relationship. When data of December 1979 white perch densities were examined with a factorial analysis of variance, the Liberty Belle caught significantly fewer fish than the Sametta Too. Adjustment of the densities for this boat effect did not significantly change the fit to the hypothesized relationship; there was still no significant increase in density with increasing towing speed and an asymptotic model could not be fit to the data. An examination of the literature, however, suggested that the catch efficiency of the 1.0-m^2 epibenthic sled was extremely low (probably less than 10%) for YOY striped bass and white perch.

SECTION II

INTRODUCTION

The disparity between the number of fish encountered in the path of a towed net and the actual catch (i.e., density) by that gear is an expression of catch efficiency. A measure of catch efficiency can be used to adjust the catch to derive estimates of "true" or "absolute" fish abundance and population size. Texas Instruments (TI) has been involved in several catch efficiency studies as part of an on-going program of gear design and evaluation in the Hudson River estuary (TI 1977, 1978, 1979a, 1979b). In 1978, a preliminary study evaluated application of an exponential model to determine the catch efficiency of a 1.0-m^2 epibenthic sled for sampling young-of-the-year (YOY) striped bass (*Morone saxatilis*), white perch (*M. americana*), and Atlantic tomcod (*Microgadus tomcod*) (TI 1979b). Re-evaluation of the results of this 1978 study suggested the exponential model was inappropriate.

This report is intended to supersede the 1978 Catch Efficiency Study (TI 1979b). Several catch efficiency models are considered in addition to an exponential model, and the 1978 data are reanalyzed and combined with results from 1979. The primary objective was to empirically estimate the catch efficiency of the 1.0-m^2 epibenthic sled deployed by TI to sample YOY white perch, striped bass, and Atlantic tomcod in the Hudson River estuary. A secondary objective or corollary to this study was to identify factors affecting the catch efficiency of this gear.

Catch efficiency varies with gear characteristics and deployment techniques which elicit detection and avoidance behavior in fish. These factors have been identified and discussed in detail by Clutter and Anraku (1968) and will be only briefly summarized here.

Gear characteristics affecting visual detection by fish include the coloration and contrast of netting and the presence of reflective surfaces. Increased night catches versus day catches have been attributed to a reduction in detection distance and avoidance ability by fish in low light intensities (Clutter and Anraku 1968). Hydrodynamics, a function of net geometry and mesh filtration, can influence catch efficiency by creating pressure waves detectable by fish in advance of the net. For example, Smith (reported in Clutter and Anraku 1968) measured pressure waves 1.5 m in advance of a 1.0-m diameter net towed at 1.4 $m \cdot sec^{-1}$. The net diameter to length ratio, mesh size, bridle configuration, and towing speed were also identified as factors influencing catch efficiency by altering net hydrodynamics. Additionally, mesh size selectively affects fish retention or extrusion.

Barkley (1972) developed a geometric model which related catch efficiency to gear characteristics and detection and avoidance behavior by the fish. In this mechanistic model, probability of capture (catch efficiency) was considered a function of four parameters as follows:

$$PC = \left[1 - \frac{X_o}{R\sqrt{\frac{U^2}{U_e^2} - 1}} \right]^2 \qquad (1)$$

where

PC = probability of capture

X_o = detection distance

R = net radius

U = net speed

U_e = escape speed

For a particular net, species and size of fish, and environmental conditions, X_o, R, and U_e can be considered constants, and catch efficiency will increase as a function of towing speed to an asymptote at 100% efficiency (PC = 1) [Figure II-1(A)]. An increase in catch with increasing towing speed was observed by several investigators, including Aron and Collard (1969) and Clutter and Anraku (1968). A major limitation of the Barkley model is the difficulty of experimentally quantifying detection distance (X_o) and escape speed (U_e). When experimentally determined values for X_o and U_e are available, probability of capture (PC) may be calculated diectly from equation 1 (with certain limitations as described in Appendix Figure 1). Barkley (1972) also provided a formula for calculating PC using the ratio of catches at two different towing speeds to approximate X_o and U_e, but he concluded that this method is only valid for escape speeds less than 30% of towing speeds.

The actual relationship between catch efficiency and towing speed could assume one of several theoretical forms (Figure II-1). An asymptotic approach to 100% efficiency is the basic premise common to most forms. The density at 100% efficiency (D_o in Figure II-1) represents the "true" population density. These curves describing the relationship between catch efficiency and towing speed can be classified into two categories based on characteristics of their shape. The curves A through D in Figure II-1 all rise continuously from, at or near, the origin in their approach to the asymptote, while curves E and F have a plateau at low efficiency and rise to the asymptote above the threshold towing speed (U_t). The former curves actually represent subsets of the latter in which the threshold speed is close to zero. The underlying purpose of the 1978 and 1979 studies with the 1.0-m^2 sled was to empirically determine the appropriate model and asymptote density by examining the change in density with increasing towing speed.

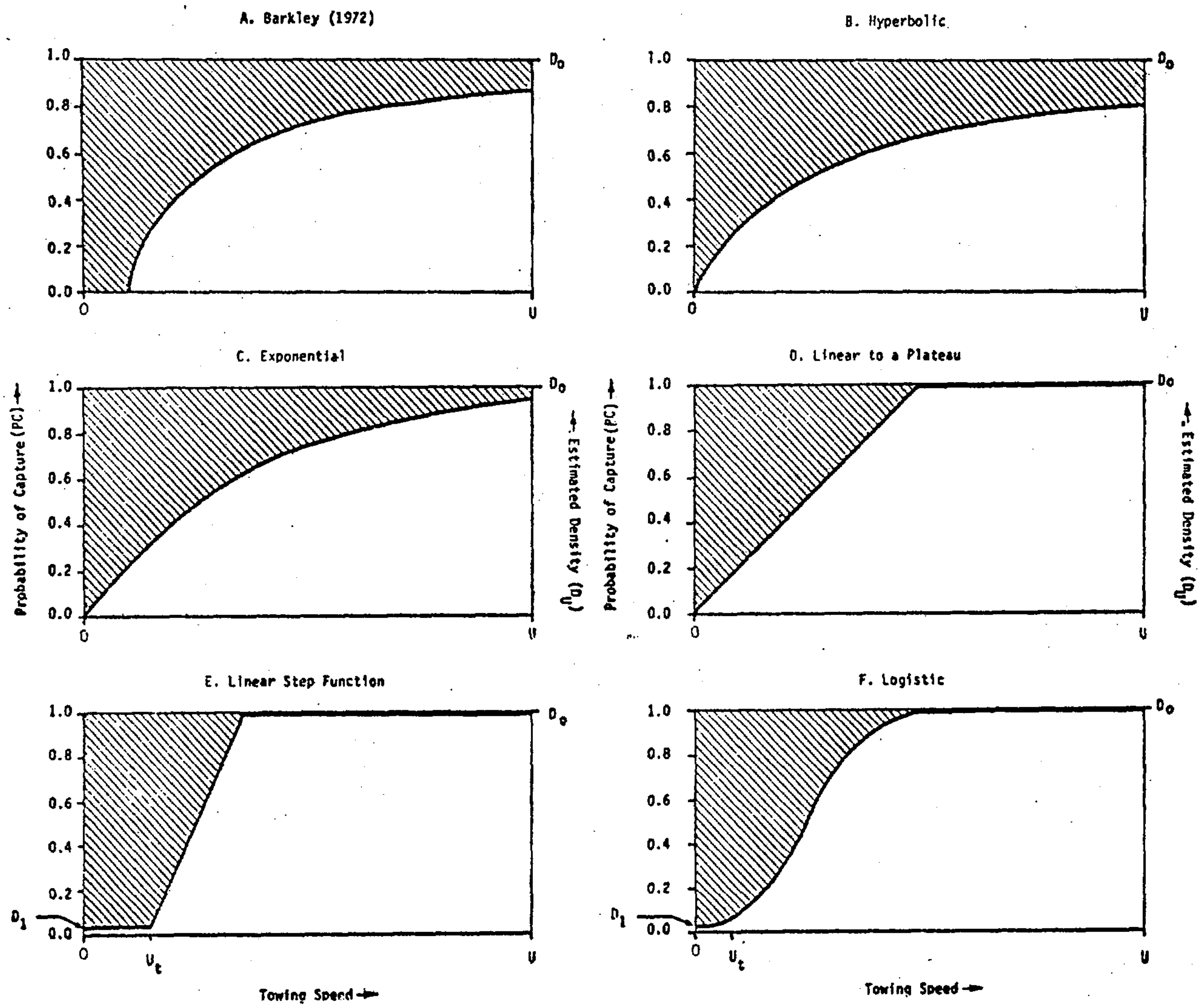

Figure II-1. Selected Hypothetical Models of Relationship between Catch Efficiency (probability of capture = PC) and Towing Speed (U) [all curves approach true density, D_o, (PC = 1.0) asymptotically; D_1 is a low plateau; U_t is a threshold speed; see text for explanation]

SECTION III

MATERIALS AND METHODS

A. FIELD AND LABORATORY

This study utilized the results of a catch efficiency study in 1979, and reanalyzed data from a similar study conducted in 1978. Both studies were designed to minimize or control sources of variation not directly attributable to the change in catch efficiency of the 1.0-m^2 epibenthic sled with increasing towing speed. To minimize temporal variation, sampling for YOY fishes was conducted at night and was limited to one week in each of two months in 1978 and 1979 (11 through 15 September and 9 through 13 October, 1978; 5 through 8 November and 3 through 6 December, 1979). In 1978, sampling was timed to concur with peak YOY striped bass abundance and in 1979 with peak YOY white perch abundance (TI 1979c).

Sampling within a week was limited to the same river region and bottom type. In September 1978 and November 1979, sampling was conducted in the Tappan Zee region (RM 24 through RM 33) in depths of 4 to 6 m of water over a smooth, muddy bottom. In October 1978 and December 1979, sampling was conducted in depths of 3 to 5 m of water in the Croton-Haverstraw region (RM 34 through RM 38) over similar bottom conditions. Consideration was given to preventing the overlap of towing paths within a region, because bottom disturbance from a previous tow could bias subsequent tows.

Paired samples (two boats towing in parallel approximately 10 to 15 m apart) were collected in an attempt to reduce variation in catch due to patchiness of fish distribution within a region. Pairing can reduce sampling variation by increasing the probability that the same patches or gaps in distribution are sampled by both experimental and standard tows. One boat always towed at 1.5 $m \cdot sec^{-1}$ (standard) and the other at 0.7, 1.1, 1.5, 1.9, or 2.3 $m \cdot sec^{-1}$ (experimental), except in 1978 when the 1.5 $m \cdot sec^{-1}$ experimental tows were not taken. The 1.5 $m \cdot sec^{-1}$ experimental tows were added in 1979 to allow examination of the variation in catch between boats which was independent of towing speed.

Towing durations were varied over experimental speeds to maintain an approximately constant sample volume and tow length. Table III-1 indicates the number of sample pairs collected, the variations in sample volumes, and the number of paired tows in which both experimental and standard tows collected at least one fish of the species considered. Field observations indicated a relatively constant tow length (approximately 450 m) was obtained.

Experimental towing speed and position relative to shore (proximal or distal) were randomly assigned to one of the two boats (Sametta Too or Liberty Belle), and the other boat was assigned the standard speed and other position. However, boat and engine capabilities (Appendix Table 1) limited assignment of the slowest towing speed (0.7 $m \cdot sec^{-1}$) to the Sametta Too, and the highest speed (2.3 $m \cdot sec^{-1}$) to the Liberty Belle. To examine possible variation in density estimates due to this nonrandom assignment of boats at extreme towing speeds, experimental speed was randomly assigned in a balanced, factorial design across the three intermediate speeds (1.1, 1.5, and 1.9 $m \cdot sec^{-1}$) for the collections made in December 1979.

The 1.0-m^2 epibenthic sled was equipped with a 3000 μm mesh net with an enlarged conical fyke attached to the cod end (TI 1979c). With this fine mesh net, mesh selectivity was not considered to vary during the studies and 100% retention of YOY fishes [>60 mm mean total length (TL)] was assumed. Laboratory processing of the YOY fishes followed standard operating procedures for the Fall Shoals Survey (TI 1979c).

Table III-1

Variation in Sample Volumes, Number of Paired Tows, and Number of Non-Zero Paired Tows for 1.0-m^2 Epibenthic Sled Study, 1978-1979

				Variation in Tow Volume (m^3)				Number of Non-Zero Pairs**		
				Experimental		Standard ($1.5 m \cdot sec^{-1}$)		Species‡		
Year	Sampling Date	Experimental Towing Speed ($m \cdot sec^{-1}$)	Number of Sample Pairs	$\bar{x}$*	S.E.†	$\bar{x}$	S.E.	SB	WP	AT
1978	11 Sep - 15 Sep	0.7	23	386.4	13.1	405.4	6.3	5	2	2
		1.1	21	417.2	14.4	420.1	8.9	9	1	1
		1.9	20	416.1	4.8	429.5	5.8	11	1	0
		2.3	23	405.4	5.8	418.3	5.2	5	1	1
	Total		87					30	5	4
	09 Oct - 13 Oct	0.7	22	437.1	6.1	444.8	3.4	5	10	0
		1.1	22	444.3	6.2	438.1	4.3	5	13	0
		1.9	23	458.6	7.2	436.8	5.5	3	8	0
		2.3	22	450.6	6.8	421.7	3.9	4	8	0
	Total		89					17	39	0
1979	05 Nov - 08 Nov	0.7	17	416.9	9.4	416.0	6.0	1	12	6
		1.1	15	422.4	7.1	417.1	6.0	2	15	8
		1.5	13	411.0	3.7	411.5	4.7	2	11	6
		1.9	13	417.3	16.2	431.0	6.0	4	13	8
		2.3	17	423.4	7.7	420.0	5.1	5	15	10
	Total		75					14	66	38
	03 Dec - 06 Dec	0.7	19	421.8	9.4	454.1	7.2	4	18	3
		1.1	19	436.4	6.6	443.7	4.6	2	18	7
		1.5	18	431.0	5.4	435.5	4.8	2	17	5
		1.9	21	439.2	7.8	445.8	4.6	5	19	6
		2.3	18	436.4	11.5	419.0	6.0	0	15	1
	Total		95					13	87	22

*$\bar{x}$ = Mean

†S.E. = Standard Error

**A paired tow in which both the experimental and standard tows collected at least one fish of the species considered

‡SB = striped bass, WP = white perch, AT = Atlantic tomcod

Prior to sampling, it was necessary to determine the variation in filtration efficiency of the 1.0-m^2 epibenthic sled across the range of experimental speeds. An appreciable change (e.g., >10%) would require an adjustment to both the number of organisms caught and towing speed because 1) catch would vary directly with change in filtration efficiency (Tranter and Smith 1968) and 2) speed through the water was considered to be the towing speed. Filtration efficiency data were collected and analyzed in 1978 using linear regression (TI 1979b). These data were reanalyzed in this report using an analysis of variance (ANOVA) design. Filtration efficiency was determined as the ratio of water velocity through the net mouth to the velocity of the net through the water (measured with electronic flowmeters mounted in the net mouth and suspended 0.5 m to the outboard side of the net, respectively). Observations were taken simultaneously over a range of boat speeds from 1.2 to 2.4 $m \cdot sec^{-1}$ (as measured by the flowmeter suspended outside the net). Boat speed was used as the blocking factor and flowmeter location (inside or outside the 1.0-m^2 epibenthic sled) was the treatment factor. Both boat speed ($F = 157.21$, $p \leq 0.0001$) and flowmeter location ($F = 33.16$, $p \leq 0.0001$) were highly significant main effects (Appendix Table 2), but the interaction between these two factors was not significant ($F = 0.57$, $p \geq 0.7505$). Therefore, filtration efficiency was considered constant across the range of speeds used and was computed as 92.2% by taking the ratio of mean flowmeter readings ($m \cdot sec^{-1}$) inside and outside the 1.0-m^2 epibenthic sled. Since filtration efficiency was constant, adjustments to towing speed or density were unnecessary.

B. DATA ANALYSES

Data analyses followed the flow diagram in Figure III-1. Catches of YOY striped bass, white perch, and Atlantic tomcod were converted to densities ($number \cdot 1000\ m^{-3}$) to be directly comparable, and analyzed separately by month. To examine the empirical relationship between towing speed and density, two measures of density were used. A

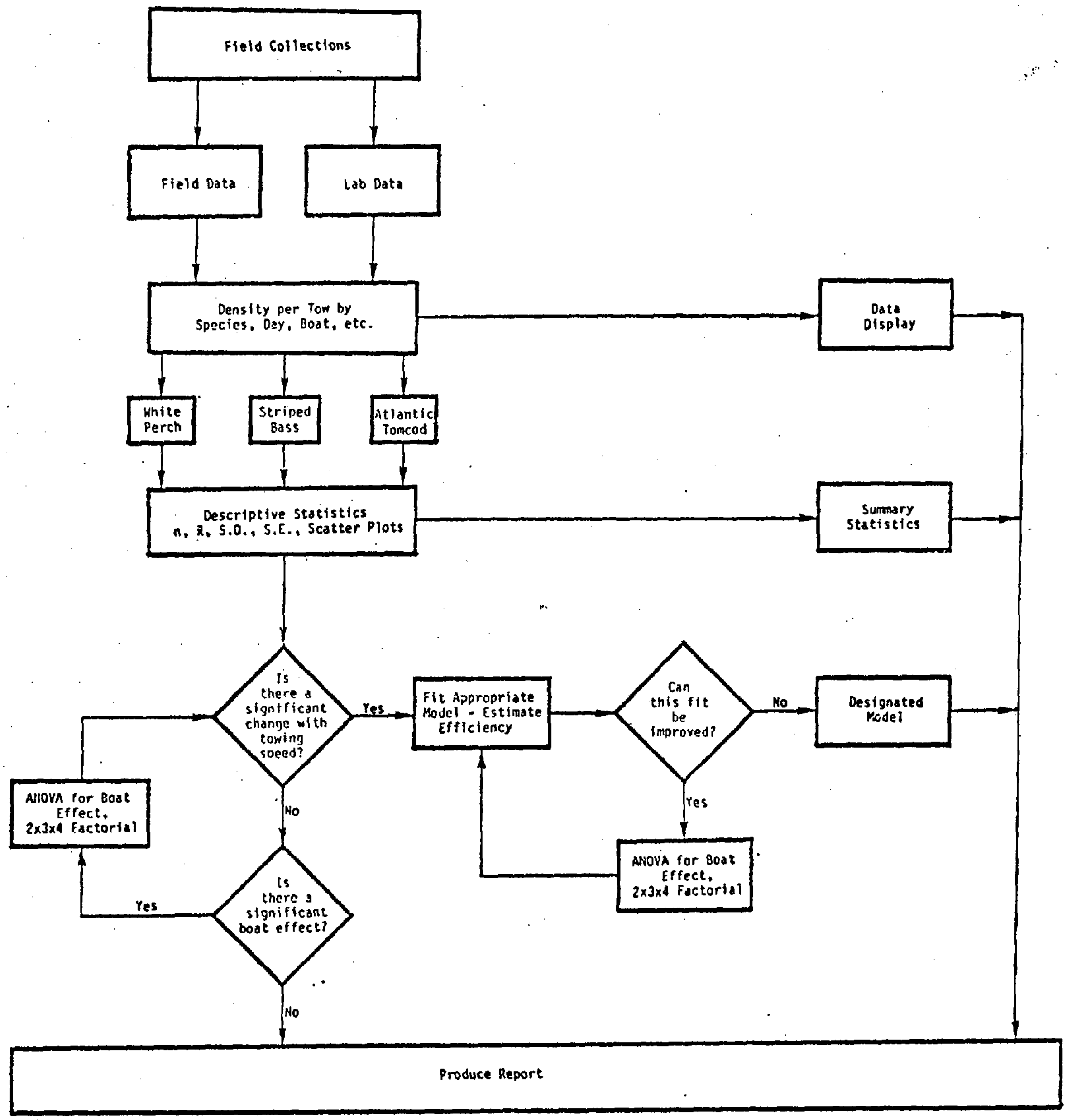

Figure III-1. Diagrammatic Representation of Analytical Procedures Used to Fit a Catch Efficiency Model direct measure, the density at each of the experimental speeds, was calculated using all catch data (i.e., both zero and non-zero catches). A second measure, the ratio of densities between experimental and standard tows (relative density), utilized the effectiveness of paired tows in reducing variation due to regional density differences. For example, a ratio of 1:3 for one pair of samples is comparable to a ratio of 10:30 for another, although an order of magnitude difference in their absolute densities exists. When relative densities were used in these analyses they were derived from non-zero paired catches only.

Descriptive statistics [Figure III-1: means ($\bar{x}$), standard deviations (S.D.), standard errors (S.E.)] and scatter plots were used to identify the empirical relationship between density and towing speed for each species-month combination. If this relationship had resembled an approach to an upper asymptote, the next step in this analysis would have been to fit each of the hypothesized models (Figure II-1) to the data to determine the most appropriate model (best fit to the data). A 2x3x4 factorial analysis of variance (Helwig and Council 1979) was performed on December 1979 white perch data to identify significant interactions and separate the effects of days in the week and boats from towing speeds. The main effects were the two boats (Liberty Belle and Sametta Too), three intermediate towing speeds (1.1, 1.5, and 1.9 $m \cdot sec^{-1}$), and four sampling days. The catch parameter used in this ANOVA was white perch density in experimental tows, transformed by $\log_{10}(x)$ to eliminate variance heterogeneity.

SECTION IV

RESULTS AND DISCUSSION

The basic pattern depicted by mean density of YOY striped bass, white perch, and Atlantic tomcod in 1978-79 was one of no consistent change in catch by the 1.0-m^2 epibenthic sled with increasing towing speed (Tables IV-1 through IV-3). This pattern was observed for all species and months in 1978 and 1979, and for both density at experimental speed and relative density. Examination of the standard error of the mean density (Tables IV-1 through IV-3) or twice the standard error (as an approximate 95% confidence interval) indicated mean density at the highest experimental towing speed (2.3 $m \cdot sec^{-1}$) appeared slightly lower than the density at slower speeds. Densities were extremely low for Atlantic tomcod in all months, for striped bass in all months but September 1978, and for white perch in September 1978; subsequent inferences will be made exclusive of these species-month data sets. Densities at 0.7 and 2.3 $m \cdot sec^{-1}$ for striped bass in September 1978 (Figure IV-1) had less scatter about the mean and lower means than for the intermediate towing speeds (1.1 and 1.9 $m \cdot sec^{-1}$). In December 1979 (Figure IV-2), a similar pattern for white perch was apparent, although not as distinct as for striped bass. Relative density for white perch in December 1979 (Figure IV-3) had reduced scatter of points about all means, but several large values appeared at intermediate speeds. These outliers, the relatively wide scatter observed at intermediate speeds, and the low densities at 2.3 $m \cdot sec^{-1}$ suggested that a boat effect may have obscured the relationship between density and towing speed.

This boat effect on the collection of white perch was examined in a 2x3x4 factorial ANOVA which was incorporated in the sampling design for December 1979. A strong boat effect was present ($F = 6.24$, $p=0.020$; Appendix Table 3); the Sametta Too caught significantly more fish than

Table IV-1

Mean Densities for Young-of-the-Year Striped Bass Caught by 1.0-m^2 Epibenthic Sled, 1978-1979

Year	Sampling Date	Experimental Towing Speed ($m \cdot sec^{-1}$)	Experimental Tows			Standard Tows ($1.5 m \cdot sec^{-1}$)			Relative Density*** ($Experimental \cdot Standard^{-1}$)		
			n*	$\bar{x}$†	S.E.**	n	$\bar{x}$†	S.E.	n	$\bar{x}$‡	S.E.
1978	11 Sep - 15 Sep	0.7	23	2.01	0.84	23	7.57	2.47	5	0.64	0.13
		1.1	21	10.67	3.96	21	8.04	2.02	9	1.67	0.54
		1.9	20	12.44	3.51	20	14.45	4.37	11	1.62	0.65
		2.3	23	2.82	1.83	23	11.94	3.15	5	0.38	0.21
	09 Oct - 13 Oct	0.7	22	1.12	0.44	22	1.92	0.62	5	1.48	0.41
		1.1	22	1.41	0.62	22	1.44	0.66	5	0.71	0.20
		1.9	23	0.77	0.26	23	1.70	0.58	3	0.85	0.53
		2.3	22	2.20	0.65	22	1.86	0.88	4	0.87	0.38
1979	05 Nov - 08 Nov	0.7	17	1.01	0.37	17	1.13	0.36	1	1.10	--
		1.1	15	2.28	0.91	15	2.20	0.63	2	1.12	0.18
		1.5	13	0.74	0.42	13	2.07	0.67	2	1.47	0.51
		1.9	13	1.63	0.62	13	3.05	0.84	4	0.59	0.09
		2.3	17	1.88	0.54	17	1.52	0.49	5	0.96	0.19
	03 Dec - 06 Dec	0.7	19	2.83	0.97	19	0.59	0.28	4	2.85	1.64
		1.1	19	1.51	0.59	19	1.60	0.78	2	3.15	0.17
		1.5	18	1.68	1.31	18	1.15	0.65	2	5.52	5.33
		1.9	21	1.95	0.77	21	1.28	0.37	5	1.52	0.54
		2.3	18	0.12	0.12	18	1.24	0.53	0	--	--

*n = Number of paired tows

†$\bar{x}$ = Mean density (number individuals$\cdot 1000m^{-3}$)

**S.E. = Standard error of mean density

‡$\bar{x}$ = Mean relative density (ratio of experimental to standard density)

***Calculated from non-zero paired tows in which both the experimental and standard tows collected at least one fish of the species considered

Table IV-2

Mean Densities for Young-of-the-Year White Perch Caught by 1.0-m^2 Epibenthic Sled, 1978-1979

Year	Sampling Date	Experimental Towing Speed ($m \cdot sec^{-1}$)	Experimental Tows			Standard Tows ($1.5 m \cdot sec^{-1}$)			Relative Density*** ($Experimental \cdot Standard^{-1}$)		
			n*	$\bar{x}$†	S.E.**	n	$\bar{x}$†	S.E.	n	$\bar{x}$‡	S.E.
1978	11 Sep - 15 Sep	0.7	23	0.84	0.30	23	0.20	0.14	2	0.97	0.09
		1.1	21	0.85	0.33	21	0.61	0.30	1	0.88	--
		1.9	20	0.50	0.30	20	0.72	0.31	1	0.95	--
		2.3	23	0.24	0.24	23	0.82	0.35	1	1.20	--
	09 Oct - 13 Oct	0.7	22	3.67	1.62	22	5.58	1.24	10	0.96	0.21
		1.1	22	4.59	0.98	22	4.64	1.49	13	1.58	0.35
		1.9	22	6.36	1.75	23	2.61	0.84	8	1.52	0.33
		2.3	23	7.05	1.73	22	2.62	1.01	8	2.90	0.87
1979	05 Nov - 08 Nov	0.7	17	10.90	3.05	17	10.17	2.55	12	2.33	1.08
		1.1	15	17.97	4.82	15	19.07	3.60	15	0.95	0.16
		1.5	13	14.67	3.67	13	15.89	2.89	11	1.28	0.28
		1.9	13	18.09	5.19	13	25.02	6.37	13	0.73	0.13
		2.3	17	15.54	3.32	17	18.43	4.48	15	1.28	0.23
	03 Dec - 06 Dec	0.7	19	27.66	5.93	19	21.25	4.11	18	1.41	0.24
		1.1	19	33.88	7.33	19	31.76	4.82	18	1.87	0.79
		1.5	18	25.20	4.04	18	18.78	4.48	17	2.77	1.06
		1.9	21	22.50	7.33	21	28.07	6.06	19	0.94	0.22
		2.3	18	13.08	2.60	18	19.00	3.02	15	0.99	0.33

*n = Number of paired tows

†$\bar{x}$ = Mean density (number $individuals \cdot 1000m^{-3}$)

**S.E. = Standard error of mean density

‡$\bar{x}$ = Mean relative density (ratio of experimental to standard density)

***Calculated from non-zero paired tows in which both the experimental and standard tows collected at least one fish of the species considered

Table IV-3

Mean Densities for Young-of-the-Year Atlantic Tomcod Caught by 1.0-m^2 Epibenthic Sled, 1978-1979

Year	Sampling Date	Experimental Towing Speed ($m \cdot sec^{-1}$)	Experimental Tows			Standard Tows ($1.5 m \cdot sec^{-1}$)			Relative Density*** Experimental·Standard^{-1}		
			n*	$\bar{x}$†	S.E.**	n	$\bar{x}$†	S.E.	n	$\bar{x}$‡	S.E.
1978	11 Sep - 15 Sep	0.7	23	0.48	0.22	23	0.68	0.29	2	0.78	0.25
		1.1	21	1.42	0.75	21	0.67	0.36	1	6.08	--
		1.9	20	1.00	0.68	20	1.29	0.61	0	--	--
		2.3	23	0.24	0.24	23	1.06	0.38	1	2.40	--
	09 Oct - 13 Oct	0.7	22	0.00	0.00	22	0.20	0.14	0	--	--
		1.1	22	0.00	0.00	22	0.00	0.00	0	--	--
		1.9	23	0.00	0.00	23	0.10	0.10	0	--	--
		2.3	22	0.00	0.00	22	0.00	0.00	0	--	--
1979	05 Nov - 08 Nov	0.7	17	4.35	0.90	17	2.77	0.94	6	1.46	0.33
		1.1	15	3.54	1.12	15	5.31	1.25	8	0.85	0.15
		1.5	13	2.40	0.94	13	4.51	0.99	6	1.26	0.31
		1.9	13	4.05	1.00	13	3.56	0.89	8	0.93	0.17
		2.3	17	3.28	0.82	17	3.49	1.01	10	1.30	0.29
	03 Dec - 06 Dec	0.7	19	1.35	0.50	19	1.56	0.53	3	1.81	0.79
		1.1	19	2.09	0.44	19	1.92	0.47	7	0.85	0.11
		1.5	18	1.02	0.34	18	1.93	0.43	5	0.87	0.10
		1.9	21	1.63	0.36	21	1.17	0.42	6	1.19	0.31
		2.3	18	0.29	0.20	18	0.66	0.26	1	1.11	--

*n = Number of paired tows

†$\bar{x}$ = Mean density (number individuals·1000^{-3})

**S.E. = Standard error of mean density

‡$\bar{x}$ = Mean relative density (ratio of experimental to standard density)

***Calculated from non-zero paired tows in which both the experimental and standard tows collected at least one fish of the species considered

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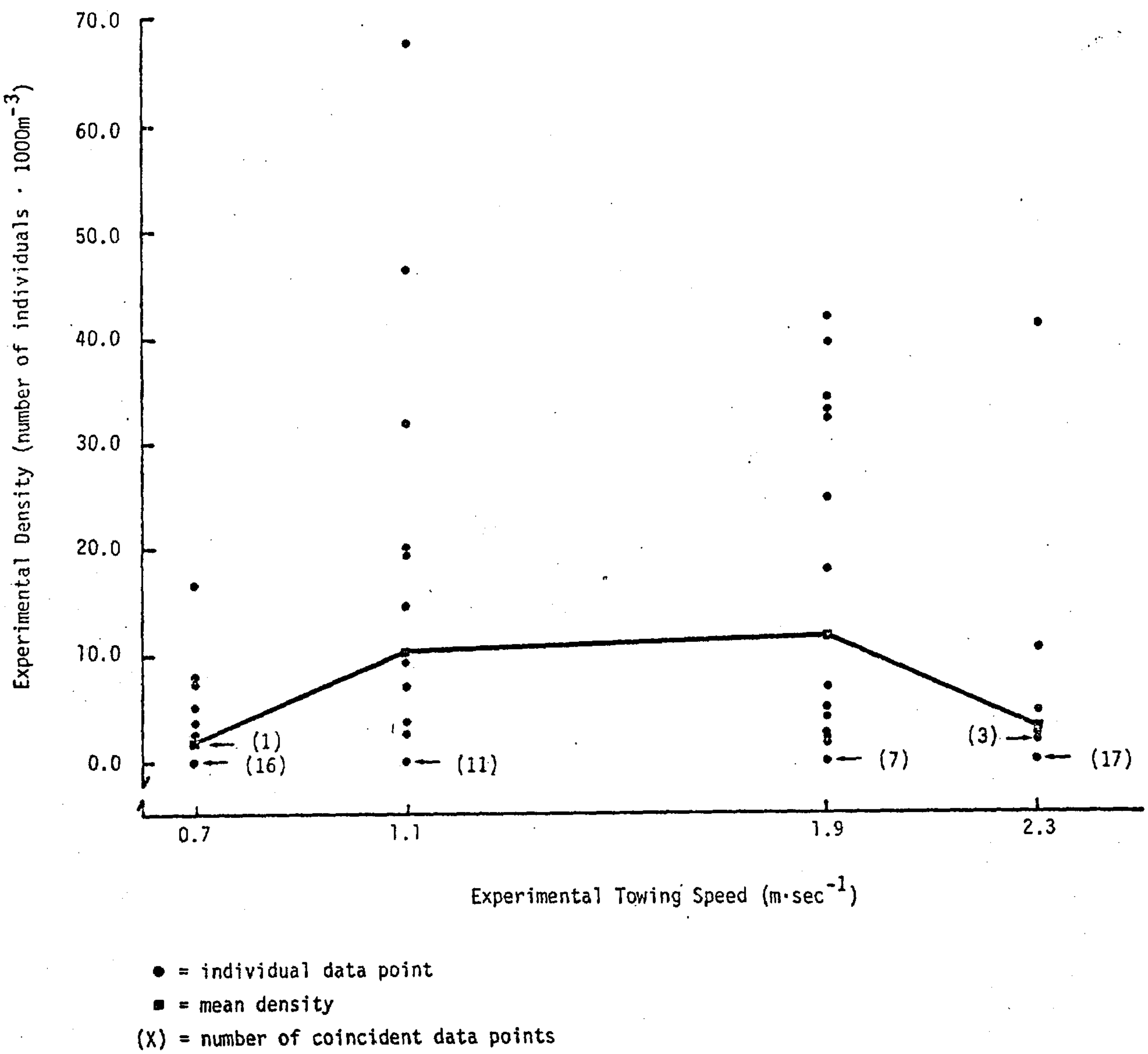

Figure IV-1. Relationship between Young-of-the-Year Striped Bass Density and Experimental Towing Speeds for September, 1978

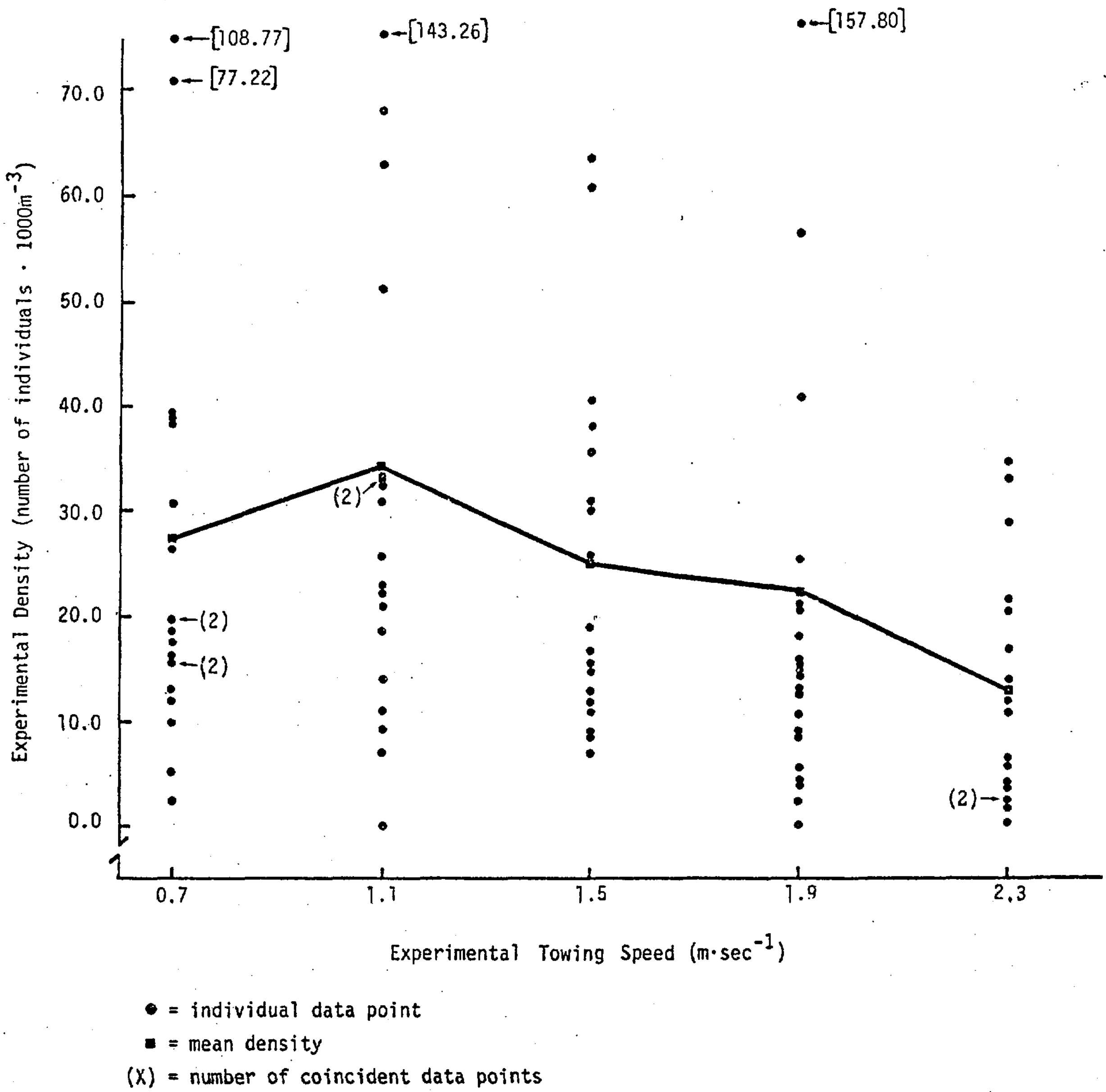

Figure IV-2. Relationship between Young-of-the-Year White Perch Density and Experimental Towing Speeds for December, 1979

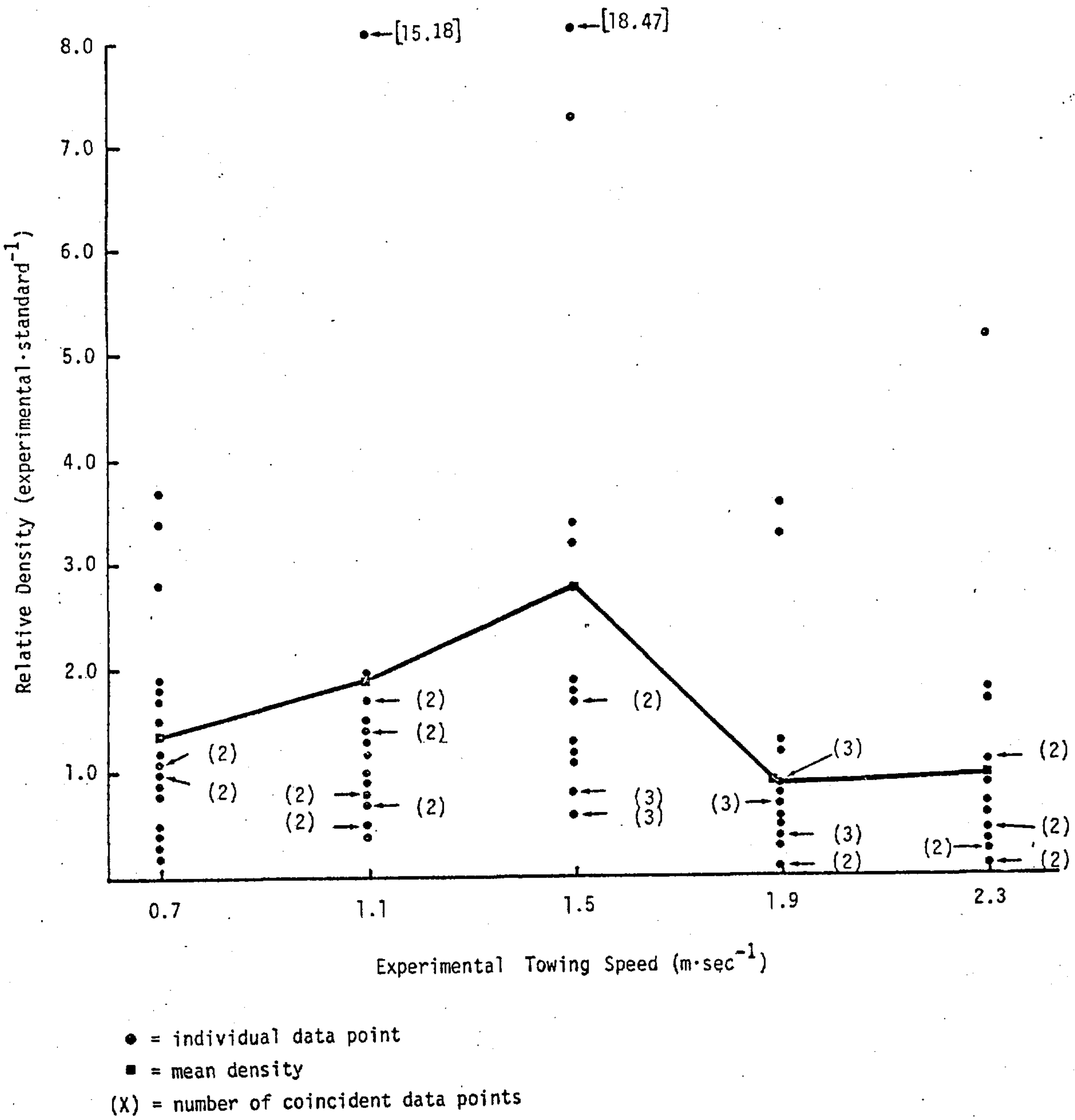

Figure IV-3. Relationship between Relative Density (ratio of experimental to standard density) of Young-of-the-Year White Perch and Experimental Towing Speeds for December, 1979 the Liberty Belle (Duncan's Multiple Comparison Test, $p<0.05$). Boat speed, as a main effect, was also significant ($F = 3.51$, $p = 0.046$) with density significantly lower at 1.9 $m \cdot sec^{-1}$ than at 1.1 $m \cdot sec^{-1}$ (Duncan's Multiple Comparison Test, $p<0.05$). Day, as a main effect, and the two and three factor interactions were not significant. The Sametta Too mean density was highest at 1.1 $m \cdot sec^{-1}$ (Figure IV-4). Liberty Belle mean densities were highest at 1.1 and 1.5 $m \cdot sec^{-1}$ and lowest at 1.9 and 2.3 $m \cdot sec^{-1}$. The mean densities of YOY white perch captured by the two boats were similar only at the standard towing speed of 1.5 $m \cdot sec^{-1}$.

The significantly lower densities of YOY white perch captured by the Liberty Belle may be related to engine characteristics which permit this boat to tow at the fastest but not the slowest towing speed. The Liberty Belle has a larger propeller than the Sametta Too (Appendix Table 1), and this characteristic may create turbulence which the fish can detect and avoid in advance of the net. Detection of this turbulence was probably enhanced by the shallow depths (3 to 6 m) sampled in the study.

The significant boat effect offered an explanation for the patterns observed in the scatter diagrams (Figures IV-1 through IV-3). Low density estimates by the Liberty Belle and high densities by the Sametta Too increased the scatter about mean density at the three intermediate towing speeds (1.1, 1.5, and 1.9 $m \cdot sec^{-1}$). At 0.7 and 2.3 $m \cdot sec^{-1}$, scatter was relatively low because only one boat was assigned each speed. The low density at 2.3 $m \cdot sec^{-1}$ probably occurred because sampling at that speed was limited to the Liberty Belle.

This boat effect would also differentially affect the variance of relative density estimates. If the experimental density in the numerator was derived from a Liberty Belle sample, the value of the ratio would be decreased. Similarly, the ratio would be increased if

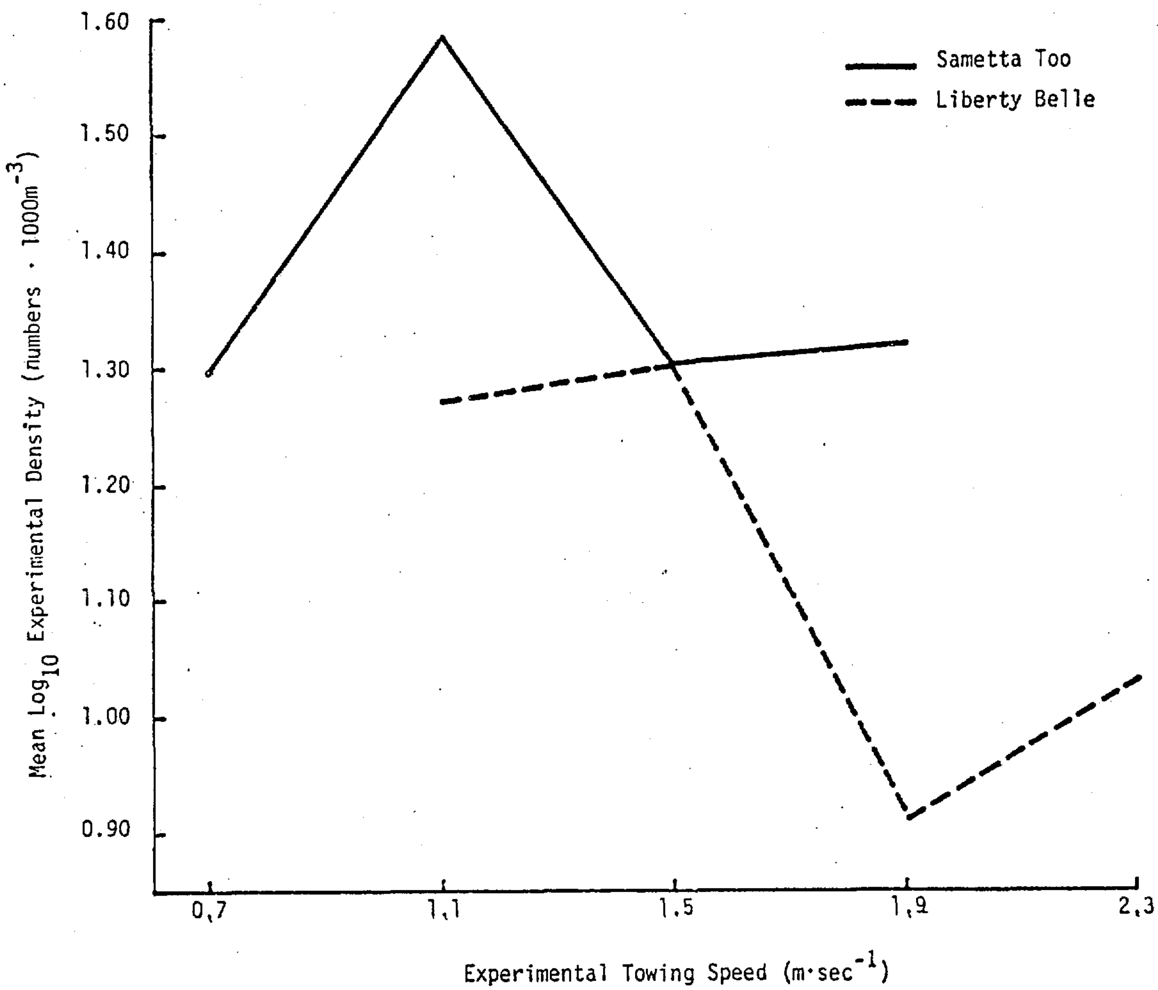

Figure IV-4. Mean Log_{10} Density of Young-of-the-Year White Perch Caught by Sametta Too and Liberty Belle in Experimental Tows in December, 1979 the Sametta Too density was the numerator. The outlying high values appeared (Figure IV-3) when relative density was calculated with Sametta Too density as the numerator.

Since a strong boat effect existed and the December 1979 white perch data did not resemble any of the hypothesized models (Figure II-1), density estimates from one boat were adjusted with respect to the other to eliminate this boat effect. The adjustment factor was derived from the difference between mean $\log_{10}$ density of the two boats. Adjustment did not significantly alter the relationship (Figure IV-5); there was no increase in density with increasing towing speed. Therefore, regardless of the parameter and adjustment used, a plateau in density occurred between towing speeds of 0.7 and 2.3 $m \cdot sec^{-1}$.

This plateau may be at either extremely high efficiency [near D_0 in Figure II-1(A and F)] or at extremely low efficiency [D_1 in Figures II-1 (E and F)]. Literature values for a comparable gear and deployment technique suggest it was a low plateau. For example, Kuipers (1975) used a 2-m beam trawl towed at 0.5 $m \cdot sec^{-1}$ and observed a catch efficiency of approximately 20% for juvenile plaice (Pleuronectes platessa, 140 to 200 mm). Murphy and Clutter (1972) towed a 1.0-m net at 0.76 $m \cdot sec^{-1}$ and found the catch efficiency was only 7% for Hawaiian anchovy (Stolephorus purpureus) larvae. Loesh et al. (1976) deployed a 4.9-m trawl (1.5-m sweep) at 1.1 $m \cdot sec^{-1}$ and captured spot (Leiostomus xanthurus) with only a 4 to 9% catch efficiency. Applying his model to the anchovy catch of Murphy and Clutter (1972), Barkley (1972) calculated catch efficiencies ranging from 35% for 4.5-mm fish to 0.02% for 11.5-mm fish. Barkley (1972) also applied his model to catch data of California smoothtongue (Bathylagus stilbius) taken with a 6-m Isaacs-Kidd mid-water trawl (Aron and Collard 1969). This relatively large trawl had a catch efficiency of 7.3% for 72-mm fish when towed at speeds less than 1.6 $m \cdot sec^{-1}$ and 33% when towed at speeds greater than 1.6 $m \cdot sec^{-1}$.

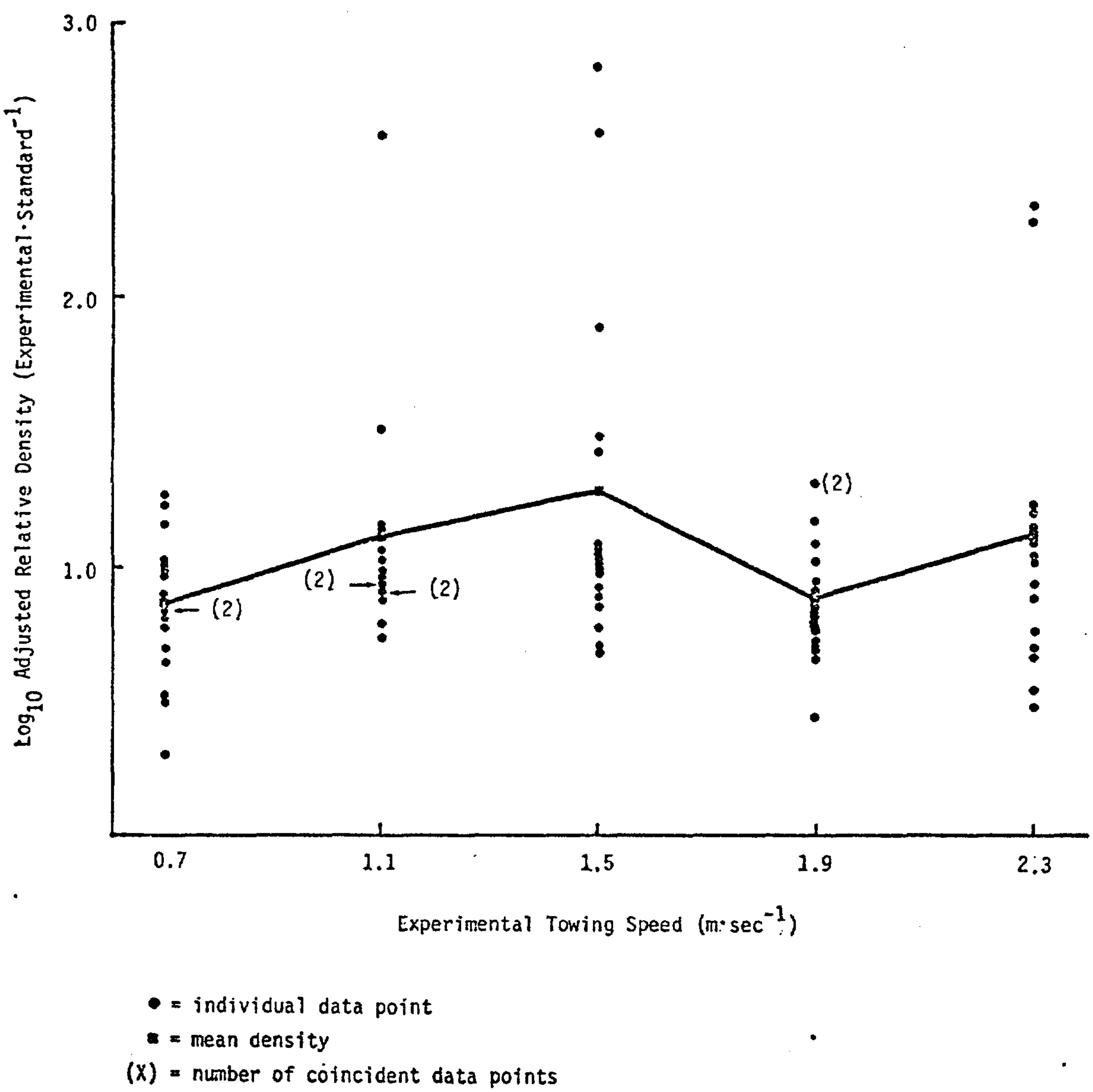

Figure IV-5. Relationship between Log_{10} Adjusted Relative Density (ratio of experimental to standard density) of Young-of-the-Year White Perch and Experimental Towing Speed for December, 1979 (m·sec^{-1}) (density of Liberty Belle samples adjusted to density of Sametta Too samples by adding 0.239384 to log_{10} Liberty Belle density)

To further investigate the low plateau hypothesis, Barkley's model was applied to white perch densities in this study by making the following assumptions: 1) YOY white perch with a mean body length of 70 mm TL (TI 1979) had an escape speed of 10 body lengths per second (0.7 $m \cdot sec^{-1}$) (Bainbridge 1960), 2) the minimum detection distance was 1.5 m (Smith in Clutter and Anraku 1968), and 3) the 1.0-m^2 epibenthic sled fished similarly to a circular 1.0-m diameter net. The conservative nature of this model was apparent since the catch efficiency of the 1.0-m^2 epibenthic sled was essentially undefined and close to zero at towing speeds less than 2.3 $m \cdot sec^{-1}$ (Appendix Figure 1) and was approximately 0.2% at 2.3 $m \cdot sec^{-1}$. Since the Barkley model assumed optimum avoidance behavior, catch efficiencies determined by this model were quite low and probably represent minimum values. Nevertheless, both applications of the Barkley model and the work of other researchers cited herein suggest catch efficiency of the 1.0-m^2 epibenthic sled for YOY white perch and striped bass is at a low plateau [D_1 in Figure II-1(E and F)] and probably less than 10%.

An implication of the Barkley model and the work of Laval (1974), Murphy and Clutter (1972), and others (summarized in Clutter and Anraku 1968), was that a relatively small increase in net diameter would increase catch efficiency more significantly than a relatively large increase in towing speed. It may not be mechanically possible to tow at speeds fast enough to observe an increase in catch efficiency with a small (1.0-m^2) net and large fish ($\geq$70 mm TL). Mechanical limitations of the gear and/or boat would cause the relationship between density and towing speed to reach a plateau at some density less than the true population density (D_o). This gear efficiency plateau was consistently observed for large trawls by Ionas (1967). We therefore conclude that a theoretical model of the relationship between density and towing speed does not appear to be the best method for the evaluation of catch efficiency for the 1.0-m^2 epibenthic sled, since it does not distinguish between a gear efficiency plateau and a plateau at the true population density.

SECTION V

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APPENDIX

APPENDIX

The Barkley (1972) model is as follows:

$$PC = \left[1 - \frac{X_o}{R\sqrt{\frac{U^2}{U_e^2} - 1}} \right]^2$$

where

PC = probability of capture (catch efficiency)
X_o = detection distance
R = net radius
U = net speed
U_e = escape speed

Examination of this model indicates three general restrictions apply:

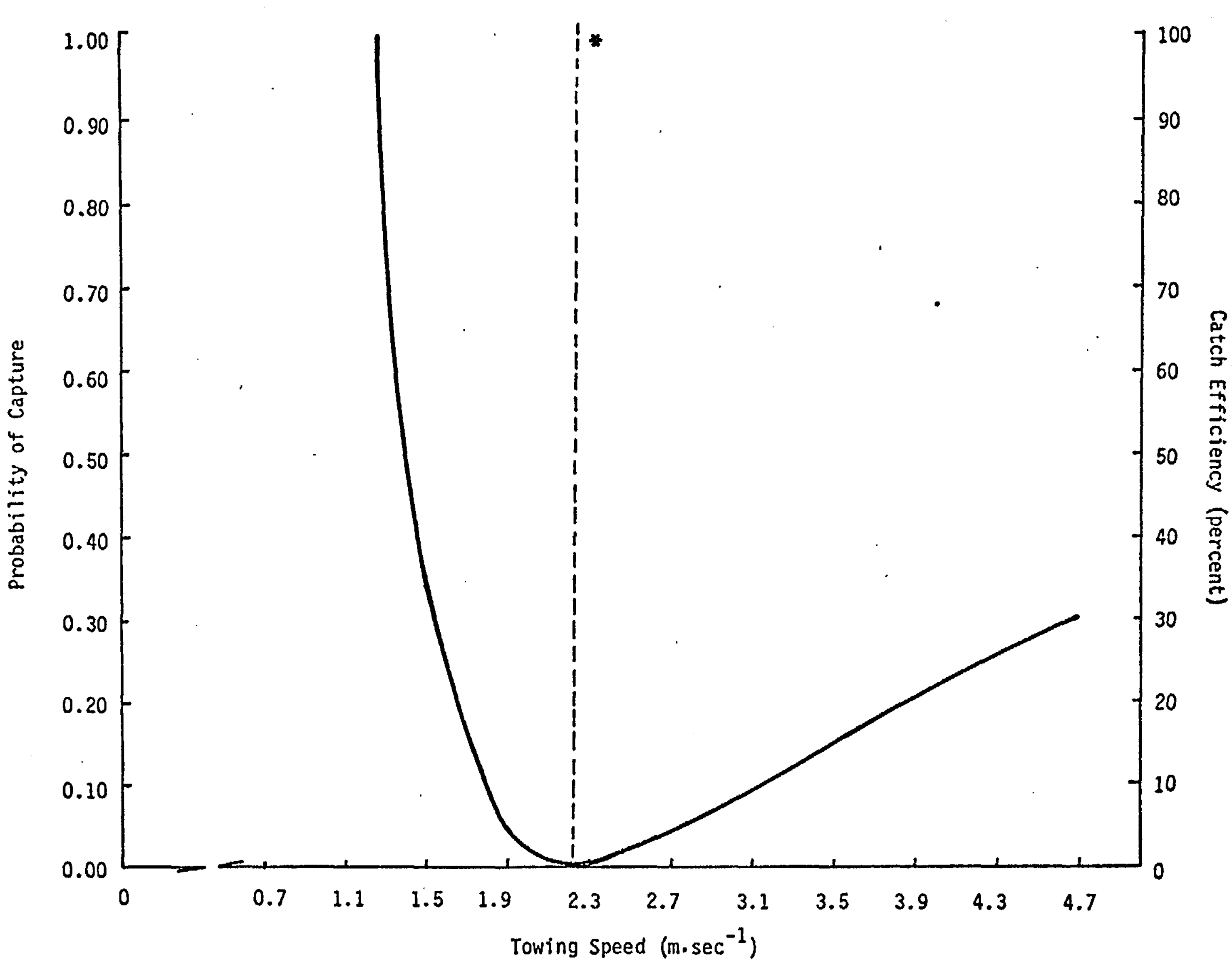
Restriction 1: U_e must be greater than zero, otherwise a division by zero would be attempted.

Restriction 2: U must be greater than U_e (i.e., greater than 0.7 $m \cdot sec^{-1}$ in this study), otherwise a square root of a zero or negative number would be attempted.

Restriction 3: The term $\left[\frac{X_o}{R\sqrt{\frac{U^2}{U_e^2} - 1}} \right]$ must be equal to or less than one.

When this term equals one, PC = 0. In this study, this occurred at a towing speed of 2.2 $m \cdot sec^{-1}$ (Appendix Figure 1). When this term is less than one, PC increases with increasing towing speed as indicated in Figure II-1(A) and the right-hand portion of Appendix Figure 1. When this term is greater than one, PC increases with decreasing towing speed and exceeds 100% efficiency (left-hand portion of Appendix Figure 1). This biological impossibility occurred at towing speeds below 1.26 $m \cdot sec^{-1}$ in this study.

Therefore, the catch efficiency for Barkley's model under the conditions of the present study was operationally defined as 0% (PC=0) at towing speeds ≤ 2.2 $m \cdot sec^{-1}$. Barkley's model was used to estimate catch efficiency only at towing speeds greater than 2.2 $m \cdot sec^{-1}$ (e.g. at 2.3 $m \cdot sec^{-1}$).



*Dashed vertical line at 2.2 m · sec^{-1} towing speed is the effective lower bound for the Barkley model (PC=0)

Appendix Figure 1. Probability of Capture (PC) or Catch Efficiency (percent) Determined from Barkley's (1972) Model as a Function of Towing Speed (U), with Constant Values for Net Radius (R=0.5 m), Reaction Distance (X_o=1.5 m), and Escape Speed (U_e=0.7 m·sec^{-1})

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Appendix Table 1

Characteristics of Two Boats Used in 1978-1979
Epibenthic Sled Catch Efficiency Study

Boat Characteristics	Sametta Too	Liberty Belle
Hull Construction	wood	solid fiberglass
Dimensions		
LOA (overall length)	11.9 m	11.9 m
Beam	3.7 m	3.6 m
Draft	1.1 m	1.1 m
Engine		
Type	Perkins 6-354	GM 6-71
Fuel	Diesel	Diesel
Reduction Gear Ratio	2.1/1.0	2.5/1.0
Propeller		
Number of Blades	3	4
Diameter	53 cm	71 cm
Pitch	46 cm	69 cm
Approximate RPM For Each Towing Speed		
0.7 $m \cdot sec^{-1}$	1000	-
1.1 $m \cdot sec^{-1}$	1350	520
1.5 $m \cdot sec^{-1}$	1790	720
1.9 $m \cdot sec^{-1}$	2200	920
2.3 $m \cdot sec^{-1}$	-	1120

Appendix Table 2

Two-Way Analysis of Variance (ANOVA) on Electric Flowmeter Readings ($m \cdot sec^{-1}$) Taken Simultaneously Inside (In) and Alongside (Out) Epibenthic Sled at Seven Selected Towing Speeds ($m \cdot sec^{-1}$) [treatment = flowmeter location, blocking factor = seven towing speeds, and three observations per cell (except at fastest speed where there were two observations per cell)] and Duncan's Multiple Comparison Test

Source	df	SS	MS	F	p
Model	13	53858.33	4142.95	75.37*	0.0001
Boat Speed	6	51847.92		157.21*	0.0001
Flowmeter Location (In or Out)	1	1822.50		33.16*	0.0001
Boat Speed X Flowmeter Location	6	187.92		0.57	0.7505
Error	26	1429.16	54.97		
Total	39	55287.15			

*significant at $p \leq 0.0001$

df = degrees of freedom

SS = sum of squares

MS = mean square

F = calculated F-ratio

p = probability of obtaining a larger F-ratio

Duncan's Multiple Comparison Test*

Factor	Comparison across Levels of Each Factor						
Boat Speed ($m \cdot sec^{-1}$)	1.1	1.3	1.5	1.7	1.9	2.1	2.3
Flowmeter Readings		Inside			Outside		

*For factors with a significant F-ratio, using the error mean square and associated degrees of freedom as the testing term [factor levels among which no significant (α=0.05) difference exists are underlined]

Appendix Table 3

2X3X4 Analysis of Variance (ANOVA) on Log_{10} Experimental Density of Young-of-the-Year White Perch Caught by Epibenthic Sled in December, 1979 (main factors were towing speed, date in week, and boat) and Duncan's Multiple Comparison Test

Source	df	SS	MS	F	p
Model	23	3.99	0.17	1.57	0.139
Towing Speed	2	0.77		3.51	0.046*
Boat	1	0.69		6.24	0.020*
Date	3	0.75		2.28	0.106
Towing Speed X Boat	2	0.37		1.67	0.210
Towing Speed X Date	6	0.58		0.87	0.531
Boat X Date	3	0.49		1.49	0.243
Towing Speed X Boat X Date	6	0.34		0.51	0.795
Error	24	2.65	0.11		
Total	47	6.64			

*significant at $0.01 \le p \le 0.05$

df = degrees of freedom

SS = sum of squares

MS = mean square

F = calculated F-ratio

p = probability of obtaining a larger F-ratio

Duncan's Multiple Comparison Test*

Factor	Comparison across Levels of Each Factor
Towing Speed ($m \cdot sec^{-1}$)	1.1 1.5 1.9
Boat	Sametta Too Liberty Belle

*For factors with a significant F-ratio, using the error mean square and associated degrees of freedom as the testing term [factor levels among which no significant (α=0.05) difference exists are underlined]

DATA DISPLAY FOR 1983 AND 1984

GEAR COMPARISON STUDIES

Prepared under contract with

NEW YORK POWER AUTHORITY
123 Main Street
White Plains, New York 10601

Jointly Financed by

Central Hudson Gas and Electric Corporation
Consolidated Edison Company of New York, Inc.
Orange and Rockland Utilities, Inc.
Niagara Mohawk Power Corporation
New York Power Authority

Prepared by

NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
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June 1985

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VARIABLE DEFINITIONS

VARIABLE NAME	DEFINITION
AD_YOY	Areal density of young of the year (length class 1) fish expressed as number/1000 m^2
AD_YR_OL	Areal density of yearling and older fish (length classes 2 through 4 combined) expressed as number/1000 m^2
AD_TOTAL	Areal density of all fish (length classes 1 through 4 combined) expressed as number/1000 m^2
BOTM_TYP	Bottom type 2 = mud
COMMENTS	'1' if a comment is written on data sheet, otherwise blank
DATE	Date and year in mm/dd/yy format
DPTH_RIV	River Depth (in feet) from surface to bottom
DURATION	Duration of sampling effort in minutes
ENG_RPM	Revolutions per minute (RPM) of vessel engine during sample collection
GEAR	Sampling gear 18 = 3 m beam trawl 50 = 6.2 m high rise trawl 64 = 1 m epibenthic sled
LENGTH	The length of an individual in millimeters
REGION	Hudson River Region TZ = Tappan Zee, river miles 24 through 33 CH = Croton Haverstraw, river miles 34 through 38
RIV_MILE	River mile where sample was collected

VARIABLE DEFINITIONS (Continued)

VARIABLE NAME	DEFINITION
SAMPLE	Sample number
SITE	Specific area within river mile 4 = west of channel (≤ 20 ft. deep) 5 = channel (> 20 ft. deep) 6 = east of channel (≤ 20 ft. deep)
TAXON	Species code 1 = alewife 2 = bay anchovy 3 = American shad 4 = bluefish 6 = brown bullhead 7 = pumpkinseed 9 = carp 10 = American eel 13 = hogchoker 14 = tesselated darter 19 = Atlantic menhaden 22 = blueback herring 25 = rainbow smelt 29 = Atlantic sturgeon 30 = striped bass 32 = Atlantic tomcod 34 = white catfish 35 = white perch 36 = yellow perch 39 = northern pipefish 42 = crevalle jack 45 = weakfish 49 = lookdown 73 = tidewater silverside 80 = butterfish 104 = rough silverside 106 = summer flounder 110 = striped searobin
TIME	Hour and minute of sample collection
TOW_AREA	The area sampled in square meters

VARIABLE DEFINITIONS (Continued)

VARIABLE NAME	DEFINITION
TOW_DIR	Direction toward which the gear was towed 1 = north 2 = south
TOW_DIST	The distance in meters from where tow was initiated to where tow was terminated
TOW_SPD	Speed of boat (meters per second) through water during sampling
USE_CODE	Sample use code 1 = no sampling problems 5 = void
VD_YOY	Volumetric density of young of the year fish (length class 1) expressed as number/1000 m^3
VD_YR_OL	Volumetric density of yearling and older fish (length classes 2 through 4 combined) expressed as number/1000 m^3
VD_TOTAL	Volumetric density of all fish (length classes 1-4 combined) expressed as number/1000 m^3
VESL_CODE	Vessel identification code 9 = Woody I 10 = Ecological Analysts Pride 16 = Duranautic 17 = R/V Fritcher 18 = Pocahantas
VOLUME	Volume of water sampled in cubic meters
WAVE_HT	Wave Height 1 = Calm 0 to 1/2 ft 2 = Light chop > 1/2 ft to 1 ft 3 = Heavy chop >1 ft to 2 ft 4 = Large waves >2 ft
WEEK	The week of the sampling program

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
FOR USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1	1	10/20/83	3:11	11683	64	2	5.0	TZ	645.57	624.10	1.55	0.00	1.55	1.60	0.00	1.60
2	1	10/20/83	3:58	11743	64	2	5.0	TZ	337.70	326.47	2.96	0.00	2.96	3.06	0.00	3.06
3	1	10/20/83	4:17	11983	64	2	5.0	TZ	263.93	255.16	3.79	0.00	3.79	3.92	0.00	3.92
4	1	10/20/83	20:09	12133	64	2	5.0	TZ	419.35	405.41	2.38	0.00	2.38	2.47	0.00	2.47
5	1	10/20/83	22:01	12253	64	2	5.0	YK	357.81	345.91	2.79	0.00	2.79	2.89	0.00	2.89
6	1	10/20/83	23:29	12353	64	2	4.0	YK	215.34	208.18	0.00	4.64	4.64	0.00	4.80	4.80
7	2	10/05/83	20:26	6133	64	1	5.0	CH	355.25	343.44	1173.81	0.00	1173.81	1214.18	0.00	1214.18
8	2	10/05/83	20:35	6143	64	1	5.0	CH	387.83	374.94	1170.62	0.00	1170.62	1210.88	0.00	1210.88
9	2	10/05/83	20:44	6153	64	1	5.0	CH	402.99	389.60	387.10	4.96	392.07	400.42	5.13	405.55
10	2	10/05/83	20:54	6163	64	1	5.0	CH	405.75	392.26	485.53	4.93	490.45	502.22	5.10	507.32
11	2	10/05/83	21:04	6173	64	1	5.0	CH	490.36	474.06	526.14	4.08	530.22	544.24	4.22	548.45
12	2	10/05/83	21:18	6183	64	1	5.0	CH	419.10	405.16	317.35	19.09	336.44	328.26	19.75	348.01
13	2	10/05/83	21:27	6193	64	1	5.0	CH	392.70	379.65	295.39	5.09	300.48	305.55	5.27	310.82
14	2	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	81.73	23.73	105.46	84.54	24.54	109.08
15	2	10/05/83	21:53	6213	64	1	5.0	CH	356.85	344.98	566.07	8.41	574.47	585.53	8.70	594.23
16	2	10/05/83	22:01	6223	64	1	5.0	CH	413.29	399.55	123.40	2.42	125.82	127.64	2.50	130.15
17	2	10/05/83	22:08	6233	64	1	5.0	CH	430.54	416.23	255.49	0.00	255.49	264.28	0.00	264.28
18	2	10/05/83	23:12	6293	64	1	5.0	TZ	441.07	426.40	77.09	9.07	86.15	79.74	9.38	89.12
19	2	10/05/83	23:19	6303	64	1	5.0	TZ	405.25	391.78	264.03	0.00	264.03	273.11	0.00	273.11
20	2	10/05/83	23:28	6313	64	1	5.0	TZ	431.49	417.15	152.96	4.64	157.59	158.22	4.79	163.01
21	2	10/05/83	23:45	6323	64	1	5.0	TZ	467.26	451.72	768.31	4.28	772.59	794.74	4.43	799.16
22	2	10/05/83	23:58	6333	64	1	5.0	TZ	449.98	435.02	1355.62	2.22	1357.84	1402.24	2.30	1404.54
23	2	10/06/83	0:11	6343	64	1	5.0	TZ	491.52	475.18	561.52	2.03	563.56	580.83	2.10	582.94
24	2	10/06/83	0:18	6353	64	1	5.0	TZ	414.77	400.98	1538.21	2.41	1540.62	1591.11	2.49	1593.60
25	2	10/06/83	0:27	6363	64	1	5.0	TZ	381.38	368.70	138.97	0.00	138.97	143.75	0.00	143.75
26	2	10/06/83	1:14	6393	64	1	5.0	CH	395.12	381.98	159.44	12.65	172.10	164.93	13.09	178.02
27	2	10/06/83	1:25	6403	64	1	5.0	CH	405.45	391.97	623.99	0.00	623.99	645.45	0.00	645.45
28	2	10/06/83	1:54	6433	64	1	5.0	CH	396.94	383.74	775.94	2.52	778.46	802.63	2.61	805.23
29	2	10/06/83	2:02	6443	64	1	5.0	CH	435.43	420.95	470.80	0.00	470.80	486.99	0.00	486.99
30	2	10/06/83	2:08	6453	64	1	5.0	CH	407.18	393.65	1014.28	4.91	1019.19	1049.16	5.08	1054.25
31	2	10/06/83	2:38	6483	64	1	5.0	CH	342.14	330.77	505.63	0.00	505.63	523.02	0.00	523.02
32	2	10/06/83	19:58	6523	64	1	5.0	TZ	393.05	379.98	875.20	5.09	880.29	905.30	5.26	910.57
33	2	10/06/83	20:08	10013	64	1	5.0	TZ	405.20	391.73	2991.09	4.94	2996.02	3093.96	5.11	3099.06
34	2	10/06/83	20:37	10043	64	1	5.0	TZ	406.22	392.71	812.37	0.00	812.37	840.31	0.00	840.31
35	2	10/06/83	21:13	10073	64	1	5.0	TZ	408.00	394.43	509.81	7.35	517.16	527.34	7.61	534.95
36	2	10/06/83	21:21	10083	64	1	5.0	TZ	460.67	445.35	436.32	0.00	436.32	451.33	0.00	451.33
37	2	10/06/83	21:27	10093	64	1	5.0	TZ	398.61	385.35	489.21	0.00	489.21	506.03	0.00	506.03
38	2	10/06/83	21:33	10103	64	1	5.0	TZ	406.98	393.45	692.91	9.83	702.73	716.74	10.17	726.90
39	2	10/06/83	21:40	11753	64	1	5.0	TZ	377.03	364.50	373.97	7.96	381.93	386.83	8.23	395.07
40	2	10/06/83	21:47	11763	64	1	5.0	TZ	419.16	405.22	543.95	7.16	551.11	562.66	7.40	570.06
41	2	10/06/83	21:53	11773	64	1	5.0	TZ	367.11	354.90	566.59	8.17	574.76	586.08	8.45	594.53
42	2	10/06/83	21:58	11783	64	1	5.0	TZ	371.36	359.02	875.16	0.00	875.16	905.25	0.00	905.25
43	2	10/06/83	22:08	11793	64	1	5.0	TZ	427.77	413.54	698.98	7.01	705.99	723.02	7.25	730.27
44	2	10/06/83	22:14	11803	64	1	5.0	TZ	402.97	389.57	275.46	0.00	275.46	284.93	0.00	284.93
45	2	10/06/83	23:12	11813	64	1	5.0	TZ	396.18	383.01	323.08	5.05	328.13	334.19	5.22	339.42
46	2	10/06/83	23:18	11823	64	1	5.0	TZ	409.01	395.41	300.72	4.89	305.61	311.07	5.06	316.12
47	2	10/06/83	23:35	11833	64	1	5.0	TZ	438.32	423.75	175.67	9.13	184.80	181.71	9.44	191.15
48	2	10/06/83	23:59	11863	64	1	5.0	TZ	418.38	404.47	573.64	4.78	578.42	593.37	4.94	598.32
49	2	10/07/83	0:05	11873	64	1	5.0	TZ	392.10	379.06	295.85	12.75	308.60	306.02	13.19	319.21
50	2	10/07/83	0:36	11903	64	1	5.0	TZ	414.43	400.65	591.17	7.24	598.41	611.50	7.49	618.99
51	2	10/07/83	0:43	11913	64	1	5.0	TZ	389.76	376.80	649.11	15.39	664.51	671.44	15.92	687.36
52	2	10/07/83	0:50	11923	64	1	5.0	TZ	415.27	401.46	722.42	16.86	739.28	747.27	17.44	764.71
53	2	10/07/83	0:55	9863	64	1	5.0	YK	355.54	343.72	165.94	30.94	196.88	171.65	32.00	203.65
54	2	10/07/83	1:02	11933	64	1	5.0	TZ	387.67	374.78	330.18	12.90	343.08	341.54	13.34	354.88

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
FOR USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
55	2	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	335.20	8.04	343.25	346.73	8.32	355.05
56	2	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	121.62	32.43	154.05	125.80	33.55	159.35
57	2	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	135.10	35.03	170.13	139.75	36.23	175.98
58	2	10/07/83	1:42	9923	64	1	5.0	YK	345.21	333.73	98.49	8.69	107.18	101.88	8.99	110.87
59	2	10/07/83	2:10	9953	64	1	5.0	YK	405.70	392.22	147.89	12.32	160.22	152.98	12.75	165.73
60	2	10/07/83	2:24	9973	64	1	5.0	TZ	336.18	325.00	428.35	8.92	437.27	443.08	9.23	452.31
61	2	10/19/83	22:16	11313	64	2	5.0	CH	300.21	290.23	16.66	0.00	16.66	17.23	0.00	17.23
62	2	10/19/83	22:22	11323	64	2	5.0	CH	430.82	416.50	27.85	0.00	27.85	28.81	0.00	28.81
63	2	10/19/83	22:28	11333	64	2	5.0	CH	451.82	436.80	221.33	0.00	221.33	228.94	0.00	228.94
64	2	10/19/83	23:06	11383	64	2	5.0	CH	391.02	378.02	74.16	0.00	74.16	76.72	0.00	76.72
65	2	10/19/83	23:06	11383	64	2	5.0	CH	391.02	378.02	217.38	0.00	217.38	224.86	0.00	224.86
66	2	10/19/83	23:21	11403	64	2	5.0	CH	399.78	386.49	522.78	17.51	540.29	540.76	18.11	558.87
67	2	10/19/83	23:47	11433	64	2	5.0	CH	384.82	372.02	1530.60	0.00	1530.60	1583.24	0.00	1583.24
68	2	10/19/83	23:53	11443	64	2	5.0	CH	426.05	411.88	1018.67	0.00	1018.67	1053.71	0.00	1053.71
69	2	10/19/83	23:59	11453	64	2	5.0	CH	278.31	269.05	700.66	0.00	700.66	724.76	0.00	724.76
70	2	10/20/83	0:06	11463	64	2	5.0	CH	286.72	277.19	240.65	0.00	240.65	248.93	0.00	248.93
71	2	10/20/83	0:14	11473	64	2	5.0	CH	411.44	397.76	296.52	0.00	296.52	306.71	0.00	306.71
72	2	10/20/83	0:22	11483	64	2	5.0	CH	288.34	278.75	485.54	3.47	489.01	502.24	3.59	505.83
73	2	10/20/83	0:29	11493	64	2	5.0	CH	408.18	394.61	244.99	0.00	244.99	253.41	0.00	253.41
74	2	10/20/83	0:32	11503	64	2	5.0	CH	415.07	401.27	238.51	0.00	238.51	246.72	0.00	246.72
75	2	10/20/83	1:00	11533	64	2	5.0	CH	354.47	342.68	149.52	5.64	155.16	154.66	5.84	160.50
76	2	10/20/83	1:07	11543	64	2	5.0	CH	367.10	354.89	125.31	2.72	128.03	129.62	2.82	132.43
77	2	10/20/83	2:02	11583	64	2	5.0	TZ	314.27	303.82	159.10	6.36	165.46	164.57	6.58	171.16
78	2	10/20/83	2:08	11593	64	2	5.0	TZ	307.57	297.34	149.56	0.00	149.56	154.70	0.00	154.70
79	2	10/20/83	2:35	11633	64	2	5.0	TZ	350.09	338.45	174.24	0.00	174.24	180.23	0.00	180.23
80	2	10/20/83	2:41	11643	64	2	5.0	TZ	381.80	369.10	162.39	0.00	162.39	167.98	0.00	167.98
81	2	10/20/83	2:51	11653	64	2	5.0	TZ	340.23	328.92	117.57	0.00	117.57	121.61	0.00	121.61
82	2	10/20/83	2:57	11663	64	2	5.0	TZ	395.85	382.69	146.52	5.05	151.57	151.56	5.23	156.78
83	2	10/20/83	3:04	11673	64	2	5.0	TZ	357.70	345.81	385.80	8.39	394.18	399.07	8.68	407.74
84	2	10/20/83	3:11	11683	64	2	5.0	TZ	645.57	624.10	435.28	6.20	441.47	450.25	6.41	456.65
85	2	10/20/83	3:28	11703	64	2	5.0	TZ	425.45	411.31	211.54	2.35	213.89	218.81	2.43	221.25
86	2	10/20/83	3:34	11713	64	2	5.0	TZ	387.83	374.94	260.42	0.00	260.42	269.38	0.00	269.38
87	2	10/20/83	3:41	11723	64	2	5.0	TZ	356.87	345.01	283.02	0.00	283.02	292.75	0.00	292.75
88	2	10/20/83	3:58	11743	64	2	5.0	TZ	337.70	326.47	355.34	2.96	358.30	367.56	3.06	370.63
89	2	10/20/83	4:04	11963	64	2	5.0	TZ	378.43	365.85	229.90	0.00	229.90	237.80	0.00	237.80
90	2	10/20/83	4:11	11973	64	2	5.0	TZ	450.61	435.63	195.29	0.00	195.29	202.01	0.00	202.01
91	2	10/20/83	4:17	11983	64	2	5.0	TZ	263.93	255.16	166.71	3.79	170.50	172.44	3.92	176.36
92	2	10/20/83	5:17	12063	64	2	5.0	TZ	346.10	334.59	352.50	2.89	355.39	364.62	2.99	367.61
93	2	10/20/83	5:23	12073	64	2	5.0	TZ	403.64	390.22	136.26	0.00	136.26	140.95	0.00	140.95
94	2	10/20/83	5:30	12083	64	2	5.0	TZ	384.49	371.71	257.48	0.00	257.48	266.34	0.00	266.34
95	2	10/20/83	5:37	12093	64	2	5.0	TZ	366.43	354.25	161.01	0.00	161.01	166.55	0.00	166.55
96	2	10/20/83	5:42	12103	64	2	5.0	TZ	357.84	345.94	106.19	0.00	106.19	109.85	0.00	109.85
97	2	10/20/83	20:09	12133	64	2	5.0	TZ	419.35	405.41	69.15	9.54	78.69	71.53	9.87	81.40
98	2	10/20/83	20:20	12143	64	2	5.0	TZ	386.91	374.05	43.94	0.00	43.94	45.45	0.00	45.45
99	2	10/20/83	20:26	12153	64	2	5.0	TZ	397.32	384.11	57.89	0.00	57.89	59.88	0.00	59.88
100	2	10/20/83	20:33	12163	64	2	5.0	TZ	393.15	380.08	61.04	7.63	68.68	63.14	7.89	71.04
101	2	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	91.64	2.62	94.26	94.79	2.71	97.50
102	2	10/20/83	20:50	12183	64	2	5.0	TZ	387.17	374.29	69.74	5.17	74.90	72.14	5.34	77.48
103	2	10/20/83	20:56	12193	64	2	5.0	TZ	391.50	378.48	84.29	0.00	84.29	87.19	0.00	87.19
104	2	10/20/83	21:32	12233	64	2	5.0	TZ	400.36	387.05	47.46	0.00	47.46	49.09	0.00	49.09
105	2	10/20/83	21:40	12243	64	2	5.0	TZ	397.91	384.68	30.16	0.00	30.16	31.19	0.00	31.19
106	2	10/20/83	22:01	12253	64	2	5.0	YK	357.81	345.91	36.33	11.18	47.51	37.58	11.56	49.15
107	2	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	119.03	13.23	132.26	123.13	13.68	136.81
108	2	10/20/83	23:01	12313	64	2	5.0	YK	422.50	408.46	28.40	0.00	28.40	29.38	0.00	29.38

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
FOR USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
109	2	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	161.35	7.33	168.68	166.89	7.59	174.48
110	2	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	224.91	17.11	242.02	232.64	17.70	250.34
111	2	10/20/83	23:29	12353	64	2	4.0	YK	215.34	208.18	74.30	23.22	97.52	76.86	24.02	100.88
112	3	10/05/83	20:54	6163	64	1	5.0	CH	405.75	392.26	2.46	0.00	2.46	2.55	0.00	2.55
113	3	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	5.27	0.00	5.27	5.45	0.00	5.45
114	3	10/05/83	23:58	6333	64	1	5.0	TZ	449.98	435.02	2.22	0.00	2.22	2.30	0.00	2.30
115	3	10/06/83	1:14	6393	64	1	5.0	CH	395.12	381.98	2.53	0.00	2.53	2.62	0.00	2.62
116	3	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	2.70	0.00	2.70	2.80	0.00	2.80
117	3	10/20/83	3:04	11673	64	2	5.0	TZ	357.70	345.81	8.39	0.00	8.39	8.68	0.00	8.68
118	3	10/20/83	3:11	11683	64	2	5.0	TZ	645.57	624.10	1.55	0.00	1.55	1.60	0.00	1.60
119	3	10/20/83	5:37	12093	64	2	5.0	TZ	366.43	354.25	2.73	0.00	2.73	2.82	0.00	2.82
120	3	10/20/83	5:42	12103	64	2	5.0	TZ	357.84	345.94	2.79	0.00	2.79	2.89	0.00	2.89
121	3	10/20/83	20:20	12143	64	2	5.0	TZ	386.91	374.05	2.58	0.00	2.58	2.67	0.00	2.67
122	3	10/20/83	20:26	12153	64	2	5.0	TZ	397.32	384.11	5.03	0.00	5.03	5.21	0.00	5.21
123	3	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	2.62	0.00	2.62	2.71	0.00	2.71
124	3	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	10.58	0.00	10.58	10.94	0.00	10.94
125	3	10/20/83	23:01	12313	64	2	5.0	YK	422.50	408.46	7.10	0.00	7.10	7.34	0.00	7.34
126	3	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	2.44	0.00	2.44	2.53	0.00	2.53
127	3	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	9.78	0.00	9.78	10.11	0.00	10.11
128	4	10/06/83	21:58	11783	64	1	5.0	TZ	371.36	359.02	0.00	0.00	0.00	0.00	0.00	0.00
129	10	10/05/83	20:26	6133	64	1	5.0	CH	355.25	343.44	0.00	5.63	5.63	0.00	5.82	5.82
130	10	10/05/83	20:35	6143	64	1	5.0	CH	387.83	374.94	0.00	2.58	2.58	0.00	2.67	2.67
131	10	10/05/83	20:54	6163	64	1	5.0	CH	405.75	392.26	0.00	2.46	2.46	0.00	2.55	2.55
132	10	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	0.00	2.64	2.64	0.00	2.73	2.73
133	10	10/05/83	22:01	6223	64	1	5.0	CH	413.29	399.55	0.00	12.10	12.10	0.00	12.51	12.51
134	10	10/05/83	22:08	6233	64	1	5.0	CH	430.54	416.23	0.00	4.65	4.65	0.00	4.81	4.81
135	10	10/05/83	23:12	6293	64	1	5.0	TZ	441.07	426.40	0.00	13.60	13.60	0.00	14.07	14.07
136	10	10/05/83	23:19	6303	64	1	5.0	TZ	405.25	391.78	0.00	9.87	9.87	0.00	10.21	10.21
137	10	10/05/83	23:28	6313	64	1	5.0	TZ	431.49	417.15	0.00	2.32	2.32	0.00	2.40	2.40
138	10	10/07/83	1:02	11933	64	1	5.0	TZ	387.67	374.78	0.00	5.16	5.16	0.00	5.34	5.34
139	10	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	0.00	2.68	2.68	0.00	2.77	2.77
140	10	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	0.00	10.01	10.01	0.00	10.35	10.35
141	10	10/07/83	1:42	9923	64	1	5.0	YK	345.21	333.73	0.00	8.69	8.69	0.00	8.99	8.99
142	10	10/07/83	2:10	9953	64	1	5.0	YK	405.70	392.22	0.00	9.86	9.86	0.00	10.20	10.20
143	10	10/07/83	2:24	9973	64	1	5.0	TZ	336.18	325.00	0.00	20.82	20.82	0.00	21.54	21.54
144	10	10/20/83	2:51	11653	64	2	5.0	TZ	340.23	328.92	0.00	2.94	2.94	0.00	3.04	3.04
145	10	10/20/83	20:20	12143	64	2	5.0	TZ	386.91	374.05	0.00	5.17	5.17	0.00	5.35	5.35
146	10	10/20/83	20:26	12153	64	2	5.0	TZ	397.32	384.11	0.00	5.03	5.03	0.00	5.21	5.21
147	10	10/20/83	20:33	12163	64	2	5.0	TZ	393.15	380.08	0.00	10.17	10.17	0.00	10.52	10.52
148	10	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	0.00	2.62	2.62	0.00	2.71	2.71
149	10	10/20/83	21:32	12233	64	2	5.0	TZ	400.36	387.05	0.00	2.50	2.50	0.00	2.58	2.58
150	10	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	0.00	5.29	5.29	0.00	5.47	5.47
151	10	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	0.00	7.33	7.33	0.00	7.59	7.59
152	10	10/20/83	23:16	12333	64	2	5.0	YK	421.50	407.48	0.00	2.37	2.37	0.00	2.45	2.45
153	10	10/20/83	23:22	12343	64	2	5.0	YK	428.46	414.22	0.00	4.67	4.67	0.00	4.83	4.83
154	10	10/20/83	23:29	12353	64	2	4.0	YK	215.34	208.18	0.00	4.64	4.64	0.00	4.80	4.80
155	13	10/05/83	20:26	6133	64	1	5.0	CH	355.25	343.44	0.00	36.59	36.59	0.00	37.85	37.85
156	13	10/05/83	20:44	6153	64	1	5.0	CH	402.99	389.60	0.00	2.48	2.48	0.00	2.57	2.57
157	13	10/05/83	21:53	6213	64	1	5.0	CH	356.85	344.98	0.00	2.80	2.80	0.00	2.90	2.90
158	13	10/05/83	22:01	6223	64	1	5.0	CH	413.29	399.55	0.00	9.68	9.68	0.00	10.01	10.01
159	13	10/05/83	22:08	6233	64	1	5.0	CH	430.54	416.23	0.00	32.52	32.52	0.00	33.64	33.64
160	13	10/05/83	23:12	6293	64	1	5.0	TZ	441.07	426.40	0.00	24.94	24.94	0.00	25.80	25.80
161	13	10/05/83	23:19	6303	64	1	5.0	TZ	405.25	391.78	0.00	2.47	2.47	0.00	2.55	2.55
162	13	10/06/83	0:11	6343	64	1	5.0	TZ	491.52	475.18	0.00	2.03	2.03	0.00	2.10	2.10

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
FOR USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
163	13	10/06/83	1:14	6393	64	1	5.0	CH	395.12	381.98	0.00	20.25	20.25	0.00	20.94	20.94
164	13	10/06/83	1:25	6403	64	1	5.0	CH	405.45	391.97	0.00	4.93	4.93	0.00	5.10	5.10
165	13	10/06/83	1:54	6433	64	1	5.0	CH	396.94	383.74	0.00	2.52	2.52	0.00	2.61	2.61
166	13	10/06/83	2:38	6483	64	1	5.0	CH	342.14	330.77	0.00	5.85	5.85	0.00	6.05	6.05
167	13	10/06/83	23:35	11833	64	1	5.0	TZ	438.32	423.75	0.00	4.56	4.56	0.00	4.72	4.72
168	13	10/07/83	0:55	9863	64	1	5.0	YK	355.54	343.72	0.00	2.81	2.81	0.00	2.91	2.91
169	13	10/07/83	1:02	11933	64	1	5.0	TZ	387.67	374.78	0.00	2.58	2.58	0.00	2.67	2.67
170	13	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	0.00	151.34	151.34	0.00	156.55	156.55
171	13	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	0.00	40.03	40.03	0.00	41.41	41.41
172	13	10/07/83	1:42	9923	64	1	5.0	YK	345.21	333.73	5.79	14.48	20.28	5.99	14.98	20.97
173	13	10/07/83	2:10	9953	64	1	5.0	YK	405.70	392.22	17.25	88.73	105.99	17.85	91.79	109.63
174	13	10/07/83	2:24	9973	64	1	5.0	TZ	336.18	325.00	5.95	20.82	26.77	6.15	21.54	27.69
175	13	10/19/83	22:16	11313	64	2	5.0	CH	300.21	290.23	0.00	3.33	3.33	0.00	3.45	3.45
176	13	10/20/83	2:02	11583	64	2	5.0	TZ	314.27	303.82	0.00	6.36	6.36	0.00	6.58	6.58
177	13	10/20/83	2:08	11593	64	2	5.0	TZ	307.57	297.34	0.00	6.50	6.50	0.00	6.73	6.73
178	13	10/20/83	2:51	11653	64	2	5.0	TZ	340.23	328.92	0.00	2.94	2.94	0.00	3.04	3.04
179	13	10/20/83	2:57	11663	64	2	5.0	TZ	395.85	382.69	0.00	2.53	2.53	0.00	2.61	2.61
180	13	10/20/83	20:09	12133	64	2	5.0	TZ	419.35	405.41	0.00	2.38	2.38	0.00	2.47	2.47
181	13	10/20/83	20:26	12153	64	2	5.0	TZ	397.32	384.11	0.00	2.52	2.52	0.00	2.60	2.60
182	13	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	0.00	2.62	2.62	0.00	2.71	2.71
183	13	10/20/83	20:50	12183	64	2	5.0	TZ	387.17	374.29	0.00	2.58	2.58	0.00	2.67	2.67
184	13	10/20/83	20:56	12193	64	2	5.0	TZ	391.50	378.48	0.00	10.22	10.22	0.00	10.57	10.57
185	13	10/20/83	21:40	12243	64	2	5.0	TZ	397.91	384.68	0.00	2.51	2.51	0.00	2.60	2.60
186	13	10/20/83	22:01	12253	64	2	5.0	YK	357.81	345.91	0.00	11.18	11.18	0.00	11.56	11.56
187	13	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	0.00	10.58	10.58	0.00	10.94	10.94
188	13	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	0.00	12.22	12.22	0.00	12.64	12.64
189	13	10/20/83	23:22	12343	64	2	5.0	YK	428.46	414.22	0.00	4.67	4.67	0.00	4.83	4.83
190	19	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	0.00	2.68	2.68	0.00	2.77	2.77
191	19	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	0.00	2.70	2.70	0.00	2.80	2.80
192	19	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	0.00	5.00	5.00	0.00	5.18	5.18
193	19	10/07/83	1:42	9923	64	1	5.0	YK	345.21	333.73	0.00	2.90	2.90	0.00	3.00	3.00
194	22	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	2.64	0.00	2.64	2.73	0.00	2.73
195	22	10/05/83	21:53	6213	64	1	5.0	CH	356.85	344.98	2.80	0.00	2.80	2.90	0.00	2.90
196	22	10/05/83	22:01	6223	64	1	5.0	CH	413.29	399.55	9.68	0.00	9.68	10.01	0.00	10.01
197	22	10/05/83	23:12	6293	64	1	5.0	TZ	441.07	426.40	2.27	0.00	2.27	2.35	0.00	2.35
198	22	10/06/83	0:27	6363	64	1	5.0	TZ	381.38	368.70	5.24	0.00	5.24	5.42	0.00	5.42
199	22	10/06/83	20:08	10013	64	1	5.0	TZ	405.20	391.73	2.47	0.00	2.47	2.55	0.00	2.55
200	22	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	2.68	0.00	2.68	2.77	0.00	2.77
201	22	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	5.41	0.00	5.41	5.59	0.00	5.59
202	22	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	12.51	0.00	12.51	12.94	0.00	12.94
203	22	10/07/83	2:10	9953	64	1	5.0	YK	405.70	392.22	7.39	0.00	7.39	7.65	0.00	7.65
204	22	10/07/83	2:24	9973	64	1	5.0	TZ	336.18	325.00	5.95	0.00	5.95	6.15	0.00	6.15
205	22	10/19/83	22:16	11313	64	2	5.0	CH	300.21	290.23	6.66	0.00	6.66	6.89	0.00	6.89
206	22	10/19/83	22:22	11323	64	2	5.0	CH	430.82	416.50	11.61	0.00	11.61	12.00	0.00	12.00
207	22	10/19/83	22:28	11333	64	2	5.0	CH	451.82	436.80	2.21	0.00	2.21	2.29	0.00	2.29
208	22	10/19/83	23:06	11383	64	2	5.0	CH	391.02	378.02	23.02	0.00	23.02	23.81	0.00	23.81
209	22	10/19/83	23:06	11383	64	2	5.0	CH	391.02	378.02	38.36	0.00	38.36	39.68	0.00	39.68
210	22	10/19/83	23:21	11403	64	2	5.0	CH	399.78	386.49	2.50	0.00	2.50	2.59	0.00	2.59
211	22	10/19/83	23:47	11433	64	2	5.0	CH	384.82	372.02	2.60	0.00	2.60	2.69	0.00	2.69
212	22	10/19/83	23:53	11443	64	2	5.0	CH	426.05	411.88	2.35	0.00	2.35	2.43	0.00	2.43
213	22	10/20/83	0:06	11463	64	2	5.0	CH	286.72	277.19	3.49	0.00	3.49	3.61	0.00	3.61
214	22	10/20/83	0:22	11483	64	2	5.0	CH	288.34	278.75	10.40	0.00	10.40	10.76	0.00	10.76
215	22	10/20/83	0:29	11493	64	2	5.0	CH	408.18	394.61	12.25	0.00	12.25	12.67	0.00	12.67
216	22	10/20/83	0:32	11503	64	2	5.0	CH	415.07	401.27	9.64	0.00	9.64	9.97	0.00	9.97

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
FOR USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
217	22	10/20/83	1:07	11543	64	2	5.0	CH	367.10	354.89	10.90	0.00	10.90	11.27	0.00	11.27
218	22	10/20/83	2:02	11583	64	2	5.0	TZ	314.27	303.82	6.36	0.00	6.36	6.58	0.00	6.58
219	22	10/20/83	2:51	11653	64	2	5.0	TZ	340.23	328.92	2.94	0.00	2.94	3.04	0.00	3.04
220	22	10/20/83	3:04	11673	64	2	5.0	TZ	357.70	345.81	2.80	0.00	2.80	2.89	0.00	2.89
221	22	10/20/83	3:11	11683	64	2	5.0	TZ	645.57	624.10	7.75	0.00	7.75	8.01	0.00	8.01
222	22	10/20/83	3:41	11723	64	2	5.0	TZ	356.87	345.01	2.80	0.00	2.80	2.90	0.00	2.90
223	22	10/20/83	3:58	11743	64	2	5.0	TZ	337.70	326.47	26.65	0.00	26.65	27.57	0.00	27.57
224	22	10/20/83	4:04	11963	64	2	5.0	TZ	378.43	365.85	21.14	0.00	21.14	21.87	0.00	21.87
225	22	10/20/83	4:11	11973	64	2	5.0	TZ	450.61	435.63	8.88	0.00	8.88	9.18	0.00	9.18
226	22	10/20/83	4:17	11983	64	2	5.0	TZ	263.93	255.16	11.37	0.00	11.37	11.76	0.00	11.76
227	22	10/20/83	5:17	12063	64	2	5.0	TZ	346.10	334.59	11.56	0.00	11.56	11.95	0.00	11.95
228	22	10/20/83	5:30	12083	64	2	5.0	TZ	384.49	371.71	31.21	0.00	31.21	32.28	0.00	32.28
229	22	10/20/83	5:37	12093	64	2	5.0	TZ	366.43	354.25	30.02	0.00	30.02	31.05	0.00	31.05
230	22	10/20/83	5:42	12103	64	2	5.0	TZ	357.84	345.94	27.95	0.00	27.95	28.91	0.00	28.91
231	22	10/20/83	20:09	12133	64	2	5.0	TZ	419.35	405.41	7.15	0.00	7.15	7.40	0.00	7.40
232	22	10/20/83	20:20	12143	64	2	5.0	TZ	386.91	374.05	5.17	0.00	5.17	5.35	0.00	5.35
233	22	10/20/83	20:26	12153	64	2	5.0	TZ	397.32	384.11	2.52	0.00	2.52	2.60	0.00	2.60
234	22	10/20/83	20:33	12163	64	2	5.0	TZ	393.15	380.08	0.00	2.54	2.54	0.00	2.63	2.63
235	22	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	2.62	0.00	2.62	2.71	0.00	2.71
236	22	10/20/83	21:40	12243	64	2	5.0	TZ	397.91	384.68	2.51	0.00	2.51	2.60	0.00	2.60
237	22	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	5.29	0.00	5.29	5.47	0.00	5.47
238	22	10/20/83	23:16	12333	64	2	5.0	YK	421.50	407.48	0.00	9.49	9.49	0.00	9.82	9.82
239	24	10/06/83	2:08	6453	64	1	5.0	CH	407.18	393.65	0.00	2.46	2.46	0.00	2.54	2.54
240	24	10/20/83	0:32	11503	64	2	5.0	CH	415.07	401.27	0.00	2.41	2.41	0.00	2.49	2.49
241	30	10/05/83	20:26	6133	64	1	5.0	CH	355.25	343.44	8.44	0.00	8.44	8.74	0.00	8.74
242	30	10/05/83	20:35	6143	64	1	5.0	CH	387.83	374.94	2.58	0.00	2.58	2.67	0.00	2.67
243	30	10/05/83	20:54	6163	64	1	5.0	CH	405.75	392.26	12.32	0.00	12.32	12.75	0.00	12.75
244	30	10/05/83	21:04	6173	64	1	5.0	CH	490.36	474.06	2.04	0.00	2.04	2.11	0.00	2.11
245	30	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	29.00	0.00	29.00	30.00	0.00	30.00
246	30	10/05/83	21:53	6213	64	1	5.0	CH	356.85	344.98	22.42	0.00	22.42	23.19	0.00	23.19
247	30	10/05/83	22:01	6223	64	1	5.0	CH	413.29	399.55	21.78	0.00	21.78	22.53	0.00	22.53
248	30	10/05/83	23:12	6293	64	1	5.0	TZ	441.07	426.40	2.27	0.00	2.27	2.35	0.00	2.35
249	30	10/05/83	23:19	6303	64	1	5.0	TZ	405.25	391.78	7.40	4.94	12.34	7.66	5.10	12.76
250	30	10/06/83	1:14	6393	64	1	5.0	CH	395.12	381.98	7.59	0.00	7.59	7.85	0.00	7.85
251	30	10/07/83	1:42	9923	64	1	5.0	YK	345.21	333.73	2.90	0.00	2.90	3.00	0.00	3.00
252	30	10/19/83	23:21	11403	64	2	5.0	CH	399.78	386.49	2.50	0.00	2.50	2.59	0.00	2.59
253	30	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	2.62	0.00	2.62	2.71	0.00	2.71
254	32	10/07/83	0:55	9863	64	1	5.0	YK	355.54	343.72	2.81	5.63	8.44	2.91	5.82	8.73
255	32	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	2.68	0.00	2.68	2.77	0.00	2.77
256	32	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	2.70	5.41	8.11	2.80	5.59	8.39
257	32	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	2.50	5.00	7.51	2.59	5.18	7.76
258	32	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	4.89	0.00	4.89	5.06	0.00	5.06
259	35	10/05/83	20:26	6133	64	1	5.0	CH	355.25	343.44	0.00	16.89	16.89	0.00	17.47	17.47
260	35	10/05/83	20:35	6143	64	1	5.0	CH	387.83	374.94	0.00	10.31	10.31	0.00	10.67	10.67
261	35	10/05/83	20:44	6153	64	1	5.0	CH	402.99	389.60	0.00	7.44	7.44	0.00	7.70	7.70
262	35	10/05/83	20:54	6163	64	1	5.0	CH	405.75	392.26	0.00	17.25	17.25	0.00	17.85	17.85
263	35	10/05/83	21:27	6193	64	1	5.0	CH	392.70	379.65	0.00	2.55	2.55	0.00	2.63	2.63
264	35	10/05/83	21:53	6213	64	1	5.0	CH	356.85	344.98	0.00	36.43	36.43	0.00	37.68	37.68
265	35	10/05/83	22:01	6223	64	1	5.0	CH	413.29	399.55	0.00	41.13	41.13	0.00	42.55	42.55
266	35	10/05/83	22:08	6233	64	1	5.0	CH	430.54	416.23	0.00	4.65	4.65	0.00	4.81	4.81
267	35	10/05/83	23:12	6293	64	1	5.0	TZ	441.07	426.40	6.80	61.22	68.02	7.04	63.32	70.36
268	35	10/05/83	23:19	6303	64	1	5.0	TZ	405.25	391.78	2.47	19.74	22.21	2.55	20.42	22.97
269	35	10/05/83	23:28	6313	64	1	5.0	TZ	431.49	417.15	0.00	30.13	30.13	0.00	31.16	31.16
270	35	10/06/83	0:18	6353	64	1	5.0	TZ	414.77	400.98	0.00	2.41	2.41	0.00	2.49	2.49

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
FOR USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
271	35	10/06/83	1:14	6393	64	1	5.0	CH	395.12	381.98	2.53	0.00	2.53	2.62	0.00	2.62
272	35	10/06/83	2:38	6483	64	1	5.0	CH	342.14	330.77	0.00	11.69	11.69	0.00	12.09	12.09
273	35	10/07/83	0:55	9863	64	1	5.0	YK	355.54	343.72	0.00	19.69	19.69	0.00	20.37	20.37
274	35	10/07/83	2:10	9953	64	1	5.0	YK	405.70	392.22	2.46	0.00	2.46	2.55	0.00	2.55
275	35	10/19/83	23:21	11403	64	2	5.0	CH	399.78	386.49	0.00	7.50	7.50	0.00	7.76	7.76
276	35	10/20/83	2:35	11633	64	2	5.0	TZ	350.09	338.45	0.00	2.86	2.86	0.00	2.95	2.95
277	35	10/20/83	2:41	11643	64	2	5.0	TZ	381.80	369.10	0.00	2.62	2.62	0.00	2.71	2.71
278	35	10/20/83	3:28	11703	64	2	5.0	TZ	425.45	411.31	0.00	4.70	4.70	0.00	4.86	4.86
279	35	10/20/83	20:20	12143	64	2	5.0	TZ	386.91	374.05	0.00	20.68	20.68	0.00	21.39	21.39
280	35	10/20/83	20:26	12153	64	2	5.0	TZ	397.32	384.11	0.00	20.14	20.14	0.00	20.83	20.83
281	35	10/20/83	20:33	12163	64	2	5.0	TZ	393.15	380.08	0.00	2.54	2.54	0.00	2.63	2.63
282	35	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	0.00	7.85	7.85	0.00	8.12	8.12
283	35	10/20/83	20:56	12193	64	2	5.0	TZ	391.50	378.48	0.00	2.55	2.55	0.00	2.64	2.64
284	35	10/20/83	21:40	12243	64	2	5.0	TZ	397.91	384.68	0.00	7.54	7.54	0.00	7.80	7.80
285	35	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	0.00	10.58	10.58	0.00	10.94	10.94
286	35	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	0.00	7.33	7.33	0.00	7.59	7.59
287	39	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	2.64	0.00	2.64	2.73	0.00	2.73
288	39	10/05/83	22:08	6233	64	1	5.0	CH	430.54	416.23	2.32	0.00	2.32	2.40	0.00	2.40
289	39	10/05/83	23:19	6303	64	1	5.0	TZ	405.25	391.78	2.47	0.00	2.47	2.55	0.00	2.55
290	39	10/06/83	0:18	6353	64	1	5.0	TZ	414.77	400.98	2.41	0.00	2.41	2.49	0.00	2.49
291	39	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	2.68	0.00	2.68	2.77	0.00	2.77
292	45	10/05/83	20:44	6153	64	1	5.0	CH	402.99	389.60	2.48	0.00	2.48	2.57	0.00	2.57
293	45	10/05/83	21:53	6213	64	1	5.0	CH	356.85	344.98	2.80	0.00	2.80	2.90	0.00	2.90
294	45	10/05/83	23:28	6313	64	1	5.0	TZ	431.49	417.15	2.32	0.00	2.32	2.40	0.00	2.40
295	45	10/06/83	1:14	6393	64	1	5.0	CH	395.12	381.98	2.53	0.00	2.53	2.62	0.00	2.62
296	45	10/06/83	2:38	6483	64	1	5.0	CH	342.14	330.77	2.92	0.00	2.92	3.02	0.00	3.02
297	45	10/06/83	21:33	10103	64	1	5.0	TZ	406.98	393.45	2.46	0.00	2.46	2.54	0.00	2.54
298	45	10/07/83	0:50	11923	64	1	5.0	TZ	415.27	401.46	2.41	0.00	2.41	2.49	0.00	2.49
299	45	10/07/83	0:55	9863	64	1	5.0	YK	355.54	343.72	2.81	0.00	2.81	2.91	0.00	2.91
300	45	10/07/83	1:02	11933	64	1	5.0	TZ	387.67	374.78	2.58	0.00	2.58	2.67	0.00	2.67
301	45	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	10.73	2.68	13.41	11.10	2.77	13.87
302	45	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	10.81	0.00	10.81	11.18	0.00	11.18
303	45	10/07/83	1:42	9923	64	1	5.0	YK	345.21	333.73	11.59	0.00	11.59	11.99	0.00	11.99
304	45	10/07/83	2:10	9953	64	1	5.0	YK	405.70	392.22	14.79	0.00	14.79	15.30	0.00	15.30
305	45	10/07/83	2:24	9973	64	1	5.0	TZ	336.18	325.00	2.97	2.97	5.95	3.08	3.08	6.15
306	45	10/20/83	3:58	11743	64	2	5.0	TZ	337.70	326.47	5.92	0.00	5.92	6.13	0.00	6.13
307	45	10/20/83	20:33	12163	64	2	5.0	TZ	393.15	380.08	2.54	0.00	2.54	2.63	0.00	2.63
308	45	10/20/83	20:39	12173	64	2	5.0	TZ	381.94	369.24	7.85	0.00	7.85	8.12	0.00	8.12
309	45	10/20/83	20:56	12193	64	2	5.0	TZ	391.50	378.48	2.55	0.00	2.55	2.64	0.00	2.64
310	45	10/20/83	21:40	12243	64	2	5.0	TZ	397.91	384.68	5.03	0.00	5.03	5.20	0.00	5.20
311	45	10/20/83	22:11	12263	64	2	5.0	YK	378.04	365.48	15.87	0.00	15.87	16.42	0.00	16.42
312	45	10/20/83	23:01	12313	64	2	5.0	YK	422.50	408.46	9.47	0.00	9.47	9.79	0.00	9.79
313	45	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	4.89	0.00	4.89	5.06	0.00	5.06
314	45	10/20/83	23:09	12323	64	2	5.0	YK	409.06	395.46	12.22	0.00	12.22	12.64	0.00	12.64
315	80	10/07/83	0:55	9863	64	1	5.0	YK	355.54	343.72	0.00	5.63	5.63	0.00	5.82	5.82
316	80	10/07/83	1:02	11933	64	1	5.0	TZ	387.67	374.78	0.00	5.16	5.16	0.00	5.34	5.34
317	80	10/07/83	1:03	9873	64	1	5.0	YK	372.91	360.51	0.00	10.73	10.73	0.00	11.10	11.10
318	80	10/07/83	1:08	9883	64	1	5.0	YK	370.02	357.71	0.00	10.81	10.81	0.00	11.18	11.18
319	80	10/07/83	1:15	9893	64	1	5.0	YK	399.70	386.41	0.00	2.50	2.50	0.00	2.59	2.59
320	80	10/07/83	2:24	9973	64	1	5.0	TZ	336.18	325.00	0.00	2.97	2.97	0.00	3.08	3.08
321	80	10/20/83	5:17	12063	64	2	5.0	TZ	346.10	334.59	0.00	2.89	2.89	0.00	2.99	2.99
322	80	10/20/83	20:20	12143	64	2	5.0	TZ	386.91	374.05	0.00	0.00	0.00	0.00	0.00	0.00
323	110	10/05/83	21:40	6203	64	1	5.0	CH	379.30	366.69	5.27	0.00	5.27	5.45	0.00	5.45

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH (TAXON=35) LENGTH DATA,
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64).

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1	30	10/05/83	19:52	6113	38	CH	85
2	30	10/05/83	19:52	6113	38	CH	90
3	30	10/05/83	19:52	6113	38	CH	99
4	30	10/05/83	20:26	6133	37	CH	89
5	30	10/05/83	20:26	6133	37	CH	95
6	30	10/05/83	20:26	6133	37	CH	103
7	30	10/05/83	20:54	6163	36	CH	80
8	30	10/05/83	20:54	6163	36	CH	86
9	30	10/05/83	20:54	6163	36	CH	99
10	30	10/05/83	20:54	6163	36	CH	101
11	30	10/05/83	20:54	6163	36	CH	115
12	30	10/05/83	21:53	6213	34	CH	107
13	30	10/05/83	21:53	6213	34	CH	118
14	30	10/05/83	22:57	6273	31	TZ	91
15	30	10/05/83	22:57	6273	31	TZ	99
16	30	10/05/83	23:04	6283	31	TZ	90
17	30	10/05/83	23:04	6283	31	TZ	90
18	30	10/05/83	23:04	6283	31	TZ	97
19	30	10/05/83	23:04	6283	31	TZ	107
20	30	10/05/83	23:04	6283	31	TZ	111
21	30	10/05/83	23:12	6293	31	TZ	82
22	30	10/05/83	23:19	6303	30	TZ	100
23	30	10/05/83	23:19	6303	30	TZ	106
24	30	10/05/83	23:19	6303	30	TZ	109
25	30	10/05/83	23:19	6303	30	TZ	116
26	30	10/06/83	2:28	6473	36	CH	85
27	30	10/06/83	2:45	6493	37	CH	72
28	30	10/06/83	2:45	6493	37	CH	81
29	30	10/06/83	2:45	6493	37	CH	91
30	30	10/06/83	2:57	6503	38	CH	96
31	30	10/06/83	2:57	6503	38	CH	97
32	30	10/06/83	2:57	6503	38	CH	99
33	30	10/06/83	2:57	6503	38	CH	100
34	30	10/06/83	2:57	6503	38	CH	105
35	30	10/19/83	23:21	11403	36	CH	102
36	30	10/20/83	20:39	12173	25	TZ	120
37	35	10/05/83	22:27	6253	34	CH	65
38	35	10/05/83	23:12	6293	31	TZ	72
39	35	10/05/83	23:12	6293	31	TZ	85
40	35	10/05/83	23:19	6303	30	TZ	82
41	35	10/06/83	1:14	6393	34	CH	69

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1	1	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
2	1	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
3	1	18OCT83	0:36	1157	18	2	10	CH	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
4	1	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.00	0.44	0.44	0.00	0.67	0.67
5	1	20OCT83	21:34	1186	18	2	5	TZ	1005.84	660.84	0.00	1.99	1.99	0.00	3.03	3.03
6	2	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	2.38	0.00	2.38	3.62	0.00	3.62
7	2	06OCT83	19:52	1084	18	1	5	TZ	1066.80	700.89	5.62	0.94	6.56	8.56	1.43	9.99
8	2	06OCT83	20:38	1086	18	1	10	TZ	2164.08	1421.80	16.64	0.00	16.64	25.32	0.00	25.32
9	2	06OCT83	21:21	1087	18	1	5	TZ	1097.28	720.91	21.87	0.00	21.87	33.29	0.00	33.29
10	2	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	8.32	0.00	8.32	12.66	0.00	12.66
11	2	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	2.24	0.00	2.24	3.40	0.00	3.40
12	2	06OCT83	22:46	1090	18	1	10	TZ	2316.48	1521.93	3.45	0.00	3.45	5.26	0.00	5.26
13	2	06OCT83	23:10	1091	18	1	10	TZ	2377.44	1561.98	10.52	0.84	11.36	16.01	1.28	17.29
14	2	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	7.81	0.00	7.81	11.89	0.00	11.89
15	2	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	2.47	0.00	2.47	3.76	0.00	3.76
16	2	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	9.62	2.62	12.25	14.65	3.99	18.64
17	2	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	26.43	3.65	30.07	40.23	5.55	45.78
18	2	07OCT83	3:53	1098	18	1	5	TZ	1188.72	780.99	8.41	0.00	8.41	12.80	0.00	12.80
19	2	07OCT83	5:02	1101	18	1	10	TZ	1706.88	1121.42	4.69	1.17	5.86	7.13	1.78	8.92
20	2	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	4.00	3.20	7.20	6.09	4.87	10.96
21	2	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	6.91	0.00	6.91	10.51	0.00	10.51
22	2	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	1.75	0.00	1.75	2.66	0.00	2.66
23	2	08OCT83	0:08	1107	18	1	5	TZ	1310.64	861.09	2.29	0.00	2.29	3.48	0.00	3.48
24	2	08OCT83	0:32	1108	18	1	5	TZ	1066.80	700.89	5.62	0.94	6.56	8.56	1.43	9.99
25	2	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	1.60	0.80	2.40	2.44	1.22	3.65
26	2	08OCT83	1:57	1111	18	1	10	TZ	2651.76	1742.21	5.66	1.89	7.54	8.61	2.87	11.48
27	2	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	4.34	2.89	7.24	6.61	4.41	11.02
28	2	08OCT83	3:51	1113	18	1	5	CH	1188.72	780.99	1.68	0.84	2.52	2.56	1.28	3.84
29	2	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	1.75	0.00	1.75	2.66	0.00	2.66
30	2	08OCT83	20:16	1117	18	1	5	CH	1219.20	801.01	5.74	1.64	7.38	8.74	2.50	11.24
31	2	08OCT83	20:45	1118	18	1	10	CH	2621.28	1722.18	0.76	0.76	1.53	1.16	1.16	2.32
32	2	08OCT83	21:11	1119	18	1	10	CH	2590.80	1702.16	0.77	1.93	2.70	1.17	2.94	4.11
33	2	08OCT83	21:44	1120	18	1	5	CH	1280.16	841.07	0.78	0.78	1.56	1.19	1.19	2.38
34	2	08OCT83	22:03	1121	18	1	5	CH	1341.12	881.12	1.49	0.00	1.49	2.27	0.00	2.27
35	2	08OCT83	22:22	1122	18	1	5	CH	1219.20	801.01	3.28	0.00	3.28	4.99	0.00	4.99
36	2	08OCT83	23:42	1125	18	1	10	CH	2346.96	1541.95	0.85	0.85	1.70	1.30	1.30	2.59
37	2	09OCT83	0:15	1126	18	1	10	CH	2468.88	1622.05	0.81	0.00	0.81	1.23	0.00	1.23
38	2	09OCT83	1:09	1128	18	1	5	CH	1158.24	760.96	0.86	0.86	1.73	1.31	1.31	2.63
39	2	17OCT83	21:47	1131	18	2	5	CH	1280.16	841.07	0.78	0.00	0.78	1.19	0.00	1.19
40	2	17OCT83	22:10	1153	18	2	5	CH	1341.12	881.12	0.75	0.00	0.75	1.13	0.00	1.13
41	2	17OCT83	22:49	1154	18	2	10	CH	2682.24	1762.23	1.86	0.75	2.61	2.84	1.13	3.97
42	2	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	3.02	0.00	3.02	4.59	0.00	4.59
43	2	18OCT83	0:10	1156	18	2	10	CH	2468.88	1622.05	0.41	0.00	0.41	0.62	0.00	0.62
44	2	18OCT83	0:36	1157	18	2	10	CH	2255.52	1481.88	0.89	0.44	1.33	1.35	0.67	2.02
45	2	18OCT83	1:04	1158	18	2	5	CH	1219.20	801.01	1.64	0.00	1.64	2.50	0.00	2.50
46	2	18OCT83	1:29	1159	18	2	5	CH	1310.64	861.09	4.58	0.76	5.34	6.97	1.16	8.13
47	2	18OCT83	19:08	1160	18	2	5	CH	1463.04	961.22	0.68	0.00	0.68	1.04	0.00	1.04
48	2	18OCT83	19:26	1161	18	2	5	CH	1524.00	1001.27	0.66	0.00	0.66	1.00	0.00	1.00
49	2	18OCT83	20:06	1162	18	2	10	CH	2346.96	1541.95	1.70	0.00	1.70	2.59	0.00	2.59
50	2	18OCT83	21:14	1164	18	2	10	TZ	2438.40	1602.03	0.82	0.00	0.82	1.25	0.00	1.25
51	2	18OCT83	21:58	1165	18	2	5	TZ	1341.12	881.12	23.86	1.49	25.35	36.32	2.27	38.59
52	2	18OCT83	22:13	1166	18	2	10	TZ	2255.52	1481.88	4.43	0.89	5.32	6.75	1.35	8.10
53	2	18OCT83	22:38	1167	18	2	5	TZ	1188.72	780.99	8.41	0.00	8.41	12.80	0.00	12.80

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
54	2	18OCT83	23:02	1168	18	2	10	TZ	2895.60	1902.41	6.22	0.69	6.91	9.46	1.05	10.51
55	2	18OCT83	23:21	1169	18	2	10	TZ	2468.88	1622.05	15.39	0.41	15.80	23.43	0.62	24.04
56	2	18OCT83	23:45	1170	18	2	5	TZ	1249.68	821.04	4.00	0.00	4.00	6.09	0.00	6.09
57	2	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	6.12	4.45	10.57	9.31	6.77	16.08
58	2	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	12.70	3.70	16.40	19.33	5.64	24.97
59	2	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	11.61	0.00	11.61	17.67	0.00	17.67
60	2	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	13.12	2.19	15.31	19.97	3.33	23.30
61	2	19OCT83	22:39	83	18	2	5	TZ	1310.64	861.09	1.53	0.00	1.53	2.32	0.00	2.32
62	2	19OCT83	22:58	84	18	2	10	TZ	2529.84	1662.10	0.00	1.19	1.19	0.00	1.80	1.80
63	2	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.00	6.21	6.21	0.00	9.45	9.45
64	2	20OCT83	1:20	87	18	2	10	TZ	1584.96	1041.32	0.00	0.63	0.63	0.00	0.96	0.96
65	2	20OCT83	2:03	89	18	2	5	TZ	822.96	540.68	9.72	1.22	10.94	14.80	1.85	16.65
66	2	20OCT83	2:23	90	18	2	10	TZ	1889.76	1241.57	1.06	0.53	1.59	1.61	0.81	2.42
67	2	20OCT83	19:23	1181	18	2	10	TZ	2651.76	1742.21	3.02	1.13	4.15	4.59	1.72	6.31
68	2	20OCT83	20:01	1182	18	2	10	TZ	2316.48	1521.93	2.59	2.59	5.18	3.94	3.94	7.88
69	2	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	1.99	0.00	1.99	3.03	0.00	3.03
70	2	20OCT83	20:53	1184	18	2	10	TZ	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
71	2	20OCT83	21:21	1185	18	2	5	TZ	1005.84	660.84	1.99	0.00	1.99	3.03	0.00	3.03
72	2	20OCT83	21:34	1186	18	2	5	TZ	1005.84	660.84	0.99	0.00	0.99	1.51	0.00	1.51
73	3	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.46	0.00	0.46	0.70	0.00	0.70
74	3	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	0.91	0.00	0.91	1.39	0.00	1.39
75	3	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.80	0.00	0.80	1.22	0.00	1.22
76	3	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
77	3	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	1.13	0.00	1.13	1.72	0.00	1.72
78	3	18OCT83	0:10	1156	18	2	10	CH	2468.88	1622.05	2.03	0.00	2.03	3.08	0.00	3.08
79	3	18OCT83	0:36	1157	18	2	10	CH	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
80	3	18OCT83	1:04	1158	18	2	5	CH	1219.20	801.01	1.64	0.00	1.64	2.50	0.00	2.50
81	3	18OCT83	19:26	1161	18	2	5	CH	1524.00	1001.27	1.31	0.00	1.31	2.00	0.00	2.00
82	3	18OCT83	20:06	1162	18	2	10	CH	2346.96	1541.95	0.43	0.00	0.43	0.65	0.00	0.65
83	3	18OCT83	23:21	1169	18	2	10	TZ	2468.88	1622.05	0.41	0.00	0.41	0.62	0.00	0.62
84	3	18OCT83	23:45	1170	18	2	5	TZ	1249.68	821.04	0.80	0.00	0.80	1.22	0.00	1.22
85	3	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	4.45	0.00	4.45	6.77	0.00	6.77
86	3	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	2.12	0.00	2.12	3.22	0.00	3.22
87	3	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	0.50	0.00	0.50	0.77	0.00	0.77
88	3	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
89	3	20OCT83	1:20	87	18	2	10	TZ	1584.96	1041.32	1.89	0.00	1.89	2.88	0.00	2.88
90	3	20OCT83	2:23	90	18	2	10	TZ	1889.76	1241.57	0.53	0.00	0.53	0.81	0.00	0.81
91	3	20OCT83	19:23	1181	18	2	10	TZ	2651.76	1742.21	1.51	0.00	1.51	2.30	0.00	2.30
92	3	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	0.99	0.00	0.99	1.51	0.00	1.51
93	3	20OCT83	20:53	1184	18	2	10	TZ	2255.52	1481.88	1.33	0.00	1.33	2.02	0.00	2.02
94	3	20OCT83	21:58	1187	18	2	5	TZ	1280.16	841.07	0.78	0.00	0.78	1.19	0.00	1.19
95	4	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.40	0.00	0.40	0.61	0.00	0.61
96	4	08OCT83	21:11	1119	18	1	10	CH	2590.80	1702.16	0.77	0.00	0.77	1.17	0.00	1.17
97	4	20OCT83	21:21	1185	18	2	5	TZ	1005.84	660.84	0.99	0.00	0.99	1.51	0.00	1.51
98	4	20OCT83	21:58	1187	18	2	5	TZ	1280.16	841.07	0.78	0.00	0.78	1.19	0.00	1.19
99	10	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	0.00	0.95	0.95	0.00	1.45	1.45
100	10	06OCT83	19:52	1084	18	1	5	TZ	1066.80	700.89	0.00	1.87	1.87	0.00	2.85	2.85
101	10	06OCT83	20:38	1086	18	1	10	TZ	2164.08	1421.80	0.00	3.70	3.70	0.00	5.63	5.63
102	10	06OCT83	21:21	1087	18	1	5	TZ	1097.28	720.91	0.00	1.82	1.82	0.00	2.77	2.77
103	10	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.00	1.39	1.39	0.00	2.11	2.11
104	10	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	0.00	1.49	1.49	0.00	2.27	2.27
105	10	06OCT83	22:46	1090	18	1	10	TZ	2316.48	1521.93	0.00	5.61	5.61	0.00	8.54	8.54
106	10	06OCT83	23:10	1091	18	1	10	TZ	2377.44	1561.98	0.00	1.68	1.68	0.00	2.56	2.56

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
107	10	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	0.00	3.12	3.12	0.00	4.76	4.76
108	10	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	0.00	3.88	3.88	0.00	5.91	5.91
109	10	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	0.00	1.82	1.82	0.00	2.77	2.77
110	10	07OCT83	4:22	1099	18	1	5	TZ	1097.28	720.91	0.00	0.91	0.91	0.00	1.39	1.39
111	10	07OCT83	4:39	1100	18	1	5	TZ	1005.84	660.84	0.00	0.99	0.99	0.00	1.51	1.51
112	10	07OCT83	5:02	1101	18	1	10	TZ	1706.88	1121.42	0.00	1.17	1.17	0.00	1.78	1.78
113	10	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.00	13.60	13.60	0.00	20.71	20.71
114	10	07OCT83	22:16	1104	18	1	10	TZ	2316.48	1521.93	0.00	0.43	0.43	0.00	0.66	0.66
115	10	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	0.00	5.18	5.18	0.00	7.88	7.88
116	10	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.00	0.87	0.87	0.00	1.33	1.33
117	10	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	0.00	6.06	6.06	0.00	9.22	9.22
118	10	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	0.00	16.40	16.40	0.00	24.97	24.97
119	10	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.00	0.44	0.44	0.00	0.67	0.67
120	10	20OCT83	0:25	88	18	2	5	TZ	883.92	580.74	0.00	2.26	2.26	0.00	3.44	3.44
121	10	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	0.00	0.99	0.99	0.00	1.51	1.51
122	13	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	0.00	76.55	76.55	0.00	116.52	116.52
123	13	06OCT83	19:52	1084	18	1	5	TZ	1066.80	700.89	0.00	14.06	14.06	0.00	21.40	21.40
124	13	06OCT83	20:22	1085	18	1	5	TZ	1036.32	680.86	0.00	27.02	27.02	0.00	41.12	41.12
125	13	06OCT83	20:38	1086	18	1	10	TZ	2164.08	1421.80	0.00	57.30	57.30	0.00	87.21	87.21
126	13	06OCT83	21:21	1087	18	1	5	TZ	1097.28	720.91	0.00	87.49	87.49	0.00	133.16	133.16
127	13	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.00	77.63	77.63	0.00	118.16	118.16
128	13	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	0.00	51.45	51.45	0.00	78.31	78.31
129	13	06OCT83	22:46	1090	18	1	10	TZ	2316.48	1521.93	0.00	40.58	40.58	0.00	61.76	61.76
130	13	06OCT83	23:10	1091	18	1	10	TZ	2377.44	1561.98	0.00	44.59	44.59	0.00	67.86	67.86
131	13	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	0.00	114.05	114.05	0.00	173.59	173.59
132	13	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	0.00	83.61	83.61	0.00	127.26	127.26
133	13	07OCT83	1:22	1095	18	1	10	TZ	2225.04	1461.85	0.00	20.67	20.67	0.00	31.47	31.47
134	13	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	0.00	80.93	80.93	0.00	123.18	123.18
135	13	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	0.00	295.28	295.28	0.00	449.43	449.43
136	13	07OCT83	3:53	1098	18	1	5	TZ	1188.72	780.99	3.36	0.00	3.36	5.12	0.00	5.12
137	13	07OCT83	4:22	1099	18	1	5	TZ	1097.28	720.91	0.00	1.82	1.82	0.00	2.77	2.77
138	13	07OCT83	4:39	1100	18	1	5	TZ	1005.84	660.84	0.00	16.90	16.90	0.00	25.72	25.72
139	13	07OCT83	5:02	1101	18	1	10	TZ	1706.88	1121.42	0.00	54.49	54.49	0.00	82.93	82.93
140	13	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.00	124.83	124.83	0.00	190.00	190.00
141	13	07OCT83	22:16	1104	18	1	10	TZ	2316.48	1521.93	0.00	0.86	0.86	0.00	1.31	1.31
142	13	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	0.00	5.18	5.18	0.00	7.88	7.88
143	13	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.00	7.87	7.87	0.00	11.98	11.98
144	13	08OCT83	0:08	1107	18	1	5	TZ	1310.64	861.09	0.00	15.26	15.26	0.00	23.23	23.23
145	13	08OCT83	0:32	1108	18	1	5	TZ	1066.80	700.89	0.00	7.50	7.50	0.00	11.41	11.41
146	13	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	0.00	3.20	3.20	0.00	4.87	4.87
147	13	08OCT83	1:57	1111	18	1	10	TZ	2651.76	1742.21	0.00	3.39	3.39	0.00	5.17	5.17
148	13	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	0.00	16.40	16.40	0.00	24.97	24.97
149	13	08OCT83	3:51	1113	18	1	5	CH	1188.72	780.99	0.00	8.41	8.41	0.00	12.80	12.80
150	13	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	0.00	2.19	2.19	0.00	3.33	3.33
151	13	08OCT83	21:11	1119	18	1	10	CH	2590.80	1702.16	0.00	0.39	0.39	0.00	0.59	0.59
152	13	08OCT83	22:03	1121	18	1	5	CH	1341.12	881.12	0.75	0.00	0.75	1.13	0.00	1.13
153	13	08OCT83	23:24	1124	18	1	5	CH	1219.20	801.01	0.00	0.82	0.82	0.00	1.25	1.25
154	13	08OCT83	23:42	1125	18	1	10	CH	2346.96	1541.95	0.00	0.43	0.43	0.00	0.65	0.65
155	13	09OCT83	0:15	1126	18	1	10	CH	2468.88	1622.05	0.41	0.41	0.81	0.62	0.62	1.23
156	13	09OCT83	0:43	1127	18	1	10	CH	2377.44	1561.98	0.00	1.26	1.26	0.00	1.92	1.92
157	13	17OCT83	19:51	1129	18	2	10	CH	2377.44	1561.98	0.00	2.52	2.52	0.00	3.84	3.84
158	13	17OCT83	20:51	1130	18	2	5	CH	1249.68	821.04	0.00	1.60	1.60	0.00	2.44	2.44
159	13	17OCT83	21:47	1131	18	2	5	CH	1280.16	841.07	0.00	1.56	1.56	0.00	2.38	2.38

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
160	13	18OCT83	0:10	1156	18	2	10	CH	2468.88	1622.05	0.00	0.41	0.41	0.00	0.62	0.62
161	13	18OCT83	20:06	1162	18	2	10	CH	2346.96	1541.95	0.00	0.43	0.43	0.00	0.65	0.65
162	13	18OCT83	20:54	1163	18	2	5	CH	1158.24	760.96	0.86	7.77	8.63	1.31	11.83	13.14
163	13	18OCT83	21:14	1164	18	2	10	TZ	2438.40	1602.03	0.00	6.56	6.56	0.00	9.99	9.99
164	13	18OCT83	22:38	1167	18	2	5	TZ	1188.72	780.99	0.00	41.22	41.22	0.00	62.74	62.74
165	13	18OCT83	23:02	1168	18	2	10	TZ	2895.60	1902.41	0.00	0.35	0.35	0.00	0.53	0.53
166	13	18OCT83	23:21	1169	18	2	10	TZ	2468.88	1622.05	0.00	0.41	0.41	0.00	0.62	0.62
167	13	18OCT83	23:45	1170	18	2	5	TZ	1249.68	821.04	0.00	1.60	1.60	0.00	2.44	2.44
168	13	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	0.00	29.47	29.47	0.00	44.86	44.86
169	13	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	0.00	73.55	73.55	0.00	111.95	111.95
170	13	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	0.00	108.52	108.52	0.00	165.18	165.18
171	13	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	0.00	51.40	51.40	0.00	78.23	78.23
172	13	19OCT83	22:39	83	18	2	5	TZ	1310.64	861.09	0.00	9.92	9.92	0.00	15.10	15.10
173	13	19OCT83	22:58	84	18	2	10	TZ	2529.84	1662.10	0.00	46.64	46.64	0.00	70.99	70.99
174	13	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.00	6.21	6.21	0.00	9.45	9.45
175	13	20OCT83	0:25	88	18	2	5	TZ	883.92	580.74	0.00	23.76	23.76	0.00	36.16	36.16
176	13	20OCT83	1:20	87	18	2	10	TZ	1584.96	1041.32	0.00	0.63	0.63	0.00	0.96	0.96
177	13	20OCT83	2:03	89	18	2	5	TZ	822.96	540.68	0.00	17.01	17.01	0.00	25.89	25.89
178	13	20OCT83	2:23	90	18	2	10	TZ	1889.76	1241.57	0.00	3.18	3.18	0.00	4.83	4.83
179	13	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	0.00	0.99	0.99	0.00	1.51	1.51
180	13	20OCT83	20:53	1184	18	2	10	TZ	2255.52	1481.88	0.00	0.89	0.89	0.00	1.35	1.35
181	13	20OCT83	21:21	1185	18	2	5	TZ	1005.84	660.84	0.00	7.95	7.95	0.00	12.11	12.11
182	13	20OCT83	21:34	1186	18	2	5	TZ	1005.84	660.84	0.00	2.98	2.98	0.00	4.54	4.54
183	13	20OCT83	21:58	1187	18	2	5	TZ	1280.16	841.07	0.00	1.56	1.56	0.00	2.38	2.38
184	19	07OCT83	5:02	1101	18	1	10	TZ	1706.88	1121.42	0.00	1.17	1.17	0.00	1.78	1.78
185	19	18OCT83	20:54	1163	18	2	5	CH	1158.24	760.96	0.00	0.86	0.86	0.00	1.31	1.31
186	22	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	1.56	0.00	1.56	2.38	0.00	2.38
187	22	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.40	0.00	0.40	0.61	0.00	0.61
188	22	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	0.38	0.00	0.38	0.57	0.00	0.57
189	22	18OCT83	0:10	1156	18	2	10	CH	2468.88	1622.05	1.22	0.00	1.22	1.85	0.00	1.85
190	22	18OCT83	1:04	1158	18	2	5	CH	1219.20	801.01	0.82	0.00	0.82	1.25	0.00	1.25
191	22	18OCT83	19:08	1160	18	2	5	CH	1463.04	961.22	0.68	0.00	0.68	1.04	0.00	1.04
192	22	18OCT83	19:26	1161	18	2	5	CH	1524.00	1001.27	0.66	0.00	0.66	1.00	0.00	1.00
193	22	18OCT83	23:02	1168	18	2	10	TZ	2895.60	1902.41	0.35	0.00	0.35	0.53	0.00	0.53
194	22	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	2.78	0.00	2.78	4.23	0.00	4.23
195	22	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	3.70	0.00	3.70	5.64	0.00	5.64
196	22	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	2.02	0.00	2.02	3.07	0.00	3.07
197	22	19OCT83	22:39	83	18	2	5	TZ	1310.64	861.09	0.76	0.00	0.76	1.16	0.00	1.16
198	22	20OCT83	19:23	1181	18	2	10	TZ	2651.76	1742.21	0.38	0.00	0.38	0.57	0.00	0.57
199	22	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	0.99	0.00	0.99	1.51	0.00	1.51
200	22	20OCT83	21:21	1185	18	2	5	TZ	1005.84	660.84	0.99	0.00	0.99	1.51	0.00	1.51
201	29	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.00	0.40	0.40	0.00	0.61	0.61
202	30	06OCT83	20:22	1085	18	1	5	TZ	1036.32	680.86	0.00	0.96	0.96	0.00	1.47	1.47
203	30	06OCT83	20:38	1086	18	1	10	TZ	2164.08	1421.80	0.46	0.46	0.92	0.70	0.70	1.41
204	30	06OCT83	21:21	1087	18	1	5	TZ	1097.28	720.91	5.47	0.00	5.47	8.32	0.00	8.32
205	30	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	4.16	0.92	5.08	6.33	1.41	7.74
206	30	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	2.24	0.75	2.98	3.40	1.13	4.54
207	30	06OCT83	22:46	1090	18	1	10	TZ	2316.48	1521.93	18.99	0.43	19.43	28.91	0.66	29.57
208	30	06OCT83	23:10	1091	18	1	10	TZ	2377.44	1561.98	13.04	0.42	13.46	19.85	0.64	20.49
209	30	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	7.03	0.00	7.03	10.70	0.00	10.70
210	30	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	15.17	3.53	18.70	23.09	5.37	28.46
211	30	07OCT83	1:22	1095	18	1	10	TZ	2225.04	1461.85	0.45	0.00	0.45	0.68	0.00	0.68
212	30	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	2.62	0.87	3.50	3.99	1.33	5.33

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
213	30	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	5.47	0.00	5.47	8.32	0.00	8.32
214	30	07OCT83	3:53	1098	18	1	5	TZ	1188.72	780.99	2.52	0.00	2.52	3.84	0.00	3.84
215	30	07OCT83	4:22	1099	18	1	5	TZ	1097.28	720.91	1.82	0.00	1.82	2.77	0.00	2.77
216	30	07OCT83	5:02	1101	18	1	10	TZ	1706.88	1121.42	9.96	0.59	10.55	15.16	0.89	16.05
217	30	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	7.20	0.00	7.20	10.96	0.00	10.96
218	30	07OCT83	22:16	1104	18	1	10	TZ	2316.48	1521.93	0.86	0.00	0.86	1.31	0.00	1.31
219	30	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	3.45	0.00	3.45	5.26	0.00	5.26
220	30	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	8.31	0.00	8.31	12.65	0.00	12.65
221	30	08OCT83	0:08	1107	18	1	5	TZ	1310.64	861.09	2.29	1.53	3.81	3.48	2.32	5.81
222	30	08OCT83	0:32	1108	18	1	5	TZ	1066.80	700.89	19.69	1.87	21.56	29.96	2.85	32.82
223	30	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	8.00	0.80	8.80	12.18	1.22	13.40
224	30	08OCT83	1:57	1111	18	1	10	TZ	2651.76	1742.21	6.03	0.75	6.79	9.18	1.15	10.33
225	30	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	3.86	0.00	3.86	5.87	0.00	5.87
226	30	08OCT83	3:51	1113	18	1	5	CH	1188.72	780.99	1.68	0.00	1.68	2.56	0.00	2.56
227	30	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	5.25	0.44	5.69	7.99	0.67	8.66
228	30	08OCT83	20:16	1117	18	1	5	CH	1219.20	801.01	9.02	0.00	9.02	13.73	0.00	13.73
229	30	08OCT83	20:45	1118	18	1	10	CH	2621.28	1722.18	0.38	0.00	0.38	0.58	0.00	0.58
230	30	08OCT83	21:11	1119	18	1	10	CH	2590.80	1702.16	3.09	0.00	3.09	4.70	0.00	4.70
231	30	08OCT83	21:44	1120	18	1	5	CH	1280.16	841.07	2.34	0.00	2.34	3.57	0.00	3.57
232	30	08OCT83	22:22	1122	18	1	5	CH	1219.20	801.01	5.74	0.00	5.74	8.74	0.00	8.74
233	30	08OCT83	23:03	1123	18	1	10	CH	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
234	30	08OCT83	23:24	1124	18	1	5	CH	1219.20	801.01	0.82	0.00	0.82	1.25	0.00	1.25
235	30	08OCT83	23:42	1125	18	1	10	CH	2346.96	1541.95	4.69	0.00	4.69	7.13	0.00	7.13
236	30	09OCT83	0:15	1126	18	1	10	CH	2468.88	1622.05	0.41	0.00	0.41	0.62	0.00	0.62
237	30	09OCT83	0:43	1127	18	1	10	CH	2377.44	1561.98	2.52	0.00	2.52	3.84	0.00	3.84
238	30	09OCT83	1:09	1128	18	1	5	CH	1158.24	760.96	2.59	0.86	3.45	3.94	1.31	5.26
239	30	17OCT83	19:51	1129	18	2	10	CH	2377.44	1561.98	8.41	1.26	9.67	12.80	1.92	14.72
240	30	17OCT83	20:51	1130	18	2	5	CH	1249.68	821.04	3.20	0.00	3.20	4.87	0.00	4.87
241	30	17OCT83	21:47	1131	18	2	5	CH	1280.16	841.07	0.78	0.00	0.78	1.19	0.00	1.19
242	30	17OCT83	22:10	1153	18	2	5	CH	1341.12	881.12	5.22	0.75	5:97	7.94	1.13	9.08
243	30	17OCT83	22:49	1154	18	2	10	CH	2682.24	1762.23	8.95	0.37	9.32	13.62	0.57	14.19
244	30	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	2.64	0.00	2.64	4.02	0.00	4.02
245	30	18OCT83	0:10	1156	18	2	10	CH	2468.88	1622.05	6.89	0.00	6.89	10.48	0.00	10.48
246	30	18OCT83	0:36	1157	18	2	10	CH	2255.52	1481.88	10.64	0.00	10.64	16.20	0.00	16.20
247	30	18OCT83	1:04	1158	18	2	5	CH	1219.20	801.01	8.20	0.00	8.20	12.48	0.00	12.48
248	30	18OCT83	1:29	1159	18	2	5	CH	1310.64	861.09	12.97	0.00	12.97	19.74	0.00	19.74
249	30	18OCT83	19:08	1160	18	2	5	CH	1463.04	961.22	1.37	0.00	1.37	2.08	0.00	2.08
250	30	18OCT83	19:26	1161	18	2	5	CH	1524.00	1001.27	5.91	0.66	6.56	8.99	1.00	9.99
251	30	18OCT83	20:06	1162	18	2	10	CH	2346.96	1541.95	0.43	0.00	0.43	0.65	0.00	0.65
252	30	18OCT83	20:54	1163	18	2	5	CH	1158.24	760.96	6.91	0.00	6.91	10.51	0.00	10.51
253	30	18OCT83	21:14	1164	18	2	10	TZ	2438.40	1602.03	3.69	0.41	4.10	5.62	0.62	6.24
254	30	18OCT83	21:58	1165	18	2	5	TZ	1341.12	881.12	2.24	0.00	2.24	3.40	0.00	3.40
255	30	18OCT83	22:13	1166	18	2	10	TZ	2255.52	1481.88	0.89	0.00	0.89	1.35	0.00	1.35
256	30	18OCT83	23:02	1168	18	2	10	TZ	2895.60	1902.41	4.49	0.00	4.49	6.83	0.00	6.83
257	30	18OCT83	23:21	1169	18	2	10	TZ	2468.88	1622.05	11.34	0.00	11.34	17.26	0.00	17.26
258	30	18OCT83	23:45	1170	18	2	5	TZ	1249.68	821.04	1.60	0.00	1.60	2.44	0.00	2.44
259	30	19OCT83	22:58	84	18	2	10	TZ	2529.84	1662.10	0.00	0.40	0.40	0.00	0.60	0.60
260	30	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
261	30	20OCT83	1:20	87	18	2	10	TZ	1584.96	1041.32	8.83	0.00	8.83	13.44	0.00	13.44
262	30	20OCT83	2:03	89	18	2	5	TZ	822.96	540.68	13.37	1.22	14.58	20.34	1.85	22.19
263	30	20OCT83	2:23	90	18	2	10	TZ	1889.76	1241.57	13.76	0.53	14.29	20.94	0.81	21.75
264	30	20OCT83	19:23	1181	18	2	10	TZ	2651.76	1742.21	9.05	0.00	9.05	13.78	0.00	13.78
265	30	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	2.98	0.00	2.98	4.54	0.00	4.54

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
266	30	20OCT83	20:53	1184	18	2	10	TZ	2255.52	1481.88	2.22	0.00	2.22	3.37	0.00	3.37
267	30	20OCT83	21:21	1185	18	2	5	TZ	1005.84	660.84	8.95	0.99	9.94	13.62	1.51	15.13
268	30	20OCT83	21:34	1186	18	2	5	TZ	1005.84	660.84	8.95	0.00	8.95	13.62	0.00	13.62
269	30	20OCT83	21:58	1187	18	2	5	TZ	1280.16	841.07	0.78	0.00	0.78	1.19	0.00	1.19
270	32	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	0.95	0.00	0.95	1.45	0.00	1.45
271	32	06OCT83	22:46	1090	18	1	10	TZ	2316.48	1521.93	0.43	0.00	0.43	0.66	0.00	0.66
272	32	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
273	32	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	0.91	0.00	0.91	1.39	0.00	1.39
274	32	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	0.86	0.00	0.86	1.31	0.00	1.31
275	32	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	6.12	0.00	6.12	9.31	0.00	9.31
276	32	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	5.29	1.59	6.88	8.05	2.42	10.47
277	32	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	3.53	0.50	4.04	5.38	0.77	6.15
278	32	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	3.28	0.00	3.28	4.99	0.00	4.99
279	32	20OCT83	0:25	88	18	2	5	TZ	883.92	580.74	4.53	0.00	4.53	6.89	0.00	6.89
280	34	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.00	0.44	0.44	0.00	0.67	0.67
281	34	08OCT83	0:08	1107	18	1	5	TZ	1310.64	861.09	0.00	0.76	0.76	0.00	1.16	1.16
282	34	08OCT83	0:32	1108	18	1	5	TZ	1066.80	700.89	0.00	0.94	0.94	0.00	1.43	1.43
283	34	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	0.00	0.80	0.80	0.00	1.22	1.22
284	34	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	0.00	2.41	2.41	0.00	3.67	3.67
285	34	08OCT83	3:51	1113	18	1	5	CH	1188.72	780.99	0.00	0.84	0.84	0.00	1.28	1.28
286	34	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	0.00	0.44	0.44	0.00	0.67	0.67
287	34	08OCT83	22:22	1122	18	1	5	CH	1219.20	801.01	0.00	0.82	0.82	0.00	1.25	1.25
288	34	17OCT83	19:51	1129	18	2	10	CH	2377.44	1561.98	0.00	0.84	0.84	0.00	1.28	1.28
289	34	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	0.00	0.38	0.38	0.00	0.57	0.57
290	34	18OCT83	1:04	1158	18	2	5	CH	1219.20	801.01	0.00	0.82	0.82	0.00	1.25	1.25
291	34	18OCT83	20:54	1163	18	2	5	CH	1158.24	760.96	0.00	0.86	0.86	0.00	1.31	1.31
292	34	20OCT83	1:20	87	18	2	10	TZ	1584.96	1041.32	0.00	0.63	0.63	0.00	0.96	0.96
293	34	20OCT83	2:03	89	18	2	5	TZ	822.96	540.68	0.00	1.22	1.22	0.00	1.85	1.85
294	35	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	0.00	5.23	5.23	0.00	7.96	7.96
295	35	06OCT83	19:52	1084	18	1	5	TZ	1066.80	700.89	0.00	66.55	66.55	0.00	101.30	101.30
296	35	06OCT83	20:22	1085	18	1	5	TZ	1036.32	680.86	0.00	8.68	8.68	0.00	13.22	13.22
297	35	06OCT83	20:38	1086	18	1	10	TZ	2164.08	1421.80	0.00	7.39	7.39	0.00	11.25	11.25
298	35	06OCT83	21:21	1087	18	1	5	TZ	1097.28	720.91	0.00	8.20	8.20	0.00	12.48	12.48
299	35	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.00	5.55	5.55	0.00	8.44	8.44
300	35	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	0.00	11.93	11.93	0.00	18.16	18.16
301	35	06OCT83	22:46	1090	18	1	10	TZ	2316.48	1521.93	0.00	9.50	9.50	0.00	14.46	14.46
302	35	06OCT83	23:10	1091	18	1	10	TZ	2377.44	1561.98	0.00	6.73	6.73	0.00	10.24	10.24
303	35	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	0.00	9.37	9.37	0.00	14.27	14.27
304	35	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	0.00	34.57	34.57	0.00	52.62	52.62
305	35	07OCT83	1:22	1095	18	1	10	TZ	2225.04	1461.85	0.00	1.80	1.80	0.00	2.74	2.74
306	35	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	0.00	16.19	16.19	0.00	24.64	24.64
307	35	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	0.00	9.11	9.11	0.00	13.87	13.87
308	35	07OCT83	3:53	1098	18	1	5	TZ	1188.72	780.99	0.00	54.68	54.68	0.00	83.23	83.23
309	35	07OCT83	4:22	1099	18	1	5	TZ	1097.28	720.91	0.00	28.25	28.25	0.00	43.00	43.00
310	35	07OCT83	4:39	1100	18	1	5	TZ	1005.84	660.84	0.00	58.66	58.66	0.00	89.28	89.28
311	35	07OCT83	5:02	1101	18	1	10	TZ	1706.88	1121.42	0.00	4.69	4.69	0.00	7.13	7.13
312	35	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	2.80	72.82	75.62	4.26	110.84	115.10
313	35	07OCT83	22:16	1104	18	1	10	TZ	2316.48	1521.93	0.00	93.68	93.68	0.00	142.58	142.58
314	35	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	1.73	15.54	17.27	2.63	23.65	26.28
315	35	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	1.75	41.12	42.87	2.66	62.59	65.25
316	35	08OCT83	0:08	1107	18	1	5	TZ	1310.64	861.09	3.05	31.28	34.33	4.65	47.61	52.26
317	35	08OCT83	0:32	1108	18	1	5	TZ	1066.80	700.89	7.50	86.24	93.74	11.41	131.26	142.68
318	35	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	4.80	26.41	31.21	7.31	40.19	47.50

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
319	35	08OCT83	1:57	1111	18	1	10	TZ	2651.76	1742.21	2.26	73.16	75.42	3.44	111.35	114.80
320	35	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	1.93	113.38	115.31	2.94	172.58	175.51
321	35	08OCT83	3:51	1113	18	1	5	CH	1188.72	780.99	3.36	16.82	20.19	5.12	25.61	30.73
322	35	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	1.75	10.06	11.81	2.66	15.31	17.98
323	35	08OCT83	20:16	1117	18	1	5	CH	1219.20	801.01	0.00	38.55	38.55	0.00	58.68	58.68
324	35	08OCT83	20:45	1118	18	1	10	CH	2621.28	1722.18	0.00	24.42	24.42	0.00	37.16	37.16
325	35	08OCT83	21:11	1119	18	1	10	CH	2590.80	1702.16	0.77	15.83	16.60	1.17	24.09	25.26
326	35	08OCT83	21:44	1120	18	1	5	CH	1280.16	841.07	0.00	12.50	12.50	0.00	19.02	19.02
327	35	08OCT83	22:03	1121	18	1	5	CH	1341.12	881.12	0.00	22.37	22.37	0.00	34.05	34.05
328	35	08OCT83	22:22	1122	18	1	5	CH	1219.20	801.01	0.00	27.07	27.07	0.00	41.20	41.20
329	35	08OCT83	23:03	1123	18	1	10	CH	2286.00	1501.90	0.00	12.25	12.25	0.00	18.64	18.64
330	35	08OCT83	23:24	1124	18	1	5	CH	1219.20	801.01	0.00	15.58	15.58	0.00	23.72	23.72
331	35	08OCT83	23:42	1125	18	1	10	CH	2346.96	1541.95	0.00	41.76	41.76	0.00	63.56	63.56
332	35	09OCT83	0:15	1126	18	1	10	CH	2468.88	1622.05	0.00	29.57	29.57	0.00	45.00	45.00
333	35	09OCT83	0:43	1127	18	1	10	CH	2377.44	1561.98	0.00	16.82	16.82	0.00	25.61	25.61
334	35	09OCT83	1:09	1128	18	1	5	CH	1158.24	760.96	0.86	8.63	9.50	1.31	13.14	14.46
335	35	17OCT83	19:51	1129	18	2	10	CH	2377.44	1561.98	0.00	14.30	14.30	0.00	21.77	21.77
336	35	17OCT83	20:51	1130	18	2	5	CH	1249.68	821.04	0.00	10.40	10.40	0.00	15.83	15.83
337	35	17OCT83	21:47	1131	18	2	5	CH	1280.16	841.07	0.00	5.47	5.47	0.00	8.32	8.32
338	35	17OCT83	22:10	1153	18	2	5	CH	1341.12	881.12	0.00	6.71	6.71	0.00	10.21	10.21
339	35	17OCT83	22:49	1154	18	2	10	CH	2682.24	1762.23	0.00	11.56	11.56	0.00	17.59	17.59
340	35	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	0.00	13.20	13.20	0.00	20.09	20.09
341	35	18OCT83	0:10	1156	18	2	10	CH	2468.88	1622.05	0.00	8.51	8.51	0.00	12.95	12.95
342	35	18OCT83	0:36	1157	18	2	10	CH	2255.52	1481.88	0.00	7.09	7.09	0.00	10.80	10.80
343	35	18OCT83	1:04	1158	18	2	5	CH	1219.20	801.01	0.00	9.84	9.84	0.00	14.98	14.98
344	35	18OCT83	1:29	1159	18	2	5	CH	1310.64	861.09	0.00	1.53	1.53	0.00	2.32	2.32
345	35	18OCT83	19:08	1160	18	2	5	CH	1463.04	961.22	0.00	3.42	3.42	0.00	5.20	5.20
346	35	18OCT83	19:26	1161	18	2	5	CH	1524.00	1001.27	0.00	4.59	4.59	0.00	6.99	6.99
347	35	18OCT83	20:54	1163	18	2	5	CH	1158.24	760.96	0.86	29.35	30.22	1.31	44.68	45.99
348	35	18OCT83	21:14	1164	18	2	10	TZ	2438.40	1602.03	0.82	11.48	12.30	1.25	17.48	18.73
349	35	18OCT83	21:58	1165	18	2	5	TZ	1341.12	881.12	1.49	3.73	5.22	2.27	5.67	7.94
350	35	18OCT83	22:13	1166	18	2	10	TZ	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
351	35	18OCT83	22:38	1167	18	2	5	TZ	1188.72	780.99	0.00	27.76	27.76	0.00	42.25	42.25
352	35	18OCT83	23:02	1168	18	2	10	TZ	2895.60	1902.41	0.00	10.36	10.36	0.00	15.77	15.77
353	35	18OCT83	23:21	1169	18	2	10	TZ	2468.88	1622.05	0.00	10.13	10.13	0.00	15.41	15.41
354	35	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	0.00	10.01	10.01	0.00	15.23	15.23
355	35	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	0.00	15.35	15.35	0.00	23.36	23.36
356	35	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	0.00	13.63	13.63	0.00	20.74	20.74
357	35	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	0.00	8.75	8.75	0.00	13.32	13.32
358	35	19OCT83	22:39	83	18	2	5	TZ	1310.64	861.09	0.00	0.76	0.76	0.00	1.16	1.16
359	35	19OCT83	22:58	84	18	2	10	TZ	2529.84	1662.10	0.00	1.58	1.58	0.00	2.41	2.41
360	35	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.00	4.88	4.88	0.00	7.42	7.42
361	35	20OCT83	0:25	88	18	2	5	TZ	883.92	580.74	0.00	22.63	22.63	0.00	34.44	34.44
362	35	20OCT83	1:20	87	18	2	10	TZ	1584.96	1041.32	0.63	15.14	15.77	0.96	23.05	24.01
363	35	20OCT83	2:03	89	18	2	5	TZ	822.96	540.68	1.22	7.29	8.51	1.85	11.10	12.95
364	35	20OCT83	2:23	90	18	2	10	TZ	1889.76	1241.57	0.53	16.93	17.46	0.81	25.77	26.58
365	35	20OCT83	19:23	1181	18	2	10	TZ	2651.76	1742.21	0.38	15.08	15.46	0.57	22.96	23.53
366	35	20OCT83	20:01	1182	18	2	10	TZ	2316.48	1521.93	0.00	26.76	26.76	0.00	40.74	40.74
367	35	20OCT83	20:33	1183	18	2	5	TZ	1005.84	660.84	0.00	5.97	5.97	0.00	9.08	9.08
368	35	20OCT83	20:53	1184	18	2	10	TZ	2255.52	1481.88	0.00	2.66	2.66	0.00	4.05	4.05
369	35	20OCT83	21:21	1185	18	2	5	TZ	1005.84	660.84	3.98	9.94	13.92	6.05	15.13	21.19
370	35	20OCT83	21:34	1186	18	2	5	TZ	1005.84	660.84	0.00	58.66	58.66	0.00	89.28	89.28
371	35	20OCT83	21:58	1187	18	2	5	TZ	1280.16	841.07	0.78	53.90	54.68	1.19	82.04	83.23

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
372	39	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	0.00	0.80	0.80	0.00	1.22	1.22
373	42	09OCT83	0:43	1127	18	1	10	CH	2377.44	1561.98	0.00	0.42	0.42	0.00	0.64	0.64
374	42	18OCT83	21:58	1165	18	2	5	TZ	1341.12	881.12	0.00	0.75	0.75	0.00	1.13	1.13
375	45	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	3.80	0.00	3.80	5.79	0.00	5.79
376	45	06OCT83	19:52	1084	18	1	5	TZ	1066.80	700.89	2.81	0.00	2.81	4.28	0.00	4.28
377	45	06OCT83	20:22	1085	18	1	5	TZ	1036.32	680.86	0.96	0.00	0.96	1.47	0.00	1.47
378	45	06OCT83	20:38	1086	18	1	10	TZ	2164.08	1421.80	0.46	0.00	0.46	0.70	0.00	0.70
379	45	06OCT83	23:42	1092	18	1	5	TZ	1280.16	841.07	3.12	0.00	3.12	4.76	0.00	4.76
380	45	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	0.35	0.00	0.35	0.54	0.00	0.54
381	45	07OCT83	1:22	1095	18	1	10	TZ	2225.04	1461.85	0.45	0.00	0.45	0.68	0.00	0.68
382	45	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	1.31	0.00	1.31	2.00	0.00	2.00
383	45	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	5.47	0.00	5.47	8.32	0.00	8.32
384	45	07OCT83	3:53	1098	18	1	5	TZ	1188.72	780.99	0.84	0.00	0.84	1.28	0.00	1.28
385	45	07OCT83	22:16	1104	18	1	10	TZ	2316.48	1521.93	0.43	0.00	0.43	0.66	0.00	0.66
386	45	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	2.59	0.00	2.59	3.94	0.00	3.94
387	45	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.87	0.00	0.87	1.33	0.00	1.33
388	45	08OCT83	0:32	1108	18	1	5	TZ	1066.80	700.89	2.81	0.00	2.81	4.28	0.00	4.28
389	45	08OCT83	1:10	1109	18	1	5	TZ	1249.68	821.04	0.80	0.00	0.80	1.22	0.00	1.22
390	45	08OCT83	1:57	1111	18	1	10	TZ	2651.76	1742.21	0.75	0.00	0.75	1.15	0.00	1.15
391	45	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	0.96	0.00	0.96	1.47	0.00	1.47
392	45	08OCT83	6:14	1116	18	1	10	CH	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
393	45	08OCT83	20:16	1117	18	1	5	CH	1219.20	801.01	0.82	0.00	0.82	1.25	0.00	1.25
394	45	08OCT83	23:24	1124	18	1	5	CH	1219.20	801.01	0.82	0.00	0.82	1.25	0.00	1.25
395	45	08OCT83	23:42	1125	18	1	10	CH	2346.96	1541.95	0.43	0.00	0.43	0.65	0.00	0.65
396	45	17OCT83	23:09	1155	18	2	10	CH	2651.76	1742.21	0.38	0.00	0.38	0.57	0.00	0.57
397	45	18OCT83	21:14	1164	18	2	10	TZ	2438.40	1602.03	0.41	0.00	0.41	0.62	0.00	0.62
398	45	18OCT83	23:02	1168	18	2	10	TZ	2895.60	1902.41	0.35	0.00	0.35	0.53	0.00	0.53
399	45	19OCT83	19:41	1171	18	2	10	YK	1798.32	1181.50	8.90	0.00	8.90	13.54	0.00	13.54
400	45	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	1.01	0.00	1.01	1.54	0.00	1.54
401	45	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	1.09	0.00	1.09	1.66	0.00	1.66
402	45	19OCT83	22:39	83	18	2	5	TZ	1310.64	861.09	0.76	0.00	0.76	1.16	0.00	1.16
403	45	19OCT83	22:58	84	18	2	10	TZ	2529.84	1662.10	3.56	0.00	3.56	5.41	0.00	5.41
404	45	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	1.33	0.00	1.33	2.02	0.00	2.02
405	45	20OCT83	2:23	90	18	2	10	TZ	1889.76	1241.57	1.06	0.00	1.06	1.61	0.00	1.61
406	45	20OCT83	19:23	1181	18	2	10	TZ	2651.76	1742.21	0.38	0.00	0.38	0.57	0.00	0.57
407	45	20OCT83	20:01	1182	18	2	10	TZ	2316.48	1521.93	0.43	0.00	0.43	0.66	0.00	0.66
408	45	20OCT83	20:53	1184	18	2	10	TZ	2255.52	1481.88	0.44	0.00	0.44	0.67	0.00	0.67
409	45	20OCT83	21:34	1186	18	2	5	TZ	1005.84	660.84	1.99	0.00	1.99	3.03	0.00	3.03
410	49	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
411	72	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	0.95	0.00	0.95	1.45	0.00	1.45
412	72	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.00	0.46	0.46	0.00	0.70	0.70
413	72	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	0.75	0.00	0.75	1.13	0.00	1.13
414	72	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	0.00	0.35	0.35	0.00	0.54	0.54
415	72	07OCT83	4:39	1100	18	1	5	TZ	1005.84	660.84	0.00	0.99	0.99	0.00	1.51	1.51
416	72	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.00	0.44	0.44	0.00	0.67	0.67
417	72	19OCT83	20:32	80	18	2	10	YK	1889.76	1241.57	0.53	0.00	0.53	0.81	0.00	0.81
418	72	19OCT83	21:15	81	18	2	10	YK	1981.20	1301.65	0.50	0.00	0.50	0.77	0.00	0.77
419	72	19OCT83	21:50	82	18	2	5	YK	914.40	600.76	0.00	4.37	4.37	0.00	6.66	6.66
420	80	07OCT83	2:01	1096	18	1	10	TZ	2286.00	1501.90	0.00	2.19	2.19	0.00	3.33	3.33
421	80	19OCT83	23:21	85	18	2	10	TZ	2255.52	1481.88	0.00	0.44	0.44	0.00	0.67	0.67
422	110	06OCT83	19:21	1083	18	1	10	TZ	2103.12	1381.75	0.95	0.00	0.95	1.45	0.00	1.45
423	110	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.46	0.00	0.46	0.70	0.00	0.70
424	110	06OCT83	22:23	1089	18	1	5	TZ	1341.12	881.12	0.75	0.00	0.75	1.13	0.00	1.13

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
425	110	07OCT83	0:46	1094	18	1	10	TZ	2834.64	1862.36	0.71	0.00	0.71	1.07	0.00	1.07
426	110	07OCT83	3:13	1097	18	1	5	TZ	1097.28	720.91	0.91	0.00	0.91	1.39	0.00	1.39
427	110	07OCT83	3:53	1098	18	1	5	TZ	1188.72	780.99	0.84	0.00	0.84	1.28	0.00	1.28
428	110	07OCT83	21:26	1103	18	1	10	TZ	2499.36	1642.08	0.40	0.40	0.80	0.61	0.61	1.22
429	110	07OCT83	22:53	1105	18	1	5	TZ	1158.24	760.96	0.86	0.00	0.86	1.31	0.00	1.31
430	110	07OCT83	23:16	1106	18	1	10	TZ	2286.00	1501.90	0.44	0.00	0.44	0.67	0.00	0.67
431	110	08OCT83	1:57	1111	18	1	10	TZ	2651.76	1742.21	0.38	0.00	0.38	0.57	0.00	0.57
432	110	08OCT83	2:36	1112	18	1	10	CH	2072.64	1361.72	0.48	0.00	0.48	0.73	0.00	0.73
433	110	08OCT83	23:42	1125	18	1	10	CH	2346.96	1541.95	0.43	0.00	0.43	0.65	0.00	0.65
434	110	19OCT83	22:58	84	18	2	10	TZ	2529.84	1662.10	0.40	0.00	0.40	0.60	0.00	0.60
435	136	06OCT83	21:39	1088	18	1	10	TZ	2164.08	1421.80	0.46	0.00	0.46	0.70	0.00	0.70
436	1	06OCT83	23:10	1051	50	1	10	TZ	3432.00	5652.50	0.00	0.29	0.29	0.00	0.18	0.18
437	1	07OCT83	2:01	1056	50	1	10	TZ	3300.00	5435.10	0.00	0.30	0.30	0.00	0.18	0.18
438	1	07OCT83	5:30	1062	50	1	10	TZ	2640.00	4348.08	0.76	0.00	0.76	0.46	0.00	0.46
439	1	17OCT83	22:49	6	50	2	10	CH	3872.00	6377.18	0.00	0.26	0.26	0.00	0.16	0.16
440	1	18OCT83	0:10	8	50	2	10	CH	3564.00	5869.91	0.56	0.00	0.56	0.34	0.00	0.34
441	1	18OCT83	1:04	10	50	2	5	CH	1760.00	2898.72	0.57	0.00	0.57	0.34	0.00	0.34
442	1	18OCT83	19:08	12	50	2	5	CH	2112.00	3478.46	0.00	0.47	0.47	0.00	0.29	0.29
443	1	18OCT83	21:58	18	50	2	5	TZ	1936.00	3188.59	1.03	0.00	1.03	0.63	0.00	0.63
444	1	18OCT83	22:13	19	50	2	10	TZ	3256.00	5362.63	0.31	0.00	0.31	0.19	0.00	0.19
445	1	18OCT83	23:02	21	50	2	10	TZ	4180.00	6884.46	0.48	0.00	0.48	0.29	0.00	0.29
446	1	19OCT83	19:41	1148	50	2	10	YK	2596.00	4275.61	0.39	0.39	0.77	0.23	0.23	0.47
447	1	19OCT83	21:50	1152	50	2	5	YK	1320.00	2174.04	0.00	0.76	0.76	0.00	0.46	0.46
448	1	19OCT83	22:58	1193	50	2	10	TZ	3652.00	6014.84	0.00	0.55	0.55	0.00	0.33	0.33
449	1	19OCT83	23:21	1194	50	2	10	TZ	3256.00	5362.63	0.00	2.15	2.15	0.00	1.31	1.31
450	1	20OCT83	20:33	1174	50	2	5	TZ	1452.00	2391.44	0.69	0.00	0.69	0.42	0.00	0.42
451	2	06OCT83	19:21	1043	50	1	10	TZ	3036.00	5000.29	5.60	0.00	5.60	3.40	0.00	3.40
452	2	06OCT83	19:52	1044	50	1	5	TZ	1540.00	2536.38	11.04	0.65	11.69	6.70	0.39	7.10
453	2	06OCT83	20:22	1045	50	1	5	TZ	1496.00	2463.91	10.70	0.00	10.70	6.49	0.00	6.49
454	2	06OCT83	20:38	1046	50	1	10	TZ	3124.00	5145.23	18.25	0.32	18.57	11.08	0.19	11.27
455	2	06OCT83	21:21	1047	50	1	5	TZ	1584.00	2608.85	22.10	0.00	22.10	13.42	0.00	13.42
456	2	06OCT83	21:39	1048	50	1	10	TZ	3124.00	5145.23	12.16	1.60	13.76	7.39	0.97	8.36
457	2	06OCT83	22:23	1049	50	1	5	TZ	1936.00	3188.59	12.40	0.52	12.91	7.53	0.31	7.84
458	2	06OCT83	22:46	1050	50	1	10	TZ	3344.00	5507.57	15.25	2.09	17.34	9.26	1.27	10.53
459	2	06OCT83	23:10	1051	50	1	10	TZ	3432.00	5652.50	6.41	0.58	6.99	3.89	0.35	4.25
460	2	06OCT83	23:42	1052	50	1	5	TZ	1848.00	3043.66	26.52	0.54	27.06	16.10	0.33	16.43
461	2	07OCT83	0:21	1053	50	1	10	TZ	4224.00	6956.93	13.97	0.71	14.68	8.48	0.43	8.91
462	2	07OCT83	1:22	1055	50	1	10	TZ	3212.00	5290.16	8.09	0.00	8.09	4.91	0.00	4.91
463	2	07OCT83	2:01	1056	50	1	10	TZ	3300.00	5435.10	22.73	0.61	23.33	13.80	0.37	14.17
464	2	07OCT83	3:13	1057	50	1	5	TZ	1584.00	2608.85	18.94	1.26	20.20	11.50	0.77	12.27
465	2	07OCT83	3:53	1058	50	1	5	TZ	1716.00	2826.25	13.99	1.17	15.15	8.49	0.71	9.20
466	2	07OCT83	4:22	1059	50	1	5	TZ	1584.00	2608.85	5.05	0.00	5.05	3.07	0.00	3.07
467	2	07OCT83	4:39	1060	50	1	5	TZ	1452.00	2391.44	1.38	0.00	1.38	0.84	0.00	0.84
468	2	07OCT83	5:02	1061	50	1	10	TZ	2464.00	4058.21	0.41	0.41	0.81	0.25	0.25	0.49
469	2	07OCT83	5:30	1062	50	1	10	TZ	2640.00	4348.08	35.23	0.00	35.23	21.39	0.00	21.39
470	2	07OCT83	21:26	1063	50	1	10	TZ	3608.00	5942.38	4.71	0.00	4.71	2.86	0.00	2.86
471	2	07OCT83	22:16	1064	50	1	10	TZ	3344.00	5507.57	0.60	0.00	0.60	0.36	0.00	0.36
472	2	07OCT83	22:53	1065	50	1	5	TZ	1672.00	2753.78	6.58	0.00	6.58	3.99	0.00	3.99
473	2	07OCT83	23:16	1066	50	1	10	TZ	3300.00	5435.10	2.73	0.00	2.73	1.66	0.00	1.66
474	2	08OCT83	0:08	1067	50	1	5	TZ	1892.00	3116.12	0.53	0.00	0.53	0.32	0.00	0.32
475	2	08OCT83	0:32	1068	50	1	5	TZ	1540.00	2536.38	4.55	0.00	4.55	2.76	0.00	2.76
476	2	08OCT83	1:10	1069	50	1	5	TZ	1804.00	2971.19	0.55	0.55	1.11	0.34	0.34	0.67
477	2	08OCT83	1:33	1070	50	1	10	TZ	4092.00	6739.52	0.98	0.00	0.98	0.59	0.00	0.59

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FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
478	2	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	0.27	0.00	0.27	0.16	0.00	0.16
479	2	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	1.70	1.14	2.84	1.03	0.69	1.72
480	2	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	3.96	0.53	4.49	2.41	0.32	2.73
481	2	08OCT83	21:11	1137	50	1	10	CH	3740	6159.78	1.60	0.80	2.41	0.97	0.49	1.46
482	2	08OCT83	21:44	1138	50	1	5	CH	1848	3043.66	4.87	1.08	5.95	2.96	0.66	3.61
483	2	08OCT83	22:03	1139	50	1	5	CH	1936	3188.59	3.10	1.03	4.13	1.88	0.63	2.51
484	2	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	2.27	0.00	2.27	1.38	0.00	1.38
485	2	08OCT83	23:03	1141	50	1	10	CH	3300	5435.10	1.21	0.30	1.52	0.74	0.18	0.92
486	2	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	7.95	0.57	8.52	4.83	0.34	5.17
487	2	08OCT83	23:42	1143	50	1	10	CH	3388	5580.04	4.13	0.30	4.43	2.51	0.18	2.69
488	2	09OCT83	0:15	1144	50	1	10	CH	3564	5869.91	2.53	0.28	2.81	1.53	0.17	1.70
489	2	09OCT83	0:43	1145	50	1	10	CH	3432	5652.50	0.58	0.58	1.17	0.35	0.35	0.71
490	2	09OCT83	1:09	1146	50	1	5	CH	1672	2753.78	8.97	0.00	8.97	5.45	0.00	5.45
491	2	17OCT83	21:55	4	50	2	5	CH	1848	3043.66	1.08	0.54	1.62	0.66	0.33	0.99
492	2	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	3.10	0.26	3.36	1.88	0.16	2.04
493	2	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	2.09	0.26	2.35	1.27	0.16	1.43
494	2	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	0.56	0.00	0.56	0.34	0.00	0.34
495	2	18OCT83	1:04	10	50	2	5	CH	1760	2898.72	0.57	0.00	0.57	0.34	0.00	0.34
496	2	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	0.00	0.47	0.47	0.00	0.29	0.29
497	2	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	0.89	0.00	0.89	0.54	0.00	0.54
498	2	18OCT83	20:54	16	50	2	5	CH	1672	2753.78	0.00	1.20	1.20	0.00	0.73	0.73
499	2	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.85	0.28	1.14	0.52	0.17	0.69
500	2	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	16.53	5.17	21.69	10.04	3.14	13.17
501	2	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	31.63	1.84	33.48	19.21	1.12	20.33
502	2	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	43.71	2.91	46.62	26.54	1.77	28.31
503	2	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	6.70	0.48	7.18	4.07	0.29	4.36
504	2	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	4.77	0.56	5.33	2.90	0.34	3.24
505	2	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	1.66	0.00	1.66	1.01	0.00	1.01
506	2	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	1.93	0.77	2.70	1.17	0.47	1.64
507	2	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	12.46	0.37	12.83	7.57	0.22	7.79
508	2	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	8.04	0.70	8.74	4.88	0.42	5.31
509	2	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	5.30	1.52	6.82	3.22	0.92	4.14
510	2	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	1.06	0.53	1.59	0.64	0.32	0.96
511	2	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	1.10	1.37	2.46	0.67	0.83	1.50
512	2	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	2.15	3.69	5.84	1.31	2.24	3.54
513	2	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	1.10	1.47	2.57	0.67	0.89	1.56
514	2	20OCT83	20:33	1174	50	2	5	TZ	1452	2391.44	5.51	0.00	5.51	3.35	0.00	3.35
515	2	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	1.54	0.31	1.84	0.93	0.19	1.12
516	2	20OCT83	21:34	1177	50	2	5	TZ	1452	2391.44	1.38	0.00	1.38	0.84	0.00	0.84
517	3	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	1.28	0.00	1.28	0.78	0.00	0.78
518	3	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	1.60	0.00	1.60	0.97	0.00	0.97
519	3	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	1.03	0.00	1.03	0.63	0.00	0.63
520	3	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	0.90	0.00	0.90	0.54	0.00	0.54
521	3	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	1.17	0.00	1.17	0.71	0.00	0.71
522	3	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	2.16	0.00	2.16	1.31	0.00	1.31
523	3	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	1.18	0.00	1.18	0.72	0.00	0.72
524	3	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	2.42	0.00	2.42	1.47	0.00	1.47
525	3	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	2.53	0.00	2.53	1.53	0.00	1.53
526	3	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.38	0.00	0.38	0.23	0.00	0.23
527	3	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	0.83	0.00	0.83	0.50	0.00	0.50
528	3	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	0.98	0.00	0.98	0.59	0.00	0.59
529	3	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.33	0.00	0.33	0.20	0.00	0.20
530	3	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	0.26	0.00	0.26	0.16	0.00	0.16

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
531	3	08OCT83	21:44	1138	50	1	5	CH	1848	3043.66	1.08	0.00	1.08	0.66	0.00	0.66
532	3	17OCT83	20:51	3	50	2	5	CH	1804	2971.19	0.55	0.00	0.55	0.34	0.00	0.34
533	3	17OCT83	21:55	4	50	2	5	CH	1848	3043.66	3.79	0.00	3.79	2.30	0.00	2.30
534	3	17OCT83	22:10	5	50	2	5	CH	1936	3188.59	1.55	0.00	1.55	0.94	0.00	0.94
535	3	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	1.29	0.00	1.29	0.78	0.00	0.78
536	3	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	3.13	0.00	3.13	1.90	0.00	1.90
537	3	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	7.86	0.00	7.86	4.77	0.00	4.77
538	3	18OCT83	0:36	9	50	2	10	CH	3256	5362.63	1.23	0.00	1.23	0.75	0.00	0.75
539	3	18OCT83	1:04	10	50	2	5	CH	1760	2898.72	5.68	0.00	5.68	3.45	0.00	3.45
540	3	18OCT83	1:29	11	50	2	5	CH	1892	3116.12	0.53	0.00	0.53	0.32	0.00	0.32
541	3	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	2.84	0.00	2.84	1.72	0.00	1.72
542	3	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	2.27	0.00	2.27	1.38	0.00	1.38
543	3	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	1.03	0.00	1.03	0.63	0.00	0.63
544	3	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.61	0.00	0.61	0.37	0.00	0.37
545	3	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	1.17	0.00	1.17	0.71	0.00	0.71
546	3	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	1.67	0.72	2.39	1.02	0.44	1.45
547	3	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	1.12	0.00	1.12	0.68	0.00	0.68
548	3	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	0.55	0.00	0.55	0.34	0.00	0.34
549	3	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	5.39	0.00	5.39	3.27	0.00	3.27
550	3	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.37	0.00	0.37	0.22	0.00	0.22
551	3	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	2.80	0.35	3.15	1.70	0.21	1.91
552	3	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	0.76	0.00	0.76	0.46	0.00	0.46
553	3	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	1.59	0.00	1.59	0.96	0.00	0.96
554	3	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	0.61	0.61	0.00	0.37	0.37
555	3	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	1.75	0.00	1.75	1.06	0.00	1.06
556	3	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	0.37	0.37	0.73	0.22	0.22	0.45
557	3	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	4.18	0.26	4.44	2.54	0.16	2.70
558	3	20OCT83	20:33	1174	50	2	5	TZ	1452	2391.44	1.38	0.00	1.38	0.84	0.00	0.84
559	3	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	1.54	0.00	1.54	0.93	0.00	0.93
560	3	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	1.38	0.00	1.38	0.84	0.00	0.84
561	3	20OCT83	21:34	1177	50	2	5	TZ	1452	2391.44	2.07	0.00	2.07	1.25	0.00	1.25
562	3	20OCT83	21:58	1178	50	2	5	TZ	1848	3043.66	2.16	1.08	3.25	1.31	0.66	1.97
563	4	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	1.55	0.00	1.55	0.94	0.00	0.94
564	4	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.24	0.00	0.24	0.14	0.00	0.14
565	4	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	0.63	0.00	0.63	0.38	0.00	0.38
566	4	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.38	0.00	0.38	0.23	0.00	0.23
567	4	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	1.14	0.00	1.14	0.69	0.00	0.69
568	4	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	1.06	0.00	1.06	0.64	0.00	0.64
569	4	08OCT83	21:11	1137	50	1	10	CH	3740	6159.78	2.67	0.00	2.67	1.62	0.00	1.62
570	4	08OCT83	21:44	1138	50	1	5	CH	1848	3043.66	4.87	0.00	4.87	2.96	0.00	2.96
571	4	08OCT83	22:03	1139	50	1	5	CH	1936	3188.59	3.10	0.00	3.10	1.88	0.00	1.88
572	4	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	2.84	0.00	2.84	1.72	0.00	1.72
573	4	17OCT83	20:29	2	50	2	10	CH	3432	5652.50	0.29	0.00	0.29	0.18	0.00	0.18
574	4	17OCT83	20:51	3	50	2	5	CH	1804	2971.19	0.55	0.00	0.55	0.34	0.00	0.34
575	4	17OCT83	22:10	5	50	2	5	CH	1936	3188.59	0.52	0.00	0.52	0.31	0.00	0.31
576	4	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	1.03	0.00	1.03	0.63	0.00	0.63
577	4	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	0.78	0.00	0.78	0.48	0.00	0.48
578	4	18OCT83	1:04	10	50	2	5	CH	1760	2898.72	0.57	0.00	0.57	0.34	0.00	0.34
579	4	18OCT83	1:29	11	50	2	5	CH	1892	3116.12	1.06	0.00	1.06	0.64	0.00	0.64
580	4	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	1.42	0.00	1.42	0.86	0.00	0.86
581	4	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	2.27	0.00	2.27	1.38	0.00	1.38
582	4	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	0.59	0.00	0.59	0.36	0.00	0.36
583	4	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.28	0.00	0.28	0.17	0.00	0.17

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
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OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
584	4	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	2.07	0.00	2.07	1.25	0.00	1.25
585	4	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.31	0.00	0.31	0.19	0.00	0.19
586	4	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	1.75	0.00	1.75	1.06	0.00	1.06
587	4	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	0.72	0.00	0.72	0.44	0.00	0.44
588	4	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	0.56	0.00	0.56	0.34	0.00	0.34
589	4	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.31	0.00	0.31	0.19	0.00	0.19
590	4	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	0.44	0.00	0.44	0.27	0.00	0.27
591	4	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	0.73	0.00	0.73	0.45	0.00	0.45
592	4	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	0.52	0.00	0.52	0.32	0.00	0.32
593	4	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	0.92	0.00	0.92	0.56	0.00	0.56
594	5	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.00	0.37	0.37	0.00	0.22	0.22
595	7	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	0.00	0.57	0.57	0.00	0.34	0.34
596	10	06OCT83	19:21	1043	50	1	10	TZ	3036	5000.29	0.00	4.61	4.61	0.00	2.80	2.80
597	10	06OCT83	19:52	1044	50	1	5	TZ	1540	2536.38	0.00	5.19	5.19	0.00	3.15	3.15
598	10	06OCT83	20:22	1045	50	1	5	TZ	1496	2463.91	0.00	3.34	3.34	0.00	2.03	2.03
599	10	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	0.00	3.79	3.79	0.00	2.30	2.30
600	10	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	0.00	1.92	1.92	0.00	1.17	1.17
601	10	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	0.00	15.50	15.50	0.00	9.41	9.41
602	10	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	0.00	14.95	14.95	0.00	9.08	9.08
603	10	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.00	7.28	7.28	0.00	4.42	4.42
604	10	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	0.00	4.87	4.87	0.00	2.96	2.96
605	10	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.00	3.79	3.79	0.00	2.30	2.30
606	10	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	0.00	13.39	13.39	0.00	8.13	8.13
607	10	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.00	9.09	9.09	0.00	5.52	5.52
608	10	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	0.00	4.42	4.42	0.00	2.68	2.68
609	10	07OCT83	3:53	1058	50	1	5	TZ	1716	2826.25	0.00	0.58	0.58	0.00	0.35	0.35
610	10	07OCT83	4:22	1059	50	1	5	TZ	1584	2608.85	0.00	1.26	1.26	0.00	0.77	0.77
611	10	07OCT83	4:39	1060	50	1	5	TZ	1452	2391.44	0.00	4.13	4.13	0.00	2.51	2.51
612	10	07OCT83	5:02	1061	50	1	10	TZ	2464	4058.21	0.00	0.81	0.81	0.00	0.49	0.49
613	10	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.00	2.65	2.65	0.00	1.61	1.61
614	10	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	0.00	8.31	8.31	0.00	5.05	5.05
615	10	07OCT83	22:16	1064	50	1	10	TZ	3344	5507.57	0.00	1.20	1.20	0.00	0.73	0.73
616	10	07OCT83	22:53	1065	50	1	5	TZ	1672	2753.78	0.00	5.98	5.98	0.00	3.63	3.63
617	10	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	0.00	3.64	3.64	0.00	2.21	2.21
618	10	08OCT83	0:08	1067	50	1	5	TZ	1892	3116.12	0.00	0.53	0.53	0.00	0.32	0.32
619	10	08OCT83	0:32	1068	50	1	5	TZ	1540	2536.38	0.00	3.90	3.90	0.00	2.37	2.37
620	10	08OCT83	1:10	1069	50	1	5	TZ	1804	2971.19	0.00	1.66	1.66	0.00	1.01	1.01
621	10	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	0.00	0.98	0.98	0.00	0.59	0.59
622	10	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.00	0.67	0.67	0.00	0.41	0.41
623	10	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	0.00	0.54	0.54	0.00	0.33	0.33
624	10	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	0.00	1.14	1.14	0.00	0.69	0.69
625	10	08OCT83	23:42	1143	50	1	10	CH	3388	5580.04	0.00	0.30	0.30	0.00	0.18	0.18
626	10	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	0.00	0.52	0.52	0.00	0.32	0.32
627	10	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.00	0.28	0.28	0.00	0.17	0.17
628	10	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	0.00	3.47	3.47	0.00	2.10	2.10
629	10	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.00	7.70	7.70	0.00	4.67	4.67
630	10	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	0.00	6.29	6.29	0.00	3.82	3.82
631	10	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	0.00	19.70	19.70	0.00	11.96	11.96
632	10	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	0.00	3.70	3.70	0.00	2.25	2.25
633	10	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.00	0.82	0.82	0.00	0.50	0.50
634	10	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	1.84	1.84	0.00	1.12	1.12
635	10	20OCT83	0:01	1195	50	2	5	TZ	1276	2101.57	0.00	4.70	4.70	0.00	2.86	2.86
636	10	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	0.00	0.73	0.73	0.00	0.45	0.45

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
637	10	20OCT83	21:58	1178	50	2	5	TZ	1848	3043.66	0.00	0.54	0.54	0.00	0.33	0.33
638	13	06OCT83	19:21	1043	50	1	10	TZ	3036	5000.29	0.33	61.92	62.25	0.20	37.60	37.80
639	13	06OCT83	19:52	1044	50	1	5	TZ	1540	2536.38	0.00	8.44	8.44	0.00	5.13	5.13
640	13	06OCT83	20:22	1045	50	1	5	TZ	1496	2463.91	0.00	91.58	91.58	0.00	55.60	55.60
641	13	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	0.00	38.73	38.73	0.00	23.52	23.52
642	13	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	0.00	40.40	40.40	0.00	24.53	24.53
643	13	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	0.00	31.69	31.69	0.00	19.24	19.24
644	13	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	0.00	28.93	28.93	0.00	17.56	17.56
645	13	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	0.00	36.78	36.78	0.00	22.33	22.33
646	13	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.00	26.81	26.81	0.00	16.28	16.28
647	13	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	0.00	41.67	41.67	0.00	25.30	25.30
648	13	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.24	45.45	45.69	0.14	27.60	27.74
649	13	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	0.00	182.13	182.13	0.00	110.58	110.58
650	13	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.00	110.61	110.61	0.00	67.16	67.16
651	13	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	0.00	136.36	136.36	0.00	82.80	82.80
652	13	07OCT83	3:53	1058	50	1	5	TZ	1716	2826.25	0.00	4.66	4.66	0.00	2.83	2.83
653	13	07OCT83	4:22	1059	50	1	5	TZ	1584	2608.85	0.00	4.42	4.42	0.00	2.68	2.68
654	13	07OCT83	4:39	1060	50	1	5	TZ	1452	2391.44	0.00	19.97	19.97	0.00	12.13	12.13
655	13	07OCT83	5:02	1061	50	1	10	TZ	2464	4058.21	0.00	89.29	89.29	0.00	54.21	54.21
656	13	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.00	79.17	79.17	0.00	48.07	48.07
657	13	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	0.00	88.41	88.41	0.00	53.68	53.68
658	13	07OCT83	22:16	1064	50	1	10	TZ	3344	5507.57	0.30	6.88	7.18	0.18	4.18	4.36
659	13	07OCT83	22:53	1065	50	1	5	TZ	1672	2753.78	0.00	5.38	5.38	0.00	3.27	3.27
660	13	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	0.00	3.94	3.94	0.00	2.39	2.39
661	13	08OCT83	0:08	1067	50	1	5	TZ	1892	3116.12	0.00	10.57	10.57	0.00	6.42	6.42
662	13	08OCT83	0:32	1068	50	1	5	TZ	1540	2536.38	0.65	11.69	12.34	0.39	7.10	7.49
663	13	08OCT83	1:10	1069	50	1	5	TZ	1804	2971.19	9.42	0.00	9.42	5.72	0.00	5.72
664	13	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	0.00	8.55	8.55	0.00	5.19	5.19
665	13	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.00	26.07	26.07	0.00	15.83	15.83
666	13	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	0.00	12.82	12.82	0.00	7.78	7.78
667	13	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	0.00	8.12	8.12	0.00	4.93	4.93
668	13	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	0.00	0.26	0.26	0.00	0.16	0.16
669	13	08OCT83	23:03	1141	50	1	10	CH	3300	5435.10	0.00	1.21	1.21	0.00	0.74	0.74
670	13	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	0.57	3.41	3.98	0.34	2.07	2.41
671	13	08OCT83	23:42	1143	50	1	10	CH	3388	5580.04	0.30	0.59	0.89	0.18	0.36	0.54
672	13	09OCT83	0:15	1144	50	1	10	CH	3564	5869.91	0.56	0.28	0.84	0.34	0.17	0.51
673	13	09OCT83	0:43	1145	50	1	10	CH	3432	5652.50	0.00	0.29	0.29	0.00	0.18	0.18
674	13	09OCT83	1:09	1146	50	1	5	CH	1672	2753.78	0.00	0.60	0.60	0.00	0.36	0.36
675	13	17OCT83	20:29	2	50	2	10	CH	3432	5652.50	0.00	1.75	1.75	0.00	1.06	1.06
676	13	17OCT83	20:51	3	50	2	5	CH	1804	2971.19	0.55	0.55	1.11	0.34	0.34	0.67
677	13	17OCT83	21:55	4	50	2	5	CH	1848	3043.66	0.54	0.00	0.54	0.33	0.00	0.33
678	13	17OCT83	22:10	5	50	2	5	CH	1936	3188.59	1.03	1.03	2.07	0.63	0.63	1.25
679	13	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	0.00	0.26	0.26	0.00	0.16	0.16
680	13	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	0.00	0.26	0.26	0.00	0.16	0.16
681	13	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	0.00	1.12	1.12	0.00	0.68	0.68
682	13	18OCT83	1:29	11	50	2	5	CH	1892	3116.12	0.53	0.53	1.06	0.32	0.32	0.64
683	13	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	0.00	2.37	2.37	0.00	1.44	1.44
684	13	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	0.00	0.45	0.45	0.00	0.28	0.28
685	13	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	0.89	1.48	2.36	0.54	0.90	1.43
686	13	18OCT83	20:54	16	50	2	5	CH	1672	2753.78	1.79	1.79	3.59	1.09	1.09	2.18
687	13	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.00	5.40	5.40	0.00	3.28	3.28
688	13	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	0.00	0.52	0.52	0.00	0.31	0.31
689	13	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.31	0.31	0.61	0.19	0.19	0.37

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
690	13	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	0.00	0.58	0.58	0.00	0.35	0.35
691	13	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	0.00	0.48	0.48	0.00	0.29	0.29
692	13	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	0.00	2.24	2.24	0.00	1.36	1.36
693	13	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	0.00	2.22	2.22	0.00	1.35	1.35
694	13	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	0.00	62.40	62.40	0.00	37.89	37.89
695	13	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.37	78.08	78.45	0.22	47.41	47.63
696	13	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	0.00	95.80	95.80	0.00	58.17	58.17
697	13	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	0.00	96.21	96.21	0.00	58.42	58.42
698	13	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	0.00	12.16	12.16	0.00	7.38	7.38
699	13	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.27	30.67	30.94	0.17	18.62	18.79
700	13	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	15.97	15.97	0.00	9.70	9.70
701	13	20OCT83	0:01	1195	50	2	5	TZ	1276	2101.57	0.00	19.59	19.59	0.00	11.90	11.90
702	13	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	0.00	6.12	6.12	0.00	3.72	3.72
703	13	20OCT83	2:03	1197	50	2	5	TZ	1188	1956.64	0.00	16.84	16.84	0.00	10.22	10.22
704	13	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	0.00	5.50	5.50	0.00	3.34	3.34
705	13	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	4.44	0.00	4.44	2.70	0.00	2.70
706	13	20OCT83	20:33	1174	50	2	5	TZ	1452	2391.44	0.00	2.07	2.07	0.00	1.25	1.25
707	13	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	0.00	1.84	1.84	0.00	1.12	1.12
708	13	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	5.51	0.00	5.51	3.35	0.00	3.35
709	13	20OCT83	21:34	1177	50	2	5	TZ	1452	2391.44	0.00	2.07	2.07	0.00	1.25	1.25
710	13	20OCT83	21:58	1178	50	2	5	TZ	1848	3043.66	0.00	1.62	1.62	0.00	0.99	0.99
711	14	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	0.58	0.00	0.58	0.35	0.00	0.35
712	19	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	0.00	0.63	0.63	0.00	0.38	0.38
713	19	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	0.00	0.30	0.30	0.00	0.18	0.18
714	19	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.00	0.30	0.30	0.00	0.18	0.18
715	19	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.00	0.76	0.76	0.00	0.46	0.46
716	19	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	0.00	0.26	0.26	0.00	0.16	0.16
717	19	18OCT83	0:36	9	50	2	10	CH	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
718	19	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	0.35	0.00	0.35	0.21	0.00	0.21
719	22	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	0.32	0.00	0.32	0.19	0.00	0.19
720	22	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	1.26	0.00	1.26	0.77	0.00	0.77
721	22	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	1.60	0.32	1.92	0.97	0.19	1.17
722	22	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	0.60	0.00	0.60	0.36	0.00	0.36
723	22	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	1.62	0.54	2.16	0.99	0.33	1.31
724	22	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	1.66	0.47	2.13	1.01	0.29	1.29
725	22	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.91	0.00	0.91	0.55	0.00	0.55
726	22	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	3.16	0.00	3.16	1.92	0.00	1.92
727	22	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	2.27	0.00	2.27	1.38	0.00	1.38
728	22	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	0.55	0.28	0.83	0.34	0.17	0.50
729	22	07OCT83	22:53	1065	50	1	5	TZ	1672	2753.78	0.60	0.00	0.60	0.36	0.00	0.36
730	22	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	0.24	0.00	0.24	0.15	0.00	0.15
731	22	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	0.52	0.00	0.52	0.31	0.00	0.31
732	22	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	1.83	0.00	1.83	1.11	0.00	1.11
733	22	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	2.24	0.00	2.24	1.36	0.00	1.36
734	22	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.28	0.00	0.28	0.17	0.00	0.17
735	22	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	0.00	0.52	0.52	0.00	0.31	0.31
736	22	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.92	0.00	0.92	0.56	0.00	0.56
737	22	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	1.93	0.77	2.70	1.17	0.47	1.64
738	22	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	4.20	0.35	4.55	2.55	0.21	2.76
739	22	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	1.52	0.00	1.52	0.92	0.00	0.92
740	22	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.61	0.00	0.61	0.37	0.00	0.37
741	22	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	0.00	0.44	0.44	0.00	0.27	0.27
742	22	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	0.31	0.00	0.31	0.19	0.00	0.19

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
743	22	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	2.07	0.00	2.07	1.25	0.00	1.25
744	27	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	0.00	4.08	4.08	0.00	2.48	2.48
745	27	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	0.00	0.57	0.57	0.00	0.34	0.34
746	27	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	0.00	0.57	0.57	0.00	0.34	0.34
747	27	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	0.00	0.52	0.52	0.00	0.31	0.31
748	27	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	0.00	0.26	0.26	0.00	0.16	0.16
749	29	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.00	0.24	0.24	0.00	0.14	0.14
750	29	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.00	0.33	0.33	0.00	0.20	0.20
751	29	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
752	30	06OCT83	19:52	1044	50	1	5	TZ	1540	2536.38	0.65	0.00	0.65	0.39	0.00	0.39
753	30	06OCT83	20:22	1045	50	1	5	TZ	1496	2463.91	6.68	2.01	8.69	4.06	1.22	5.28
754	30	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	1.60	0.32	1.92	0.97	0.19	1.17
755	30	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	3.16	1.89	5.05	1.92	1.15	3.07
756	30	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	2.88	0.64	3.52	1.75	0.39	2.14
757	30	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	21.18	1.03	22.21	12.86	0.63	13.49
758	30	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	20.93	5.08	26.02	12.71	3.09	15.80
759	30	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	11.07	1.75	12.82	6.72	1.06	7.78
760	30	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	5.41	0.54	5.95	3.29	0.33	3.61
761	30	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	12.55	1.18	13.73	7.62	0.72	8.34
762	30	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	9.96	4.05	14.01	6.05	2.46	8.51
763	30	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	20.30	1.21	21.52	12.33	0.74	13.06
764	30	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	6.94	0.00	6.94	4.22	0.00	4.22
765	30	07OCT83	3:53	1058	50	1	5	TZ	1716	2826.25	1.17	0.00	1.17	0.71	0.00	0.71
766	30	07OCT83	5:02	1061	50	1	10	TZ	2464	4058.21	0.81	0.41	1.22	0.49	0.25	0.74
767	30	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	7.95	0.00	7.95	4.83	0.00	4.83
768	30	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	2.49	0.28	2.77	1.51	0.17	1.68
769	30	07OCT83	22:16	1064	50	1	10	TZ	3344	5507.57	3.59	0.00	3.59	2.18	0.00	2.18
770	30	07OCT83	22:53	1065	50	1	5	TZ	1672	2753.78	2.99	0.60	3.59	1.82	0.36	2.18
771	30	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	11.21	0.91	12.12	6.81	0.55	7.36
772	30	08OCT83	0:08	1067	50	1	5	TZ	1892	3116.12	8.99	3.17	12.16	5.46	1.93	7.38
773	30	08OCT83	0:32	1068	50	1	5	TZ	1540	2536.38	32.47	4.55	37.01	19.71	2.76	22.47
774	30	08OCT83	1:10	1069	50	1	5	TZ	1804	2971.19	17.74	0.00	17.74	10.77	0.00	10.77
775	30	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	0.49	1.71	2.20	0.30	1.04	1.34
776	30	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	5.68	0.00	5.68	3.45	0.00	3.45
777	30	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	2.33	0.00	2.33	1.42	0.00	1.42
778	30	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	4.60	0.00	4.60	2.79	0.00	2.79
779	30	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	26.70	0.00	26.70	16.21	0.00	16.21
780	30	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	31.71	0.00	31.71	19.25	0.00	19.25
781	30	08OCT83	21:11	1137	50	1	10	CH	3740	6159.78	23.26	0.00	23.26	14.12	0.00	14.12
782	30	08OCT83	21:44	1138	50	1	5	CH	1848	3043.66	27.60	0.00	27.60	16.76	0.00	16.76
783	30	08OCT83	22:03	1139	50	1	5	CH	1936	3188.59	22.21	0.00	22.21	13.49	0.00	13.49
784	30	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	21.02	0.00	21.02	12.76	0.00	12.76
785	30	08OCT83	23:03	1141	50	1	10	CH	3300	5435.10	18.18	0.00	18.18	11.04	0.00	11.04
786	30	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	17.05	0.00	17.05	10.35	0.00	10.35
787	30	08OCT83	23:42	1143	50	1	10	CH	3388	5580.04	20.96	0.00	20.96	12.72	0.00	12.72
788	30	09OCT83	0:15	1144	50	1	10	CH	3564	5869.91	13.19	0.00	13.19	8.01	0.00	8.01
789	30	09OCT83	0:43	1145	50	1	10	CH	3432	5652.50	27.68	0.00	27.68	16.81	0.00	16.81
790	30	09OCT83	1:09	1146	50	1	5	CH	1672	2753.78	14.95	0.00	14.95	9.08	0.00	9.08
791	30	17OCT83	20:29	2	50	2	10	CH	3432	5652.50	15.44	0.29	15.73	9.38	0.18	9.55
792	30	17OCT83	20:51	3	50	2	5	CH	1804	2971.19	7.76	0.00	7.76	4.71	0.00	4.71
793	30	17OCT83	21:55	4	50	2	5	CH	1848	3043.66	14.07	0.54	14.61	8.54	0.33	8.87
794	30	17OCT83	22:10	5	50	2	5	CH	1936	3188.59	30.48	2.07	32.54	18.50	1.25	19.76
795	30	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	20.40	0.00	20.40	12.39	0.00	12.39

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
796	30	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	33.44	0.26	33.70	20.30	0.16	20.46
797	30	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	16.55	0.28	16.84	10.05	0.17	10.22
798	30	18OCT83	0:36	9	50	2	10	CH	3256	5362.63	10.75	0.00	10.75	6.53	0.00	6.53
799	30	18OCT83	1:04	10	50	2	5	CH	1760	2898.72	28.98	0.57	29.55	17.59	0.34	17.94
800	30	18OCT83	1:29	11	50	2	5	CH	1892	3116.12	31.18	0.00	31.18	18.93	0.00	18.93
801	30	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	12.78	0.00	12.78	7.76	0.00	7.76
802	30	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	22.27	2.73	25.00	13.52	1.66	15.18
803	30	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	8.85	0.00	8.85	5.38	0.00	5.38
804	30	18OCT83	20:54	16	50	2	5	CH	1672	2753.78	4.19	0.00	4.19	2.54	0.00	2.54
805	30	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	5.68	0.00	5.68	3.45	0.00	3.45
806	30	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	19.63	0.52	20.14	11.92	0.31	12.23
807	30	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	6.14	0.61	6.76	3.73	0.37	4.10
808	30	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	1.17	0.00	1.17	0.71	0.00	0.71
809	30	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	29.19	0.24	29.43	17.72	0.15	17.87
810	30	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	38.44	0.28	38.72	23.34	0.17	23.51
811	30	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	30.49	2.77	33.26	18.51	1.68	20.19
812	30	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.00	0.37	0.37	0.00	0.22	0.22
813	30	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	0.00	0.53	0.53	0.00	0.32	0.32
814	30	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.55	0.27	0.82	0.33	0.17	0.50
815	30	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.61	1.54	2.15	0.37	0.93	1.31
816	30	20OCT83	0:01	1195	50	2	5	TZ	1276	2101.57	0.00	0.78	0.78	0.00	0.48	0.48
817	30	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	26.66	0.00	26.66	16.19	0.00	16.19
818	30	20OCT83	2:03	1197	50	2	5	TZ	1188	1956.64	21.04	0.00	21.04	12.78	0.00	12.78
819	30	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	45.09	0.73	45.82	27.38	0.45	27.82
820	30	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	34.48	1.04	35.53	20.94	0.63	21.57
821	30	20OCT83	20:33	1174	50	2	5	TZ	1452	2391.44	6.20	0.00	6.20	3.76	0.00	3.76
822	30	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	15.05	0.31	15.36	9.14	0.19	9.32
823	30	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	23.42	1.38	24.79	14.22	0.84	15.05
824	30	20OCT83	21:34	1177	50	2	5	TZ	1452	2391.44	14.46	0.00	14.46	8.78	0.00	8.78
825	30	20OCT83	21:58	1178	50	2	5	TZ	1848	3043.66	1.08	0.00	1.08	0.66	0.00	0.66
826	32	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	0.32	0.00	0.32	0.19	0.00	0.19
827	32	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.29	0.00	0.29	0.18	0.00	0.18
828	32	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	0.31	0.00	0.31	0.19	0.00	0.19
829	32	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.91	0.00	0.91	0.55	0.00	0.55
830	32	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	1.26	0.00	1.26	0.77	0.00	0.77
831	32	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.76	0.00	0.76	0.46	0.00	0.46
832	32	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.28	0.00	0.28	0.17	0.00	0.17
833	32	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	3.47	0.39	3.85	2.10	0.23	2.34
834	32	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	2.57	0.73	3.30	1.56	0.45	2.00
835	32	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	2.10	0.00	2.10	1.27	0.00	1.27
836	32	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	1.52	0.00	1.52	0.92	0.00	0.92
837	32	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	1.59	0.00	1.59	0.96	0.00	0.96
838	32	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.55	0.00	0.55	0.33	0.00	0.33
839	32	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
840	32	20OCT83	0:01	1195	50	2	5	TZ	1276	2101.57	2.35	0.00	2.35	1.43	0.00	1.43
841	32	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	0.69	0.00	0.69	0.42	0.00	0.42
842	34	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	0.00	0.63	0.63	0.00	0.38	0.38
843	34	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	0.00	1.55	1.55	0.00	0.94	0.94
844	34	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.00	0.47	0.47	0.00	0.29	0.29
845	34	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	0.00	0.55	0.55	0.00	0.34	0.34
846	34	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	0.00	0.30	0.30	0.00	0.18	0.18
847	34	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.00	5.35	5.35	0.00	3.25	3.25
848	34	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	0.00	1.17	1.17	0.00	0.71	0.71

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
849	34	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	0.00	0.27	0.27	0.00	0.16	0.16
850	34	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	0.00	0.57	0.57	0.00	0.34	0.34
851	34	17OCT83	20:29	2	50	2	10	CH	3432	5652.50	0.00	0.29	0.29	0.00	0.18	0.18
852	34	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	0.00	0.26	0.26	0.00	0.16	0.16
853	34	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	0.00	1.42	1.42	0.00	0.86	0.86
854	34	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	0.00	2.73	2.73	0.00	1.66	1.66
855	34	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	0.00	2.27	2.27	0.00	1.38	1.38
856	34	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.00	0.92	0.92	0.00	0.56	0.56
857	34	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	0.00	0.28	0.28	0.00	0.17	0.17
858	34	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	0.00	1.11	1.11	0.00	0.67	0.67
859	34	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	0.00	0.76	0.76	0.00	0.46	0.46
860	34	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	0.00	0.53	0.53	0.00	0.32	0.32
861	34	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.00	0.55	0.55	0.00	0.33	0.33
862	35	06OCT83	19:21	1043	50	1	10	TZ	3036	5000.29	0.00	6.92	6.92	0.00	4.20	4.20
863	35	06OCT83	19:52	1044	50	1	5	TZ	1540	2536.38	0.00	77.27	77.27	0.00	46.92	46.92
864	35	06OCT83	20:22	1045	50	1	5	TZ	1496	2463.91	0.00	18.72	18.72	0.00	11.36	11.36
865	35	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	0.00	6.08	6.08	0.00	3.69	3.69
866	35	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	0.00	7.58	7.58	0.00	4.60	4.60
867	35	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	0.00	2.88	2.88	0.00	1.75	1.75
868	35	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	0.00	7.75	7.75	0.00	4.70	4.70
869	35	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	0.00	8.67	8.67	0.00	5.27	5.27
870	35	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.00	6.41	6.41	0.00	3.89	3.89
871	35	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	0.00	4.87	4.87	0.00	2.96	2.96
872	35	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.00	13.02	13.02	0.00	7.91	7.91
873	35	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	0.00	20.24	20.24	0.00	12.29	12.29
874	35	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.30	31.52	31.82	0.18	19.13	19.32
875	35	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	0.00	11.36	11.36	0.00	6.90	6.90
876	35	07OCT83	3:53	1058	50	1	5	TZ	1716	2826.25	2.91	65.85	68.76	1.77	39.98	41.75
877	35	07OCT83	4:22	1059	50	1	5	TZ	1584	2608.85	0.00	34.09	34.09	0.00	20.70	20.70
878	35	07OCT83	4:39	1060	50	1	5	TZ	1452	2391.44	1.38	117.77	119.15	0.84	71.50	72.34
879	35	07OCT83	5:02	1061	50	1	10	TZ	2464	4058.21	0.81	8.52	9.33	0.49	5.17	5.67
880	35	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	0.00	4.55	4.55	0.00	2.76	2.76
881	35	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	1.39	46.01	47.39	0.84	27.93	28.78
882	35	07OCT83	22:16	1064	50	1	10	TZ	3344	5507.57	0.00	129.19	129.19	0.00	78.44	78.44
883	35	07OCT83	22:53	1065	50	1	5	TZ	1672	2753.78	0.60	45.45	46.05	0.36	27.60	27.96
884	35	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	2.42	82.73	85.15	1.47	50.23	51.70
885	35	08OCT83	0:08	1067	50	1	5	TZ	1892	3116.12	7.40	133.72	141.12	4.49	81.19	85.68
886	35	08OCT83	0:32	1068	50	1	5	TZ	1540	2536.38	5.19	134.42	139.61	3.15	81.61	84.77
887	35	08OCT83	1:10	1069	50	1	5	TZ	1804	2971.19	4.99	106.98	111.97	3.03	64.96	67.99
888	35	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	0.49	43.74	44.23	0.30	26.56	26.86
889	35	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	4.68	131.35	136.03	2.84	79.75	82.59
890	35	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	15.15	120.63	135.78	9.20	73.24	82.44
891	35	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	3.25	58.17	61.42	1.97	35.32	37.29
892	35	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	0.00	102.84	102.84	0.00	62.44	62.44
893	35	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	0.00	82.98	82.98	0.00	50.38	50.38
894	35	08OCT83	21:11	1137	50	1	10	CH	3740	6159.78	0.00	68.45	68.45	0.00	41.56	41.56
895	35	08OCT83	21:44	1138	50	1	5	CH	1848	3043.66	0.00	54.65	54.65	0.00	33.18	33.18
896	35	08OCT83	22:03	1139	50	1	5	CH	1936	3188.59	1.03	37.19	38.22	0.63	22.58	23.21
897	35	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	0.57	94.89	95.45	0.34	57.61	57.96
898	35	08OCT83	23:03	1141	50	1	10	CH	3300	5435.10	0.30	72.42	72.73	0.18	43.97	44.16
899	35	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	0.00	35.80	35.80	0.00	21.73	21.73
900	35	08OCT83	23:42	1143	50	1	10	CH	3388	5580.04	0.00	55.19	55.19	0.00	33.51	33.51
901	35	09OCT83	0:15	1144	50	1	10	CH	3564	5869.91	0.00	45.45	45.45	0.00	27.60	27.60

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OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
902	35	09OCT83	0:43	1145	50	1	10	CH	3432	5652.50	0.29	47.49	47.79	0.18	28.84	29.01
903	35	09OCT83	1:09	1146	50	1	5	CH	1672	2753.78	0.00	59.21	59.21	0.00	35.95	35.95
904	35	17OCT83	20:29	2	50	2	10	CH	3432	5652.50	0.00	76.63	76.63	0.00	46.53	46.53
905	35	17OCT83	20:51	3	50	2	5	CH	1804	2971.19	0.00	61.53	61.53	0.00	37.36	37.36
906	35	17OCT83	21:55	4	50	2	5	CH	1848	3043.66	0.00	49.78	49.78	0.00	30.23	30.23
907	35	17OCT83	22:10	5	50	2	5	CH	1936	3188.59	0.00	47.00	47.00	0.00	28.54	28.54
908	35	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	0.00	39.00	39.00	0.00	23.68	23.68
909	35	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	0.00	69.49	69.49	0.00	42.19	42.19
910	35	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	0.00	58.36	58.36	0.00	35.43	35.43
911	35	18OCT83	0:36	9	50	2	10	CH	3256	5362.63	0.00	28.87	28.87	0.00	17.53	17.53
912	35	18OCT83	1:04	10	50	2	5	CH	1760	2898.72	0.00	68.75	68.75	0.00	41.74	41.74
913	35	18OCT83	1:29	11	50	2	5	CH	1892	3116.12	0.00	33.83	33.83	0.00	20.54	20.54
914	35	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	0.47	22.25	22.73	0.29	13.51	13.80
915	35	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	0.00	45.91	45.91	0.00	27.87	27.87
916	35	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	0.30	61.69	61.98	0.18	37.45	37.63
917	35	18OCT83	20:54	16	50	2	5	CH	1672	2753.78	2.39	61.60	64.00	1.45	37.40	38.86
918	35	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	1.14	74.15	75.28	0.69	45.02	45.71
919	35	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	2.58	78.00	80.58	1.57	47.36	48.92
920	35	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.61	31.02	31.63	0.37	18.83	19.21
921	35	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	0.00	36.13	36.13	0.00	21.94	21.94
922	35	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	0.24	40.67	40.91	0.15	24.69	24.84
923	35	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	1.12	67.62	68.74	0.68	41.06	41.74
924	35	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	0.00	26.05	26.05	0.00	15.82	15.82
925	35	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	0.00	12.33	12.33	0.00	7.48	7.48
926	35	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.00	17.23	17.23	0.00	10.46	10.46
927	35	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	0.00	19.93	19.93	0.00	12.10	12.10
928	35	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	0.00	9.85	9.85	0.00	5.98	5.98
929	35	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	0.00	10.57	10.57	0.00	6.42	6.42
930	35	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.00	5.75	5.75	0.00	3.49	3.49
931	35	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	30.41	30.41	0.00	18.46	18.46
932	35	20OCT83	0:01	1195	50	2	5	TZ	1276	2101.57	0.00	26.65	26.65	0.00	16.18	16.18
933	35	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	2.19	107.52	109.70	1.33	65.28	66.61
934	35	20OCT83	2:03	1197	50	2	5	TZ	1188	1956.64	4.21	94.28	98.48	2.56	57.24	59.80
935	35	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	2.93	109.60	112.54	1.78	66.55	68.33
936	35	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	6.53	120.69	127.22	3.97	73.28	77.24
937	35	20OCT83	20:01	1173	50	2	10	TZ	3344	5507.57	0.00	17.94	17.94	0.00	10.89	10.89
938	35	20OCT83	20:33	1174	50	2	5	TZ	1452	2391.44	0.69	8.95	9.64	0.42	5.44	5.85
939	35	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	0.00	26.11	26.11	0.00	15.85	15.85
940	35	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	4.82	46.14	50.96	2.93	28.02	30.94
941	35	20OCT83	21:34	1177	50	2	5	TZ	1452	2391.44	4.82	163.22	168.04	2.93	99.10	102.03
942	35	20OCT83	21:58	1178	50	2	5	TZ	1848	3043.66	0.00	119.05	119.05	0.00	72.28	72.28
943	39	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	0.00	0.31	0.31	0.00	0.19	0.19
944	39	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	0.00	0.57	0.57	0.00	0.34	0.34
945	39	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	0.00	0.28	0.28	0.00	0.17	0.17
946	39	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	0.37	0.37	0.73	0.22	0.22	0.45
947	42	08OCT83	20:16	1135	50	1	5	CH	1760	2898.72	0.00	0.57	0.57	0.00	0.34	0.34
948	42	09OCT83	0:43	1145	50	1	10	CH	3432	5652.50	0.00	0.29	0.29	0.00	0.18	0.18
949	42	09OCT83	1:09	1146	50	1	5	CH	1672	2753.78	0.00	1.20	1.20	0.00	0.73	0.73
950	42	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	0.00	1.03	1.03	0.00	0.63	0.63
951	45	06OCT83	19:52	1044	50	1	5	TZ	1540	2536.38	3.90	0.00	3.90	2.37	0.00	2.37
952	45	06OCT83	20:22	1045	50	1	5	TZ	1496	2463.91	3.34	0.00	3.34	2.03	0.00	2.03
953	45	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	1.92	0.00	1.92	1.17	0.00	1.17
954	45	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	1.89	0.00	1.89	1.15	0.00	1.15

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
955	45	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	3.84	0	3.84	2.33	0	2.33
956	45	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	2.07	0	2.07	1.25	0	1.25
957	45	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	3.29	0	3.29	2.00	0	2.00
958	45	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	2.62	0	2.62	1.59	0	1.59
959	45	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	3.79	0	3.79	2.30	0	2.30
960	45	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	4.26	0	4.26	2.59	0	2.59
961	45	07OCT83	1:22	1055	50	1	10	TZ	3212	5290.16	11.83	0	11.83	7.18	0	7.18
962	45	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	26.36	0	26.36	16.01	0	16.01
963	45	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	8.84	0	8.84	5.37	0	5.37
964	45	07OCT83	3:53	1058	50	1	5	TZ	1716	2826.25	1.17	0	1.17	0.71	0	0.71
965	45	07OCT83	4:22	1059	50	1	5	TZ	1584	2608.85	3.16	0	3.16	1.92	0	1.92
966	45	07OCT83	5:30	1062	50	1	10	TZ	2640	4348.08	1.89	0	1.89	1.15	0	1.15
967	45	07OCT83	22:16	1064	50	1	10	TZ	3344	5507.57	2.69	0	2.69	1.63	0	1.63
968	45	07OCT83	22:53	1065	50	1	5	TZ	1672	2753.78	3.59	0	3.59	2.18	0	2.18
969	45	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	1.21	0	1.21	0.74	0	0.74
970	45	08OCT83	0:08	1067	50	1	5	TZ	1892	3116.12	1.06	0	1.06	0.64	0	0.64
971	45	08OCT83	0:32	1068	50	1	5	TZ	1540	2536.38	1.95	0	1.95	1.18	0	1.18
972	45	08OCT83	1:10	1069	50	1	5	TZ	1804	2971.19	2.77	0	2.77	1.68	0	1.68
973	45	08OCT83	1:33	1070	50	1	10	TZ	4092	6739.52	2.69	0	2.69	1.63	0	1.63
974	45	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	1.67	0	1.67	1.01	0	1.01
975	45	08OCT83	3:51	1133	50	1	5	CH	1716	2826.25	0.58	0	0.58	0.35	0	0.35
976	45	08OCT83	4:33	1134	50	1	10	CH	3696	6087.31	0.27	0	0.27	0.16	0	0.16
977	45	08OCT83	20:45	1136	50	1	10	CH	3784	6232.25	2.11	0	2.11	1.28	0	1.28
978	45	08OCT83	21:11	1137	50	1	10	CH	3740	6159.78	1.07	0	1.07	0.65	0	0.65
979	45	08OCT83	21:44	1138	50	1	5	CH	1848	3043.66	2.16	0	2.16	1.31	0	1.31
980	45	08OCT83	22:03	1139	50	1	5	CH	1936	3188.59	2.58	0	2.58	1.57	0	1.57
981	45	08OCT83	22:22	1140	50	1	5	CH	1760	2898.72	2.27	0	2.27	1.38	0	1.38
982	45	08OCT83	23:03	1141	50	1	10	CH	3300	5435.10	1.82	0	1.82	1.10	0	1.10
983	45	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	2.27	0	2.27	1.38	0	1.38
984	45	08OCT83	23:42	1143	50	1	10	CH	3388	5580.04	4.13	0	4.13	2.51	0	2.51
985	45	09OCT83	0:15	1144	50	1	10	CH	3564	5869.91	3.65	0	3.65	2.21	0	2.21
986	45	09OCT83	0:43	1145	50	1	10	CH	3432	5652.50	3.21	0	3.21	1.95	0	1.95
987	45	09OCT83	1:09	1146	50	1	5	CH	1672	2753.78	0.60	0	0.60	0.36	0	0.36
988	45	17OCT83	20:29	2	50	2	10	CH	3432	5652.50	0.58	0	0.58	0.35	0	0.35
989	45	17OCT83	21:55	4	50	2	5	CH	1848	3043.66	0.54	0	0.54	0.33	0	0.33
990	45	17OCT83	22:10	5	50	2	5	CH	1936	3188.59	0.52	0	0.52	0.31	0	0.31
991	45	17OCT83	22:49	6	50	2	10	CH	3872	6377.18	2.32	0	2.32	1.41	0	1.41
992	45	17OCT83	23:09	7	50	2	10	CH	3828	6304.72	1.04	0	1.04	0.63	0	0.63
993	45	18OCT83	0:10	8	50	2	10	CH	3564	5869.91	1.40	0	1.40	0.85	0	0.85
994	45	18OCT83	0:36	9	50	2	10	CH	3256	5362.63	2.15	0	2.15	1.31	0	1.31
995	45	18OCT83	1:04	10	50	2	5	CH	1760	2898.72	1.70	0	1.70	1.03	0	1.03
996	45	18OCT83	1:29	11	50	2	5	CH	1892	3116.12	3.17	0	3.17	1.93	0	1.93
997	45	18OCT83	19:08	12	50	2	5	CH	2112	3478.46	0.95	0	0.95	0.57	0	0.57
998	45	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	6.36	0	6.36	3.86	0	3.86
999	45	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	5.31	0	5.31	3.23	0	3.23
1000	45	18OCT83	20:54	16	50	2	5	CH	1672	2753.78	2.39	0	2.39	1.45	0	1.45
1001	45	18OCT83	21:14	17	50	2	10	TZ	3520	5797.44	1.42	0	1.42	0.86	0	0.86
1002	45	18OCT83	21:58	18	50	2	5	TZ	1936	3188.59	3.10	0	3.10	1.88	0	1.88
1003	45	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	1.54	0	1.54	0.93	0	0.93
1004	45	18OCT83	22:38	20	50	2	5	TZ	1716	2826.25	4.08	0	4.08	2.48	0	2.48
1005	45	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	2.87	0	2.87	1.74	0	1.74
1006	45	18OCT83	23:21	22	50	2	10	TZ	3564	5869.91	5.89	0	5.89	3.58	0	3.58
1007	45	18OCT83	23:45	1147	50	2	5	TZ	1804	2971.19	3.88	0	3.88	2.36	0	2.36

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1008	45	19OCT83	19:41	1148	50	2	10	YK	2596	4275.61	3.08	0.00	3.08	1.87	0.00	1.87
1009	45	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	2.93	0.00	2.93	1.78	0.00	1.78
1010	45	19OCT83	21:15	1150	50	2	10	YK	2860	4710.42	2.80	0.00	2.80	1.70	0.00	1.70
1011	45	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	3.03	0.00	3.03	1.84	0.00	1.84
1012	45	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	7.93	0.00	7.93	4.81	0.00	4.81
1013	45	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	20.54	0.00	20.54	12.47	0.00	12.47
1014	45	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	16.89	0.00	16.89	10.26	0.00	10.26
1015	45	20OCT83	0:01	1195	50	2	5	TZ	1276	2101.57	21.16	0.00	21.16	12.85	0.00	12.85
1016	45	20OCT83	1:20	1196	50	2	10	TZ	2288	3768.34	2.62	0.00	2.62	1.59	0.00	1.59
1017	45	20OCT83	2:03	1197	50	2	5	TZ	1188	1956.64	7.58	0.00	7.58	4.60	0.00	4.60
1018	45	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	7.33	0.00	7.33	4.45	0.00	4.45
1019	45	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	3.66	0.00	3.66	2.22	0.00	2.22
1020	45	20OCT83	20:33	1174	50	2	5	TZ	1452	2391.44	4.13	0.00	4.13	2.51	0.00	2.51
1021	45	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	2.76	0.00	2.76	1.68	0.00	1.68
1022	45	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	1.38	0.00	1.38	0.84	0.00	0.84
1023	45	20OCT83	21:34	1177	50	2	5	TZ	1452	2391.44	2.75	0.00	2.75	1.67	0.00	1.67
1024	66	06OCT83	19:21	1043	50	1	10	TZ	3036	5000.29	0.00	0.66	0.66	0.00	0.40	0.40
1025	72	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.29	0.00	0.29	0.18	0.00	0.18
1026	72	07OCT83	21:26	1063	50	1	10	TZ	3608	5942.38	0.28	0.00	0.28	0.17	0.00	0.17
1027	72	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	0.00	0.30	0.30	0.00	0.18	0.18
1028	72	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.00	0.33	0.33	0.00	0.20	0.20
1029	72	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
1030	72	19OCT83	20:32	1151	50	2	10	YK	2728	4493.02	1.10	0.73	1.83	0.67	0.45	1.11
1031	72	19OCT83	21:50	1152	50	2	5	YK	1320	2174.04	0.00	0.76	0.76	0.00	0.46	0.46
1032	72	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	0.00	0.53	0.53	0.00	0.32	0.32
1033	72	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	0.00	1.10	1.10	0.00	0.67	0.67
1034	72	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
1035	72	20OCT83	2:23	1198	50	2	10	TZ	2728	4493.02	0.00	0.37	0.37	0.00	0.22	0.22
1036	72	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	0.00	0.52	0.52	0.00	0.32	0.32
1037	72	20OCT83	21:21	1176	50	2	5	TZ	1452	2391.44	0.00	0.69	0.69	0.00	0.42	0.42
1038	80	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	0.00	0.32	0.32	0.00	0.19	0.19
1039	80	06OCT83	21:21	1047	50	1	5	TZ	1584	2608.85	0.00	1.89	1.89	0.00	1.15	1.15
1040	80	06OCT83	21:39	1048	50	1	10	TZ	3124	5145.23	0.00	0.32	0.32	0.00	0.19	0.19
1041	80	06OCT83	23:42	1052	50	1	5	TZ	1848	3043.66	0.00	0.54	0.54	0.00	0.33	0.33
1042	80	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.00	0.91	0.91	0.00	0.55	0.55
1043	80	07OCT83	5:02	1061	50	1	10	TZ	2464	4058.21	0.00	1.22	1.22	0.00	0.74	0.74
1044	80	18OCT83	22:13	19	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
1045	80	20OCT83	20:53	1175	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
1046	106	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.00	0.29	0.29	0.00	0.18	0.18
1047	106	07OCT83	3:13	1057	50	1	5	TZ	1584	2608.85	0.00	0.63	0.63	0.00	0.38	0.38
1048	106	07OCT83	23:16	1066	50	1	10	TZ	3300	5435.10	0.00	0.30	0.30	0.00	0.18	0.18
1049	106	17OCT83	20:51	3	50	2	5	CH	1804	2971.19	0.00	0.55	0.55	0.00	0.34	0.34
1050	106	18OCT83	19:26	13	50	2	5	CH	2200	3623.40	0.00	0.91	0.91	0.00	0.55	0.55
1051	106	18OCT83	20:31	15	50	2	10	CH	3388	5580.04	0.00	0.30	0.30	0.00	0.18	0.18
1052	106	18OCT83	23:02	21	50	2	10	TZ	4180	6884.46	0.00	0.24	0.24	0.00	0.15	0.15
1053	106	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.00	0.31	0.31	0.00	0.19	0.19
1054	106	20OCT83	19:23	1172	50	2	10	TZ	3828	6304.72	0.00	0.26	0.26	0.00	0.16	0.16
1055	110	06OCT83	19:21	1043	50	1	10	TZ	3036	5000.29	1.98	0.00	1.98	1.20	0.00	1.20
1056	110	06OCT83	20:22	1045	50	1	5	TZ	1496	2463.91	0.67	0.00	0.67	0.41	0.00	0.41
1057	110	06OCT83	22:23	1049	50	1	5	TZ	1936	3188.59	1.03	0.00	1.03	0.63	0.00	0.63
1058	110	06OCT83	22:46	1050	50	1	10	TZ	3344	5507.57	1.50	0.00	1.50	0.91	0.00	0.91
1059	110	06OCT83	23:10	1051	50	1	10	TZ	3432	5652.50	0.58	0.00	0.58	0.35	0.00	0.35
1060	110	07OCT83	0:21	1053	50	1	10	TZ	4224	6956.93	0.24	0.00	0.24	0.14	0.00	0.14

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 6.2 METER HIGH RISE TRAWL
AND 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1061	110	07OCT83	2:01	1056	50	1	10	TZ	3300	5435.10	0.91	0.00	0.91	0.55	0.00	0.55
1062	110	07OCT83	3:53	1058	50	1	5	TZ	1716	2826.25	2.33	0.00	2.33	1.42	0.00	1.42
1063	110	07OCT83	4:39	1060	50	1	5	TZ	1452	2391.44	0.69	0.00	0.69	0.42	0.00	0.42
1064	110	08OCT83	2:36	1071	50	1	10	CH	2992	4927.82	0.33	0.00	0.33	0.20	0.00	0.20
1065	110	08OCT83	23:24	1142	50	1	5	CH	1760	2898.72	1.14	0.00	1.14	0.69	0.00	0.69
1066	110	19OCT83	22:39	1192	50	2	5	TZ	1892	3116.12	1.06	0.00	1.06	0.64	0.00	0.64
1067	110	19OCT83	22:58	1193	50	2	10	TZ	3652	6014.84	2.19	0.27	2.46	1.33	0.17	1.50
1068	110	19OCT83	23:21	1194	50	2	10	TZ	3256	5362.63	0.92	0.00	0.92	0.56	0.00	0.56
1069	131	06OCT83	19:21	1043	50	1	10	TZ	3036	5000.29	0.00	0.33	0.33	0.00	0.20	0.20
1070	131	06OCT83	20:38	1046	50	1	10	TZ	3124	5145.23	0.00	0.32	0.32	0.00	0.19	0.19

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1	30	04OCT83	22:25	1075	18	27	TZ	170
2	30	04OCT83	23:00	1076	18	28	TZ	157
3	30	05OCT83	1:15	1079	18	29	TZ	80
4	30	05OCT83	1:15	1079	18	29	TZ	80
5	30	05OCT83	1:15	1079	18	29	TZ	82
6	30	05OCT83	1:15	1079	18	29	TZ	85
7	30	05OCT83	1:15	1079	18	29	TZ	85
8	30	05OCT83	1:15	1079	18	29	TZ	85
9	30	05OCT83	1:15	1079	18	29	TZ	85
10	30	05OCT83	1:15	1079	18	29	TZ	86
11	30	05OCT83	1:15	1079	18	29	TZ	87
12	30	05OCT83	1:15	1079	18	29	TZ	90
13	30	05OCT83	1:15	1079	18	29	TZ	91
14	30	05OCT83	1:15	1079	18	29	TZ	94
15	30	05OCT83	1:15	1079	18	29	TZ	94
16	30	05OCT83	1:15	1079	18	29	TZ	95
17	30	05OCT83	1:15	1079	18	29	TZ	95
18	30	05OCT83	1:15	1079	18	29	TZ	96
19	30	05OCT83	1:15	1079	18	29	TZ	99
20	30	05OCT83	1:15	1079	18	29	TZ	100
21	30	05OCT83	1:15	1079	18	29	TZ	102
22	30	05OCT83	1:15	1079	18	29	TZ	102
23	30	05OCT83	1:15	1079	18	29	TZ	102
24	30	05OCT83	1:15	1079	18	29	TZ	105
25	30	05OCT83	1:15	1079	18	29	TZ	106
26	30	05OCT83	1:15	1079	18	29	TZ	107
27	30	05OCT83	1:15	1079	18	29	TZ	109
28	30	05OCT83	1:15	1079	18	29	TZ	110
29	30	05OCT83	1:15	1079	18	29	TZ	113
30	30	05OCT83	1:15	1079	18	29	TZ	123
31	30	05OCT83	2:26	1080	18	29	TZ	80
32	30	05OCT83	2:26	1080	18	29	TZ	85
33	30	05OCT83	2:26	1080	18	29	TZ	87
34	30	05OCT83	2:26	1080	18	29	TZ	90
35	30	05OCT83	2:26	1080	18	29	TZ	95
36	30	05OCT83	2:26	1080	18	29	TZ	96
37	30	05OCT83	2:26	1080	18	29	TZ	97
38	30	05OCT83	2:26	1080	18	29	TZ	99
39	30	05OCT83	2:26	1080	18	29	TZ	100
40	30	05OCT83	2:26	1080	18	29	TZ	100
41	30	05OCT83	2:26	1080	18	29	TZ	100
42	30	05OCT83	2:26	1080	18	29	TZ	103
43	30	05OCT83	2:26	1080	18	29	TZ	107
44	30	05OCT83	2:26	1080	18	29	TZ	108
45	30	05OCT83	2:26	1080	18	29	TZ	112
46	30	05OCT83	2:26	1080	18	29	TZ	139
47	30	05OCT83	3:04	1081	18	29	TZ	90
48	30	05OCT83	3:04	1081	18	29	TZ	110
49	30	05OCT83	3:04	1081	18	29	TZ	175
50	30	06OCT83	20:22	1085	18	27	TZ	226
51	30	06OCT83	20:38	1086	18	27	TZ	108
52	30	06OCT83	20:38	1086	18	27	TZ	188
53	30	06OCT83	21:21	1087	18	28	TZ	91
54	30	06OCT83	21:21	1087	18	28	TZ	93

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
55	30	06OCT83	21:21	1087	18	28	TZ	95
56	30	06OCT83	21:21	1087	18	28	TZ	95
57	30	06OCT83	21:21	1087	18	28	TZ	95
58	30	06OCT83	21:21	1087	18	28	TZ	111
59	30	06OCT83	21:39	1088	18	28	TZ	78
60	30	06OCT83	21:39	1088	18	28	TZ	85
61	30	06OCT83	21:39	1088	18	28	TZ	87
62	30	06OCT83	21:39	1088	18	28	TZ	90
63	30	06OCT83	21:39	1088	18	28	TZ	95
64	30	06OCT83	21:39	1088	18	28	TZ	95
65	30	06OCT83	21:39	1088	18	28	TZ	97
66	30	06OCT83	21:39	1088	18	28	TZ	105
67	30	06OCT83	21:39	1088	18	28	TZ	112
68	30	06OCT83	21:39	1088	18	28	TZ	150
69	30	06OCT83	21:39	1088	18	28	TZ	178
70	30	06OCT83	22:23	1089	18	29	TZ	90
71	30	06OCT83	22:23	1089	18	29	TZ	90
72	30	06OCT83	22:23	1089	18	29	TZ	115
73	30	06OCT83	22:23	1089	18	29	TZ	185
74	30	06OCT83	22:46	1090	18	29	TZ	68
75	30	06OCT83	22:46	1090	18	29	TZ	78
76	30	06OCT83	22:46	1090	18	29	TZ	81
77	30	06OCT83	22:46	1090	18	29	TZ	81
78	30	06OCT83	22:46	1090	18	29	TZ	87
79	30	06OCT83	22:46	1090	18	29	TZ	88
80	30	06OCT83	22:46	1090	18	29	TZ	88
81	30	06OCT83	22:46	1090	18	29	TZ	88
82	30	06OCT83	22:46	1090	18	29	TZ	89
83	30	06OCT83	22:46	1090	18	29	TZ	90
84	30	06OCT83	22:46	1090	18	29	TZ	90
85	30	06OCT83	22:46	1090	18	29	TZ	90
86	30	06OCT83	22:46	1090	18	29	TZ	90
87	30	06OCT83	22:46	1090	18	29	TZ	90
88	30	06OCT83	22:46	1090	18	29	TZ	91
89	30	06OCT83	22:46	1090	18	29	TZ	91
90	30	06OCT83	22:46	1090	18	29	TZ	92
91	30	06OCT83	22:46	1090	18	29	TZ	94
92	30	06OCT83	22:46	1090	18	29	TZ	94
93	30	06OCT83	22:46	1090	18	29	TZ	95
94	30	06OCT83	22:46	1090	18	29	TZ	96
95	30	06OCT83	22:46	1090	18	29	TZ	96
96	30	06OCT83	22:46	1090	18	29	TZ	98
97	30	06OCT83	22:46	1090	18	29	TZ	98
98	30	06OCT83	22:46	1090	18	29	TZ	98
99	30	06OCT83	22:46	1090	18	29	TZ	98
100	30	06OCT83	22:46	1090	18	29	TZ	100
101	30	06OCT83	22:46	1090	18	29	TZ	100
102	30	06OCT83	22:46	1090	18	29	TZ	100
103	30	06OCT83	22:46	1090	18	29	TZ	100
104	30	06OCT83	22:46	1090	18	29	TZ	100
105	30	06OCT83	22:46	1090	18	29	TZ	100
106	30	06OCT83	22:46	1090	18	29	TZ	100
107	30	06OCT83	22:46	1090	18	29	TZ	105
108	30	06OCT83	22:46	1090	18	29	TZ	105

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
109	30	06OCT83	22:46	1090	18	29	TZ	106
110	30	06OCT83	22:46	1090	18	29	TZ	107
111	30	06OCT83	22:46	1090	18	29	TZ	110
112	30	06OCT83	22:46	1090	18	29	TZ	110
113	30	06OCT83	22:46	1090	18	29	TZ	110
114	30	06OCT83	22:46	1090	18	29	TZ	110
115	30	06OCT83	22:46	1090	18	29	TZ	110
116	30	06OCT83	22:46	1090	18	29	TZ	111
117	30	06OCT83	22:46	1090	18	29	TZ	117
118	30	06OCT83	22:46	1090	18	29	TZ	195
119	30	06OCT83	23:10	1091	18	29	TZ	78
120	30	06OCT83	23:10	1091	18	29	TZ	85
121	30	06OCT83	23:10	1091	18	29	TZ	87
122	30	06OCT83	23:10	1091	18	29	TZ	90
123	30	06OCT83	23:10	1091	18	29	TZ	90
124	30	06OCT83	23:10	1091	18	29	TZ	90
125	30	06OCT83	23:10	1091	18	29	TZ	90
126	30	06OCT83	23:10	1091	18	29	TZ	90
127	30	06OCT83	23:10	1091	18	29	TZ	92
128	30	06OCT83	23:10	1091	18	29	TZ	95
129	30	06OCT83	23:10	1091	18	29	TZ	95
130	30	06OCT83	23:10	1091	18	29	TZ	95
131	30	06OCT83	23:10	1091	18	29	TZ	95
132	30	06OCT83	23:10	1091	18	29	TZ	96
133	30	06OCT83	23:10	1091	18	29	TZ	98
134	30	06OCT83	23:10	1091	18	29	TZ	98
135	30	06OCT83	23:10	1091	18	29	TZ	98
136	30	06OCT83	23:10	1091	18	29	TZ	100
137	30	06OCT83	23:10	1091	18	29	TZ	100
138	30	06OCT83	23:10	1091	18	29	TZ	100
139	30	06OCT83	23:10	1091	18	29	TZ	100
140	30	06OCT83	23:10	1091	18	29	TZ	102
141	30	06OCT83	23:10	1091	18	29	TZ	103
142	30	06OCT83	23:10	1091	18	29	TZ	105
143	30	06OCT83	23:10	1091	18	29	TZ	105
144	30	06OCT83	23:10	1091	18	29	TZ	108
145	30	06OCT83	23:10	1091	18	29	TZ	108
146	30	06OCT83	23:10	1091	18	29	TZ	110
147	30	06OCT83	23:10	1091	18	29	TZ	111
148	30	06OCT83	23:10	1091	18	29	TZ	112
149	30	06OCT83	23:10	1091	18	29	TZ	112
150	30	06OCT83	23:10	1091	18	29	TZ	180
151	30	06OCT83	23:42	1092	18	29	TZ	78
152	30	06OCT83	23:42	1092	18	29	TZ	88
153	30	06OCT83	23:42	1092	18	29	TZ	90
154	30	06OCT83	23:42	1092	18	29	TZ	90
155	30	06OCT83	23:42	1092	18	29	TZ	93
156	30	06OCT83	23:42	1092	18	29	TZ	94
157	30	06OCT83	23:42	1092	18	29	TZ	95
158	30	06OCT83	23:42	1092	18	29	TZ	95
159	30	06OCT83	23:42	1092	18	29	TZ	105
160	30	07OCT83	1:22	1095	18	30	TZ	98
161	30	07OCT83	2:01	1096	18	30	TZ	76
162	30	07OCT83	2:01	1096	18	30	TZ	92

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
163	30	07OCT83	2:01	1096	18	30	TZ	96
164	30	07OCT83	2:01	1096	18	30	TZ	104
165	30	07OCT83	2:01	1096	18	30	TZ	105
166	30	07OCT83	2:01	1096	18	30	TZ	106
167	30	07OCT83	2:01	1096	18	30	TZ	191
168	30	07OCT83	2:01	1096	18	30	TZ	582
169	30	07OCT83	3:13	1097	18	30	TZ	90
170	30	07OCT83	3:13	1097	18	30	TZ	95
171	30	07OCT83	3:13	1097	18	30	TZ	100
172	30	07OCT83	3:13	1097	18	30	TZ	103
173	30	07OCT83	3:13	1097	18	30	TZ	105
174	30	07OCT83	3:13	1097	18	30	TZ	110
175	30	07OCT83	3:53	1098	18	30	TZ	73
176	30	07OCT83	3:53	1098	18	30	TZ	77
177	30	07OCT83	3:53	1098	18	30	TZ	104
178	30	07OCT83	4:22	1099	18	30	TZ	90
179	30	07OCT83	4:22	1099	18	30	TZ	94
180	30	07OCT83	5:02	1101	18	30	TZ	70
181	30	07OCT83	5:02	1101	18	30	TZ	78
182	30	07OCT83	5:02	1101	18	30	TZ	88
183	30	07OCT83	5:02	1101	18	30	TZ	90
184	30	07OCT83	5:02	1101	18	30	TZ	93
185	30	07OCT83	5:02	1101	18	30	TZ	100
186	30	07OCT83	5:02	1101	18	30	TZ	104
187	30	07OCT83	5:02	1101	18	30	TZ	105
188	30	07OCT83	5:02	1101	18	30	TZ	107
189	30	07OCT83	5:02	1101	18	30	TZ	107
190	30	07OCT83	5:02	1101	18	30	TZ	107
191	30	07OCT83	5:02	1101	18	30	TZ	108
192	30	07OCT83	5:02	1101	18	30	TZ	109
193	30	07OCT83	5:02	1101	18	30	TZ	110
194	30	07OCT83	5:02	1101	18	30	TZ	111
195	30	07OCT83	5:02	1101	18	30	TZ	118
196	30	07OCT83	5:02	1101	18	30	TZ	119
197	30	07OCT83	5:02	1101	18	30	TZ	156
198	30	07OCT83	21:26	1103	18	31	TZ	80
199	30	07OCT83	21:26	1103	18	31	TZ	83
200	30	07OCT83	21:26	1103	18	31	TZ	85
201	30	07OCT83	21:26	1103	18	31	TZ	85
202	30	07OCT83	21:26	1103	18	31	TZ	86
203	30	07OCT83	21:26	1103	18	31	TZ	87
204	30	07OCT83	21:26	1103	18	31	TZ	95
205	30	07OCT83	21:26	1103	18	31	TZ	96
206	30	07OCT83	21:26	1103	18	31	TZ	102
207	30	07OCT83	21:26	1103	18	31	TZ	104
208	30	07OCT83	21:26	1103	18	31	TZ	104
209	30	07OCT83	21:26	1103	18	31	TZ	105
210	30	07OCT83	21:26	1103	18	31	TZ	107
211	30	07OCT83	21:26	1103	18	31	TZ	107
212	30	07OCT83	21:26	1103	18	31	TZ	107
213	30	07OCT83	21:26	1103	18	31	TZ	109
214	30	07OCT83	21:26	1103	18	31	TZ	110
215	30	07OCT83	21:26	1103	18	31	TZ	110
216	30	07OCT83	22:16	1104	18	31	TZ	95

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
217	30	07OCT83	22:16	1104	18	31	TZ	102
218	30	07OCT83	22:53	1105	18	31	TZ	85
219	30	07OCT83	22:53	1105	18	31	TZ	87
220	30	07OCT83	22:53	1105	18	31	TZ	90
221	30	07OCT83	22:53	1105	18	31	TZ	97
222	30	07OCT83	23:16	1106	18	32	TZ	70
223	30	07OCT83	23:16	1106	18	32	TZ	78
224	30	07OCT83	23:16	1106	18	32	TZ	78
225	30	07OCT83	23:16	1106	18	32	TZ	80
226	30	07OCT83	23:16	1106	18	32	TZ	80
227	30	07OCT83	23:16	1106	18	32	TZ	81
228	30	07OCT83	23:16	1106	18	32	TZ	83
229	30	07OCT83	23:16	1106	18	32	TZ	87
230	30	07OCT83	23:16	1106	18	32	TZ	87
231	30	07OCT83	23:16	1106	18	32	TZ	88
232	30	07OCT83	23:16	1106	18	32	TZ	93
233	30	07OCT83	23:16	1106	18	32	TZ	95
234	30	07OCT83	23:16	1106	18	32	TZ	95
235	30	07OCT83	23:16	1106	18	32	TZ	97
236	30	07OCT83	23:16	1106	18	32	TZ	99
237	30	07OCT83	23:16	1106	18	32	TZ	100
238	30	07OCT83	23:16	1106	18	32	TZ	105
239	30	07OCT83	23:16	1106	18	32	TZ	115
240	30	07OCT83	23:16	1106	18	32	TZ	130
241	30	08OCT83	0:08	1107	18	32	TZ	87
242	30	08OCT83	0:08	1107	18	32	TZ	90
243	30	08OCT83	0:08	1107	18	32	TZ	92
244	30	08OCT83	0:08	1107	18	32	TZ	183
245	30	08OCT83	0:08	1107	18	32	TZ	193
246	30	08OCT83	0:32	1108	18	32	TZ	62
247	30	08OCT83	0:32	1108	18	32	TZ	80
248	30	08OCT83	0:32	1108	18	32	TZ	85
249	30	08OCT83	0:32	1108	18	32	TZ	85
250	30	08OCT83	0:32	1108	18	32	TZ	87
251	30	08OCT83	0:32	1108	18	32	TZ	88
252	30	08OCT83	0:32	1108	18	32	TZ	89
253	30	08OCT83	0:32	1108	18	32	TZ	90
254	30	08OCT83	0:32	1108	18	32	TZ	92
255	30	08OCT83	0:32	1108	18	32	TZ	93
256	30	08OCT83	0:32	1108	18	32	TZ	95
257	30	08OCT83	0:32	1108	18	32	TZ	97
258	30	08OCT83	0:32	1108	18	32	TZ	97
259	30	08OCT83	0:32	1108	18	32	TZ	100
260	30	08OCT83	0:32	1108	18	32	TZ	103
261	30	08OCT83	0:32	1108	18	32	TZ	104
262	30	08OCT83	0:32	1108	18	32	TZ	110
263	30	08OCT83	0:32	1108	18	32	TZ	111
264	30	08OCT83	0:32	1108	18	32	TZ	111
265	30	08OCT83	0:32	1108	18	32	TZ	112
266	30	08OCT83	0:32	1108	18	32	TZ	115
267	30	08OCT83	0:32	1108	18	32	TZ	171
268	30	08OCT83	0:32	1108	18	32	TZ	190
269	30	08OCT83	1:10	1109	18	33	TZ	81
270	30	08OCT83	1:10	1109	18	33	TZ	89

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
271	30	08OCT83	1:10	1109	18	33	TZ	89
272	30	08OCT83	1:10	1109	18	33	TZ	89
273	30	08OCT83	1:10	1109	18	33	TZ	90
274	30	08OCT83	1:10	1109	18	33	TZ	93
275	30	08OCT83	1:10	1109	18	33	TZ	94
276	30	08OCT83	1:10	1109	18	33	TZ	95
277	30	08OCT83	1:10	1109	18	33	TZ	101
278	30	08OCT83	1:10	1109	18	33	TZ	102
279	30	08OCT83	1:10	1109	18	33	TZ	161
280	30	08OCT83	1:57	1111	18	33	TZ	82
281	30	08OCT83	1:57	1111	18	33	TZ	84
282	30	08OCT83	1:57	1111	18	33	TZ	88
283	30	08OCT83	1:57	1111	18	33	TZ	89
284	30	08OCT83	1:57	1111	18	33	TZ	94
285	30	08OCT83	1:57	1111	18	33	TZ	95
286	30	08OCT83	1:57	1111	18	33	TZ	100
287	30	08OCT83	1:57	1111	18	33	TZ	100
288	30	08OCT83	1:57	1111	18	33	TZ	103
289	30	08OCT83	1:57	1111	18	33	TZ	108
290	30	08OCT83	1:57	1111	18	33	TZ	110
291	30	08OCT83	1:57	1111	18	33	TZ	111
292	30	08OCT83	1:57	1111	18	33	TZ	111
293	30	08OCT83	1:57	1111	18	33	TZ	111
294	30	08OCT83	1:57	1111	18	33	TZ	112
295	30	08OCT83	1:57	1111	18	33	TZ	116
296	30	08OCT83	1:57	1111	18	33	TZ	159
297	30	08OCT83	1:57	1111	18	33	TZ	227
298	30	08OCT83	2:36	1112	18	34	CH	84
299	30	08OCT83	2:36	1112	18	34	CH	86
300	30	08OCT83	2:36	1112	18	34	CH	88
301	30	08OCT83	2:36	1112	18	34	CH	89
302	30	08OCT83	2:36	1112	18	34	CH	93
303	30	08OCT83	2:36	1112	18	34	CH	94
304	30	08OCT83	2:36	1112	18	34	CH	103
305	30	08OCT83	2:36	1112	18	34	CH	114
306	30	08OCT83	3:51	1113	18	34	CH	78
307	30	08OCT83	3:51	1113	18	34	CH	102
308	30	08OCT83	6:14	1116	18	34	CH	80
309	30	08OCT83	6:14	1116	18	34	CH	80
310	30	08OCT83	6:14	1116	18	34	CH	82
311	30	08OCT83	6:14	1116	18	34	CH	84
312	30	08OCT83	6:14	1116	18	34	CH	85
313	30	08OCT83	6:14	1116	18	34	CH	87
314	30	08OCT83	6:14	1116	18	34	CH	87
315	30	08OCT83	6:14	1116	18	34	CH	93
316	30	08OCT83	6:14	1116	18	34	CH	96
317	30	08OCT83	6:14	1116	18	34	CH	98
318	30	08OCT83	6:14	1116	18	34	CH	104
319	30	08OCT83	6:14	1116	18	34	CH	110
320	30	08OCT83	6:14	1116	18	34	CH	200
321	30	08OCT83	20:16	1117	18	35	CH	80
322	30	08OCT83	20:16	1117	18	35	CH	82
323	30	08OCT83	20:16	1117	18	35	CH	90
324	30	08OCT83	20:16	1117	18	35	CH	90

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
325	30	08OCT83	20:16	1117	18	35	CH	93
326	30	08OCT83	20:16	1117	18	35	CH	93
327	30	08OCT83	20:16	1117	18	35	CH	93
328	30	08OCT83	20:16	1117	18	35	CH	96
329	30	08OCT83	20:16	1117	18	35	CH	96
330	30	08OCT83	20:16	1117	18	35	CH	97
331	30	08OCT83	20:16	1117	18	35	CH	107
332	30	08OCT83	20:45	1118	18	35	CH	125
333	30	08OCT83	21:11	1119	18	35	CH	81
334	30	08OCT83	21:11	1119	18	35	CH	82
335	30	08OCT83	21:11	1119	18	35	CH	85
336	30	08OCT83	21:11	1119	18	35	CH	88
337	30	08OCT83	21:11	1119	18	35	CH	88
338	30	08OCT83	21:11	1119	18	35	CH	91
339	30	08OCT83	21:11	1119	18	35	CH	93
340	30	08OCT83	21:11	1119	18	35	CH	102
341	30	08OCT83	22:22	1122	18	36	CH	82
342	30	08OCT83	22:22	1122	18	36	CH	82
343	30	08OCT83	22:22	1122	18	36	CH	88
344	30	08OCT83	22:22	1122	18	36	CH	90
345	30	08OCT83	22:22	1122	18	36	CH	90
346	30	08OCT83	22:22	1122	18	36	CH	90
347	30	08OCT83	22:22	1122	18	36	CH	97
348	30	08OCT83	23:03	1123	18	36	CH	94
349	30	08OCT83	23:24	1124	18	36	CH	110
350	30	08OCT83	23:42	1125	18	36	CH	58
351	30	08OCT83	23:42	1125	18	36	CH	76
352	30	08OCT83	23:42	1125	18	36	CH	77
353	30	08OCT83	23:42	1125	18	36	CH	81
354	30	08OCT83	23:42	1125	18	36	CH	87
355	30	08OCT83	23:42	1125	18	36	CH	89
356	30	08OCT83	23:42	1125	18	36	CH	96
357	30	08OCT83	23:42	1125	18	36	CH	96
358	30	08OCT83	23:42	1125	18	36	CH	96
359	30	08OCT83	23:42	1125	18	36	CH	98
360	30	08OCT83	23:42	1125	18	36	CH	100
361	30	09OCT83	0:15	1126	18	36	CH	100
362	30	09OCT83	0:43	1127	18	37	CH	91
363	30	09OCT83	0:43	1127	18	37	CH	93
364	30	09OCT83	0:43	1127	18	37	CH	95
365	30	09OCT83	0:43	1127	18	37	CH	98
366	30	09OCT83	0:43	1127	18	37	CH	100
367	30	09OCT83	0:43	1127	18	37	CH	103
368	30	09OCT83	1:09	1128	18	37	CH	91
369	30	09OCT83	1:09	1128	18	37	CH	91
370	30	09OCT83	1:09	1128	18	37	CH	96
371	30	09OCT83	1:09	1128	18	37	CH	168
372	30	17OCT83	19:51	1129	18	38	CH	81
373	30	17OCT83	19:51	1129	18	38	CH	85
374	30	17OCT83	19:51	1129	18	38	CH	86
375	30	17OCT83	19:51	1129	18	38	CH	88
376	30	17OCT83	19:51	1129	18	38	CH	90
377	30	17OCT83	19:51	1129	18	38	CH	99
378	30	17OCT83	19:51	1129	18	38	CH	100

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
379	30	17OCT83	19:51	1129	18	38	CH	102
380	30	17OCT83	19:51	1129	18	38	CH	103
381	30	17OCT83	19:51	1129	18	38	CH	104
382	30	17OCT83	19:51	1129	18	38	CH	104
383	30	17OCT83	19:51	1129	18	38	CH	104
384	30	17OCT83	19:51	1129	18	38	CH	105
385	30	17OCT83	19:51	1129	18	38	CH	106
386	30	17OCT83	19:51	1129	18	38	CH	106
387	30	17OCT83	19:51	1129	18	38	CH	107
388	30	17OCT83	19:51	1129	18	38	CH	115
389	30	17OCT83	19:51	1129	18	38	CH	117
390	30	17OCT83	19:51	1129	18	38	CH	142
391	30	17OCT83	19:51	1129	18	38	CH	142
392	30	17OCT83	19:51	1129	18	38	CH	166
393	30	17OCT83	19:51	1129	18	38	CH	195
394	30	17OCT83	19:51	1129	18	38	CH	231
395	30	17OCT83	20:51	1130	18	38	CH	85
396	30	17OCT83	20:51	1130	18	38	CH	88
397	30	17OCT83	20:51	1130	18	38	CH	90
398	30	17OCT83	20:51	1130	18	38	CH	99
399	30	17OCT83	21:47	1131	18	38	CH	118
400	30	17OCT83	22:10	1153	18	38	CH	100
401	30	17OCT83	22:10	1153	18	38	CH	102
402	30	17OCT83	22:10	1153	18	38	CH	103
403	30	17OCT83	22:10	1153	18	38	CH	107
404	30	17OCT83	22:10	1153	18	38	CH	116
405	30	17OCT83	22:10	1153	18	38	CH	117
406	30	17OCT83	22:10	1153	18	38	CH	123
407	30	17OCT83	22:10	1153	18	38	CH	186
408	30	17OCT83	22:49	1154	18	37	CH	81
409	30	17OCT83	22:49	1154	18	37	CH	81
410	30	17OCT83	22:49	1154	18	37	CH	88
411	30	17OCT83	22:49	1154	18	37	CH	90
412	30	17OCT83	22:49	1154	18	37	CH	91
413	30	17OCT83	22:49	1154	18	37	CH	93
414	30	17OCT83	22:49	1154	18	37	CH	95
415	30	17OCT83	22:49	1154	18	37	CH	95
416	30	17OCT83	22:49	1154	18	37	CH	97
417	30	17OCT83	22:49	1154	18	37	CH	98
418	30	17OCT83	22:49	1154	18	37	CH	100
419	30	17OCT83	22:49	1154	18	37	CH	102
420	30	17OCT83	22:49	1154	18	37	CH	103
421	30	17OCT83	22:49	1154	18	37	CH	107
422	30	17OCT83	22:49	1154	18	37	CH	107
423	30	17OCT83	22:49	1154	18	37	CH	108
424	30	17OCT83	22:49	1154	18	37	CH	111
425	30	17OCT83	22:49	1154	18	37	CH	113
426	30	17OCT83	22:49	1154	18	37	CH	114
427	30	17OCT83	22:49	1154	18	37	CH	119
428	30	17OCT83	22:49	1154	18	37	CH	119
429	30	17OCT83	22:49	1154	18	37	CH	120
430	30	17OCT83	22:49	1154	18	37	CH	125
431	30	17OCT83	22:49	1154	18	37	CH	132
432	30	17OCT83	22:49	1154	18	37	CH	182

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
433	30	170CT83	23:09	1155	18	36	CH	88
434	30	170CT83	23:09	1155	18	36	CH	92
435	30	170CT83	23:09	1155	18	36	CH	98
436	30	170CT83	23:09	1155	18	36	CH	100
437	30	170CT83	23:09	1155	18	36	CH	105
438	30	170CT83	23:09	1155	18	36	CH	105
439	30	170CT83	23:09	1155	18	36	CH	105
440	30	180CT83	0:10	1156	18	36	CH	78
441	30	180CT83	0:10	1156	18	36	CH	80
442	30	180CT83	0:10	1156	18	36	CH	85
443	30	180CT83	0:10	1156	18	36	CH	88
444	30	180CT83	0:10	1156	18	36	CH	88
445	30	180CT83	0:10	1156	18	36	CH	90
446	30	180CT83	0:10	1156	18	36	CH	91
447	30	180CT83	0:10	1156	18	36	CH	94
448	30	180CT83	0:10	1156	18	36	CH	94
449	30	180CT83	0:10	1156	18	36	CH	96
450	30	180CT83	0:10	1156	18	36	CH	98
451	30	180CT83	0:10	1156	18	36	CH	100
452	30	180CT83	0:10	1156	18	36	CH	101
453	30	180CT83	0:10	1156	18	36	CH	102
454	30	180CT83	0:10	1156	18	36	CH	103
455	30	180CT83	0:10	1156	18	36	CH	106
456	30	180CT83	0:10	1156	18	36	CH	107
457	30	180CT83	0:36	1157	18	36	CH	81
458	30	180CT83	0:36	1157	18	36	CH	83
459	30	180CT83	0:36	1157	18	36	CH	86
460	30	180CT83	0:36	1157	18	36	CH	87
461	30	180CT83	0:36	1157	18	36	CH	87
462	30	180CT83	0:36	1157	18	36	CH	90
463	30	180CT83	0:36	1157	18	36	CH	91
464	30	180CT83	0:36	1157	18	36	CH	93
465	30	180CT83	0:36	1157	18	36	CH	94
466	30	180CT83	0:36	1157	18	36	CH	94
467	30	180CT83	0:36	1157	18	36	CH	95
468	30	180CT83	0:36	1157	18	36	CH	95
469	30	180CT83	0:36	1157	18	36	CH	96
470	30	180CT83	0:36	1157	18	36	CH	97
471	30	180CT83	0:36	1157	18	36	CH	97
472	30	180CT83	0:36	1157	18	36	CH	98
473	30	180CT83	0:36	1157	18	36	CH	101
474	30	180CT83	0:36	1157	18	36	CH	102
475	30	180CT83	0:36	1157	18	36	CH	102
476	30	180CT83	0:36	1157	18	36	CH	102
477	30	180CT83	0:36	1157	18	36	CH	103
478	30	180CT83	0:36	1157	18	36	CH	103
479	30	180CT83	0:36	1157	18	36	CH	105
480	30	180CT83	0:36	1157	18	36	CH	107
481	30	180CT83	1:04	1158	18	36	CH	84
482	30	180CT83	1:04	1158	18	36	CH	85
483	30	180CT83	1:04	1158	18	36	CH	87
484	30	180CT83	1:04	1158	18	36	CH	91
485	30	180CT83	1:04	1158	18	36	CH	91
486	30	180CT83	1:04	1158	18	36	CH	93

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
487	30	18OCT83	1:04	1158	18	36	CH	100
488	30	18OCT83	1:04	1158	18	36	CH	101
489	30	18OCT83	1:04	1158	18	36	CH	102
490	30	18OCT83	1:04	1158	18	36	CH	111
491	30	18OCT83	1:29	1159	18	34	CH	78
492	30	18OCT83	1:29	1159	18	34	CH	84
493	30	18OCT83	1:29	1159	18	34	CH	84
494	30	18OCT83	1:29	1159	18	34	CH	89
495	30	18OCT83	1:29	1159	18	34	CH	95
496	30	18OCT83	1:29	1159	18	34	CH	95
497	30	18OCT83	1:29	1159	18	34	CH	96
498	30	18OCT83	1:29	1159	18	34	CH	96
499	30	18OCT83	1:29	1159	18	34	CH	97
500	30	18OCT83	1:29	1159	18	34	CH	98
501	30	18OCT83	1:29	1159	18	34	CH	102
502	30	18OCT83	1:29	1159	18	34	CH	105
503	30	18OCT83	1:29	1159	18	34	CH	108
504	30	18OCT83	1:29	1159	18	34	CH	110
505	30	18OCT83	1:29	1159	18	34	CH	111
506	30	18OCT83	1:29	1159	18	34	CH	121
507	30	18OCT83	1:29	1159	18	34	CH	131
508	30	18OCT83	19:08	1160	18	35	CH	80
509	30	18OCT83	19:08	1160	18	35	CH	86
510	30	18OCT83	19:26	1161	18	35	CH	87
511	30	18OCT83	19:26	1161	18	35	CH	88
512	30	18OCT83	19:26	1161	18	35	CH	91
513	30	18OCT83	19:26	1161	18	35	CH	91
514	30	18OCT83	19:26	1161	18	35	CH	93
515	30	18OCT83	19:26	1161	18	35	CH	95
516	30	18OCT83	19:26	1161	18	35	CH	95
517	30	18OCT83	19:26	1161	18	35	CH	97
518	30	18OCT83	19:26	1161	18	35	CH	97
519	30	18OCT83	19:26	1161	18	35	CH	205
520	30	18OCT83	20:06	1162	18	34	CH	91
521	30	18OCT83	20:54	1163	18	34	CH	70
522	30	18OCT83	20:54	1163	18	34	CH	88
523	30	18OCT83	20:54	1163	18	34	CH	92
524	30	18OCT83	20:54	1163	18	34	CH	96
525	30	18OCT83	20:54	1163	18	34	CH	99
526	30	18OCT83	20:54	1163	18	34	CH	99
527	30	18OCT83	20:54	1163	18	34	CH	103
528	30	18OCT83	20:54	1163	18	34	CH	106
529	30	18OCT83	21:14	1164	18	33	TZ	96
530	30	18OCT83	21:14	1164	18	33	TZ	100
531	30	18OCT83	21:14	1164	18	33	TZ	100
532	30	18OCT83	21:14	1164	18	33	TZ	103
533	30	18OCT83	21:14	1164	18	33	TZ	105
534	30	18OCT83	21:14	1164	18	33	TZ	106
535	30	18OCT83	21:14	1164	18	33	TZ	110
536	30	18OCT83	21:14	1164	18	33	TZ	114
537	30	18OCT83	21:14	1164	18	33	TZ	121
538	30	18OCT83	21:14	1164	18	33	TZ	244
539	30	18OCT83	21:58	1165	18	32	TZ	72
540	30	18OCT83	21:58	1165	18	32	TZ	92

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
541	30	18OCT83	21:58	1165	18	32	TZ	97
542	30	18OCT83	22:13	1166	18	32	TZ	88
543	30	18OCT83	22:13	1166	18	32	TZ	92
544	30	18OCT83	23:02	1168	18	32	TZ	76
545	30	18OCT83	23:02	1168	18	32	TZ	81
546	30	18OCT83	23:02	1168	18	32	TZ	83
547	30	18OCT83	23:02	1168	18	32	TZ	83
548	30	18OCT83	23:02	1168	18	32	TZ	84
549	30	18OCT83	23:02	1168	18	32	TZ	87
550	30	18OCT83	23:02	1168	18	32	TZ	87
551	30	18OCT83	23:02	1168	18	32	TZ	89
552	30	18OCT83	23:02	1168	18	32	TZ	90
553	30	18OCT83	23:02	1168	18	32	TZ	91
554	30	18OCT83	23:02	1168	18	32	TZ	95
555	30	18OCT83	23:02	1168	18	32	TZ	107
556	30	18OCT83	23:02	1168	18	32	TZ	123
557	30	18OCT83	23:21	1169	18	32	TZ	79
558	30	18OCT83	23:21	1169	18	32	TZ	80
559	30	18OCT83	23:21	1169	18	32	TZ	86
560	30	18OCT83	23:21	1169	18	32	TZ	87
561	30	18OCT83	23:21	1169	18	32	TZ	88
562	30	18OCT83	23:21	1169	18	32	TZ	89
563	30	18OCT83	23:21	1169	18	32	TZ	89
564	30	18OCT83	23:21	1169	18	32	TZ	89
565	30	18OCT83	23:21	1169	18	32	TZ	95
566	30	18OCT83	23:21	1169	18	32	TZ	95
567	30	18OCT83	23:21	1169	18	32	TZ	95
568	30	18OCT83	23:21	1169	18	32	TZ	96
569	30	18OCT83	23:21	1169	18	32	TZ	97
570	30	18OCT83	23:21	1169	18	32	TZ	97
571	30	18OCT83	23:21	1169	18	32	TZ	97
572	30	18OCT83	23:21	1169	18	32	TZ	97
573	30	18OCT83	23:21	1169	18	32	TZ	98
574	30	18OCT83	23:21	1169	18	32	TZ	98
575	30	18OCT83	23:21	1169	18	32	TZ	98
576	30	18OCT83	23:21	1169	18	32	TZ	101
577	30	18OCT83	23:21	1169	18	32	TZ	102
578	30	18OCT83	23:21	1169	18	32	TZ	106
579	30	18OCT83	23:21	1169	18	32	TZ	107
580	30	18OCT83	23:21	1169	18	32	TZ	108
581	30	18OCT83	23:21	1169	18	32	TZ	111
582	30	18OCT83	23:21	1169	18	32	TZ	114
583	30	18OCT83	23:21	1169	18	32	TZ	114
584	30	18OCT83	23:21	1169	18	32	TZ	126
585	30	18OCT83	23:45	1170	18	32	TZ	90
586	30	18OCT83	23:45	1170	18	32	TZ	91
587	30	19OCT83	22:58	84	18	26	TZ	186
588	30	19OCT83	23:21	85	18	26	TZ	144
589	30	20OCT83	1:20	87	18	30	TZ	78
590	30	20OCT83	1:20	87	18	30	TZ	95
591	30	20OCT83	1:20	87	18	30	TZ	100
592	30	20OCT83	1:20	87	18	30	TZ	102
593	30	20OCT83	1:20	87	18	30	TZ	102
594	30	20OCT83	1:20	87	18	30	TZ	104

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
595	30	20OCT83	1:20	87	18	30	TZ	104
596	30	20OCT83	1:20	87	18	30	TZ	107
597	30	20OCT83	1:20	87	18	30	TZ	109
598	30	20OCT83	1:20	87	18	30	TZ	110
599	30	20OCT83	1:20	87	18	30	TZ	110
600	30	20OCT83	1:20	87	18	30	TZ	112
601	30	20OCT83	1:20	87	18	30	TZ	113
602	30	20OCT83	1:20	87	18	30	TZ	114
603	30	20OCT83	2:03	89	18	30	TZ	87
604	30	20OCT83	2:03	89	18	30	TZ	92
605	30	20OCT83	2:03	89	18	30	TZ	97
606	30	20OCT83	2:03	89	18	30	TZ	100
607	30	20OCT83	2:03	89	18	30	TZ	101
608	30	20OCT83	2:03	89	18	30	TZ	103
609	30	20OCT83	2:03	89	18	30	TZ	107
610	30	20OCT83	2:03	89	18	30	TZ	107
611	30	20OCT83	2:03	89	18	30	TZ	108
612	30	20OCT83	2:03	89	18	30	TZ	110
613	30	20OCT83	2:03	89	18	30	TZ	114
614	30	20OCT83	2:03	89	18	30	TZ	155
615	30	20OCT83	2:23	90	18	30	TZ	82
616	30	20OCT83	2:23	90	18	30	TZ	91
617	30	20OCT83	2:23	90	18	30	TZ	92
618	30	20OCT83	2:23	90	18	30	TZ	95
619	30	20OCT83	2:23	90	18	30	TZ	97
620	30	20OCT83	2:23	90	18	30	TZ	97
621	30	20OCT83	2:23	90	18	30	TZ	98
622	30	20OCT83	2:23	90	18	30	TZ	98
623	30	20OCT83	2:23	90	18	30	TZ	98
624	30	20OCT83	2:23	90	18	30	TZ	102
625	30	20OCT83	2:23	90	18	30	TZ	103
626	30	20OCT83	2:23	90	18	30	TZ	103
627	30	20OCT83	2:23	90	18	30	TZ	106
628	30	20OCT83	2:23	90	18	30	TZ	106
629	30	20OCT83	2:23	90	18	30	TZ	107
630	30	20OCT83	2:23	90	18	30	TZ	108
631	30	20OCT83	2:23	90	18	30	TZ	109
632	30	20OCT83	2:23	90	18	30	TZ	110
633	30	20OCT83	2:23	90	18	30	TZ	112
634	30	20OCT83	2:23	90	18	30	TZ	112
635	30	20OCT83	2:23	90	18	30	TZ	114
636	30	20OCT83	2:23	90	18	30	TZ	114
637	30	20OCT83	2:23	90	18	30	TZ	115
638	30	20OCT83	2:23	90	18	30	TZ	116
639	30	20OCT83	2:23	90	18	30	TZ	122
640	30	20OCT83	2:23	90	18	30	TZ	128
641	30	20OCT83	2:23	90	18	30	TZ	164
642	30	20OCT83	19:23	1181	18	31	TZ	86
643	30	20OCT83	19:23	1181	18	31	TZ	89
644	30	20OCT83	19:23	1181	18	31	TZ	90
645	30	20OCT83	19:23	1181	18	31	TZ	91
646	30	20OCT83	19:23	1181	18	31	TZ	94
647	30	20OCT83	19:23	1181	18	31	TZ	95
648	30	20OCT83	19:23	1181	18	31	TZ	95

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
649	30	20OCT83	19:23	1181	18	31	TZ	96
650	30	20OCT83	19:23	1181	18	31	TZ	97
651	30	20OCT83	19:23	1181	18	31	TZ	98
652	30	20OCT83	19:23	1181	18	31	TZ	100
653	30	20OCT83	19:23	1181	18	31	TZ	100
654	30	20OCT83	19:23	1181	18	31	TZ	100
655	30	20OCT83	19:23	1181	18	31	TZ	101
656	30	20OCT83	19:23	1181	18	31	TZ	103
657	30	20OCT83	19:23	1181	18	31	TZ	106
658	30	20OCT83	19:23	1181	18	31	TZ	106
659	30	20OCT83	19:23	1181	18	31	TZ	109
660	30	20OCT83	19:23	1181	18	31	TZ	113
661	30	20OCT83	19:23	1181	18	31	TZ	119
662	30	20OCT83	19:23	1181	18	31	TZ	122
663	30	20OCT83	19:23	1181	18	31	TZ	122
664	30	20OCT83	19:23	1181	18	31	TZ	124
665	30	20OCT83	19:23	1181	18	31	TZ	126
666	30	20OCT83	20:33	1183	18	30	TZ	105
667	30	20OCT83	20:33	1183	18	30	TZ	111
668	30	20OCT83	20:33	1183	18	30	TZ	112
669	30	20OCT83	20:53	1184	18	30	TZ	101
670	30	20OCT83	20:53	1184	18	30	TZ	102
671	30	20OCT83	20:53	1184	18	30	TZ	104
672	30	20OCT83	20:53	1184	18	30	TZ	106
673	30	20OCT83	20:53	1184	18	30	TZ	111
674	30	20OCT83	21:21	1185	18	30	TZ	95
675	30	20OCT83	21:21	1185	18	30	TZ	98
676	30	20OCT83	21:21	1185	18	30	TZ	99
677	30	20OCT83	21:21	1185	18	30	TZ	100
678	30	20OCT83	21:21	1185	18	30	TZ	102
679	30	20OCT83	21:21	1185	18	30	TZ	110
680	30	20OCT83	21:21	1185	18	30	TZ	111
681	30	20OCT83	21:21	1185	18	30	TZ	111
682	30	20OCT83	21:21	1185	18	30	TZ	114
683	30	20OCT83	21:21	1185	18	30	TZ	164
684	30	20OCT83	21:34	1186	18	29	TZ	95
685	30	20OCT83	21:34	1186	18	29	TZ	96
686	30	20OCT83	21:34	1186	18	29	TZ	97
687	30	20OCT83	21:34	1186	18	29	TZ	97
688	30	20OCT83	21:34	1186	18	29	TZ	102
689	30	20OCT83	21:34	1186	18	29	TZ	102
690	30	20OCT83	21:34	1186	18	29	TZ	103
691	30	20OCT83	21:34	1186	18	29	TZ	103
692	30	20OCT83	21:34	1186	18	29	TZ	126
693	30	20OCT83	21:58	1187	18	29	TZ	108
694	30	04OCT83	22:25	1035	50	27	TZ	92
695	30	04OCT83	24:00	1037	50	28	TZ	92
696	30	04OCT83	24:00	1037	50	28	TZ	107
697	30	04OCT83	24:00	1037	50	28	TZ	197
698	30	04OCT83	24:00	1037	50	28	TZ	237
699	30	04OCT83	24:00	1037	50	28	TZ	281
700	30	05OCT83	2:26	1040	50	29	TZ	82
701	30	05OCT83	2:26	1040	50	29	TZ	86
702	30	05OCT83	2:26	1040	50	29	TZ	89

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
703	30	05OCT83	2:26	1040	50	29	TZ	89
704	30	05OCT83	2:26	1040	50	29	TZ	90
705	30	05OCT83	2:26	1040	50	29	TZ	91
706	30	05OCT83	2:26	1040	50	29	TZ	93
707	30	05OCT83	2:26	1040	50	29	TZ	96
708	30	05OCT83	2:26	1040	50	29	TZ	98
709	30	05OCT83	2:26	1040	50	29	TZ	98
710	30	05OCT83	2:26	1040	50	29	TZ	100
711	30	05OCT83	2:26	1040	50	29	TZ	102
712	30	05OCT83	2:26	1040	50	29	TZ	103
713	30	05OCT83	2:26	1040	50	29	TZ	104
714	30	05OCT83	2:26	1040	50	29	TZ	105
715	30	05OCT83	2:26	1040	50	29	TZ	106
716	30	05OCT83	2:26	1040	50	29	TZ	106
717	30	05OCT83	2:26	1040	50	29	TZ	108
718	30	05OCT83	2:26	1040	50	29	TZ	109
719	30	05OCT83	2:26	1040	50	29	TZ	111
720	30	05OCT83	2:26	1040	50	29	TZ	119
721	30	05OCT83	2:26	1040	50	29	TZ	153
722	30	05OCT83	2:26	1040	50	29	TZ	156
723	30	05OCT83	2:26	1040	50	29	TZ	162
724	30	05OCT83	2:26	1040	50	29	TZ	192
725	30	05OCT83	3:04	1041	50	29	TZ	86
726	30	05OCT83	3:04	1041	50	29	TZ	94
727	30	05OCT83	3:04	1041	50	29	TZ	97
728	30	05OCT83	3:04	1041	50	29	TZ	120
729	30	05OCT83	3:04	1041	50	29	TZ	167
730	30	05OCT83	3:31	1042	50	29	TZ	96
731	30	05OCT83	3:31	1042	50	29	TZ	96
732	30	05OCT83	3:31	1042	50	29	TZ	100
733	30	05OCT83	3:31	1042	50	29	TZ	101
734	30	05OCT83	3:31	1042	50	29	TZ	103
735	30	05OCT83	3:31	1042	50	29	TZ	105
736	30	05OCT83	3:31	1042	50	29	TZ	106
737	30	05OCT83	3:31	1042	50	29	TZ	107
738	30	05OCT83	3:31	1042	50	29	TZ	110
739	30	05OCT83	3:31	1042	50	29	TZ	115
740	30	05OCT83	3:31	1042	50	29	TZ	176
741	30	05OCT83	3:31	1042	50	29	TZ	218
742	30	06OCT83	19:52	1044	50	27	TZ	122
743	30	06OCT83	20:22	1045	50	27	TZ	90
744	30	06OCT83	20:22	1045	50	27	TZ	90
745	30	06OCT83	20:22	1045	50	27	TZ	97
746	30	06OCT83	20:22	1045	50	27	TZ	97
747	30	06OCT83	20:22	1045	50	27	TZ	98
748	30	06OCT83	20:22	1045	50	27	TZ	100
749	30	06OCT83	20:22	1045	50	27	TZ	108
750	30	06OCT83	20:22	1045	50	27	TZ	110
751	30	06OCT83	20:22	1045	50	27	TZ	112
752	30	06OCT83	20:22	1045	50	27	TZ	112
753	30	06OCT83	20:22	1045	50	27	TZ	150
754	30	06OCT83	20:22	1045	50	27	TZ	153
755	30	06OCT83	20:22	1045	50	27	TZ	225
756	30	06OCT83	20:38	1046	50	27	TZ	98

798 30 06OCT83 22:23 1049 50 29 TZ 101

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
757	30	06OCT83	20:38	1046	50	27	TZ	105
758	30	06OCT83	20:38	1046	50	27	TZ	107
759	30	06OCT83	20:38	1046	50	27	TZ	117
760	30	06OCT83	20:38	1046	50	27	TZ	121
761	30	06OCT83	20:38	1046	50	27	TZ	208
762	30	06OCT83	21:21	1047	50	28	TZ	87
763	30	06OCT83	21:21	1047	50	28	TZ	92
764	30	06OCT83	21:21	1047	50	28	TZ	97
765	30	06OCT83	21:21	1047	50	28	TZ	107
766	30	06OCT83	21:21	1047	50	28	TZ	110
767	30	06OCT83	21:21	1047	50	28	TZ	195
768	30	06OCT83	21:21	1047	50	28	TZ	205
769	30	06OCT83	21:21	1047	50	28	TZ	220
770	30	06OCT83	21:39	1048	50	28	TZ	90
771	30	06OCT83	21:39	1048	50	28	TZ	91
772	30	06OCT83	21:39	1048	50	28	TZ	93
773	30	06OCT83	21:39	1048	50	28	TZ	95
774	30	06OCT83	21:39	1048	50	28	TZ	100
775	30	06OCT83	21:39	1048	50	28	TZ	103
776	30	06OCT83	21:39	1048	50	28	TZ	111
777	30	06OCT83	21:39	1048	50	28	TZ	111
778	30	06OCT83	21:39	1048	50	28	TZ	112
779	30	06OCT83	21:39	1048	50	28	TZ	240
780	30	06OCT83	21:39	1048	50	28	TZ	245
781	30	06OCT83	22:23	1049	50	29	TZ	79
782	30	06OCT83	22:23	1049	50	29	TZ	90
783	30	06OCT83	22:23	1049	50	29	TZ	90
784	30	06OCT83	22:23	1049	50	29	TZ	90
785	30	06OCT83	22:23	1049	50	29	TZ	91
786	30	06OCT83	22:23	1049	50	29	TZ	91
787	30	06OCT83	22:23	1049	50	29	TZ	91
788	30	06OCT83	22:23	1049	50	29	TZ	92
789	30	06OCT83	22:23	1049	50	29	TZ	92
790	30	06OCT83	22:23	1049	50	29	TZ	95
791	30	06OCT83	22:23	1049	50	29	TZ	97
792	30	06OCT83	22:23	1049	50	29	TZ	97
793	30	06OCT83	22:23	1049	50	29	TZ	97
794	30	06OCT83	22:23	1049	50	29	TZ	97
795	30	06OCT83	22:23	1049	50	29	TZ	98
796	30	06OCT83	22:23	1049	50	29	TZ	100
797	30	06OCT83	22:23	1049	50	29	TZ	100
798	30	06OCT83	22:23	1049	50	29	TZ	101
799	30	06OCT83	22:23	1049	50	29	TZ	102
800	30	06OCT83	22:23	1049	50	29	TZ	103
801	30	06OCT83	22:23	1049	50	29	TZ	103
802	30	06OCT83	22:23	1049	50	29	TZ	103
803	30	06OCT83	22:23	1049	50	29	TZ	103
804	30	06OCT83	22:23	1049	50	29	TZ	105
805	30	06OCT83	22:23	1049	50	29	TZ	105
806	30	06OCT83	22:23	1049	50	29	TZ	105
807	30	06OCT83	22:23	1049	50	29	TZ	105
808	30	06OCT83	22:23	1049	50	29	TZ	107
809	30	06OCT83	22:23	1049	50	29	TZ	107
810	30	06OCT83	22:23	1049	50	29	TZ	107

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
811	30	06OCT83	22:23	1049	50	29	TZ	108
812	30	06OCT83	22:23	1049	50	29	TZ	108
813	30	06OCT83	22:23	1049	50	29	TZ	108
814	30	06OCT83	22:23	1049	50	29	TZ	110
815	30	06OCT83	22:23	1049	50	29	TZ	111
816	30	06OCT83	22:23	1049	50	29	TZ	114
817	30	06OCT83	22:23	1049	50	29	TZ	115
818	30	06OCT83	22:23	1049	50	29	TZ	115
819	30	06OCT83	22:23	1049	50	29	TZ	117
820	30	06OCT83	22:23	1049	50	29	TZ	120
821	30	06OCT83	22:23	1049	50	29	TZ	127
822	30	06OCT83	22:23	1049	50	29	TZ	160
823	30	06OCT83	22:23	1049	50	29	TZ	190
824	30	06OCT83	22:46	1050	50	29	TZ	80
825	30	06OCT83	22:46	1050	50	29	TZ	83
826	30	06OCT83	22:46	1050	50	29	TZ	85
827	30	06OCT83	22:46	1050	50	29	TZ	85
828	30	06OCT83	22:46	1050	50	29	TZ	87
829	30	06OCT83	22:46	1050	50	29	TZ	90
830	30	06OCT83	22:46	1050	50	29	TZ	90
831	30	06OCT83	22:46	1050	50	29	TZ	90
832	30	06OCT83	22:46	1050	50	29	TZ	90
833	30	06OCT83	22:46	1050	50	29	TZ	90
834	30	06OCT83	22:46	1050	50	29	TZ	92
835	30	06OCT83	22:46	1050	50	29	TZ	92
836	30	06OCT83	22:46	1050	50	29	TZ	92
837	30	06OCT83	22:46	1050	50	29	TZ	92
838	30	06OCT83	22:46	1050	50	29	TZ	93
839	30	06OCT83	22:46	1050	50	29	TZ	93
840	30	06OCT83	22:46	1050	50	29	TZ	93
841	30	06OCT83	22:46	1050	50	29	TZ	93
842	30	06OCT83	22:46	1050	50	29	TZ	94
843	30	06OCT83	22:46	1050	50	29	TZ	94
844	30	06OCT83	22:46	1050	50	29	TZ	95
845	30	06OCT83	22:46	1050	50	29	TZ	95
846	30	06OCT83	22:46	1050	50	29	TZ	95
847	30	06OCT83	22:46	1050	50	29	TZ	96
848	30	06OCT83	22:46	1050	50	29	TZ	96
849	30	06OCT83	22:46	1050	50	29	TZ	96
850	30	06OCT83	22:46	1050	50	29	TZ	96
851	30	06OCT83	22:46	1050	50	29	TZ	97
852	30	06OCT83	22:46	1050	50	29	TZ	97
853	30	06OCT83	22:46	1050	50	29	TZ	97
854	30	06OCT83	22:46	1050	50	29	TZ	97
855	30	06OCT83	22:46	1050	50	29	TZ	98
856	30	06OCT83	22:46	1050	50	29	TZ	98
857	30	06OCT83	22:46	1050	50	29	TZ	98
858	30	06OCT83	22:46	1050	50	29	TZ	98
859	30	06OCT83	22:46	1050	50	29	TZ	99
860	30	06OCT83	22:46	1050	50	29	TZ	99
861	30	06OCT83	22:46	1050	50	29	TZ	100
862	30	06OCT83	22:46	1050	50	29	TZ	100
863	30	06OCT83	22:46	1050	50	29	TZ	100
864	30	06OCT83	22:46	1050	50	29	TZ	100

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
865	30	06OCT83	22:46	1050	50	29	TZ	100
866	30	06OCT83	22:46	1050	50	29	TZ	102
867	30	06OCT83	22:46	1050	50	29	TZ	102
868	30	06OCT83	22:46	1050	50	29	TZ	102
869	30	06OCT83	22:46	1050	50	29	TZ	103
870	30	06OCT83	22:46	1050	50	29	TZ	103
871	30	06OCT83	22:46	1050	50	29	TZ	103
872	30	06OCT83	22:46	1050	50	29	TZ	103
873	30	06OCT83	22:46	1050	50	29	TZ	103
874	30	06OCT83	22:46	1050	50	29	TZ	103
875	30	06OCT83	22:46	1050	50	29	TZ	104
876	30	06OCT83	22:46	1050	50	29	TZ	105
877	30	06OCT83	22:46	1050	50	29	TZ	105
878	30	06OCT83	22:46	1050	50	29	TZ	106
879	30	06OCT83	22:46	1050	50	29	TZ	106
880	30	06OCT83	22:46	1050	50	29	TZ	107
881	30	06OCT83	22:46	1050	50	29	TZ	107
882	30	06OCT83	22:46	1050	50	29	TZ	108
883	30	06OCT83	22:46	1050	50	29	TZ	110
884	30	06OCT83	22:46	1050	50	29	TZ	110
885	30	06OCT83	22:46	1050	50	29	TZ	110
886	30	06OCT83	22:46	1050	50	29	TZ	111
887	30	06OCT83	22:46	1050	50	29	TZ	112
888	30	06OCT83	22:46	1050	50	29	TZ	115
889	30	06OCT83	22:46	1050	50	29	TZ	117
890	30	06OCT83	22:46	1050	50	29	TZ	118
891	30	06OCT83	22:46	1050	50	29	TZ	119
892	30	06OCT83	22:46	1050	50	29	TZ	122
893	30	06OCT83	22:46	1050	50	29	TZ	122
894	30	06OCT83	22:46	1050	50	29	TZ	148
895	30	06OCT83	22:46	1050	50	29	TZ	159
896	30	06OCT83	22:46	1050	50	29	TZ	166
897	30	06OCT83	22:46	1050	50	29	TZ	170
898	30	06OCT83	22:46	1050	50	29	TZ	180
899	30	06OCT83	22:46	1050	50	29	TZ	181
900	30	06OCT83	22:46	1050	50	29	TZ	191
901	30	06OCT83	22:46	1050	50	29	TZ	192
902	30	06OCT83	22:46	1050	50	29	TZ	193
903	30	06OCT83	22:46	1050	50	29	TZ	196
904	30	06OCT83	22:46	1050	50	29	TZ	197
905	30	06OCT83	22:46	1050	50	29	TZ	198
906	30	06OCT83	22:46	1050	50	29	TZ	200
907	30	06OCT83	22:46	1050	50	29	TZ	210
908	30	06OCT83	22:46	1050	50	29	TZ	240
909	30	06OCT83	22:46	1050	50	29	TZ	253
910	30	06OCT83	22:46	1050	50	29	TZ	260
911	30	06OCT83	23:10	1051	50	29	TZ	84
912	30	06OCT83	23:10	1051	50	29	TZ	88
913	30	06OCT83	23:10	1051	50	29	TZ	90
914	30	06OCT83	23:10	1051	50	29	TZ	90
915	30	06OCT83	23:10	1051	50	29	TZ	90
916	30	06OCT83	23:10	1051	50	29	TZ	90
917	30	06OCT83	23:10	1051	50	29	TZ	90
918	30	06OCT83	23:10	1051	50	29	TZ	92

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
919	30	06OCT83	23:10	1051	50	29	TZ	92
920	30	06OCT83	23:10	1051	50	29	TZ	92
921	30	06OCT83	23:10	1051	50	29	TZ	92
922	30	06OCT83	23:10	1051	50	29	TZ	93
923	30	06OCT83	23:10	1051	50	29	TZ	94
924	30	06OCT83	23:10	1051	50	29	TZ	95
925	30	06OCT83	23:10	1051	50	29	TZ	95
926	30	06OCT83	23:10	1051	50	29	TZ	95
927	30	06OCT83	23:10	1051	50	29	TZ	96
928	30	06OCT83	23:10	1051	50	29	TZ	98
929	30	06OCT83	23:10	1051	50	29	TZ	98
930	30	06OCT83	23:10	1051	50	29	TZ	98
931	30	06OCT83	23:10	1051	50	29	TZ	98
932	30	06OCT83	23:10	1051	50	29	TZ	100
933	30	06OCT83	23:10	1051	50	29	TZ	100
934	30	06OCT83	23:10	1051	50	29	TZ	101
935	30	06OCT83	23:10	1051	50	29	TZ	102
936	30	06OCT83	23:10	1051	50	29	TZ	102
937	30	06OCT83	23:10	1051	50	29	TZ	103
938	30	06OCT83	23:10	1051	50	29	TZ	104
939	30	06OCT83	23:10	1051	50	29	TZ	104
940	30	06OCT83	23:10	1051	50	29	TZ	107
941	30	06OCT83	23:10	1051	50	29	TZ	108
942	30	06OCT83	23:10	1051	50	29	TZ	108
943	30	06OCT83	23:10	1051	50	29	TZ	110
944	30	06OCT83	23:10	1051	50	29	TZ	111
945	30	06OCT83	23:10	1051	50	29	TZ	111
946	30	06OCT83	23:10	1051	50	29	TZ	111
947	30	06OCT83	23:10	1051	50	29	TZ	114
948	30	06OCT83	23:10	1051	50	29	TZ	115
949	30	06OCT83	23:10	1051	50	29	TZ	164
950	30	06OCT83	23:10	1051	50	29	TZ	178
951	30	06OCT83	23:10	1051	50	29	TZ	180
952	30	06OCT83	23:10	1051	50	29	TZ	182
953	30	06OCT83	23:10	1051	50	29	TZ	204
954	30	06OCT83	23:10	1051	50	29	TZ	245
955	30	06OCT83	23:42	1052	50	29	TZ	87
956	30	06OCT83	23:42	1052	50	29	TZ	90
957	30	06OCT83	23:42	1052	50	29	TZ	97
958	30	06OCT83	23:42	1052	50	29	TZ	97
959	30	06OCT83	23:42	1052	50	29	TZ	100
960	30	06OCT83	23:42	1052	50	29	TZ	100
961	30	06OCT83	23:42	1052	50	29	TZ	101
962	30	06OCT83	23:42	1052	50	29	TZ	102
963	30	06OCT83	23:42	1052	50	29	TZ	112
964	30	06OCT83	23:42	1052	50	29	TZ	117
965	30	06OCT83	23:42	1052	50	29	TZ	227
966	30	07OCT83	1:22	1055	50	30	TZ	77
967	30	07OCT83	1:22	1055	50	30	TZ	82
968	30	07OCT83	1:22	1055	50	30	TZ	84
969	30	07OCT83	1:22	1055	50	30	TZ	85
970	30	07OCT83	1:22	1055	50	30	TZ	85
971	30	07OCT83	1:22	1055	50	30	TZ	87
972	30	07OCT83	1:22	1055	50	30	TZ	88

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
973	30	07OCT83	1:22	1055	50	30	TZ	92
974	30	07OCT83	1:22	1055	50	30	TZ	92
975	30	07OCT83	1:22	1055	50	30	TZ	92
976	30	07OCT83	1:22	1055	50	30	TZ	93
977	30	07OCT83	1:22	1055	50	30	TZ	94
978	30	07OCT83	1:22	1055	50	30	TZ	95
979	30	07OCT83	1:22	1055	50	30	TZ	96
980	30	07OCT83	1:22	1055	50	30	TZ	96
981	30	07OCT83	1:22	1055	50	30	TZ	97
982	30	07OCT83	1:22	1055	50	30	TZ	98
983	30	07OCT83	1:22	1055	50	30	TZ	100
984	30	07OCT83	1:22	1055	50	30	TZ	101
985	30	07OCT83	1:22	1055	50	30	TZ	102
986	30	07OCT83	1:22	1055	50	30	TZ	104
987	30	07OCT83	1:22	1055	50	30	TZ	104
988	30	07OCT83	1:22	1055	50	30	TZ	105
989	30	07OCT83	1:22	1055	50	30	TZ	105
990	30	07OCT83	1:22	1055	50	30	TZ	107
991	30	07OCT83	1:22	1055	50	30	TZ	108
992	30	07OCT83	1:22	1055	50	30	TZ	110
993	30	07OCT83	1:22	1055	50	30	TZ	110
994	30	07OCT83	1:22	1055	50	30	TZ	110
995	30	07OCT83	1:22	1055	50	30	TZ	115
996	30	07OCT83	1:22	1055	50	30	TZ	120
997	30	07OCT83	1:22	1055	50	30	TZ	138
998	30	07OCT83	1:22	1055	50	30	TZ	155
999	30	07OCT83	1:22	1055	50	30	TZ	180
1000	30	07OCT83	1:22	1055	50	30	TZ	185
1001	30	07OCT83	1:22	1055	50	30	TZ	195
1002	30	07OCT83	1:22	1055	50	30	TZ	200
1003	30	07OCT83	1:22	1055	50	30	TZ	209
1004	30	07OCT83	1:22	1055	50	30	TZ	220
1005	30	07OCT83	1:22	1055	50	30	TZ	255
1006	30	07OCT83	1:22	1055	50	30	TZ	291
1007	30	07OCT83	1:22	1055	50	30	TZ	291
1008	30	07OCT83	1:22	1055	50	30	TZ	300
1009	30	07OCT83	1:22	1055	50	30	TZ	320
1010	30	07OCT83	1:22	1055	50	30	TZ	350
1011	30	07OCT83	2:01	1056	50	30	TZ	83
1012	30	07OCT83	2:01	1056	50	30	TZ	87
1013	30	07OCT83	2:01	1056	50	30	TZ	87
1014	30	07OCT83	2:01	1056	50	30	TZ	88
1015	30	07OCT83	2:01	1056	50	30	TZ	88
1016	30	07OCT83	2:01	1056	50	30	TZ	88
1017	30	07OCT83	2:01	1056	50	30	TZ	89
1018	30	07OCT83	2:01	1056	50	30	TZ	89
1019	30	07OCT83	2:01	1056	50	30	TZ	89
1020	30	07OCT83	2:01	1056	50	30	TZ	89
1021	30	07OCT83	2:01	1056	50	30	TZ	90
1022	30	07OCT83	2:01	1056	50	30	TZ	91
1023	30	07OCT83	2:01	1056	50	30	TZ	92
1024	30	07OCT83	2:01	1056	50	30	TZ	94
1025	30	07OCT83	2:01	1056	50	30	TZ	94
1026	30	07OCT83	2:01	1056	50	30	TZ	94

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1027	30	07OCT83	2:01	1056	50	30	TZ	95
1028	30	07OCT83	2:01	1056	50	30	TZ	95
1029	30	07OCT83	2:01	1056	50	30	TZ	96
1030	30	07OCT83	2:01	1056	50	30	TZ	96
1031	30	07OCT83	2:01	1056	50	30	TZ	97
1032	30	07OCT83	2:01	1056	50	30	TZ	97
1033	30	07OCT83	2:01	1056	50	30	TZ	97
1034	30	07OCT83	2:01	1056	50	30	TZ	97
1035	30	07OCT83	2:01	1056	50	30	TZ	97
1036	30	07OCT83	2:01	1056	50	30	TZ	97
1037	30	07OCT83	2:01	1056	50	30	TZ	97
1038	30	07OCT83	2:01	1056	50	30	TZ	98
1039	30	07OCT83	2:01	1056	50	30	TZ	98
1040	30	07OCT83	2:01	1056	50	30	TZ	98
1041	30	07OCT83	2:01	1056	50	30	TZ	98
1042	30	07OCT83	2:01	1056	50	30	TZ	98
1043	30	07OCT83	2:01	1056	50	30	TZ	98
1044	30	07OCT83	2:01	1056	50	30	TZ	99
1045	30	07OCT83	2:01	1056	50	30	TZ	99
1046	30	07OCT83	2:01	1056	50	30	TZ	99
1047	30	07OCT83	2:01	1056	50	30	TZ	100
1048	30	07OCT83	2:01	1056	50	30	TZ	100
1049	30	07OCT83	2:01	1056	50	30	TZ	101
1050	30	07OCT83	2:01	1056	50	30	TZ	101
1051	30	07OCT83	2:01	1056	50	30	TZ	102
1052	30	07OCT83	2:01	1056	50	30	TZ	102
1053	30	07OCT83	2:01	1056	50	30	TZ	102
1054	30	07OCT83	2:01	1056	50	30	TZ	102
1055	30	07OCT83	2:01	1056	50	30	TZ	102
1056	30	07OCT83	2:01	1056	50	30	TZ	103
1057	30	07OCT83	2:01	1056	50	30	TZ	103
1058	30	07OCT83	2:01	1056	50	30	TZ	104
1059	30	07OCT83	2:01	1056	50	30	TZ	104
1060	30	07OCT83	2:01	1056	50	30	TZ	104
1061	30	07OCT83	2:01	1056	50	30	TZ	104
1062	30	07OCT83	2:01	1056	50	30	TZ	105
1063	30	07OCT83	2:01	1056	50	30	TZ	105
1064	30	07OCT83	2:01	1056	50	30	TZ	106
1065	30	07OCT83	2:01	1056	50	30	TZ	106
1066	30	07OCT83	2:01	1056	50	30	TZ	107
1067	30	07OCT83	2:01	1056	50	30	TZ	107
1068	30	07OCT83	2:01	1056	50	30	TZ	107
1069	30	07OCT83	2:01	1056	50	30	TZ	109
1070	30	07OCT83	2:01	1056	50	30	TZ	109
1071	30	07OCT83	2:01	1056	50	30	TZ	109
1072	30	07OCT83	2:01	1056	50	30	TZ	110
1073	30	07OCT83	2:01	1056	50	30	TZ	110
1074	30	07OCT83	2:01	1056	50	30	TZ	110
1075	30	07OCT83	2:01	1056	50	30	TZ	112
1076	30	07OCT83	2:01	1056	50	30	TZ	112
1077	30	07OCT83	2:01	1056	50	30	TZ	120
1078	30	07OCT83	2:01	1056	50	30	TZ	179
1079	30	07OCT83	2:01	1056	50	30	TZ	270
1080	30	07OCT83	2:01	1056	50	30	TZ	300

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1081	30	07OCT83	2:01	1056	50	30	TZ	332
1082	30	07OCT83	21:26	1063	50	31	TZ	76
1083	30	07OCT83	21:26	1063	50	31	TZ	89
1084	30	07OCT83	21:26	1063	50	31	TZ	98
1085	30	07OCT83	21:26	1063	50	31	TZ	101
1086	30	07OCT83	21:26	1063	50	31	TZ	102
1087	30	07OCT83	21:26	1063	50	31	TZ	105
1088	30	07OCT83	21:26	1063	50	31	TZ	113
1089	30	07OCT83	21:26	1063	50	31	TZ	114
1090	30	07OCT83	21:26	1063	50	31	TZ	122
1091	30	07OCT83	21:26	1063	50	31	TZ	220
1092	30	07OCT83	22:16	1064	50	31	TZ	77
1093	30	07OCT83	22:16	1064	50	31	TZ	85
1094	30	07OCT83	22:16	1064	50	31	TZ	86
1095	30	07OCT83	22:16	1064	50	31	TZ	86
1096	30	07OCT83	22:16	1064	50	31	TZ	87
1097	30	07OCT83	22:16	1064	50	31	TZ	87
1098	30	07OCT83	22:16	1064	50	31	TZ	87
1099	30	07OCT83	22:16	1064	50	31	TZ	90
1100	30	07OCT83	22:16	1064	50	31	TZ	91
1101	30	07OCT83	22:16	1064	50	31	TZ	107
1102	30	07OCT83	22:16	1064	50	31	TZ	110
1103	30	07OCT83	22:16	1064	50	31	TZ	112
1104	30	07OCT83	22:53	1065	50	31	TZ	88
1105	30	07OCT83	22:53	1065	50	31	TZ	92
1106	30	07OCT83	22:53	1065	50	31	TZ	95
1107	30	07OCT83	22:53	1065	50	31	TZ	96
1108	30	07OCT83	22:53	1065	50	31	TZ	98
1109	30	07OCT83	22:53	1065	50	31	TZ	294
1110	30	07OCT83	23:16	1066	50	32	TZ	67
1111	30	07OCT83	23:16	1066	50	32	TZ	79
1112	30	07OCT83	23:16	1066	50	32	TZ	80
1113	30	07OCT83	23:16	1066	50	32	TZ	81
1114	30	07OCT83	23:16	1066	50	32	TZ	84
1115	30	07OCT83	23:16	1066	50	32	TZ	84
1116	30	07OCT83	23:16	1066	50	32	TZ	85
1117	30	07OCT83	23:16	1066	50	32	TZ	86
1118	30	07OCT83	23:16	1066	50	32	TZ	86
1119	30	07OCT83	23:16	1066	50	32	TZ	87
1120	30	07OCT83	23:16	1066	50	32	TZ	87
1121	30	07OCT83	23:16	1066	50	32	TZ	88
1122	30	07OCT83	23:16	1066	50	32	TZ	88
1123	30	07OCT83	23:16	1066	50	32	TZ	90
1124	30	07OCT83	23:16	1066	50	32	TZ	90
1125	30	07OCT83	23:16	1066	50	32	TZ	91
1126	30	07OCT83	23:16	1066	50	32	TZ	92
1127	30	07OCT83	23:16	1066	50	32	TZ	92
1128	30	07OCT83	23:16	1066	50	32	TZ	92
1129	30	07OCT83	23:16	1066	50	32	TZ	92
1130	30	07OCT83	23:16	1066	50	32	TZ	92
1131	30	07OCT83	23:16	1066	50	32	TZ	93
1132	30	07OCT83	23:16	1066	50	32	TZ	94
1133	30	07OCT83	23:16	1066	50	32	TZ	95
1134	30	07OCT83	23:16	1066	50	32	TZ	95

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1135	30	07OCT83	23:16	1066	50	32	TZ	96
1136	30	07OCT83	23:16	1066	50	32	TZ	98
1137	30	07OCT83	23:16	1066	50	32	TZ	98
1138	30	07OCT83	23:16	1066	50	32	TZ	98
1139	30	07OCT83	23:16	1066	50	32	TZ	100
1140	30	07OCT83	23:16	1066	50	32	TZ	100
1141	30	07OCT83	23:16	1066	50	32	TZ	100
1142	30	07OCT83	23:16	1066	50	32	TZ	101
1143	30	07OCT83	23:16	1066	50	32	TZ	102
1144	30	07OCT83	23:16	1066	50	32	TZ	106
1145	30	07OCT83	23:16	1066	50	32	TZ	112
1146	30	07OCT83	23:16	1066	50	32	TZ	116
1147	30	07OCT83	23:16	1066	50	32	TZ	168
1148	30	07OCT83	23:16	1066	50	32	TZ	178
1149	30	07OCT83	23:16	1066	50	32	TZ	222
1150	30	08OCT83	0:08	1067	50	32	TZ	92
1151	30	08OCT83	0:08	1067	50	32	TZ	92
1152	30	08OCT83	0:08	1067	50	32	TZ	95
1153	30	08OCT83	0:08	1067	50	32	TZ	101
1154	30	08OCT83	0:08	1067	50	32	TZ	102
1155	30	08OCT83	0:08	1067	50	32	TZ	102
1156	30	08OCT83	0:08	1067	50	32	TZ	103
1157	30	08OCT83	0:08	1067	50	32	TZ	103
1158	30	08OCT83	0:08	1067	50	32	TZ	107
1159	30	08OCT83	0:08	1067	50	32	TZ	108
1160	30	08OCT83	0:08	1067	50	32	TZ	108
1161	30	08OCT83	0:08	1067	50	32	TZ	110
1162	30	08OCT83	0:08	1067	50	32	TZ	111
1163	30	08OCT83	0:08	1067	50	32	TZ	116
1164	30	08OCT83	0:08	1067	50	32	TZ	117
1165	30	08OCT83	0:08	1067	50	32	TZ	120
1166	30	08OCT83	0:08	1067	50	32	TZ	140
1167	30	08OCT83	0:08	1067	50	32	TZ	151
1168	30	08OCT83	0:08	1067	50	32	TZ	218
1169	30	08OCT83	0:08	1067	50	32	TZ	226
1170	30	08OCT83	0:08	1067	50	32	TZ	235
1171	30	08OCT83	0:08	1067	50	32	TZ	273
1172	30	08OCT83	0:08	1067	50	32	TZ	290
1173	30	08OCT83	0:32	1068	50	32	TZ	76
1174	30	08OCT83	0:32	1068	50	32	TZ	83
1175	30	08OCT83	0:32	1068	50	32	TZ	85
1176	30	08OCT83	0:32	1068	50	32	TZ	86
1177	30	08OCT83	0:32	1068	50	32	TZ	86
1178	30	08OCT83	0:32	1068	50	32	TZ	88
1179	30	08OCT83	0:32	1068	50	32	TZ	90
1180	30	08OCT83	0:32	1068	50	32	TZ	90
1181	30	08OCT83	0:32	1068	50	32	TZ	90
1182	30	08OCT83	0:32	1068	50	32	TZ	90
1183	30	08OCT83	0:32	1068	50	32	TZ	90
1184	30	08OCT83	0:32	1068	50	32	TZ	91
1185	30	08OCT83	0:32	1068	50	32	TZ	92
1186	30	08OCT83	0:32	1068	50	32	TZ	92
1187	30	08OCT83	0:32	1068	50	32	TZ	96
1188	30	08OCT83	0:32	1068	50	32	TZ	96

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1189	30	08OCT83	0:32	1068	50	32	TZ	96
1190	30	08OCT83	0:32	1068	50	32	TZ	97
1191	30	08OCT83	0:32	1068	50	32	TZ	97
1192	30	08OCT83	0:32	1068	50	32	TZ	97
1193	30	08OCT83	0:32	1068	50	32	TZ	99
1194	30	08OCT83	0:32	1068	50	32	TZ	100
1195	30	08OCT83	0:32	1068	50	32	TZ	100
1196	30	08OCT83	0:32	1068	50	32	TZ	100
1197	30	08OCT83	0:32	1068	50	32	TZ	101
1198	30	08OCT83	0:32	1068	50	32	TZ	101
1199	30	08OCT83	0:32	1068	50	32	TZ	101
1200	30	08OCT83	0:32	1068	50	32	TZ	101
1201	30	08OCT83	0:32	1068	50	32	TZ	102
1202	30	08OCT83	0:32	1068	50	32	TZ	104
1203	30	08OCT83	0:32	1068	50	32	TZ	104
1204	30	08OCT83	0:32	1068	50	32	TZ	105
1205	30	08OCT83	0:32	1068	50	32	TZ	105
1206	30	08OCT83	0:32	1068	50	32	TZ	106
1207	30	08OCT83	0:32	1068	50	32	TZ	106
1208	30	08OCT83	0:32	1068	50	32	TZ	107
1209	30	08OCT83	0:32	1068	50	32	TZ	107
1210	30	08OCT83	0:32	1068	50	32	TZ	108
1211	30	08OCT83	0:32	1068	50	32	TZ	109
1212	30	08OCT83	0:32	1068	50	32	TZ	110
1213	30	08OCT83	0:32	1068	50	32	TZ	111
1214	30	08OCT83	0:32	1068	50	32	TZ	112
1215	30	08OCT83	0:32	1068	50	32	TZ	113
1216	30	08OCT83	0:32	1068	50	32	TZ	116
1217	30	08OCT83	0:32	1068	50	32	TZ	117
1218	30	08OCT83	0:32	1068	50	32	TZ	117
1219	30	08OCT83	0:32	1068	50	32	TZ	118
1220	30	08OCT83	0:32	1068	50	32	TZ	122
1221	30	08OCT83	0:32	1068	50	32	TZ	122
1222	30	08OCT83	0:32	1068	50	32	TZ	131
1223	30	08OCT83	0:32	1068	50	32	TZ	146
1224	30	08OCT83	0:32	1068	50	32	TZ	154
1225	30	08OCT83	0:32	1068	50	32	TZ	167
1226	30	08OCT83	0:32	1068	50	32	TZ	171
1227	30	08OCT83	0:32	1068	50	32	TZ	198
1228	30	08OCT83	0:32	1068	50	32	TZ	205
1229	30	08OCT83	0:32	1068	50	32	TZ	214
1230	30	08OCT83	1:33	1070	50	33	TZ	86
1231	30	08OCT83	1:33	1070	50	33	TZ	94
1232	30	08OCT83	1:33	1070	50	33	TZ	208
1233	30	08OCT83	1:33	1070	50	33	TZ	221
1234	30	08OCT83	1:33	1070	50	33	TZ	224
1235	30	08OCT83	1:33	1070	50	33	TZ	226
1236	30	08OCT83	1:33	1070	50	33	TZ	236
1237	30	08OCT83	1:33	1070	50	33	TZ	252
1238	30	08OCT83	1:33	1070	50	33	TZ	277
1239	30	17OCT83	20:29	2	50	38	CH	70
1240	30	17OCT83	20:29	2	50	38	CH	81
1241	30	17OCT83	20:29	2	50	38	CH	82
1242	30	17OCT83	20:29	2	50	38	CH	82

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1243	30	17OCT83	20:29	2	50	38	CH	83
1244	30	17OCT83	20:29	2	50	38	CH	84
1245	30	17OCT83	20:29	2	50	38	CH	85
1246	30	17OCT83	20:29	2	50	38	CH	86
1247	30	17OCT83	20:29	2	50	38	CH	86
1248	30	17OCT83	20:29	2	50	38	CH	88
1249	30	17OCT83	20:29	2	50	38	CH	90
1250	30	17OCT83	20:29	2	50	38	CH	90
1251	30	17OCT83	20:29	2	50	38	CH	91
1252	30	17OCT83	20:29	2	50	38	CH	92
1253	30	17OCT83	20:29	2	50	38	CH	93
1254	30	17OCT83	20:29	2	50	38	CH	93
1255	30	17OCT83	20:29	2	50	38	CH	95
1256	30	17OCT83	20:29	2	50	38	CH	95
1257	30	17OCT83	20:29	2	50	38	CH	96
1258	30	17OCT83	20:29	2	50	38	CH	97
1259	30	17OCT83	20:29	2	50	38	CH	99
1260	30	17OCT83	20:29	2	50	38	CH	99
1261	30	17OCT83	20:29	2	50	38	CH	100
1262	30	17OCT83	20:29	2	50	38	CH	103
1263	30	17OCT83	20:29	2	50	38	CH	103
1264	30	17OCT83	20:29	2	50	38	CH	104
1265	30	17OCT83	20:29	2	50	38	CH	105
1266	30	17OCT83	20:29	2	50	38	CH	105
1267	30	17OCT83	20:29	2	50	38	CH	105
1268	30	17OCT83	20:29	2	50	38	CH	105
1269	30	17OCT83	20:29	2	50	38	CH	106
1270	30	17OCT83	20:29	2	50	38	CH	106
1271	30	17OCT83	20:29	2	50	38	CH	107
1272	30	17OCT83	20:29	2	50	38	CH	109
1273	30	17OCT83	20:29	2	50	38	CH	110
1274	30	17OCT83	20:29	2	50	38	CH	112
1275	30	17OCT83	20:29	2	50	38	CH	112
1276	30	17OCT83	20:29	2	50	38	CH	113
1277	30	17OCT83	20:29	2	50	38	CH	113
1278	30	17OCT83	20:29	2	50	38	CH	113
1279	30	17OCT83	20:29	2	50	38	CH	114
1280	30	17OCT83	20:29	2	50	38	CH	115
1281	30	17OCT83	20:29	2	50	38	CH	115
1282	30	17OCT83	20:29	2	50	38	CH	116
1283	30	17OCT83	20:29	2	50	38	CH	117
1284	30	17OCT83	20:29	2	50	38	CH	117
1285	30	17OCT83	20:29	2	50	38	CH	117
1286	30	17OCT83	20:29	2	50	38	CH	117
1287	30	17OCT83	20:29	2	50	38	CH	118
1288	30	17OCT83	20:29	2	50	38	CH	119
1289	30	17OCT83	20:29	2	50	38	CH	119
1290	30	17OCT83	20:29	2	50	38	CH	120
1291	30	17OCT83	20:29	2	50	38	CH	142
1292	30	17OCT83	20:29	2	50	38	CH	208
1293	30	17OCT83	20:51	3	50	38	CH	72
1294	30	17OCT83	20:51	3	50	38	CH	78
1295	30	17OCT83	20:51	3	50	38	CH	87
1296	30	17OCT83	20:51	3	50	38	CH	88

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1297	30	17OCT83	20:51	3	50	38	CH	88
1298	30	17OCT83	20:51	3	50	38	CH	90
1299	30	17OCT83	20:51	3	50	38	CH	90
1300	30	17OCT83	20:51	3	50	38	CH	91
1301	30	17OCT83	20:51	3	50	38	CH	96
1302	30	17OCT83	20:51	3	50	38	CH	97
1303	30	17OCT83	20:51	3	50	38	CH	98
1304	30	17OCT83	20:51	3	50	38	CH	105
1305	30	17OCT83	20:51	3	50	38	CH	105
1306	30	17OCT83	20:51	3	50	38	CH	107
1307	30	17OCT83	21:55	4	50	38	CH	75
1308	30	17OCT83	21:55	4	50	38	CH	75
1309	30	17OCT83	21:55	4	50	38	CH	77
1310	30	17OCT83	21:55	4	50	38	CH	80
1311	30	17OCT83	21:55	4	50	38	CH	81
1312	30	17OCT83	21:55	4	50	38	CH	82
1313	30	17OCT83	21:55	4	50	38	CH	83
1314	30	17OCT83	21:55	4	50	38	CH	83
1315	30	17OCT83	21:55	4	50	38	CH	84
1316	30	17OCT83	21:55	4	50	38	CH	85
1317	30	17OCT83	21:55	4	50	38	CH	87
1318	30	17OCT83	21:55	4	50	38	CH	87
1319	30	17OCT83	21:55	4	50	38	CH	90
1320	30	17OCT83	21:55	4	50	38	CH	91
1321	30	17OCT83	21:55	4	50	38	CH	92
1322	30	17OCT83	21:55	4	50	38	CH	92
1323	30	17OCT83	21:55	4	50	38	CH	93
1324	30	17OCT83	21:55	4	50	38	CH	95
1325	30	17OCT83	21:55	4	50	38	CH	95
1326	30	17OCT83	21:55	4	50	38	CH	101
1327	30	17OCT83	21:55	4	50	38	CH	103
1328	30	17OCT83	21:55	4	50	38	CH	107
1329	30	17OCT83	21:55	4	50	38	CH	108
1330	30	17OCT83	21:55	4	50	38	CH	110
1331	30	17OCT83	21:55	4	50	38	CH	110
1332	30	17OCT83	21:55	4	50	38	CH	125
1333	30	17OCT83	21:55	4	50	38	CH	251
1334	30	17OCT83	22:10	5	50	38	CH	77
1335	30	17OCT83	22:10	5	50	38	CH	78
1336	30	17OCT83	22:10	5	50	38	CH	81
1337	30	17OCT83	22:10	5	50	38	CH	85
1338	30	17OCT83	22:10	5	50	38	CH	88
1339	30	17OCT83	22:10	5	50	38	CH	90
1340	30	17OCT83	22:10	5	50	38	CH	90
1341	30	17OCT83	22:10	5	50	38	CH	91
1342	30	17OCT83	22:10	5	50	38	CH	93
1343	30	17OCT83	22:10	5	50	38	CH	96
1344	30	17OCT83	22:10	5	50	38	CH	96
1345	30	17OCT83	22:10	5	50	38	CH	96
1346	30	17OCT83	22:10	5	50	38	CH	97
1347	30	17OCT83	22:10	5	50	38	CH	97
1348	30	17OCT83	22:10	5	50	38	CH	97
1349	30	17OCT83	22:10	5	50	38	CH	100
1350	30	17OCT83	22:10	5	50	38	CH	100

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1351	30	17OCT83	22:10	5	50	38	CH	100
1352	30	17OCT83	22:10	5	50	38	CH	100
1353	30	17OCT83	22:10	5	50	38	CH	100
1354	30	17OCT83	22:10	5	50	38	CH	100
1355	30	17OCT83	22:10	5	50	38	CH	100
1356	30	17OCT83	22:10	5	50	38	CH	100
1357	30	17OCT83	22:10	5	50	38	CH	102
1358	30	17OCT83	22:10	5	50	38	CH	102
1359	30	17OCT83	22:10	5	50	38	CH	103
1360	30	17OCT83	22:10	5	50	38	CH	103
1361	30	17OCT83	22:10	5	50	38	CH	103
1362	30	17OCT83	22:10	5	50	38	CH	104
1363	30	17OCT83	22:10	5	50	38	CH	104
1364	30	17OCT83	22:10	5	50	38	CH	104
1365	30	17OCT83	22:10	5	50	38	CH	105
1366	30	17OCT83	22:10	5	50	38	CH	105
1367	30	17OCT83	22:10	5	50	38	CH	105
1368	30	17OCT83	22:10	5	50	38	CH	105
1369	30	17OCT83	22:10	5	50	38	CH	107
1370	30	17OCT83	22:10	5	50	38	CH	107
1371	30	17OCT83	22:10	5	50	38	CH	107
1372	30	17OCT83	22:10	5	50	38	CH	107
1373	30	17OCT83	22:10	5	50	38	CH	107
1374	30	17OCT83	22:10	5	50	38	CH	108
1375	30	17OCT83	22:10	5	50	38	CH	112
1376	30	17OCT83	22:10	5	50	38	CH	112
1377	30	17OCT83	22:10	5	50	38	CH	112
1378	30	17OCT83	22:10	5	50	38	CH	112
1379	30	17OCT83	22:10	5	50	38	CH	112
1380	30	17OCT83	22:10	5	50	38	CH	112
1381	30	17OCT83	22:10	5	50	38	CH	113
1382	30	17OCT83	22:10	5	50	38	CH	114
1383	30	17OCT83	22:10	5	50	38	CH	115
1384	30	17OCT83	22:10	5	50	38	CH	117
1385	30	17OCT83	22:10	5	50	38	CH	117
1386	30	17OCT83	22:10	5	50	38	CH	118
1387	30	17OCT83	22:10	5	50	38	CH	120
1388	30	17OCT83	22:10	5	50	38	CH	120
1389	30	17OCT83	22:10	5	50	38	CH	121
1390	30	17OCT83	22:10	5	50	38	CH	122
1391	30	17OCT83	22:10	5	50	38	CH	127
1392	30	17OCT83	22:10	5	50	38	CH	127
1393	30	17OCT83	22:10	5	50	38	CH	172
1394	30	17OCT83	22:10	5	50	38	CH	173
1395	30	17OCT83	22:10	5	50	38	CH	191
1396	30	17OCT83	22:10	5	50	38	CH	199
1397	30	17OCT83	22:49	6	50	37	CH	56
1398	30	17OCT83	22:49	6	50	37	CH	69
1399	30	17OCT83	22:49	6	50	37	CH	73
1400	30	17OCT83	22:49	6	50	37	CH	77
1401	30	17OCT83	22:49	6	50	37	CH	77
1402	30	17OCT83	22:49	6	50	37	CH	77
1403	30	17OCT83	22:49	6	50	37	CH	78
1404	30	17OCT83	22:49	6	50	37	CH	83

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1405	30	17OCT83	22:49	6	50	37	CH	84
1406	30	17OCT83	22:49	6	50	37	CH	85
1407	30	17OCT83	22:49	6	50	37	CH	85
1408	30	17OCT83	22:49	6	50	37	CH	85
1409	30	17OCT83	22:49	6	50	37	CH	85
1410	30	17OCT83	22:49	6	50	37	CH	86
1411	30	17OCT83	22:49	6	50	37	CH	86
1412	30	17OCT83	22:49	6	50	37	CH	87
1413	30	17OCT83	22:49	6	50	37	CH	87
1414	30	17OCT83	22:49	6	50	37	CH	88
1415	30	17OCT83	22:49	6	50	37	CH	89
1416	30	17OCT83	22:49	6	50	37	CH	90
1417	30	17OCT83	22:49	6	50	37	CH	91
1418	30	17OCT83	22:49	6	50	37	CH	91
1419	30	17OCT83	22:49	6	50	37	CH	91
1420	30	17OCT83	22:49	6	50	37	CH	91
1421	30	17OCT83	22:49	6	50	37	CH	91
1422	30	17OCT83	22:49	6	50	37	CH	91
1423	30	17OCT83	22:49	6	50	37	CH	92
1424	30	17OCT83	22:49	6	50	37	CH	92
1425	30	17OCT83	22:49	6	50	37	CH	92
1426	30	17OCT83	22:49	6	50	37	CH	92
1427	30	17OCT83	22:49	6	50	37	CH	92
1428	30	17OCT83	22:49	6	50	37	CH	93
1429	30	17OCT83	22:49	6	50	37	CH	93
1430	30	17OCT83	22:49	6	50	37	CH	93
1431	30	17OCT83	22:49	6	50	37	CH	93
1432	30	17OCT83	22:49	6	50	37	CH	93
1433	30	17OCT83	22:49	6	50	37	CH	94
1434	30	17OCT83	22:49	6	50	37	CH	94
1435	30	17OCT83	22:49	6	50	37	CH	95
1436	30	17OCT83	22:49	6	50	37	CH	95
1437	30	17OCT83	22:49	6	50	37	CH	95
1438	30	17OCT83	22:49	6	50	37	CH	96
1439	30	17OCT83	22:49	6	50	37	CH	96
1440	30	17OCT83	22:49	6	50	37	CH	96
1441	30	17OCT83	22:49	6	50	37	CH	96
1442	30	17OCT83	22:49	6	50	37	CH	97
1443	30	17OCT83	22:49	6	50	37	CH	97
1444	30	17OCT83	22:49	6	50	37	CH	97
1445	30	17OCT83	22:49	6	50	37	CH	97
1446	30	17OCT83	22:49	6	50	37	CH	98
1447	30	17OCT83	22:49	6	50	37	CH	98
1448	30	17OCT83	22:49	6	50	37	CH	98
1449	30	17OCT83	22:49	6	50	37	CH	99
1450	30	17OCT83	22:49	6	50	37	CH	99
1451	30	17OCT83	22:49	6	50	37	CH	99
1452	30	17OCT83	22:49	6	50	37	CH	101
1453	30	17OCT83	22:49	6	50	37	CH	102
1454	30	17OCT83	22:49	6	50	37	CH	102
1455	30	17OCT83	22:49	6	50	37	CH	103
1456	30	17OCT83	22:49	6	50	37	CH	104
1457	30	17OCT83	22:49	6	50	37	CH	105
1458	30	17OCT83	22:49	6	50	37	CH	106

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1459	30	17OCT83	22:49	6	50	37	CH	107
1460	30	17OCT83	22:49	6	50	37	CH	107
1461	30	17OCT83	22:49	6	50	37	CH	108
1462	30	17OCT83	22:49	6	50	37	CH	109
1463	30	17OCT83	22:49	6	50	37	CH	110
1464	30	17OCT83	22:49	6	50	37	CH	112
1465	30	17OCT83	22:49	6	50	37	CH	113
1466	30	17OCT83	22:49	6	50	37	CH	115
1467	30	17OCT83	22:49	6	50	37	CH	115
1468	30	17OCT83	22:49	6	50	37	CH	115
1469	30	17OCT83	22:49	6	50	37	CH	116
1470	30	17OCT83	22:49	6	50	37	CH	117
1471	30	17OCT83	22:49	6	50	37	CH	118
1472	30	17OCT83	22:49	6	50	37	CH	120
1473	30	17OCT83	22:49	6	50	37	CH	121
1474	30	17OCT83	22:49	6	50	37	CH	122
1475	30	17OCT83	22:49	6	50	37	CH	134
1476	30	17OCT83	23:09	7	50	36	CH	56
1477	30	17OCT83	23:09	7	50	36	CH	57
1478	30	17OCT83	23:09	7	50	36	CH	58
1479	30	17OCT83	23:09	7	50	36	CH	68
1480	30	17OCT83	23:09	7	50	36	CH	77
1481	30	17OCT83	23:09	7	50	36	CH	84
1482	30	17OCT83	23:09	7	50	36	CH	85
1483	30	17OCT83	23:09	7	50	36	CH	85
1484	30	17OCT83	23:09	7	50	36	CH	85
1485	30	17OCT83	23:09	7	50	36	CH	85
1486	30	17OCT83	23:09	7	50	36	CH	86
1487	30	17OCT83	23:09	7	50	36	CH	86
1488	30	17OCT83	23:09	7	50	36	CH	86
1489	30	17OCT83	23:09	7	50	36	CH	86
1490	30	17OCT83	23:09	7	50	36	CH	87
1491	30	17OCT83	23:09	7	50	36	CH	87
1492	30	17OCT83	23:09	7	50	36	CH	87
1493	30	17OCT83	23:09	7	50	36	CH	88
1494	30	17OCT83	23:09	7	50	36	CH	88
1495	30	17OCT83	23:09	7	50	36	CH	88
1496	30	17OCT83	23:09	7	50	36	CH	88
1497	30	17OCT83	23:09	7	50	36	CH	88
1498	30	17OCT83	23:09	7	50	36	CH	89
1499	30	17OCT83	23:09	7	50	36	CH	90
1500	30	17OCT83	23:09	7	50	36	CH	90
1501	30	17OCT83	23:09	7	50	36	CH	90
1502	30	17OCT83	23:09	7	50	36	CH	90
1503	30	17OCT83	23:09	7	50	36	CH	90
1504	30	17OCT83	23:09	7	50	36	CH	91
1505	30	17OCT83	23:09	7	50	36	CH	91
1506	30	17OCT83	23:09	7	50	36	CH	91
1507	30	17OCT83	23:09	7	50	36	CH	92
1508	30	17OCT83	23:09	7	50	36	CH	92
1509	30	17OCT83	23:09	7	50	36	CH	92
1510	30	17OCT83	23:09	7	50	36	CH	92
1511	30	17OCT83	23:09	7	50	36	CH	93
1512	30	17OCT83	23:09	7	50	36	CH	93

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1513	30	17OCT83	23:09	7	50	36	CH	93
1514	30	17OCT83	23:09	7	50	36	CH	93
1515	30	17OCT83	23:09	7	50	36	CH	93
1516	30	17OCT83	23:09	7	50	36	CH	93
1517	30	17OCT83	23:09	7	50	36	CH	94
1518	30	17OCT83	23:09	7	50	36	CH	94
1519	30	17OCT83	23:09	7	50	36	CH	95
1520	30	17OCT83	23:09	7	50	36	CH	95
1521	30	17OCT83	23:09	7	50	36	CH	96
1522	30	17OCT83	23:09	7	50	36	CH	96
1523	30	17OCT83	23:09	7	50	36	CH	96
1524	30	17OCT83	23:09	7	50	36	CH	96
1525	30	17OCT83	23:09	7	50	36	CH	96
1526	30	17OCT83	23:09	7	50	36	CH	96
1527	30	17OCT83	23:09	7	50	36	CH	97
1528	30	17OCT83	23:09	7	50	36	CH	97
1529	30	17OCT83	23:09	7	50	36	CH	97
1530	30	17OCT83	23:09	7	50	36	CH	97
1531	30	17OCT83	23:09	7	50	36	CH	97
1532	30	17OCT83	23:09	7	50	36	CH	97
1533	30	17OCT83	23:09	7	50	36	CH	97
1534	30	17OCT83	23:09	7	50	36	CH	97
1535	30	17OCT83	23:09	7	50	36	CH	97
1536	30	17OCT83	23:09	7	50	36	CH	97
1537	30	17OCT83	23:09	7	50	36	CH	97
1538	30	17OCT83	23:09	7	50	36	CH	97
1539	30	17OCT83	23:09	7	50	36	CH	98
1540	30	17OCT83	23:09	7	50	36	CH	98
1541	30	17OCT83	23:09	7	50	36	CH	98
1542	30	17OCT83	23:09	7	50	36	CH	98
1543	30	17OCT83	23:09	7	50	36	CH	98
1544	30	17OCT83	23:09	7	50	36	CH	98
1545	30	17OCT83	23:09	7	50	36	CH	98
1546	30	17OCT83	23:09	7	50	36	CH	99
1547	30	17OCT83	23:09	7	50	36	CH	100
1548	30	17OCT83	23:09	7	50	36	CH	100
1549	30	17OCT83	23:09	7	50	36	CH	100
1550	30	17OCT83	23:09	7	50	36	CH	100
1551	30	17OCT83	23:09	7	50	36	CH	100
1552	30	17OCT83	23:09	7	50	36	CH	102
1553	30	17OCT83	23:09	7	50	36	CH	103
1554	30	17OCT83	23:09	7	50	36	CH	103
1555	30	17OCT83	23:09	7	50	36	CH	103
1556	30	17OCT83	23:09	7	50	36	CH	103
1557	30	17OCT83	23:09	7	50	36	CH	103
1558	30	17OCT83	23:09	7	50	36	CH	103
1559	30	17OCT83	23:09	7	50	36	CH	103
1560	30	17OCT83	23:09	7	50	36	CH	103
1561	30	17OCT83	23:09	7	50	36	CH	103
1562	30	17OCT83	23:09	7	50	36	CH	104
1563	30	17OCT83	23:09	7	50	36	CH	104
1564	30	17OCT83	23:09	7	50	36	CH	104
1565	30	17OCT83	23:09	7	50	36	CH	104
1566	30	17OCT83	23:09	7	50	36	CH	105

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1567	30	17OCT83	23:09	7	50	36	CH	105
1568	30	17OCT83	23:09	7	50	36	CH	105
1569	30	17OCT83	23:09	7	50	36	CH	106
1570	30	17OCT83	23:09	7	50	36	CH	106
1571	30	17OCT83	23:09	7	50	36	CH	106
1572	30	17OCT83	23:09	7	50	36	CH	106
1573	30	17OCT83	23:09	7	50	36	CH	106
1574	30	17OCT83	23:09	7	50	36	CH	106
1575	30	17OCT83	23:09	7	50	36	CH	107
1576	30	17OCT83	23:09	7	50	36	CH	107
1577	30	17OCT83	23:09	7	50	36	CH	108
1578	30	17OCT83	23:09	7	50	36	CH	108
1579	30	17OCT83	23:09	7	50	36	CH	108
1580	30	17OCT83	23:09	7	50	36	CH	109
1581	30	17OCT83	23:09	7	50	36	CH	109
1582	30	17OCT83	23:09	7	50	36	CH	110
1583	30	17OCT83	23:09	7	50	36	CH	110
1584	30	17OCT83	23:09	7	50	36	CH	110
1585	30	17OCT83	23:09	7	50	36	CH	110
1586	30	17OCT83	23:09	7	50	36	CH	110
1587	30	17OCT83	23:09	7	50	36	CH	111
1588	30	17OCT83	23:09	7	50	36	CH	112
1589	30	17OCT83	23:09	7	50	36	CH	112
1590	30	17OCT83	23:09	7	50	36	CH	112
1591	30	17OCT83	23:09	7	50	36	CH	113
1592	30	17OCT83	23:09	7	50	36	CH	115
1593	30	17OCT83	23:09	7	50	36	CH	117
1594	30	17OCT83	23:09	7	50	36	CH	117
1595	30	17OCT83	23:09	7	50	36	CH	117
1596	30	17OCT83	23:09	7	50	36	CH	119
1597	30	17OCT83	23:09	7	50	36	CH	120
1598	30	17OCT83	23:09	7	50	36	CH	123
1599	30	17OCT83	23:09	7	50	36	CH	123
1600	30	17OCT83	23:09	7	50	36	CH	125
1601	30	17OCT83	23:09	7	50	36	CH	125
1602	30	17OCT83	23:09	7	50	36	CH	129
1603	30	17OCT83	23:09	7	50	36	CH	133
1604	30	17OCT83	23:09	7	50	36	CH	159
1605	30	18OCT83	19:08	12	50	35	CH	75
1606	30	18OCT83	19:08	12	50	35	CH	82
1607	30	18OCT83	19:08	12	50	35	CH	82
1608	30	18OCT83	19:08	12	50	35	CH	85
1609	30	18OCT83	19:08	12	50	35	CH	85
1610	30	18OCT83	19:08	12	50	35	CH	85
1611	30	18OCT83	19:08	12	50	35	CH	86
1612	30	18OCT83	19:08	12	50	35	CH	89
1613	30	18OCT83	19:08	12	50	35	CH	89
1614	30	18OCT83	19:08	12	50	35	CH	90
1615	30	18OCT83	19:08	12	50	35	CH	91
1616	30	18OCT83	19:08	12	50	35	CH	92
1617	30	18OCT83	19:08	12	50	35	CH	95
1618	30	18OCT83	19:08	12	50	35	CH	95
1619	30	18OCT83	19:08	12	50	35	CH	95
1620	30	18OCT83	19:08	12	50	35	CH	95

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1621	30	18OCT83	19:08	12	50	35	CH	95
1622	30	18OCT83	19:08	12	50	35	CH	96
1623	30	18OCT83	19:08	12	50	35	CH	96
1624	30	18OCT83	19:08	12	50	35	CH	97
1625	30	18OCT83	19:08	12	50	35	CH	98
1626	30	18OCT83	19:08	12	50	35	CH	101
1627	30	18OCT83	19:08	12	50	35	CH	101
1628	30	18OCT83	19:08	12	50	35	CH	103
1629	30	18OCT83	19:08	12	50	35	CH	105
1630	30	18OCT83	19:08	12	50	35	CH	105
1631	30	18OCT83	19:08	12	50	35	CH	106
1632	30	18OCT83	19:26	13	50	35	CH	72
1633	30	18OCT83	19:26	13	50	35	CH	77
1634	30	18OCT83	19:26	13	50	35	CH	77
1635	30	18OCT83	19:26	13	50	35	CH	79
1636	30	18OCT83	19:26	13	50	35	CH	82
1637	30	18OCT83	19:26	13	50	35	CH	84
1638	30	18OCT83	19:26	13	50	35	CH	84
1639	30	18OCT83	19:26	13	50	35	CH	85
1640	30	18OCT83	19:26	13	50	35	CH	85
1641	30	18OCT83	19:26	13	50	35	CH	86
1642	30	18OCT83	19:26	13	50	35	CH	86
1643	30	18OCT83	19:26	13	50	35	CH	86
1644	30	18OCT83	19:26	13	50	35	CH	86
1645	30	18OCT83	19:26	13	50	35	CH	87
1646	30	18OCT83	19:26	13	50	35	CH	87
1647	30	18OCT83	19:26	13	50	35	CH	87
1648	30	18OCT83	19:26	13	50	35	CH	88
1649	30	18OCT83	19:26	13	50	35	CH	88
1650	30	18OCT83	19:26	13	50	35	CH	88
1651	30	18OCT83	19:26	13	50	35	CH	89
1652	30	18OCT83	19:26	13	50	35	CH	90
1653	30	18OCT83	19:26	13	50	35	CH	90
1654	30	18OCT83	19:26	13	50	35	CH	90
1655	30	18OCT83	19:26	13	50	35	CH	90
1656	30	18OCT83	19:26	13	50	35	CH	90
1657	30	18OCT83	19:26	13	50	35	CH	91
1658	30	18OCT83	19:26	13	50	35	CH	91
1659	30	18OCT83	19:26	13	50	35	CH	91
1660	30	18OCT83	19:26	13	50	35	CH	91
1661	30	18OCT83	19:26	13	50	35	CH	92
1662	30	18OCT83	19:26	13	50	35	CH	92
1663	30	18OCT83	19:26	13	50	35	CH	92
1664	30	18OCT83	19:26	13	50	35	CH	93
1665	30	18OCT83	19:26	13	50	35	CH	93
1666	30	18OCT83	19:26	13	50	35	CH	93
1667	30	18OCT83	19:26	13	50	35	CH	95
1668	30	18OCT83	19:26	13	50	35	CH	97
1669	30	18OCT83	19:26	13	50	35	CH	99
1670	30	18OCT83	19:26	13	50	35	CH	99
1671	30	18OCT83	19:26	13	50	35	CH	100
1672	30	18OCT83	19:26	13	50	35	CH	102
1673	30	18OCT83	19:26	13	50	35	CH	103
1674	30	18OCT83	19:26	13	50	35	CH	103

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1675	30	18OCT83	19:26	13	50	35	CH	103
1676	30	18OCT83	19:26	13	50	35	CH	105
1677	30	18OCT83	19:26	13	50	35	CH	108
1678	30	18OCT83	19:26	13	50	35	CH	109
1679	30	18OCT83	19:26	13	50	35	CH	110
1680	30	18OCT83	19:26	13	50	35	CH	124
1681	30	18OCT83	19:26	13	50	35	CH	176
1682	30	18OCT83	19:26	13	50	35	CH	194
1683	30	18OCT83	19:26	13	50	35	CH	210
1684	30	18OCT83	19:26	13	50	35	CH	237
1685	30	18OCT83	19:26	13	50	35	CH	251
1686	30	18OCT83	19:26	13	50	35	CH	273
1687	30	18OCT83	20:31	15	50	34	CH	80
1688	30	18OCT83	20:31	15	50	34	CH	80
1689	30	18OCT83	20:31	15	50	34	CH	83
1690	30	18OCT83	20:31	15	50	34	CH	85
1691	30	18OCT83	20:31	15	50	34	CH	85
1692	30	18OCT83	20:31	15	50	34	CH	86
1693	30	18OCT83	20:31	15	50	34	CH	89
1694	30	18OCT83	20:31	15	50	34	CH	89
1695	30	18OCT83	20:31	15	50	34	CH	89
1696	30	18OCT83	20:31	15	50	34	CH	90
1697	30	18OCT83	20:31	15	50	34	CH	90
1698	30	18OCT83	20:31	15	50	34	CH	91
1699	30	18OCT83	20:31	15	50	34	CH	94
1700	30	18OCT83	20:31	15	50	34	CH	94
1701	30	18OCT83	20:31	15	50	34	CH	94
1702	30	18OCT83	20:31	15	50	34	CH	94
1703	30	18OCT83	20:31	15	50	34	CH	95
1704	30	18OCT83	20:31	15	50	34	CH	95
1705	30	18OCT83	20:31	15	50	34	CH	96
1706	30	18OCT83	20:31	15	50	34	CH	96
1707	30	18OCT83	20:31	15	50	34	CH	96
1708	30	18OCT83	20:31	15	50	34	CH	98
1709	30	18OCT83	20:31	15	50	34	CH	98
1710	30	18OCT83	20:31	15	50	34	CH	98
1711	30	18OCT83	20:31	15	50	34	CH	99
1712	30	18OCT83	20:31	15	50	34	CH	99
1713	30	18OCT83	20:31	15	50	34	CH	100
1714	30	18OCT83	20:31	15	50	34	CH	103
1715	30	18OCT83	20:31	15	50	34	CH	103
1716	30	18OCT83	20:31	15	50	34	CH	114
1717	30	18OCT83	20:54	16	50	34	CH	85
1718	30	18OCT83	20:54	16	50	34	CH	91
1719	30	18OCT83	20:54	16	50	34	CH	92
1720	30	18OCT83	20:54	16	50	34	CH	93
1721	30	18OCT83	20:54	16	50	34	CH	93
1722	30	18OCT83	20:54	16	50	34	CH	94
1723	30	18OCT83	20:54	16	50	34	CH	105
1724	30	18OCT83	21:14	17	50	33	TZ	77
1725	30	18OCT83	21:14	17	50	33	TZ	80
1726	30	18OCT83	21:14	17	50	33	TZ	80
1727	30	18OCT83	21:14	17	50	33	TZ	85
1728	30	18OCT83	21:14	17	50	33	TZ	86

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1729	30	18OCT83	21:14	17	50	33	TZ	91
1730	30	18OCT83	21:14	17	50	33	TZ	92
1731	30	18OCT83	21:14	17	50	33	TZ	93
1732	30	18OCT83	21:14	17	50	33	TZ	96
1733	30	18OCT83	21:14	17	50	33	TZ	97
1734	30	18OCT83	21:14	17	50	33	TZ	97
1735	30	18OCT83	21:14	17	50	33	TZ	102
1736	30	18OCT83	21:14	17	50	33	TZ	104
1737	30	18OCT83	21:14	17	50	33	TZ	105
1738	30	18OCT83	21:14	17	50	33	TZ	107
1739	30	18OCT83	21:14	17	50	33	TZ	108
1740	30	18OCT83	21:14	17	50	33	TZ	109
1741	30	18OCT83	21:14	17	50	33	TZ	110
1742	30	18OCT83	21:14	17	50	33	TZ	111
1743	30	18OCT83	21:14	17	50	33	TZ	117
1744	30	18OCT83	21:58	18	50	32	TZ	71
1745	30	18OCT83	21:58	18	50	32	TZ	71
1746	30	18OCT83	21:58	18	50	32	TZ	77
1747	30	18OCT83	21:58	18	50	32	TZ	79
1748	30	18OCT83	21:58	18	50	32	TZ	82
1749	30	18OCT83	21:58	18	50	32	TZ	85
1750	30	18OCT83	21:58	18	50	32	TZ	85
1751	30	18OCT83	21:58	18	50	32	TZ	85
1752	30	18OCT83	21:58	18	50	32	TZ	86
1753	30	18OCT83	21:58	18	50	32	TZ	86
1754	30	18OCT83	21:58	18	50	32	TZ	87
1755	30	18OCT83	21:58	18	50	32	TZ	87
1756	30	18OCT83	21:58	18	50	32	TZ	87
1757	30	18OCT83	21:58	18	50	32	TZ	87
1758	30	18OCT83	21:58	18	50	32	TZ	89
1759	30	18OCT83	21:58	18	50	32	TZ	92
1760	30	18OCT83	21:58	18	50	32	TZ	92
1761	30	18OCT83	21:58	18	50	32	TZ	92
1762	30	18OCT83	21:58	18	50	32	TZ	93
1763	30	18OCT83	21:58	18	50	32	TZ	93
1764	30	18OCT83	21:58	18	50	32	TZ	94
1765	30	18OCT83	21:58	18	50	32	TZ	94
1766	30	18OCT83	21:58	18	50	32	TZ	95
1767	30	18OCT83	21:58	18	50	32	TZ	95
1768	30	18OCT83	21:58	18	50	32	TZ	96
1769	30	18OCT83	21:58	18	50	32	TZ	96
1770	30	18OCT83	21:58	18	50	32	TZ	97
1771	30	18OCT83	21:58	18	50	32	TZ	97
1772	30	18OCT83	21:58	18	50	32	TZ	98
1773	30	18OCT83	21:58	18	50	32	TZ	99
1774	30	18OCT83	21:58	18	50	32	TZ	99
1775	30	18OCT83	21:58	18	50	32	TZ	100
1776	30	18OCT83	21:58	18	50	32	TZ	100
1777	30	18OCT83	21:58	18	50	32	TZ	103
1778	30	18OCT83	21:58	18	50	32	TZ	105
1779	30	18OCT83	21:58	18	50	32	TZ	110
1780	30	18OCT83	21:58	18	50	32	TZ	111
1781	30	18OCT83	21:58	18	50	32	TZ	160
1782	30	18OCT83	22:13	19	50	32	TZ	71

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1783	30	18OCT83	22:13	19	50	32	TZ	72
1784	30	18OCT83	22:13	19	50	32	TZ	78
1785	30	18OCT83	22:13	19	50	32	TZ	80
1786	30	18OCT83	22:13	19	50	32	TZ	81
1787	30	18OCT83	22:13	19	50	32	TZ	81
1788	30	18OCT83	22:13	19	50	32	TZ	82
1789	30	18OCT83	22:13	19	50	32	TZ	85
1790	30	18OCT83	22:13	19	50	32	TZ	87
1791	30	18OCT83	22:13	19	50	32	TZ	88
1792	30	18OCT83	22:13	19	50	32	TZ	89
1793	30	18OCT83	22:13	19	50	32	TZ	90
1794	30	18OCT83	22:13	19	50	32	TZ	90
1795	30	18OCT83	22:13	19	50	32	TZ	93
1796	30	18OCT83	22:13	19	50	32	TZ	94
1797	30	18OCT83	22:13	19	50	32	TZ	95
1798	30	18OCT83	22:13	19	50	32	TZ	100
1799	30	18OCT83	22:13	19	50	32	TZ	102
1800	30	18OCT83	22:13	19	50	32	TZ	103
1801	30	18OCT83	22:13	19	50	32	TZ	125
1802	30	18OCT83	22:13	19	50	32	TZ	226
1803	30	18OCT83	22:13	19	50	32	TZ	325
1804	30	18OCT83	22:38	20	50	32	TZ	92
1805	30	18OCT83	22:38	20	50	32	TZ	111
1806	30	18OCT83	23:02	21	50	32	TZ	69
1807	30	18OCT83	23:02	21	50	32	TZ	70
1808	30	18OCT83	23:02	21	50	32	TZ	70
1809	30	18OCT83	23:02	21	50	32	TZ	73
1810	30	18OCT83	23:02	21	50	32	TZ	74
1811	30	18OCT83	23:02	21	50	32	TZ	75
1812	30	18OCT83	23:02	21	50	32	TZ	75
1813	30	18OCT83	23:02	21	50	32	TZ	75
1814	30	18OCT83	23:02	21	50	32	TZ	77
1815	30	18OCT83	23:02	21	50	32	TZ	77
1816	30	18OCT83	23:02	21	50	32	TZ	77
1817	30	18OCT83	23:02	21	50	32	TZ	78
1818	30	18OCT83	23:02	21	50	32	TZ	78
1819	30	18OCT83	23:02	21	50	32	TZ	78
1820	30	18OCT83	23:02	21	50	32	TZ	78
1821	30	18OCT83	23:02	21	50	32	TZ	78
1822	30	18OCT83	23:02	21	50	32	TZ	80
1823	30	18OCT83	23:02	21	50	32	TZ	80
1824	30	18OCT83	23:02	21	50	32	TZ	80
1825	30	18OCT83	23:02	21	50	32	TZ	80
1826	30	18OCT83	23:02	21	50	32	TZ	81
1827	30	18OCT83	23:02	21	50	32	TZ	81
1828	30	18OCT83	23:02	21	50	32	TZ	81
1829	30	18OCT83	23:02	21	50	32	TZ	81
1830	30	18OCT83	23:02	21	50	32	TZ	81
1831	30	18OCT83	23:02	21	50	32	TZ	81
1832	30	18OCT83	23:02	21	50	32	TZ	82
1833	30	18OCT83	23:02	21	50	32	TZ	82
1834	30	18OCT83	23:02	21	50	32	TZ	82
1835	30	18OCT83	23:02	21	50	32	TZ	82
1836	30	18OCT83	23:02	21	50	32	TZ	83

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1837	30	18OCT83	23:02	21	50	32	TZ	83
1838	30	18OCT83	23:02	21	50	32	TZ	84
1839	30	18OCT83	23:02	21	50	32	TZ	84
1840	30	18OCT83	23:02	21	50	32	TZ	84
1841	30	18OCT83	23:02	21	50	32	TZ	85
1842	30	18OCT83	23:02	21	50	32	TZ	85
1843	30	18OCT83	23:02	21	50	32	TZ	85
1844	30	18OCT83	23:02	21	50	32	TZ	85
1845	30	18OCT83	23:02	21	50	32	TZ	85
1846	30	18OCT83	23:02	21	50	32	TZ	85
1847	30	18OCT83	23:02	21	50	32	TZ	85
1848	30	18OCT83	23:02	21	50	32	TZ	85
1849	30	18OCT83	23:02	21	50	32	TZ	85
1850	30	18OCT83	23:02	21	50	32	TZ	86
1851	30	18OCT83	23:02	21	50	32	TZ	86
1852	30	18OCT83	23:02	21	50	32	TZ	86
1853	30	18OCT83	23:02	21	50	32	TZ	87
1854	30	18OCT83	23:02	21	50	32	TZ	87
1855	30	18OCT83	23:02	21	50	32	TZ	87
1856	30	18OCT83	23:02	21	50	32	TZ	87
1857	30	18OCT83	23:02	21	50	32	TZ	87
1858	30	18OCT83	23:02	21	50	32	TZ	87
1859	30	18OCT83	23:02	21	50	32	TZ	88
1860	30	18OCT83	23:02	21	50	32	TZ	88
1861	30	18OCT83	23:02	21	50	32	TZ	88
1862	30	18OCT83	23:02	21	50	32	TZ	89
1863	30	18OCT83	23:02	21	50	32	TZ	90
1864	30	18OCT83	23:02	21	50	32	TZ	90
1865	30	18OCT83	23:02	21	50	32	TZ	90
1866	30	18OCT83	23:02	21	50	32	TZ	90
1867	30	18OCT83	23:02	21	50	32	TZ	90
1868	30	18OCT83	23:02	21	50	32	TZ	90
1869	30	18OCT83	23:02	21	50	32	TZ	90
1870	30	18OCT83	23:02	21	50	32	TZ	90
1871	30	18OCT83	23:02	21	50	32	TZ	91
1872	30	18OCT83	23:02	21	50	32	TZ	91
1873	30	18OCT83	23:02	21	50	32	TZ	91
1874	30	18OCT83	23:02	21	50	32	TZ	91
1875	30	18OCT83	23:02	21	50	32	TZ	91
1876	30	18OCT83	23:02	21	50	32	TZ	92
1877	30	18OCT83	23:02	21	50	32	TZ	92
1878	30	18OCT83	23:02	21	50	32	TZ	92
1879	30	18OCT83	23:02	21	50	32	TZ	92
1880	30	18OCT83	23:02	21	50	32	TZ	92
1881	30	18OCT83	23:02	21	50	32	TZ	92
1882	30	18OCT83	23:02	21	50	32	TZ	93
1883	30	18OCT83	23:02	21	50	32	TZ	93
1884	30	18OCT83	23:02	21	50	32	TZ	93
1885	30	18OCT83	23:02	21	50	32	TZ	93
1886	30	18OCT83	23:02	21	50	32	TZ	93
1887	30	18OCT83	23:02	21	50	32	TZ	94
1888	30	18OCT83	23:02	21	50	32	TZ	94
1889	30	18OCT83	23:02	21	50	32	TZ	95
1890	30	18OCT83	23:02	21	50	32	TZ	95

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1891	30	18OCT83	23:02	21	50	32	TZ	95
1892	30	18OCT83	23:02	21	50	32	TZ	96
1893	30	18OCT83	23:02	21	50	32	TZ	96
1894	30	18OCT83	23:02	21	50	32	TZ	96
1895	30	18OCT83	23:02	21	50	32	TZ	97
1896	30	18OCT83	23:02	21	50	32	TZ	97
1897	30	18OCT83	23:02	21	50	32	TZ	98
1898	30	18OCT83	23:02	21	50	32	TZ	98
1899	30	18OCT83	23:02	21	50	32	TZ	98
1900	30	18OCT83	23:02	21	50	32	TZ	98
1901	30	18OCT83	23:02	21	50	32	TZ	98
1902	30	18OCT83	23:02	21	50	32	TZ	99
1903	30	18OCT83	23:02	21	50	32	TZ	100
1904	30	18OCT83	23:02	21	50	32	TZ	100
1905	30	18OCT83	23:02	21	50	32	TZ	100
1906	30	18OCT83	23:02	21	50	32	TZ	100
1907	30	18OCT83	23:02	21	50	32	TZ	101
1908	30	18OCT83	23:02	21	50	32	TZ	101
1909	30	18OCT83	23:02	21	50	32	TZ	103
1910	30	18OCT83	23:02	21	50	32	TZ	103
1911	30	18OCT83	23:02	21	50	32	TZ	105
1912	30	18OCT83	23:02	21	50	32	TZ	105
1913	30	18OCT83	23:02	21	50	32	TZ	106
1914	30	18OCT83	23:02	21	50	32	TZ	106
1915	30	18OCT83	23:02	21	50	32	TZ	106
1916	30	18OCT83	23:02	21	50	32	TZ	107
1917	30	18OCT83	23:02	21	50	32	TZ	107
1918	30	18OCT83	23:02	21	50	32	TZ	109
1919	30	18OCT83	23:02	21	50	32	TZ	110
1920	30	18OCT83	23:02	21	50	32	TZ	110
1921	30	18OCT83	23:02	21	50	32	TZ	111
1922	30	18OCT83	23:02	21	50	32	TZ	112
1923	30	18OCT83	23:02	21	50	32	TZ	112
1924	30	18OCT83	23:02	21	50	32	TZ	113
1925	30	18OCT83	23:02	21	50	32	TZ	119
1926	30	18OCT83	23:02	21	50	32	TZ	121
1927	30	18OCT83	23:02	21	50	32	TZ	122
1928	30	18OCT83	23:02	21	50	32	TZ	161
1929	30	18OCT83	23:21	22	50	32	TZ	74
1930	30	18OCT83	23:21	22	50	32	TZ	75
1931	30	18OCT83	23:21	22	50	32	TZ	76
1932	30	18OCT83	23:21	22	50	32	TZ	77
1933	30	18OCT83	23:21	22	50	32	TZ	77
1934	30	18OCT83	23:21	22	50	32	TZ	77
1935	30	18OCT83	23:21	22	50	32	TZ	78
1936	30	18OCT83	23:21	22	50	32	TZ	78
1937	30	18OCT83	23:21	22	50	32	TZ	80
1938	30	18OCT83	23:21	22	50	32	TZ	80
1939	30	18OCT83	23:21	22	50	32	TZ	80
1940	30	18OCT83	23:21	22	50	32	TZ	81
1941	30	18OCT83	23:21	22	50	32	TZ	81
1942	30	18OCT83	23:21	22	50	32	TZ	81
1943	30	18OCT83	23:21	22	50	32	TZ	82
1944	30	18OCT83	23:21	22	50	32	TZ	83

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
1945	30	18OCT83	23:21	22	50	32	TZ	83
1946	30	18OCT83	23:21	22	50	32	TZ	83
1947	30	18OCT83	23:21	22	50	32	TZ	84
1948	30	18OCT83	23:21	22	50	32	TZ	84
1949	30	18OCT83	23:21	22	50	32	TZ	85
1950	30	18OCT83	23:21	22	50	32	TZ	85
1951	30	18OCT83	23:21	22	50	32	TZ	85
1952	30	18OCT83	23:21	22	50	32	TZ	85
1953	30	18OCT83	23:21	22	50	32	TZ	85
1954	30	18OCT83	23:21	22	50	32	TZ	86
1955	30	18OCT83	23:21	22	50	32	TZ	86
1956	30	18OCT83	23:21	22	50	32	TZ	86
1957	30	18OCT83	23:21	22	50	32	TZ	86
1958	30	18OCT83	23:21	22	50	32	TZ	86
1959	30	18OCT83	23:21	22	50	32	TZ	86
1960	30	18OCT83	23:21	22	50	32	TZ	86
1961	30	18OCT83	23:21	22	50	32	TZ	87
1962	30	18OCT83	23:21	22	50	32	TZ	87
1963	30	18OCT83	23:21	22	50	32	TZ	87
1964	30	18OCT83	23:21	22	50	32	TZ	87
1965	30	18OCT83	23:21	22	50	32	TZ	88
1966	30	18OCT83	23:21	22	50	32	TZ	88
1967	30	18OCT83	23:21	22	50	32	TZ	88
1968	30	18OCT83	23:21	22	50	32	TZ	88
1969	30	18OCT83	23:21	22	50	32	TZ	88
1970	30	18OCT83	23:21	22	50	32	TZ	88
1971	30	18OCT83	23:21	22	50	32	TZ	88
1972	30	18OCT83	23:21	22	50	32	TZ	88
1973	30	18OCT83	23:21	22	50	32	TZ	89
1974	30	18OCT83	23:21	22	50	32	TZ	89
1975	30	18OCT83	23:21	22	50	32	TZ	89
1976	30	18OCT83	23:21	22	50	32	TZ	89
1977	30	18OCT83	23:21	22	50	32	TZ	89
1978	30	18OCT83	23:21	22	50	32	TZ	89
1979	30	18OCT83	23:21	22	50	32	TZ	89
1980	30	18OCT83	23:21	22	50	32	TZ	90
1981	30	18OCT83	23:21	22	50	32	TZ	90
1982	30	18OCT83	23:21	22	50	32	TZ	90
1983	30	18OCT83	23:21	22	50	32	TZ	90
1984	30	18OCT83	23:21	22	50	32	TZ	90
1985	30	18OCT83	23:21	22	50	32	TZ	90
1986	30	18OCT83	23:21	22	50	32	TZ	91
1987	30	18OCT83	23:21	22	50	32	TZ	91
1988	30	18OCT83	23:21	22	50	32	TZ	91
1989	30	18OCT83	23:21	22	50	32	TZ	92
1990	30	18OCT83	23:21	22	50	32	TZ	92
1991	30	18OCT83	23:21	22	50	32	TZ	92
1992	30	18OCT83	23:21	22	50	32	TZ	92
1993	30	18OCT83	23:21	22	50	32	TZ	92
1994	30	18OCT83	23:21	22	50	32	TZ	92
1995	30	18OCT83	23:21	22	50	32	TZ	93
1996	30	18OCT83	23:21	22	50	32	TZ	93
1997	30	18OCT83	23:21	22	50	32	TZ	93
1998	30	18OCT83	23:21	22	50	32	TZ	93

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2107	30	18OCT83	23:45	1147	50	32	TZ	107
2108	30	18OCT83	23:45	1147	50	32	TZ	109
2109	30	18OCT83	23:45	1147	50	32	TZ	109
2110	30	18OCT83	23:45	1147	50	32	TZ	110
2111	30	18OCT83	23:45	1147	50	32	TZ	113
2112	30	18OCT83	23:45	1147	50	32	TZ	113
2113	30	18OCT83	23:45	1147	50	32	TZ	115
2114	30	18OCT83	23:45	1147	50	32	TZ	117
2115	30	18OCT83	23:45	1147	50	32	TZ	117
2116	30	18OCT83	23:45	1147	50	32	TZ	120
2117	30	18OCT83	23:45	1147	50	32	TZ	126
2118	30	18OCT83	23:45	1147	50	32	TZ	131
2119	30	18OCT83	23:45	1147	50	32	TZ	136
2120	30	18OCT83	23:45	1147	50	32	TZ	137
2121	30	18OCT83	23:45	1147	50	32	TZ	151
2122	30	18OCT83	23:45	1147	50	32	TZ	156
2123	30	18OCT83	23:45	1147	50	32	TZ	162
2124	30	18OCT83	23:45	1147	50	32	TZ	166
2125	30	18OCT83	23:45	1147	50	32	TZ	181
2126	30	19OCT83	20:32	1151	50	21	YK	347
2127	30	19OCT83	22:39	1192	50	25	TZ	390
2128	30	19OCT83	22:58	1193	50	26	TZ	111
2129	30	19OCT83	22:58	1193	50	26	TZ	117
2130	30	19OCT83	22:58	1193	50	26	TZ	417
2131	30	19OCT83	23:21	1194	50	26	TZ	129
2132	30	19OCT83	23:21	1194	50	26	TZ	135
2133	30	19OCT83	23:21	1194	50	26	TZ	166
2134	30	19OCT83	23:21	1194	50	26	TZ	174
2135	30	19OCT83	23:21	1194	50	26	TZ	186
2136	30	19OCT83	23:21	1194	50	26	TZ	203
2137	30	19OCT83	23:21	1194	50	26	TZ	208
2138	30	20OCT83	0:01	1195	50	26	TZ	431
2139	30	20OCT83	1:20	1196	50	30	TZ	26
2140	30	20OCT83	1:20	1196	50	30	TZ	91
2141	30	20OCT83	1:20	1196	50	30	TZ	92
2142	30	20OCT83	1:20	1196	50	30	TZ	93
2143	30	20OCT83	1:20	1196	50	30	TZ	94
2144	30	20OCT83	1:20	1196	50	30	TZ	94
2145	30	20OCT83	1:20	1196	50	30	TZ	96
2146	30	20OCT83	1:20	1196	50	30	TZ	96
2147	30	20OCT83	1:20	1196	50	30	TZ	97
2148	30	20OCT83	1:20	1196	50	30	TZ	97
2149	30	20OCT83	1:20	1196	50	30	TZ	97
2150	30	20OCT83	1:20	1196	50	30	TZ	97
2151	30	20OCT83	1:20	1196	50	30	TZ	97
2152	30	20OCT83	1:20	1196	50	30	TZ	97
2153	30	20OCT83	1:20	1196	50	30	TZ	97
2154	30	20OCT83	1:20	1196	50	30	TZ	98
2155	30	20OCT83	1:20	1196	50	30	TZ	100
2156	30	20OCT83	1:20	1196	50	30	TZ	101
2157	30	20OCT83	1:20	1196	50	30	TZ	102
2158	30	20OCT83	1:20	1196	50	30	TZ	102
2159	30	20OCT83	1:20	1196	50	30	TZ	102
2160	30	20OCT83	1:20	1196	50	30	TZ	102

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2215	30	20OCT83	2:03	1197	50	30	TZ	105
2216	30	20OCT83	2:03	1197	50	30	TZ	111
2217	30	20OCT83	2:03	1197	50	30	TZ	111
2218	30	20OCT83	2:03	1197	50	30	TZ	113
2219	30	20OCT83	2:03	1197	50	30	TZ	115
2220	30	20OCT83	2:03	1197	50	30	TZ	117
2221	30	20OCT83	2:03	1197	50	30	TZ	118
2222	30	20OCT83	2:03	1197	50	30	TZ	121
2223	30	20OCT83	2:03	1197	50	30	TZ	121
2224	30	20OCT83	2:03	1197	50	30	TZ	122
2225	30	20OCT83	20:33	1174	50	30	TZ	82
2226	30	20OCT83	20:33	1174	50	30	TZ	96
2227	30	20OCT83	20:33	1174	50	30	TZ	96
2228	30	20OCT83	20:33	1174	50	30	TZ	99
2229	30	20OCT83	20:33	1174	50	30	TZ	100
2230	30	20OCT83	20:33	1174	50	30	TZ	100
2231	30	20OCT83	20:33	1174	50	30	TZ	103
2232	30	20OCT83	20:33	1174	50	30	TZ	106
2233	30	20OCT83	20:33	1174	50	30	TZ	109
2234	30	20OCT83	20:53	1175	50	30	TZ	84
2235	30	20OCT83	20:53	1175	50	30	TZ	92
2236	30	20OCT83	20:53	1175	50	30	TZ	92
2237	30	20OCT83	20:53	1175	50	30	TZ	92
2238	30	20OCT83	20:53	1175	50	30	TZ	93
2239	30	20OCT83	20:53	1175	50	30	TZ	94
2240	30	20OCT83	20:53	1175	50	30	TZ	95
2241	30	20OCT83	20:53	1175	50	30	TZ	96
2242	30	20OCT83	20:53	1175	50	30	TZ	98
2243	30	20OCT83	20:53	1175	50	30	TZ	98
2244	30	20OCT83	20:53	1175	50	30	TZ	98
2245	30	20OCT83	20:53	1175	50	30	TZ	98
2246	30	20OCT83	20:53	1175	50	30	TZ	99
2247	30	20OCT83	20:53	1175	50	30	TZ	100
2248	30	20OCT83	20:53	1175	50	30	TZ	100
2249	30	20OCT83	20:53	1175	50	30	TZ	100
2250	30	20OCT83	20:53	1175	50	30	TZ	100
2251	30	20OCT83	20:53	1175	50	30	TZ	101
2252	30	20OCT83	20:53	1175	50	30	TZ	102
2253	30	20OCT83	20:53	1175	50	30	TZ	102
2254	30	20OCT83	20:53	1175	50	30	TZ	103
2255	30	20OCT83	20:53	1175	50	30	TZ	104
2256	30	20OCT83	20:53	1175	50	30	TZ	104
2257	30	20OCT83	20:53	1175	50	30	TZ	104
2258	30	20OCT83	20:53	1175	50	30	TZ	105
2259	30	20OCT83	20:53	1175	50	30	TZ	105
2260	30	20OCT83	20:53	1175	50	30	TZ	106
2261	30	20OCT83	20:53	1175	50	30	TZ	106
2262	30	20OCT83	20:53	1175	50	30	TZ	106
2263	30	20OCT83	20:53	1175	50	30	TZ	106
2264	30	20OCT83	20:53	1175	50	30	TZ	107
2265	30	20OCT83	20:53	1175	50	30	TZ	107
2266	30	20OCT83	20:53	1175	50	30	TZ	108
2267	30	20OCT83	20:53	1175	50	30	TZ	108
2268	30	20OCT83	20:53	1175	50	30	TZ	108

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2269	30	20OCT83	20:53	1175	50	30	TZ	109
2270	30	20OCT83	20:53	1175	50	30	TZ	109
2271	30	20OCT83	20:53	1175	50	30	TZ	110
2272	30	20OCT83	20:53	1175	50	30	TZ	110
2273	30	20OCT83	20:53	1175	50	30	TZ	110
2274	30	20OCT83	20:53	1175	50	30	TZ	111
2275	30	20OCT83	20:53	1175	50	30	TZ	111
2276	30	20OCT83	20:53	1175	50	30	TZ	111
2277	30	20OCT83	20:53	1175	50	30	TZ	114
2278	30	20OCT83	20:53	1175	50	30	TZ	114
2279	30	20OCT83	20:53	1175	50	30	TZ	114
2280	30	20OCT83	20:53	1175	50	30	TZ	115
2281	30	20OCT83	20:53	1175	50	30	TZ	121
2282	30	20OCT83	20:53	1175	50	30	TZ	128
2283	30	20OCT83	20:53	1175	50	30	TZ	194
2284	35	04OCT83	21:51	1074	18	27	TZ	160
2285	35	04OCT83	21:51	1074	18	27	TZ	165
2286	35	04OCT83	21:51	1074	18	27	TZ	170
2287	35	04OCT83	21:51	1074	18	27	TZ	175
2288	35	04OCT83	21:51	1074	18	27	TZ	180
2289	35	04OCT83	21:51	1074	18	27	TZ	182
2290	35	04OCT83	21:51	1074	18	27	TZ	185
2291	35	04OCT83	21:51	1074	18	27	TZ	187
2292	35	04OCT83	21:51	1074	18	27	TZ	190
2293	35	04OCT83	21:51	1074	18	27	TZ	190
2294	35	04OCT83	21:51	1074	18	27	TZ	190
2295	35	04OCT83	21:51	1074	18	27	TZ	190
2296	35	04OCT83	21:51	1074	18	27	TZ	197
2297	35	04OCT83	22:25	1075	18	27	TZ	158
2298	35	04OCT83	22:25	1075	18	27	TZ	170
2299	35	04OCT83	22:25	1075	18	27	TZ	175
2300	35	04OCT83	22:25	1075	18	27	TZ	182
2301	35	04OCT83	22:25	1075	18	27	TZ	187
2302	35	04OCT83	22:25	1075	18	27	TZ	200
2303	35	04OCT83	23:00	1076	18	28	TZ	157
2304	35	04OCT83	23:00	1076	18	28	TZ	160
2305	35	04OCT83	23:00	1076	18	28	TZ	160
2306	35	04OCT83	23:00	1076	18	28	TZ	172
2307	35	04OCT83	23:00	1076	18	28	TZ	180
2308	35	04OCT83	23:00	1076	18	28	TZ	190
2309	35	04OCT83	23:00	1076	18	28	TZ	191
2310	35	04OCT83	23:00	1076	18	28	TZ	197
2311	35	04OCT83	23:00	1076	18	28	TZ	202
2312	35	04OCT83	24:00	1077	18	28	TZ	140
2313	35	04OCT83	24:00	1077	18	28	TZ	150
2314	35	04OCT83	24:00	1077	18	28	TZ	155
2315	35	04OCT83	24:00	1077	18	28	TZ	172
2316	35	04OCT83	24:00	1077	18	28	TZ	183
2317	35	04OCT83	24:00	1077	18	28	TZ	185
2318	35	04OCT83	24:00	1077	18	28	TZ	191
2319	35	04OCT83	24:00	1077	18	28	TZ	198
2320	35	05OCT83	1:15	1079	18	29	TZ	156
2321	35	05OCT83	1:15	1079	18	29	TZ	171
2322	35	05OCT83	1:15	1079	18	29	TZ	185

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2323	35	05OCT83	1:15	1079	18	29	TZ	186
2324	35	05OCT83	1:15	1079	18	29	TZ	189
2325	35	05OCT83	1:15	1079	18	29	TZ	190
2326	35	05OCT83	1:15	1079	18	29	TZ	190
2327	35	05OCT83	1:15	1079	18	29	TZ	192
2328	35	05OCT83	1:15	1079	18	29	TZ	211
2329	35	05OCT83	2:26	1080	18	29	TZ	147
2330	35	05OCT83	2:26	1080	18	29	TZ	168
2331	35	05OCT83	2:26	1080	18	29	TZ	172
2332	35	05OCT83	2:26	1080	18	29	TZ	179
2333	35	05OCT83	2:26	1080	18	29	TZ	185
2334	35	05OCT83	2:26	1080	18	29	TZ	190
2335	35	05OCT83	2:26	1080	18	29	TZ	191
2336	35	05OCT83	2:26	1080	18	29	TZ	192
2337	35	05OCT83	2:26	1080	18	29	TZ	195
2338	35	05OCT83	3:04	1081	18	29	TZ	170
2339	35	05OCT83	3:31	1082	18	29	TZ	147
2340	35	05OCT83	3:31	1082	18	29	TZ	154
2341	35	06OCT83	19:21	1083	18	25	TZ	148
2342	35	06OCT83	19:21	1083	18	25	TZ	175
2343	35	06OCT83	19:21	1083	18	25	TZ	182
2344	35	06OCT83	19:21	1083	18	25	TZ	183
2345	35	06OCT83	19:21	1083	18	25	TZ	184
2346	35	06OCT83	19:21	1083	18	25	TZ	187
2347	35	06OCT83	19:21	1083	18	25	TZ	190
2348	35	06OCT83	19:21	1083	18	25	TZ	190
2349	35	06OCT83	19:21	1083	18	25	TZ	190
2350	35	06OCT83	19:21	1083	18	25	TZ	193
2351	35	06OCT83	19:21	1083	18	25	TZ	207
2352	35	06OCT83	19:52	1084	18	27	TZ	150
2353	35	06OCT83	19:52	1084	18	27	TZ	153
2354	35	06OCT83	19:52	1084	18	27	TZ	155
2355	35	06OCT83	19:52	1084	18	27	TZ	157
2356	35	06OCT83	19:52	1084	18	27	TZ	160
2357	35	06OCT83	19:52	1084	18	27	TZ	160
2358	35	06OCT83	19:52	1084	18	27	TZ	160
2359	35	06OCT83	19:52	1084	18	27	TZ	164
2360	35	06OCT83	19:52	1084	18	27	TZ	165
2361	35	06OCT83	19:52	1084	18	27	TZ	167
2362	35	06OCT83	19:52	1084	18	27	TZ	167
2363	35	06OCT83	19:52	1084	18	27	TZ	167
2364	35	06OCT83	19:52	1084	18	27	TZ	168
2365	35	06OCT83	19:52	1084	18	27	TZ	169
2366	35	06OCT83	19:52	1084	18	27	TZ	170
2367	35	06OCT83	19:52	1084	18	27	TZ	170
2368	35	06OCT83	19:52	1084	18	27	TZ	170
2369	35	06OCT83	19:52	1084	18	27	TZ	170
2370	35	06OCT83	19:52	1084	18	27	TZ	172
2371	35	06OCT83	19:52	1084	18	27	TZ	172
2372	35	06OCT83	19:52	1084	18	27	TZ	172
2373	35	06OCT83	19:52	1084	18	27	TZ	173
2374	35	06OCT83	19:52	1084	18	27	TZ	173
2375	35	06OCT83	19:52	1084	18	27	TZ	173
2376	35	06OCT83	19:52	1084	18	27	TZ	173

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2377	35	06OCT83	19:52	1084	18	27	TZ	173
2378	35	06OCT83	19:52	1084	18	27	TZ	173
2379	35	06OCT83	19:52	1084	18	27	TZ	175
2380	35	06OCT83	19:52	1084	18	27	TZ	175
2381	35	06OCT83	19:52	1084	18	27	TZ	175
2382	35	06OCT83	19:52	1084	18	27	TZ	175
2383	35	06OCT83	19:52	1084	18	27	TZ	175
2384	35	06OCT83	19:52	1084	18	27	TZ	175
2385	35	06OCT83	19:52	1084	18	27	TZ	175
2386	35	06OCT83	19:52	1084	18	27	TZ	177
2387	35	06OCT83	19:52	1084	18	27	TZ	178
2388	35	06OCT83	19:52	1084	18	27	TZ	178
2389	35	06OCT83	19:52	1084	18	27	TZ	180
2390	35	06OCT83	19:52	1084	18	27	TZ	180
2391	35	06OCT83	19:52	1084	18	27	TZ	180
2392	35	06OCT83	19:52	1084	18	27	TZ	180
2393	35	06OCT83	19:52	1084	18	27	TZ	180
2394	35	06OCT83	19:52	1084	18	27	TZ	180
2395	35	06OCT83	19:52	1084	18	27	TZ	180
2396	35	06OCT83	19:52	1084	18	27	TZ	180
2397	35	06OCT83	19:52	1084	18	27	TZ	180
2398	35	06OCT83	19:52	1084	18	27	TZ	180
2399	35	06OCT83	19:52	1084	18	27	TZ	183
2400	35	06OCT83	19:52	1084	18	27	TZ	183
2401	35	06OCT83	19:52	1084	18	27	TZ	183
2402	35	06OCT83	19:52	1084	18	27	TZ	183
2403	35	06OCT83	19:52	1084	18	27	TZ	184
2404	35	06OCT83	19:52	1084	18	27	TZ	185
2405	35	06OCT83	19:52	1084	18	27	TZ	185
2406	35	06OCT83	19:52	1084	18	27	TZ	185
2407	35	06OCT83	19:52	1084	18	27	TZ	185
2408	35	06OCT83	19:52	1084	18	27	TZ	188
2409	35	06OCT83	19:52	1084	18	27	TZ	190
2410	35	06OCT83	19:52	1084	18	27	TZ	190
2411	35	06OCT83	19:52	1084	18	27	TZ	190
2412	35	06OCT83	19:52	1084	18	27	TZ	190
2413	35	06OCT83	19:52	1084	18	27	TZ	190
2414	35	06OCT83	19:52	1084	18	27	TZ	192
2415	35	06OCT83	19:52	1084	18	27	TZ	195
2416	35	06OCT83	19:52	1084	18	27	TZ	197
2417	35	06OCT83	19:52	1084	18	27	TZ	200
2418	35	06OCT83	19:52	1084	18	27	TZ	200
2419	35	06OCT83	19:52	1084	18	27	TZ	203
2420	35	06OCT83	19:52	1084	18	27	TZ	203
2421	35	06OCT83	19:52	1084	18	27	TZ	205
2422	35	06OCT83	19:52	1084	18	27	TZ	207
2423	35	06OCT83	20:22	1085	18	27	TZ	155
2424	35	06OCT83	20:22	1085	18	27	TZ	165
2425	35	06OCT83	20:22	1085	18	27	TZ	167
2426	35	06OCT83	20:22	1085	18	27	TZ	167
2427	35	06OCT83	20:22	1085	18	27	TZ	176
2428	35	06OCT83	20:22	1085	18	27	TZ	180
2429	35	06OCT83	20:22	1085	18	27	TZ	180
2430	35	06OCT83	20:22	1085	18	27	TZ	185

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2431	35	06OCT83	20:22	1085	18	27	TZ	193
2432	35	06OCT83	20:38	1086	18	27	TZ	152
2433	35	06OCT83	20:38	1086	18	27	TZ	157
2434	35	06OCT83	20:38	1086	18	27	TZ	160
2435	35	06OCT83	20:38	1086	18	27	TZ	160
2436	35	06OCT83	20:38	1086	18	27	TZ	163
2437	35	06OCT83	20:38	1086	18	27	TZ	164
2438	35	06OCT83	20:38	1086	18	27	TZ	170
2439	35	06OCT83	20:38	1086	18	27	TZ	173
2440	35	06OCT83	20:38	1086	18	27	TZ	175
2441	35	06OCT83	20:38	1086	18	27	TZ	178
2442	35	06OCT83	20:38	1086	18	27	TZ	181
2443	35	06OCT83	20:38	1086	18	27	TZ	182
2444	35	06OCT83	20:38	1086	18	27	TZ	187
2445	35	06OCT83	20:38	1086	18	27	TZ	188
2446	35	06OCT83	20:38	1086	18	27	TZ	190
2447	35	06OCT83	20:38	1086	18	27	TZ	193
2448	35	06OCT83	21:21	1087	18	28	TZ	173
2449	35	06OCT83	21:21	1087	18	28	TZ	182
2450	35	06OCT83	21:21	1087	18	28	TZ	185
2451	35	06OCT83	21:21	1087	18	28	TZ	185
2452	35	06OCT83	21:21	1087	18	28	TZ	187
2453	35	06OCT83	21:21	1087	18	28	TZ	190
2454	35	06OCT83	21:21	1087	18	28	TZ	193
2455	35	06OCT83	21:21	1087	18	28	TZ	197
2456	35	06OCT83	21:21	1087	18	28	TZ	198
2457	35	06OCT83	21:39	1088	18	28	TZ	153
2458	35	06OCT83	21:39	1088	18	28	TZ	158
2459	35	06OCT83	21:39	1088	18	28	TZ	177
2460	35	06OCT83	21:39	1088	18	28	TZ	178
2461	35	06OCT83	21:39	1088	18	28	TZ	180
2462	35	06OCT83	21:39	1088	18	28	TZ	180
2463	35	06OCT83	21:39	1088	18	28	TZ	180
2464	35	06OCT83	21:39	1088	18	28	TZ	183
2465	35	06OCT83	21:39	1088	18	28	TZ	185
2466	35	06OCT83	21:39	1088	18	28	TZ	210
2467	35	06OCT83	21:39	1088	18	28	TZ	211
2468	35	06OCT83	21:39	1088	18	28	TZ	222
2469	35	06OCT83	22:23	1089	18	29	TZ	155
2470	35	06OCT83	22:23	1089	18	29	TZ	165
2471	35	06OCT83	22:23	1089	18	29	TZ	165
2472	35	06OCT83	22:23	1089	18	29	TZ	167
2473	35	06OCT83	22:23	1089	18	29	TZ	168
2474	35	06OCT83	22:23	1089	18	29	TZ	173
2475	35	06OCT83	22:23	1089	18	29	TZ	174
2476	35	06OCT83	22:23	1089	18	29	TZ	178
2477	35	06OCT83	22:23	1089	18	29	TZ	185
2478	35	06OCT83	22:23	1089	18	29	TZ	185
2479	35	06OCT83	22:23	1089	18	29	TZ	187
2480	35	06OCT83	22:23	1089	18	29	TZ	188
2481	35	06OCT83	22:23	1089	18	29	TZ	190
2482	35	06OCT83	22:23	1089	18	29	TZ	190
2483	35	06OCT83	22:23	1089	18	29	TZ	191
2484	35	06OCT83	22:23	1089	18	29	TZ	195

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2485	35	06OCT83	22:46	1090	18	29	TZ	98
2486	35	06OCT83	22:46	1090	18	29	TZ	155
2487	35	06OCT83	22:46	1090	18	29	TZ	158
2488	35	06OCT83	22:46	1090	18	29	TZ	160
2489	35	06OCT83	22:46	1090	18	29	TZ	161
2490	35	06OCT83	22:46	1090	18	29	TZ	165
2491	35	06OCT83	22:46	1090	18	29	TZ	170
2492	35	06OCT83	22:46	1090	18	29	TZ	170
2493	35	06OCT83	22:46	1090	18	29	TZ	170
2494	35	06OCT83	22:46	1090	18	29	TZ	175
2495	35	06OCT83	22:46	1090	18	29	TZ	175
2496	35	06OCT83	22:46	1090	18	29	TZ	180
2497	35	06OCT83	22:46	1090	18	29	TZ	183
2498	35	06OCT83	22:46	1090	18	29	TZ	183
2499	35	06OCT83	22:46	1090	18	29	TZ	185
2500	35	06OCT83	22:46	1090	18	29	TZ	188
2501	35	06OCT83	22:46	1090	18	29	TZ	192
2502	35	06OCT83	22:46	1090	18	29	TZ	193
2503	35	06OCT83	22:46	1090	18	29	TZ	193
2504	35	06OCT83	22:46	1090	18	29	TZ	195
2505	35	06OCT83	22:46	1090	18	29	TZ	198
2506	35	06OCT83	22:46	1090	18	29	TZ	198
2507	35	06OCT83	23:10	1091	18	29	TZ	160
2508	35	06OCT83	23:10	1091	18	29	TZ	165
2509	35	06OCT83	23:10	1091	18	29	TZ	165
2510	35	06OCT83	23:10	1091	18	29	TZ	168
2511	35	06OCT83	23:10	1091	18	29	TZ	175
2512	35	06OCT83	23:10	1091	18	29	TZ	175
2513	35	06OCT83	23:10	1091	18	29	TZ	175
2514	35	06OCT83	23:10	1091	18	29	TZ	178
2515	35	06OCT83	23:10	1091	18	29	TZ	180
2516	35	06OCT83	23:10	1091	18	29	TZ	180
2517	35	06OCT83	23:10	1091	18	29	TZ	183
2518	35	06OCT83	23:10	1091	18	29	TZ	185
2519	35	06OCT83	23:10	1091	18	29	TZ	188
2520	35	06OCT83	23:10	1091	18	29	TZ	190
2521	35	06OCT83	23:10	1091	18	29	TZ	190
2522	35	06OCT83	23:10	1091	18	29	TZ	192
2523	35	06OCT83	23:42	1092	18	29	TZ	170
2524	35	06OCT83	23:42	1092	18	29	TZ	170
2525	35	06OCT83	23:42	1092	18	29	TZ	172
2526	35	06OCT83	23:42	1092	18	29	TZ	172
2527	35	06OCT83	23:42	1092	18	29	TZ	178
2528	35	06OCT83	23:42	1092	18	29	TZ	180
2529	35	06OCT83	23:42	1092	18	29	TZ	183
2530	35	06OCT83	23:42	1092	18	29	TZ	187
2531	35	06OCT83	23:42	1092	18	29	TZ	190
2532	35	06OCT83	23:42	1092	18	29	TZ	192
2533	35	06OCT83	23:42	1092	18	29	TZ	200
2534	35	06OCT83	23:42	1092	18	29	TZ	203
2535	35	07OCT83	1:22	1095	18	30	TZ	140
2536	35	07OCT83	1:22	1095	18	30	TZ	148
2537	35	07OCT83	1:22	1095	18	30	TZ	168
2538	35	07OCT83	1:22	1095	18	30	TZ	190

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2539	35	07OCT83	2:01	1096	18	30	TZ	142
2540	35	07OCT83	2:01	1096	18	30	TZ	153
2541	35	07OCT83	2:01	1096	18	30	TZ	161
2542	35	07OCT83	2:01	1096	18	30	TZ	161
2543	35	07OCT83	2:01	1096	18	30	TZ	164
2544	35	07OCT83	2:01	1096	18	30	TZ	164
2545	35	07OCT83	2:01	1096	18	30	TZ	164
2546	35	07OCT83	2:01	1096	18	30	TZ	166
2547	35	07OCT83	2:01	1096	18	30	TZ	168
2548	35	07OCT83	2:01	1096	18	30	TZ	168
2549	35	07OCT83	2:01	1096	18	30	TZ	169
2550	35	07OCT83	2:01	1096	18	30	TZ	171
2551	35	07OCT83	2:01	1096	18	30	TZ	172
2552	35	07OCT83	2:01	1096	18	30	TZ	172
2553	35	07OCT83	2:01	1096	18	30	TZ	175
2554	35	07OCT83	2:01	1096	18	30	TZ	176
2555	35	07OCT83	2:01	1096	18	30	TZ	176
2556	35	07OCT83	2:01	1096	18	30	TZ	176
2557	35	07OCT83	2:01	1096	18	30	TZ	177
2558	35	07OCT83	2:01	1096	18	30	TZ	177
2559	35	07OCT83	2:01	1096	18	30	TZ	178
2560	35	07OCT83	2:01	1096	18	30	TZ	180
2561	35	07OCT83	2:01	1096	18	30	TZ	180
2562	35	07OCT83	2:01	1096	18	30	TZ	181
2563	35	07OCT83	2:01	1096	18	30	TZ	182
2564	35	07OCT83	2:01	1096	18	30	TZ	182
2565	35	07OCT83	2:01	1096	18	30	TZ	182
2566	35	07OCT83	2:01	1096	18	30	TZ	185
2567	35	07OCT83	2:01	1096	18	30	TZ	186
2568	35	07OCT83	2:01	1096	18	30	TZ	186
2569	35	07OCT83	2:01	1096	18	30	TZ	190
2570	35	07OCT83	2:01	1096	18	30	TZ	190
2571	35	07OCT83	2:01	1096	18	30	TZ	191
2572	35	07OCT83	2:01	1096	18	30	TZ	191
2573	35	07OCT83	2:01	1096	18	30	TZ	194
2574	35	07OCT83	2:01	1096	18	30	TZ	196
2575	35	07OCT83	2:01	1096	18	30	TZ	201
2576	35	07OCT83	3:13	1097	18	30	TZ	167
2577	35	07OCT83	3:13	1097	18	30	TZ	173
2578	35	07OCT83	3:13	1097	18	30	TZ	173
2579	35	07OCT83	3:13	1097	18	30	TZ	175
2580	35	07OCT83	3:13	1097	18	30	TZ	178
2581	35	07OCT83	3:13	1097	18	30	TZ	180
2582	35	07OCT83	3:13	1097	18	30	TZ	184
2583	35	07OCT83	3:13	1097	18	30	TZ	185
2584	35	07OCT83	3:13	1097	18	30	TZ	190
2585	35	07OCT83	3:13	1097	18	30	TZ	201
2586	35	07OCT83	3:53	1098	18	30	TZ	121
2587	35	07OCT83	3:53	1098	18	30	TZ	122
2588	35	07OCT83	3:53	1098	18	30	TZ	122
2589	35	07OCT83	3:53	1098	18	30	TZ	123
2590	35	07OCT83	3:53	1098	18	30	TZ	134
2591	35	07OCT83	3:53	1098	18	30	TZ	142
2592	35	07OCT83	3:53	1098	18	30	TZ	148

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2593	35	07OCT83	3:53	1098	18	30	TZ	148
2594	35	07OCT83	3:53	1098	18	30	TZ	150
2595	35	07OCT83	3:53	1098	18	30	TZ	150
2596	35	07OCT83	3:53	1098	18	30	TZ	150
2597	35	07OCT83	3:53	1098	18	30	TZ	152
2598	35	07OCT83	3:53	1098	18	30	TZ	153
2599	35	07OCT83	3:53	1098	18	30	TZ	158
2600	35	07OCT83	3:53	1098	18	30	TZ	158
2601	35	07OCT83	3:53	1098	18	30	TZ	160
2602	35	07OCT83	3:53	1098	18	30	TZ	162
2603	35	07OCT83	3:53	1098	18	30	TZ	163
2604	35	07OCT83	3:53	1098	18	30	TZ	163
2605	35	07OCT83	3:53	1098	18	30	TZ	164
2606	35	07OCT83	3:53	1098	18	30	TZ	165
2607	35	07OCT83	3:53	1098	18	30	TZ	165
2608	35	07OCT83	3:53	1098	18	30	TZ	165
2609	35	07OCT83	3:53	1098	18	30	TZ	165
2610	35	07OCT83	3:53	1098	18	30	TZ	165
2611	35	07OCT83	3:53	1098	18	30	TZ	166
2612	35	07OCT83	3:53	1098	18	30	TZ	167
2613	35	07OCT83	3:53	1098	18	30	TZ	167
2614	35	07OCT83	3:53	1098	18	30	TZ	167
2615	35	07OCT83	3:53	1098	18	30	TZ	167
2616	35	07OCT83	3:53	1098	18	30	TZ	168
2617	35	07OCT83	3:53	1098	18	30	TZ	168
2618	35	07OCT83	3:53	1098	18	30	TZ	168
2619	35	07OCT83	3:53	1098	18	30	TZ	170
2620	35	07OCT83	3:53	1098	18	30	TZ	170
2621	35	07OCT83	3:53	1098	18	30	TZ	170
2622	35	07OCT83	3:53	1098	18	30	TZ	170
2623	35	07OCT83	3:53	1098	18	30	TZ	170
2624	35	07OCT83	3:53	1098	18	30	TZ	171
2625	35	07OCT83	3:53	1098	18	30	TZ	173
2626	35	07OCT83	3:53	1098	18	30	TZ	173
2627	35	07OCT83	3:53	1098	18	30	TZ	173
2628	35	07OCT83	3:53	1098	18	30	TZ	175
2629	35	07OCT83	3:53	1098	18	30	TZ	175
2630	35	07OCT83	3:53	1098	18	30	TZ	176
2631	35	07OCT83	3:53	1098	18	30	TZ	178
2632	35	07OCT83	3:53	1098	18	30	TZ	178
2633	35	07OCT83	3:53	1098	18	30	TZ	179
2634	35	07OCT83	3:53	1098	18	30	TZ	180
2635	35	07OCT83	3:53	1098	18	30	TZ	180
2636	35	07OCT83	3:53	1098	18	30	TZ	180
2637	35	07OCT83	3:53	1098	18	30	TZ	180
2638	35	07OCT83	3:53	1098	18	30	TZ	180
2639	35	07OCT83	3:53	1098	18	30	TZ	181
2640	35	07OCT83	3:53	1098	18	30	TZ	182
2641	35	07OCT83	3:53	1098	18	30	TZ	182
2642	35	07OCT83	3:53	1098	18	30	TZ	183
2643	35	07OCT83	3:53	1098	18	30	TZ	185
2644	35	07OCT83	3:53	1098	18	30	TZ	187
2645	35	07OCT83	3:53	1098	18	30	TZ	188
2646	35	07OCT83	3:53	1098	18	30	TZ	188

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2647	35	07OCT83	3:53	1098	18	30	TZ	190
2648	35	07OCT83	3:53	1098	18	30	TZ	190
2649	35	07OCT83	3:53	1098	18	30	TZ	190
2650	35	07OCT83	3:53	1098	18	30	TZ	198
2651	35	07OCT83	4:22	1099	18	30	TZ	131
2652	35	07OCT83	4:22	1099	18	30	TZ	142
2653	35	07OCT83	4:22	1099	18	30	TZ	142
2654	35	07OCT83	4:22	1099	18	30	TZ	150
2655	35	07OCT83	4:22	1099	18	30	TZ	154
2656	35	07OCT83	4:22	1099	18	30	TZ	156
2657	35	07OCT83	4:22	1099	18	30	TZ	158
2658	35	07OCT83	4:22	1099	18	30	TZ	161
2659	35	07OCT83	4:22	1099	18	30	TZ	161
2660	35	07OCT83	4:22	1099	18	30	TZ	161
2661	35	07OCT83	4:22	1099	18	30	TZ	162
2662	35	07OCT83	4:22	1099	18	30	TZ	164
2663	35	07OCT83	4:22	1099	18	30	TZ	166
2664	35	07OCT83	4:22	1099	18	30	TZ	170
2665	35	07OCT83	4:22	1099	18	30	TZ	170
2666	35	07OCT83	4:22	1099	18	30	TZ	171
2667	35	07OCT83	4:22	1099	18	30	TZ	171
2668	35	07OCT83	4:22	1099	18	30	TZ	171
2669	35	07OCT83	4:22	1099	18	30	TZ	174
2670	35	07OCT83	4:22	1099	18	30	TZ	174
2671	35	07OCT83	4:22	1099	18	30	TZ	175
2672	35	07OCT83	4:22	1099	18	30	TZ	176
2673	35	07OCT83	4:22	1099	18	30	TZ	180
2674	35	07OCT83	4:22	1099	18	30	TZ	180
2675	35	07OCT83	4:22	1099	18	30	TZ	181
2676	35	07OCT83	4:22	1099	18	30	TZ	190
2677	35	07OCT83	4:22	1099	18	30	TZ	194
2678	35	07OCT83	4:22	1099	18	30	TZ	194
2679	35	07OCT83	4:22	1099	18	30	TZ	196
2680	35	07OCT83	4:22	1099	18	30	TZ	197
2681	35	07OCT83	4:22	1099	18	30	TZ	204
2682	35	07OCT83	4:39	1100	18	30	TZ	131
2683	35	07OCT83	4:39	1100	18	30	TZ	138
2684	35	07OCT83	4:39	1100	18	30	TZ	140
2685	35	07OCT83	4:39	1100	18	30	TZ	140
2686	35	07OCT83	4:39	1100	18	30	TZ	142
2687	35	07OCT83	4:39	1100	18	30	TZ	148
2688	35	07OCT83	4:39	1100	18	30	TZ	150
2689	35	07OCT83	4:39	1100	18	30	TZ	153
2690	35	07OCT83	4:39	1100	18	30	TZ	153
2691	35	07OCT83	4:39	1100	18	30	TZ	154
2692	35	07OCT83	4:39	1100	18	30	TZ	160
2693	35	07OCT83	4:39	1100	18	30	TZ	160
2694	35	07OCT83	4:39	1100	18	30	TZ	162
2695	35	07OCT83	4:39	1100	18	30	TZ	162
2696	35	07OCT83	4:39	1100	18	30	TZ	163
2697	35	07OCT83	4:39	1100	18	30	TZ	165
2698	35	07OCT83	4:39	1100	18	30	TZ	165
2699	35	07OCT83	4:39	1100	18	30	TZ	165
2700	35	07OCT83	4:39	1100	18	30	TZ	166

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2701	35	070CT83	4:39	1100	18	30	TZ	166
2702	35	070CT83	4:39	1100	18	30	TZ	167
2703	35	070CT83	4:39	1100	18	30	TZ	168
2704	35	070CT83	4:39	1100	18	30	TZ	168
2705	35	070CT83	4:39	1100	18	30	TZ	168
2706	35	070CT83	4:39	1100	18	30	TZ	169
2707	35	070CT83	4:39	1100	18	30	TZ	169
2708	35	070CT83	4:39	1100	18	30	TZ	170
2709	35	070CT83	4:39	1100	18	30	TZ	171
2710	35	070CT83	4:39	1100	18	30	TZ	172
2711	35	070CT83	4:39	1100	18	30	TZ	173
2712	35	070CT83	4:39	1100	18	30	TZ	173
2713	35	070CT83	4:39	1100	18	30	TZ	174
2714	35	070CT83	4:39	1100	18	30	TZ	174
2715	35	070CT83	4:39	1100	18	30	TZ	175
2716	35	070CT83	4:39	1100	18	30	TZ	175
2717	35	070CT83	4:39	1100	18	30	TZ	176
2718	35	070CT83	4:39	1100	18	30	TZ	176
2719	35	070CT83	4:39	1100	18	30	TZ	178
2720	35	070CT83	4:39	1100	18	30	TZ	178
2721	35	070CT83	4:39	1100	18	30	TZ	178
2722	35	070CT83	4:39	1100	18	30	TZ	178
2723	35	070CT83	4:39	1100	18	30	TZ	178
2724	35	070CT83	4:39	1100	18	30	TZ	178
2725	35	070CT83	4:39	1100	18	30	TZ	179
2726	35	070CT83	4:39	1100	18	30	TZ	180
2727	35	070CT83	4:39	1100	18	30	TZ	180
2728	35	070CT83	4:39	1100	18	30	TZ	181
2729	35	070CT83	4:39	1100	18	30	TZ	182
2730	35	070CT83	4:39	1100	18	30	TZ	182
2731	35	070CT83	4:39	1100	18	30	TZ	182
2732	35	070CT83	4:39	1100	18	30	TZ	183
2733	35	070CT83	4:39	1100	18	30	TZ	184
2734	35	070CT83	4:39	1100	18	30	TZ	185
2735	35	070CT83	4:39	1100	18	30	TZ	185
2736	35	070CT83	4:39	1100	18	30	TZ	185
2737	35	070CT83	4:39	1100	18	30	TZ	188
2738	35	070CT83	4:39	1100	18	30	TZ	188
2739	35	070CT83	4:39	1100	18	30	TZ	190
2740	35	070CT83	4:39	1100	18	30	TZ	190
2741	35	070CT83	5:02	1101	18	30	TZ	143
2742	35	070CT83	5:02	1101	18	30	TZ	156
2743	35	070CT83	5:02	1101	18	30	TZ	164
2744	35	070CT83	5:02	1101	18	30	TZ	165
2745	35	070CT83	5:02	1101	18	30	TZ	168
2746	35	070CT83	5:02	1101	18	30	TZ	172
2747	35	070CT83	5:02	1101	18	30	TZ	188
2748	35	070CT83	5:02	1101	18	30	TZ	198
2749	35	070CT83	22:53	1105	18	31	TZ	72
2750	35	070CT83	22:53	1105	18	31	TZ	83
2751	35	070CT83	22:53	1105	18	31	TZ	152
2752	35	070CT83	22:53	1105	18	31	TZ	170
2753	35	070CT83	22:53	1105	18	31	TZ	171
2754	35	070CT83	22:53	1105	18	31	TZ	174

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2755	35	07OCT83	22:53	1105	18	31	TZ	175
2756	35	07OCT83	22:53	1105	18	31	TZ	176
2757	35	07OCT83	22:53	1105	18	31	TZ	178
2758	35	07OCT83	22:53	1105	18	31	TZ	180
2759	35	07OCT83	22:53	1105	18	31	TZ	182
2760	35	07OCT83	22:53	1105	18	31	TZ	183
2761	35	07OCT83	22:53	1105	18	31	TZ	183
2762	35	07OCT83	22:53	1105	18	31	TZ	183
2763	35	07OCT83	22:53	1105	18	31	TZ	185
2764	35	07OCT83	22:53	1105	18	31	TZ	185
2765	35	07OCT83	22:53	1105	18	31	TZ	185
2766	35	07OCT83	22:53	1105	18	31	TZ	187
2767	35	07OCT83	22:53	1105	18	31	TZ	190
2768	35	07OCT83	22:53	1105	18	31	TZ	199
2769	35	08OCT83	0:08	1107	18	32	TZ	66
2770	35	08OCT83	0:08	1107	18	32	TZ	76
2771	35	08OCT83	0:08	1107	18	32	TZ	80
2772	35	08OCT83	0:08	1107	18	32	TZ	80
2773	35	08OCT83	0:08	1107	18	32	TZ	120
2774	35	08OCT83	0:08	1107	18	32	TZ	121
2775	35	08OCT83	0:08	1107	18	32	TZ	130
2776	35	08OCT83	0:08	1107	18	32	TZ	130
2777	35	08OCT83	0:08	1107	18	32	TZ	138
2778	35	08OCT83	0:08	1107	18	32	TZ	150
2779	35	08OCT83	0:08	1107	18	32	TZ	150
2780	35	08OCT83	0:08	1107	18	32	TZ	151
2781	35	08OCT83	0:08	1107	18	32	TZ	152
2782	35	08OCT83	0:08	1107	18	32	TZ	153
2783	35	08OCT83	0:08	1107	18	32	TZ	153
2784	35	08OCT83	0:08	1107	18	32	TZ	154
2785	35	08OCT83	0:08	1107	18	32	TZ	155
2786	35	08OCT83	0:08	1107	18	32	TZ	155
2787	35	08OCT83	0:08	1107	18	32	TZ	155
2788	35	08OCT83	0:08	1107	18	32	TZ	158
2789	35	08OCT83	0:08	1107	18	32	TZ	158
2790	35	08OCT83	0:08	1107	18	32	TZ	160
2791	35	08OCT83	0:08	1107	18	32	TZ	161
2792	35	08OCT83	0:08	1107	18	32	TZ	165
2793	35	08OCT83	0:08	1107	18	32	TZ	165
2794	35	08OCT83	0:08	1107	18	32	TZ	165
2795	35	08OCT83	0:08	1107	18	32	TZ	165
2796	35	08OCT83	0:08	1107	18	32	TZ	166
2797	35	08OCT83	0:08	1107	18	32	TZ	168
2798	35	08OCT83	0:08	1107	18	32	TZ	168
2799	35	08OCT83	0:08	1107	18	32	TZ	168
2800	35	08OCT83	0:08	1107	18	32	TZ	168
2801	35	08OCT83	0:08	1107	18	32	TZ	170
2802	35	08OCT83	0:08	1107	18	32	TZ	170
2803	35	08OCT83	0:08	1107	18	32	TZ	172
2804	35	08OCT83	0:08	1107	18	32	TZ	173
2805	35	08OCT83	0:08	1107	18	32	TZ	173
2806	35	08OCT83	0:08	1107	18	32	TZ	174
2807	35	08OCT83	0:08	1107	18	32	TZ	175
2808	35	08OCT83	0:08	1107	18	32	TZ	178

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2809	35	08OCT83	0:08	1107	18	32	TZ	183
2810	35	08OCT83	0:08	1107	18	32	TZ	184
2811	35	08OCT83	0:08	1107	18	32	TZ	190
2812	35	08OCT83	0:08	1107	18	32	TZ	193
2813	35	08OCT83	0:08	1107	18	32	TZ	193
2814	35	17OCT83	19:51	1129	18	38	CH	112
2815	35	17OCT83	19:51	1129	18	38	CH	130
2816	35	17OCT83	19:51	1129	18	38	CH	142
2817	35	17OCT83	19:51	1129	18	38	CH	146
2818	35	17OCT83	19:51	1129	18	38	CH	147
2819	35	17OCT83	19:51	1129	18	38	CH	147
2820	35	17OCT83	19:51	1129	18	38	CH	148
2821	35	17OCT83	19:51	1129	18	38	CH	149
2822	35	17OCT83	19:51	1129	18	38	CH	150
2823	35	17OCT83	19:51	1129	18	38	CH	151
2824	35	17OCT83	19:51	1129	18	38	CH	153
2825	35	17OCT83	19:51	1129	18	38	CH	153
2826	35	17OCT83	19:51	1129	18	38	CH	156
2827	35	17OCT83	19:51	1129	18	38	CH	157
2828	35	17OCT83	19:51	1129	18	38	CH	160
2829	35	17OCT83	19:51	1129	18	38	CH	161
2830	35	17OCT83	19:51	1129	18	38	CH	163
2831	35	17OCT83	19:51	1129	18	38	CH	164
2832	35	17OCT83	19:51	1129	18	38	CH	165
2833	35	17OCT83	19:51	1129	18	38	CH	165
2834	35	17OCT83	19:51	1129	18	38	CH	166
2835	35	17OCT83	19:51	1129	18	38	CH	166
2836	35	17OCT83	19:51	1129	18	38	CH	166
2837	35	17OCT83	19:51	1129	18	38	CH	167
2838	35	17OCT83	19:51	1129	18	38	CH	172
2839	35	17OCT83	19:51	1129	18	38	CH	174
2840	35	17OCT83	19:51	1129	18	38	CH	176
2841	35	17OCT83	19:51	1129	18	38	CH	178
2842	35	17OCT83	19:51	1129	18	38	CH	178
2843	35	17OCT83	19:51	1129	18	38	CH	178
2844	35	17OCT83	19:51	1129	18	38	CH	180
2845	35	17OCT83	19:51	1129	18	38	CH	182
2846	35	17OCT83	19:51	1129	18	38	CH	191
2847	35	17OCT83	19:51	1129	18	38	CH	191
2848	35	17OCT83	20:51	1130	18	38	CH	111
2849	35	17OCT83	20:51	1130	18	38	CH	149
2850	35	17OCT83	20:51	1130	18	38	CH	161
2851	35	17OCT83	20:51	1130	18	38	CH	162
2852	35	17OCT83	20:51	1130	18	38	CH	164
2853	35	17OCT83	20:51	1130	18	38	CH	164
2854	35	17OCT83	20:51	1130	18	38	CH	165
2855	35	17OCT83	20:51	1130	18	38	CH	167
2856	35	17OCT83	20:51	1130	18	38	CH	172
2857	35	17OCT83	20:51	1130	18	38	CH	173
2858	35	17OCT83	20:51	1130	18	38	CH	176
2859	35	17OCT83	20:51	1130	18	38	CH	182
2860	35	17OCT83	20:51	1130	18	38	CH	184
2861	35	17OCT83	21:47	1131	18	38	CH	115
2862	35	17OCT83	21:47	1131	18	38	CH	145

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2863	35	17OCT83	21:47	1131	18	38	CH	155
2864	35	17OCT83	21:47	1131	18	38	CH	156
2865	35	17OCT83	21:47	1131	18	38	CH	165
2866	35	17OCT83	21:47	1131	18	38	CH	173
2867	35	17OCT83	21:47	1131	18	38	CH	182
2868	35	17OCT83	22:10	1153	18	38	CH	143
2869	35	17OCT83	22:10	1153	18	38	CH	147
2870	35	17OCT83	22:10	1153	18	38	CH	152
2871	35	17OCT83	22:10	1153	18	38	CH	154
2872	35	17OCT83	22:10	1153	18	38	CH	158
2873	35	17OCT83	22:10	1153	18	38	CH	164
2874	35	17OCT83	22:10	1153	18	38	CH	166
2875	35	17OCT83	22:10	1153	18	38	CH	171
2876	35	17OCT83	22:10	1153	18	38	CH	178
2877	35	17OCT83	22:49	1154	18	37	CH	124
2878	35	17OCT83	22:49	1154	18	37	CH	136
2879	35	17OCT83	22:49	1154	18	37	CH	144
2880	35	17OCT83	22:49	1154	18	37	CH	146
2881	35	17OCT83	22:49	1154	18	37	CH	150
2882	35	17OCT83	22:49	1154	18	37	CH	155
2883	35	17OCT83	22:49	1154	18	37	CH	157
2884	35	17OCT83	22:49	1154	18	37	CH	158
2885	35	17OCT83	22:49	1154	18	37	CH	158
2886	35	17OCT83	22:49	1154	18	37	CH	162
2887	35	17OCT83	22:49	1154	18	37	CH	162
2888	35	17OCT83	22:49	1154	18	37	CH	163
2889	35	17OCT83	22:49	1154	18	37	CH	164
2890	35	17OCT83	22:49	1154	18	37	CH	170
2891	35	17OCT83	22:49	1154	18	37	CH	170
2892	35	17OCT83	22:49	1154	18	37	CH	174
2893	35	17OCT83	22:49	1154	18	37	CH	174
2894	35	17OCT83	22:49	1154	18	37	CH	176
2895	35	17OCT83	22:49	1154	18	37	CH	178
2896	35	17OCT83	22:49	1154	18	37	CH	178
2897	35	17OCT83	22:49	1154	18	37	CH	178
2898	35	17OCT83	22:49	1154	18	37	CH	180
2899	35	17OCT83	22:49	1154	18	37	CH	181
2900	35	17OCT83	22:49	1154	18	37	CH	182
2901	35	17OCT83	22:49	1154	18	37	CH	184
2902	35	17OCT83	22:49	1154	18	37	CH	184
2903	35	17OCT83	22:49	1154	18	37	CH	184
2904	35	17OCT83	22:49	1154	18	37	CH	184
2905	35	17OCT83	22:49	1154	18	37	CH	193
2906	35	17OCT83	22:49	1154	18	37	CH	204
2907	35	17OCT83	22:49	1154	18	37	CH	205
2908	35	17OCT83	23:09	1155	18	36	CH	111
2909	35	17OCT83	23:09	1155	18	36	CH	120
2910	35	17OCT83	23:09	1155	18	36	CH	130
2911	35	17OCT83	23:09	1155	18	36	CH	132
2912	35	17OCT83	23:09	1155	18	36	CH	132
2913	35	17OCT83	23:09	1155	18	36	CH	137
2914	35	17OCT83	23:09	1155	18	36	CH	138
2915	35	17OCT83	23:09	1155	18	36	CH	140
2916	35	17OCT83	23:09	1155	18	36	CH	140

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2917	35	17OCT83	23:09	1155	18	36	CH	140
2918	35	17OCT83	23:09	1155	18	36	CH	142
2919	35	17OCT83	23:09	1155	18	36	CH	144
2920	35	17OCT83	23:09	1155	18	36	CH	146
2921	35	17OCT83	23:09	1155	18	36	CH	148
2922	35	17OCT83	23:09	1155	18	36	CH	148
2923	35	17OCT83	23:09	1155	18	36	CH	148
2924	35	17OCT83	23:09	1155	18	36	CH	150
2925	35	17OCT83	23:09	1155	18	36	CH	150
2926	35	17OCT83	23:09	1155	18	36	CH	150
2927	35	17OCT83	23:09	1155	18	36	CH	151
2928	35	17OCT83	23:09	1155	18	36	CH	151
2929	35	17OCT83	23:09	1155	18	36	CH	156
2930	35	17OCT83	23:09	1155	18	36	CH	156
2931	35	17OCT83	23:09	1155	18	36	CH	156
2932	35	17OCT83	23:09	1155	18	36	CH	157
2933	35	17OCT83	23:09	1155	18	36	CH	159
2934	35	17OCT83	23:09	1155	18	36	CH	161
2935	35	17OCT83	23:09	1155	18	36	CH	161
2936	35	17OCT83	23:09	1155	18	36	CH	162
2937	35	17OCT83	23:09	1155	18	36	CH	170
2938	35	17OCT83	23:09	1155	18	36	CH	174
2939	35	17OCT83	23:09	1155	18	36	CH	176
2940	35	17OCT83	23:09	1155	18	36	CH	183
2941	35	17OCT83	23:09	1155	18	36	CH	193
2942	35	17OCT83	23:09	1155	18	36	CH	202
2943	35	18OCT83	0:10	1156	18	36	CH	104
2944	35	18OCT83	0:10	1156	18	36	CH	123
2945	35	18OCT83	0:10	1156	18	36	CH	141
2946	35	18OCT83	0:10	1156	18	36	CH	143
2947	35	18OCT83	0:10	1156	18	36	CH	144
2948	35	18OCT83	0:10	1156	18	36	CH	144
2949	35	18OCT83	0:10	1156	18	36	CH	144
2950	35	18OCT83	0:10	1156	18	36	CH	145
2951	35	18OCT83	0:10	1156	18	36	CH	147
2952	35	18OCT83	0:10	1156	18	36	CH	147
2953	35	18OCT83	0:10	1156	18	36	CH	148
2954	35	18OCT83	0:10	1156	18	36	CH	149
2955	35	18OCT83	0:10	1156	18	36	CH	150
2956	35	18OCT83	0:10	1156	18	36	CH	150
2957	35	18OCT83	0:10	1156	18	36	CH	155
2958	35	18OCT83	0:10	1156	18	36	CH	156
2959	35	18OCT83	0:10	1156	18	36	CH	156
2960	35	18OCT83	0:10	1156	18	36	CH	159
2961	35	18OCT83	0:10	1156	18	36	CH	169
2962	35	18OCT83	0:10	1156	18	36	CH	181
2963	35	18OCT83	0:10	1156	18	36	CH	195
2964	35	18OCT83	0:36	1157	18	36	CH	147
2965	35	18OCT83	0:36	1157	18	36	CH	150
2966	35	18OCT83	0:36	1157	18	36	CH	152
2967	35	18OCT83	0:36	1157	18	36	CH	152
2968	35	18OCT83	0:36	1157	18	36	CH	156
2969	35	18OCT83	0:36	1157	18	36	CH	158
2970	35	18OCT83	0:36	1157	18	36	CH	159

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
2971	35	18OCT83	0:36	1157	18	36	CH	160
2972	35	18OCT83	0:36	1157	18	36	CH	162
2973	35	18OCT83	0:36	1157	18	36	CH	165
2974	35	18OCT83	0:36	1157	18	36	CH	166
2975	35	18OCT83	0:36	1157	18	36	CH	170
2976	35	18OCT83	0:36	1157	18	36	CH	173
2977	35	18OCT83	0:36	1157	18	36	CH	173
2978	35	18OCT83	0:36	1157	18	36	CH	178
2979	35	18OCT83	0:36	1157	18	36	CH	212
2980	35	18OCT83	1:04	1158	18	36	CH	103
2981	35	18OCT83	1:04	1158	18	36	CH	123
2982	35	18OCT83	1:04	1158	18	36	CH	140
2983	35	18OCT83	1:04	1158	18	36	CH	141
2984	35	18OCT83	1:04	1158	18	36	CH	142
2985	35	18OCT83	1:04	1158	18	36	CH	145
2986	35	18OCT83	1:04	1158	18	36	CH	145
2987	35	18OCT83	1:04	1158	18	36	CH	155
2988	35	18OCT83	1:04	1158	18	36	CH	158
2989	35	18OCT83	1:04	1158	18	36	CH	167
2990	35	18OCT83	1:04	1158	18	36	CH	168
2991	35	18OCT83	1:04	1158	18	36	CH	200
2992	35	18OCT83	1:29	1159	18	34	CH	128
2993	35	18OCT83	1:29	1159	18	34	CH	152
2994	35	18OCT83	19:08	1160	18	35	CH	139
2995	35	18OCT83	19:08	1160	18	35	CH	143
2996	35	18OCT83	19:08	1160	18	35	CH	154
2997	35	18OCT83	19:08	1160	18	35	CH	167
2998	35	18OCT83	19:08	1160	18	35	CH	185
2999	35	18OCT83	19:26	1161	18	35	CH	153
3000	35	18OCT83	19:26	1161	18	35	CH	155
3001	35	18OCT83	19:26	1161	18	35	CH	161
3002	35	18OCT83	19:26	1161	18	35	CH	170
3003	35	18OCT83	19:26	1161	18	35	CH	171
3004	35	18OCT83	19:26	1161	18	35	CH	176
3005	35	18OCT83	19:26	1161	18	35	CH	196
3006	35	18OCT83	20:54	1163	18	34	CH	81
3007	35	18OCT83	20:54	1163	18	34	CH	145
3008	35	18OCT83	20:54	1163	18	34	CH	151
3009	35	18OCT83	20:54	1163	18	34	CH	151
3010	35	18OCT83	20:54	1163	18	34	CH	154
3011	35	18OCT83	20:54	1163	18	34	CH	156
3012	35	18OCT83	20:54	1163	18	34	CH	156
3013	35	18OCT83	20:54	1163	18	34	CH	160
3014	35	18OCT83	20:54	1163	18	34	CH	162
3015	35	18OCT83	20:54	1163	18	34	CH	165
3016	35	18OCT83	20:54	1163	18	34	CH	166
3017	35	18OCT83	20:54	1163	18	34	CH	168
3018	35	18OCT83	20:54	1163	18	34	CH	170
3019	35	18OCT83	20:54	1163	18	34	CH	170
3020	35	18OCT83	20:54	1163	18	34	CH	171
3021	35	18OCT83	20:54	1163	18	34	CH	171
3022	35	18OCT83	20:54	1163	18	34	CH	172
3023	35	18OCT83	20:54	1163	18	34	CH	173
3024	35	18OCT83	20:54	1163	18	34	CH	174

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3025	35	18OCT83	20:54	1163	18	34	CH	175
3026	35	18OCT83	20:54	1163	18	34	CH	175
3027	35	18OCT83	20:54	1163	18	34	CH	176
3028	35	18OCT83	20:54	1163	18	34	CH	176
3029	35	18OCT83	20:54	1163	18	34	CH	176
3030	35	18OCT83	20:54	1163	18	34	CH	177
3031	35	18OCT83	20:54	1163	18	34	CH	178
3032	35	18OCT83	20:54	1163	18	34	CH	181
3033	35	18OCT83	20:54	1163	18	34	CH	181
3034	35	18OCT83	20:54	1163	18	34	CH	183
3035	35	18OCT83	20:54	1163	18	34	CH	183
3036	35	18OCT83	20:54	1163	18	34	CH	186
3037	35	18OCT83	20:54	1163	18	34	CH	200
3038	35	18OCT83	20:54	1163	18	34	CH	202
3039	35	18OCT83	20:54	1163	18	34	CH	203
3040	35	18OCT83	20:54	1163	18	34	CH	205
3041	35	18OCT83	21:14	1164	18	33	TZ	76
3042	35	18OCT83	21:14	1164	18	33	TZ	76
3043	35	18OCT83	21:14	1164	18	33	TZ	137
3044	35	18OCT83	21:14	1164	18	33	TZ	151
3045	35	18OCT83	21:14	1164	18	33	TZ	151
3046	35	18OCT83	21:14	1164	18	33	TZ	157
3047	35	18OCT83	21:14	1164	18	33	TZ	159
3048	35	18OCT83	21:14	1164	18	33	TZ	160
3049	35	18OCT83	21:14	1164	18	33	TZ	164
3050	35	18OCT83	21:14	1164	18	33	TZ	164
3051	35	18OCT83	21:14	1164	18	33	TZ	164
3052	35	18OCT83	21:14	1164	18	33	TZ	168
3053	35	18OCT83	21:14	1164	18	33	TZ	170
3054	35	18OCT83	21:14	1164	18	33	TZ	170
3055	35	18OCT83	21:14	1164	18	33	TZ	171
3056	35	18OCT83	21:14	1164	18	33	TZ	174
3057	35	18OCT83	21:14	1164	18	33	TZ	174
3058	35	18OCT83	21:14	1164	18	33	TZ	177
3059	35	18OCT83	21:14	1164	18	33	TZ	178
3060	35	18OCT83	21:14	1164	18	33	TZ	179
3061	35	18OCT83	21:14	1164	18	33	TZ	179
3062	35	18OCT83	21:14	1164	18	33	TZ	182
3063	35	18OCT83	21:14	1164	18	33	TZ	182
3064	35	18OCT83	21:14	1164	18	33	TZ	183
3065	35	18OCT83	21:14	1164	18	33	TZ	184
3066	35	18OCT83	21:14	1164	18	33	TZ	186
3067	35	18OCT83	21:14	1164	18	33	TZ	187
3068	35	18OCT83	21:14	1164	18	33	TZ	189
3069	35	18OCT83	21:14	1164	18	33	TZ	190
3070	35	18OCT83	21:14	1164	18	33	TZ	191
3071	35	18OCT83	21:58	1165	18	32	TZ	76
3072	35	18OCT83	21:58	1165	18	32	TZ	78
3073	35	18OCT83	21:58	1165	18	32	TZ	138
3074	35	18OCT83	21:58	1165	18	32	TZ	142
3075	35	18OCT83	21:58	1165	18	32	TZ	156
3076	35	18OCT83	21:58	1165	18	32	TZ	164
3077	35	18OCT83	21:58	1165	18	32	TZ	190
3078	35	18OCT83	22:13	1166	18	32	TZ	85

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3079	35	18OCT83	22:38	1167	18	32	TZ	142
3080	35	18OCT83	22:38	1167	18	32	TZ	146
3081	35	18OCT83	22:38	1167	18	32	TZ	147
3082	35	18OCT83	22:38	1167	18	32	TZ	149
3083	35	18OCT83	22:38	1167	18	32	TZ	152
3084	35	18OCT83	22:38	1167	18	32	TZ	152
3085	35	18OCT83	22:38	1167	18	32	TZ	156
3086	35	18OCT83	22:38	1167	18	32	TZ	158
3087	35	18OCT83	22:38	1167	18	32	TZ	159
3088	35	18OCT83	22:38	1167	18	32	TZ	162
3089	35	18OCT83	22:38	1167	18	32	TZ	162
3090	35	18OCT83	22:38	1167	18	32	TZ	164
3091	35	18OCT83	22:38	1167	18	32	TZ	165
3092	35	18OCT83	22:38	1167	18	32	TZ	168
3093	35	18OCT83	22:38	1167	18	32	TZ	170
3094	35	18OCT83	22:38	1167	18	32	TZ	170
3095	35	18OCT83	22:38	1167	18	32	TZ	171
3096	35	18OCT83	22:38	1167	18	32	TZ	171
3097	35	18OCT83	22:38	1167	18	32	TZ	173
3098	35	18OCT83	22:38	1167	18	32	TZ	175
3099	35	18OCT83	22:38	1167	18	32	TZ	176
3100	35	18OCT83	22:38	1167	18	32	TZ	176
3101	35	18OCT83	22:38	1167	18	32	TZ	178
3102	35	18OCT83	22:38	1167	18	32	TZ	178
3103	35	18OCT83	22:38	1167	18	32	TZ	178
3104	35	18OCT83	22:38	1167	18	32	TZ	180
3105	35	18OCT83	22:38	1167	18	32	TZ	182
3106	35	18OCT83	22:38	1167	18	32	TZ	182
3107	35	18OCT83	22:38	1167	18	32	TZ	184
3108	35	18OCT83	22:38	1167	18	32	TZ	186
3109	35	18OCT83	22:38	1167	18	32	TZ	193
3110	35	18OCT83	22:38	1167	18	32	TZ	193
3111	35	18OCT83	22:38	1167	18	32	TZ	208
3112	35	18OCT83	23:02	1168	18	32	TZ	116
3113	35	18OCT83	23:02	1168	18	32	TZ	116
3114	35	18OCT83	23:02	1168	18	32	TZ	117
3115	35	18OCT83	23:02	1168	18	32	TZ	121
3116	35	18OCT83	23:02	1168	18	32	TZ	127
3117	35	18OCT83	23:02	1168	18	32	TZ	128
3118	35	18OCT83	23:02	1168	18	32	TZ	132
3119	35	18OCT83	23:02	1168	18	32	TZ	138
3120	35	18OCT83	23:02	1168	18	32	TZ	141
3121	35	18OCT83	23:02	1168	18	32	TZ	147
3122	35	18OCT83	23:02	1168	18	32	TZ	148
3123	35	18OCT83	23:02	1168	18	32	TZ	151
3124	35	18OCT83	23:02	1168	18	32	TZ	153
3125	35	18OCT83	23:02	1168	18	32	TZ	157
3126	35	18OCT83	23:02	1168	18	32	TZ	158
3127	35	18OCT83	23:02	1168	18	32	TZ	159
3128	35	18OCT83	23:02	1168	18	32	TZ	162
3129	35	18OCT83	23:02	1168	18	32	TZ	163
3130	35	18OCT83	23:02	1168	18	32	TZ	163
3131	35	18OCT83	23:02	1168	18	32	TZ	165
3132	35	18OCT83	23:02	1168	18	32	TZ	165

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3133	35	18OCT83	23:02	1168	18	32	TZ	171
3134	35	18OCT83	23:02	1168	18	32	TZ	174
3135	35	18OCT83	23:02	1168	18	32	TZ	176
3136	35	18OCT83	23:02	1168	18	32	TZ	179
3137	35	18OCT83	23:02	1168	18	32	TZ	182
3138	35	18OCT83	23:02	1168	18	32	TZ	187
3139	35	18OCT83	23:02	1168	18	32	TZ	193
3140	35	18OCT83	23:02	1168	18	32	TZ	198
3141	35	18OCT83	23:02	1168	18	32	TZ	207
3142	35	18OCT83	23:21	1169	18	32	TZ	114
3143	35	18OCT83	23:21	1169	18	32	TZ	119
3144	35	18OCT83	23:21	1169	18	32	TZ	120
3145	35	18OCT83	23:21	1169	18	32	TZ	121
3146	35	18OCT83	23:21	1169	18	32	TZ	132
3147	35	18OCT83	23:21	1169	18	32	TZ	138
3148	35	18OCT83	23:21	1169	18	32	TZ	140
3149	35	18OCT83	23:21	1169	18	32	TZ	143
3150	35	18OCT83	23:21	1169	18	32	TZ	146
3151	35	18OCT83	23:21	1169	18	32	TZ	151
3152	35	18OCT83	23:21	1169	18	32	TZ	152
3153	35	18OCT83	23:21	1169	18	32	TZ	156
3154	35	18OCT83	23:21	1169	18	32	TZ	160
3155	35	18OCT83	23:21	1169	18	32	TZ	168
3156	35	18OCT83	23:21	1169	18	32	TZ	176
3157	35	18OCT83	23:21	1169	18	32	TZ	180
3158	35	18OCT83	23:21	1169	18	32	TZ	181
3159	35	18OCT83	23:21	1169	18	32	TZ	182
3160	35	18OCT83	23:21	1169	18	32	TZ	182
3161	35	18OCT83	23:21	1169	18	32	TZ	183
3162	35	18OCT83	23:21	1169	18	32	TZ	184
3163	35	18OCT83	23:21	1169	18	32	TZ	186
3164	35	18OCT83	23:21	1169	18	32	TZ	190
3165	35	18OCT83	23:21	1169	18	32	TZ	192
3166	35	18OCT83	23:21	1169	18	32	TZ	198
3167	35	19OCT83	19:41	1171	18	20	YK	158
3168	35	19OCT83	19:41	1171	18	20	YK	164
3169	35	19OCT83	19:41	1171	18	20	YK	165
3170	35	19OCT83	19:41	1171	18	20	YK	170
3171	35	19OCT83	19:41	1171	18	20	YK	171
3172	35	19OCT83	19:41	1171	18	20	YK	171
3173	35	19OCT83	19:41	1171	18	20	YK	174
3174	35	19OCT83	19:41	1171	18	20	YK	174
3175	35	19OCT83	19:41	1171	18	20	YK	175
3176	35	19OCT83	19:41	1171	18	20	YK	180
3177	35	19OCT83	19:41	1171	18	20	YK	181
3178	35	19OCT83	19:41	1171	18	20	YK	183
3179	35	19OCT83	19:41	1171	18	20	YK	189
3180	35	19OCT83	19:41	1171	18	20	YK	199
3181	35	19OCT83	19:41	1171	18	20	YK	202
3182	35	19OCT83	19:41	1171	18	20	YK	209
3183	35	19OCT83	19:41	1171	18	20	YK	209
3184	35	19OCT83	19:41	1171	18	20	YK	211
3185	35	19OCT83	20:32	80	18	21	YK	158
3186	35	19OCT83	20:32	80	18	21	YK	161

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3187	35	19OCT83	20:32	80	18	21	YK	162
3188	35	19OCT83	20:32	80	18	21	YK	164
3189	35	19OCT83	20:32	80	18	21	YK	168
3190	35	19OCT83	20:32	80	18	21	YK	170
3191	35	19OCT83	20:32	80	18	21	YK	171
3192	35	19OCT83	20:32	80	18	21	YK	172
3193	35	19OCT83	20:32	80	18	21	YK	172
3194	35	19OCT83	20:32	80	18	21	YK	173
3195	35	19OCT83	20:32	80	18	21	YK	173
3196	35	19OCT83	20:32	80	18	21	YK	175
3197	35	19OCT83	20:32	80	18	21	YK	178
3198	35	19OCT83	20:32	80	18	21	YK	178
3199	35	19OCT83	20:32	80	18	21	YK	178
3200	35	19OCT83	20:32	80	18	21	YK	178
3201	35	19OCT83	20:32	80	18	21	YK	180
3202	35	19OCT83	20:32	80	18	21	YK	181
3203	35	19OCT83	20:32	80	18	21	YK	182
3204	35	19OCT83	20:32	80	18	21	YK	182
3205	35	19OCT83	20:32	80	18	21	YK	183
3206	35	19OCT83	20:32	80	18	21	YK	185
3207	35	19OCT83	20:32	80	18	21	YK	185
3208	35	19OCT83	20:32	80	18	21	YK	187
3209	35	19OCT83	20:32	80	18	21	YK	188
3210	35	19OCT83	20:32	80	18	21	YK	191
3211	35	19OCT83	20:32	80	18	21	YK	191
3212	35	19OCT83	20:32	80	18	21	YK	192
3213	35	19OCT83	20:32	80	18	21	YK	198
3214	35	19OCT83	21:15	81	18	22	YK	154
3215	35	19OCT83	21:15	81	18	22	YK	159
3216	35	19OCT83	21:15	81	18	22	YK	162
3217	35	19OCT83	21:15	81	18	22	YK	168
3218	35	19OCT83	21:15	81	18	22	YK	170
3219	35	19OCT83	21:15	81	18	22	YK	170
3220	35	19OCT83	21:15	81	18	22	YK	170
3221	35	19OCT83	21:15	81	18	22	YK	171
3222	35	19OCT83	21:15	81	18	22	YK	171
3223	35	19OCT83	21:15	81	18	22	YK	171
3224	35	19OCT83	21:15	81	18	22	YK	172
3225	35	19OCT83	21:15	81	18	22	YK	172
3226	35	19OCT83	21:15	81	18	22	YK	174
3227	35	19OCT83	21:15	81	18	22	YK	175
3228	35	19OCT83	21:15	81	18	22	YK	178
3229	35	19OCT83	21:15	81	18	22	YK	179
3230	35	19OCT83	21:15	81	18	22	YK	181
3231	35	19OCT83	21:15	81	18	22	YK	182
3232	35	19OCT83	21:15	81	18	22	YK	183
3233	35	19OCT83	21:15	81	18	22	YK	184
3234	35	19OCT83	21:15	81	18	22	YK	186
3235	35	19OCT83	21:15	81	18	22	YK	187
3236	35	19OCT83	21:15	81	18	22	YK	187
3237	35	19OCT83	21:15	81	18	22	YK	189
3238	35	19OCT83	21:15	81	18	22	YK	190
3239	35	19OCT83	21:15	81	18	22	YK	192
3240	35	19OCT83	21:15	81	18	22	YK	215

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3241	35	19OCT83	21:50	82	18	22	YK	162
3242	35	19OCT83	21:50	82	18	22	YK	173
3243	35	19OCT83	21:50	82	18	22	YK	176
3244	35	19OCT83	21:50	82	18	22	YK	178
3245	35	19OCT83	21:50	82	18	22	YK	187
3246	35	19OCT83	21:50	82	18	22	YK	188
3247	35	19OCT83	21:50	82	18	22	YK	194
3248	35	19OCT83	21:50	82	18	22	YK	197
3249	35	19OCT83	22:39	83	18	25	TZ	170
3250	35	19OCT83	22:58	84	18	26	TZ	152
3251	35	19OCT83	22:58	84	18	26	TZ	154
3252	35	19OCT83	22:58	84	18	26	TZ	185
3253	35	19OCT83	22:58	84	18	26	TZ	187
3254	35	19OCT83	23:21	85	18	26	TZ	169
3255	35	19OCT83	23:21	85	18	26	TZ	175
3256	35	19OCT83	23:21	85	18	26	TZ	180
3257	35	19OCT83	23:21	85	18	26	TZ	181
3258	35	19OCT83	23:21	85	18	26	TZ	186
3259	35	19OCT83	23:21	85	18	26	TZ	186
3260	35	19OCT83	23:21	85	18	26	TZ	186
3261	35	19OCT83	23:21	85	18	26	TZ	188
3262	35	19OCT83	23:21	85	18	26	TZ	193
3263	35	19OCT83	23:21	85	18	26	TZ	194
3264	35	19OCT83	23:21	85	18	26	TZ	195
3265	35	20OCT83	0:25	88	18	26	TZ	175
3266	35	20OCT83	0:25	88	18	26	TZ	181
3267	35	20OCT83	0:25	88	18	26	TZ	181
3268	35	20OCT83	0:25	88	18	26	TZ	181
3269	35	20OCT83	0:25	88	18	26	TZ	182
3270	35	20OCT83	0:25	88	18	26	TZ	183
3271	35	20OCT83	0:25	88	18	26	TZ	184
3272	35	20OCT83	0:25	88	18	26	TZ	185
3273	35	20OCT83	0:25	88	18	26	TZ	186
3274	35	20OCT83	0:25	88	18	26	TZ	186
3275	35	20OCT83	0:25	88	18	26	TZ	188
3276	35	20OCT83	0:25	88	18	26	TZ	190
3277	35	20OCT83	0:25	88	18	26	TZ	192
3278	35	20OCT83	0:25	88	18	26	TZ	193
3279	35	20OCT83	0:25	88	18	26	TZ	195
3280	35	20OCT83	0:25	88	18	26	TZ	196
3281	35	20OCT83	0:25	88	18	26	TZ	202
3282	35	20OCT83	0:25	88	18	26	TZ	205
3283	35	20OCT83	0:25	88	18	26	TZ	209
3284	35	20OCT83	0:25	88	18	26	TZ	209
3285	35	20OCT83	1:20	87	18	30	TZ	91
3286	35	20OCT83	1:20	87	18	30	TZ	151
3287	35	20OCT83	1:20	87	18	30	TZ	152
3288	35	20OCT83	1:20	87	18	30	TZ	155
3289	35	20OCT83	1:20	87	18	30	TZ	156
3290	35	20OCT83	1:20	87	18	30	TZ	156
3291	35	20OCT83	1:20	87	18	30	TZ	157
3292	35	20OCT83	1:20	87	18	30	TZ	162
3293	35	20OCT83	1:20	87	18	30	TZ	164
3294	35	20OCT83	1:20	87	18	30	TZ	165

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3295	35	20OCT83	1:20	87	18	30	TZ	166
3296	35	20OCT83	1:20	87	18	30	TZ	168
3297	35	20OCT83	1:20	87	18	30	TZ	172
3298	35	20OCT83	1:20	87	18	30	TZ	172
3299	35	20OCT83	1:20	87	18	30	TZ	174
3300	35	20OCT83	1:20	87	18	30	TZ	175
3301	35	20OCT83	1:20	87	18	30	TZ	176
3302	35	20OCT83	1:20	87	18	30	TZ	176
3303	35	20OCT83	1:20	87	18	30	TZ	178
3304	35	20OCT83	1:20	87	18	30	TZ	182
3305	35	20OCT83	1:20	87	18	30	TZ	182
3306	35	20OCT83	1:20	87	18	30	TZ	183
3307	35	20OCT83	1:20	87	18	30	TZ	184
3308	35	20OCT83	1:20	87	18	30	TZ	193
3309	35	20OCT83	1:20	87	18	30	TZ	196
3310	35	20OCT83	2:03	89	18	30	TZ	77
3311	35	20OCT83	2:03	89	18	30	TZ	161
3312	35	20OCT83	2:03	89	18	30	TZ	172
3313	35	20OCT83	2:03	89	18	30	TZ	177
3314	35	20OCT83	2:03	89	18	30	TZ	180
3315	35	20OCT83	2:03	89	18	30	TZ	182
3316	35	20OCT83	2:03	89	18	30	TZ	185
3317	35	20OCT83	2:23	90	18	30	TZ	87
3318	35	20OCT83	2:23	90	18	30	TZ	122
3319	35	20OCT83	2:23	90	18	30	TZ	124
3320	35	20OCT83	2:23	90	18	30	TZ	133
3321	35	20OCT83	2:23	90	18	30	TZ	152
3322	35	20OCT83	2:23	90	18	30	TZ	156
3323	35	20OCT83	2:23	90	18	30	TZ	156
3324	35	20OCT83	2:23	90	18	30	TZ	158
3325	35	20OCT83	2:23	90	18	30	TZ	158
3326	35	20OCT83	2:23	90	18	30	TZ	160
3327	35	20OCT83	2:23	90	18	30	TZ	162
3328	35	20OCT83	2:23	90	18	30	TZ	162
3329	35	20OCT83	2:23	90	18	30	TZ	164
3330	35	20OCT83	2:23	90	18	30	TZ	167
3331	35	20OCT83	2:23	90	18	30	TZ	170
3332	35	20OCT83	2:23	90	18	30	TZ	173
3333	35	20OCT83	2:23	90	18	30	TZ	174
3334	35	20OCT83	2:23	90	18	30	TZ	176
3335	35	20OCT83	2:23	90	18	30	TZ	177
3336	35	20OCT83	2:23	90	18	30	TZ	177
3337	35	20OCT83	2:23	90	18	30	TZ	177
3338	35	20OCT83	2:23	90	18	30	TZ	178
3339	35	20OCT83	2:23	90	18	30	TZ	180
3340	35	20OCT83	2:23	90	18	30	TZ	180
3341	35	20OCT83	2:23	90	18	30	TZ	181
3342	35	20OCT83	2:23	90	18	30	TZ	181
3343	35	20OCT83	2:23	90	18	30	TZ	183
3344	35	20OCT83	2:23	90	18	30	TZ	184
3345	35	20OCT83	2:23	90	18	30	TZ	184
3346	35	20OCT83	2:23	90	18	30	TZ	185
3347	35	20OCT83	2:23	90	18	30	TZ	185
3348	35	20OCT83	2:23	90	18	30	TZ	185

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3349	35	20OCT83	2:23	90	18	30	TZ	187
3350	35	20OCT83	19:23	1181	18	31	TZ	76
3351	35	20OCT83	19:23	1181	18	31	TZ	121
3352	35	20OCT83	19:23	1181	18	31	TZ	146
3353	35	20OCT83	19:23	1181	18	31	TZ	146
3354	35	20OCT83	19:23	1181	18	31	TZ	150
3355	35	20OCT83	19:23	1181	18	31	TZ	151
3356	35	20OCT83	19:23	1181	18	31	TZ	152
3357	35	20OCT83	19:23	1181	18	31	TZ	152
3358	35	20OCT83	19:23	1181	18	31	TZ	153
3359	35	20OCT83	19:23	1181	18	31	TZ	155
3360	35	20OCT83	19:23	1181	18	31	TZ	155
3361	35	20OCT83	19:23	1181	18	31	TZ	156
3362	35	20OCT83	19:23	1181	18	31	TZ	156
3363	35	20OCT83	19:23	1181	18	31	TZ	156
3364	35	20OCT83	19:23	1181	18	31	TZ	157
3365	35	20OCT83	19:23	1181	18	31	TZ	157
3366	35	20OCT83	19:23	1181	18	31	TZ	160
3367	35	20OCT83	19:23	1181	18	31	TZ	160
3368	35	20OCT83	19:23	1181	18	31	TZ	162
3369	35	20OCT83	19:23	1181	18	31	TZ	163
3370	35	20OCT83	19:23	1181	18	31	TZ	163
3371	35	20OCT83	19:23	1181	18	31	TZ	165
3372	35	20OCT83	19:23	1181	18	31	TZ	168
3373	35	20OCT83	19:23	1181	18	31	TZ	170
3374	35	20OCT83	19:23	1181	18	31	TZ	170
3375	35	20OCT83	19:23	1181	18	31	TZ	171
3376	35	20OCT83	19:23	1181	18	31	TZ	172
3377	35	20OCT83	19:23	1181	18	31	TZ	172
3378	35	20OCT83	19:23	1181	18	31	TZ	174
3379	35	20OCT83	19:23	1181	18	31	TZ	175
3380	35	20OCT83	19:23	1181	18	31	TZ	182
3381	35	20OCT83	19:23	1181	18	31	TZ	183
3382	35	20OCT83	19:23	1181	18	31	TZ	184
3383	35	20OCT83	19:23	1181	18	31	TZ	188
3384	35	20OCT83	19:23	1181	18	31	TZ	188
3385	35	20OCT83	19:23	1181	18	31	TZ	189
3386	35	20OCT83	19:23	1181	18	31	TZ	190
3387	35	20OCT83	19:23	1181	18	31	TZ	190
3388	35	20OCT83	19:23	1181	18	31	TZ	191
3389	35	20OCT83	19:23	1181	18	31	TZ	191
3390	35	20OCT83	19:23	1181	18	31	TZ	191
3391	35	20OCT83	20:01	1182	18	30	TZ	136
3392	35	20OCT83	20:01	1182	18	30	TZ	152
3393	35	20OCT83	20:01	1182	18	30	TZ	154
3394	35	20OCT83	20:01	1182	18	30	TZ	154
3395	35	20OCT83	20:01	1182	18	30	TZ	154
3396	35	20OCT83	20:01	1182	18	30	TZ	155
3397	35	20OCT83	20:01	1182	18	30	TZ	156
3398	35	20OCT83	20:01	1182	18	30	TZ	157
3399	35	20OCT83	20:01	1182	18	30	TZ	158
3400	35	20OCT83	20:01	1182	18	30	TZ	158
3401	35	20OCT83	20:01	1182	18	30	TZ	159
3402	35	20OCT83	20:01	1182	18	30	TZ	160

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3403	35	20OCT83	20:01	1182	18	30	TZ	160
3404	35	20OCT83	20:01	1182	18	30	TZ	162
3405	35	20OCT83	20:01	1182	18	30	TZ	164
3406	35	20OCT83	20:01	1182	18	30	TZ	164
3407	35	20OCT83	20:01	1182	18	30	TZ	165
3408	35	20OCT83	20:01	1182	18	30	TZ	166
3409	35	20OCT83	20:01	1182	18	30	TZ	166
3410	35	20OCT83	20:01	1182	18	30	TZ	167
3411	35	20OCT83	20:01	1182	18	30	TZ	167
3412	35	20OCT83	20:01	1182	18	30	TZ	168
3413	35	20OCT83	20:01	1182	18	30	TZ	168
3414	35	20OCT83	20:01	1182	18	30	TZ	168
3415	35	20OCT83	20:01	1182	18	30	TZ	169
3416	35	20OCT83	20:01	1182	18	30	TZ	169
3417	35	20OCT83	20:01	1182	18	30	TZ	169
3418	35	20OCT83	20:01	1182	18	30	TZ	170
3419	35	20OCT83	20:01	1182	18	30	TZ	170
3420	35	20OCT83	20:01	1182	18	30	TZ	172
3421	35	20OCT83	20:01	1182	18	30	TZ	173
3422	35	20OCT83	20:01	1182	18	30	TZ	174
3423	35	20OCT83	20:01	1182	18	30	TZ	174
3424	35	20OCT83	20:01	1182	18	30	TZ	175
3425	35	20OCT83	20:01	1182	18	30	TZ	175
3426	35	20OCT83	20:01	1182	18	30	TZ	176
3427	35	20OCT83	20:01	1182	18	30	TZ	176
3428	35	20OCT83	20:01	1182	18	30	TZ	176
3429	35	20OCT83	20:01	1182	18	30	TZ	176
3430	35	20OCT83	20:01	1182	18	30	TZ	177
3431	35	20OCT83	20:01	1182	18	30	TZ	178
3432	35	20OCT83	20:01	1182	18	30	TZ	178
3433	35	20OCT83	20:01	1182	18	30	TZ	178
3434	35	20OCT83	20:01	1182	18	30	TZ	180
3435	35	20OCT83	20:01	1182	18	30	TZ	180
3436	35	20OCT83	20:01	1182	18	30	TZ	180
3437	35	20OCT83	20:01	1182	18	30	TZ	180
3438	35	20OCT83	20:01	1182	18	30	TZ	181
3439	35	20OCT83	20:01	1182	18	30	TZ	181
3440	35	20OCT83	20:01	1182	18	30	TZ	182
3441	35	20OCT83	20:01	1182	18	30	TZ	183
3442	35	20OCT83	20:01	1182	18	30	TZ	185
3443	35	20OCT83	20:01	1182	18	30	TZ	185
3444	35	20OCT83	20:01	1182	18	30	TZ	185
3445	35	20OCT83	20:01	1182	18	30	TZ	185
3446	35	20OCT83	20:01	1182	18	30	TZ	186
3447	35	20OCT83	20:01	1182	18	30	TZ	186
3448	35	20OCT83	20:01	1182	18	30	TZ	190
3449	35	20OCT83	20:01	1182	18	30	TZ	194
3450	35	20OCT83	20:01	1182	18	30	TZ	195
3451	35	20OCT83	20:01	1182	18	30	TZ	196
3452	35	20OCT83	20:01	1182	18	30	TZ	201
3453	35	20OCT83	20:33	1183	18	30	TZ	168
3454	35	20OCT83	20:33	1183	18	30	TZ	170
3455	35	20OCT83	20:33	1183	18	30	TZ	176
3456	35	20OCT83	20:33	1183	18	30	TZ	177

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3457	35	20OCT83	20:33	1183	18	30	TZ	180
3458	35	20OCT83	20:33	1183	18	30	TZ	180
3459	35	20OCT83	20:53	1184	18	30	TZ	154
3460	35	20OCT83	20:53	1184	18	30	TZ	156
3461	35	20OCT83	20:53	1184	18	30	TZ	161
3462	35	20OCT83	20:53	1184	18	30	TZ	162
3463	35	20OCT83	20:53	1184	18	30	TZ	169
3464	35	20OCT83	20:53	1184	18	30	TZ	176
3465	35	20OCT83	21:21	1185	18	30	TZ	78
3466	35	20OCT83	21:21	1185	18	30	TZ	84
3467	35	20OCT83	21:21	1185	18	30	TZ	88
3468	35	20OCT83	21:21	1185	18	30	TZ	92
3469	35	20OCT83	21:21	1185	18	30	TZ	135
3470	35	20OCT83	21:21	1185	18	30	TZ	149
3471	35	20OCT83	21:21	1185	18	30	TZ	155
3472	35	20OCT83	21:21	1185	18	30	TZ	162
3473	35	20OCT83	21:21	1185	18	30	TZ	165
3474	35	20OCT83	21:21	1185	18	30	TZ	166
3475	35	20OCT83	21:21	1185	18	30	TZ	167
3476	35	20OCT83	21:21	1185	18	30	TZ	170
3477	35	20OCT83	21:21	1185	18	30	TZ	174
3478	35	20OCT83	21:21	1185	18	30	TZ	191
3479	35	20OCT83	21:34	1186	18	29	TZ	140
3480	35	20OCT83	21:34	1186	18	29	TZ	142
3481	35	20OCT83	21:34	1186	18	29	TZ	143
3482	35	20OCT83	21:34	1186	18	29	TZ	145
3483	35	20OCT83	21:34	1186	18	29	TZ	145
3484	35	20OCT83	21:34	1186	18	29	TZ	147
3485	35	20OCT83	21:34	1186	18	29	TZ	149
3486	35	20OCT83	21:34	1186	18	29	TZ	149
3487	35	20OCT83	21:34	1186	18	29	TZ	152
3488	35	20OCT83	21:34	1186	18	29	TZ	155
3489	35	20OCT83	21:34	1186	18	29	TZ	155
3490	35	20OCT83	21:34	1186	18	29	TZ	156
3491	35	20OCT83	21:34	1186	18	29	TZ	156
3492	35	20OCT83	21:34	1186	18	29	TZ	157
3493	35	20OCT83	21:34	1186	18	29	TZ	160
3494	35	20OCT83	21:34	1186	18	29	TZ	160
3495	35	20OCT83	21:34	1186	18	29	TZ	160
3496	35	20OCT83	21:34	1186	18	29	TZ	160
3497	35	20OCT83	21:34	1186	18	29	TZ	161
3498	35	20OCT83	21:34	1186	18	29	TZ	163
3499	35	20OCT83	21:34	1186	18	29	TZ	164
3500	35	20OCT83	21:34	1186	18	29	TZ	164
3501	35	20OCT83	21:34	1186	18	29	TZ	165
3502	35	20OCT83	21:34	1186	18	29	TZ	165
3503	35	20OCT83	21:34	1186	18	29	TZ	166
3504	35	20OCT83	21:34	1186	18	29	TZ	166
3505	35	20OCT83	21:34	1186	18	29	TZ	167
3506	35	20OCT83	21:34	1186	18	29	TZ	167
3507	35	20OCT83	21:34	1186	18	29	TZ	168
3508	35	20OCT83	21:34	1186	18	29	TZ	169
3509	35	20OCT83	21:34	1186	18	29	TZ	169
3510	35	20OCT83	21:34	1186	18	29	TZ	170

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3511	35	20OCT83	21:34	1186	18	29	TZ	170
3512	35	20OCT83	21:34	1186	18	29	TZ	170
3513	35	20OCT83	21:34	1186	18	29	TZ	171
3514	35	20OCT83	21:34	1186	18	29	TZ	171
3515	35	20OCT83	21:34	1186	18	29	TZ	172
3516	35	20OCT83	21:34	1186	18	29	TZ	172
3517	35	20OCT83	21:34	1186	18	29	TZ	174
3518	35	20OCT83	21:34	1186	18	29	TZ	174
3519	35	20OCT83	21:34	1186	18	29	TZ	175
3520	35	20OCT83	21:34	1186	18	29	TZ	175
3521	35	20OCT83	21:34	1186	18	29	TZ	177
3522	35	20OCT83	21:34	1186	18	29	TZ	177
3523	35	20OCT83	21:34	1186	18	29	TZ	178
3524	35	20OCT83	21:34	1186	18	29	TZ	180
3525	35	20OCT83	21:34	1186	18	29	TZ	180
3526	35	20OCT83	21:34	1186	18	29	TZ	182
3527	35	20OCT83	21:34	1186	18	29	TZ	183
3528	35	20OCT83	21:34	1186	18	29	TZ	183
3529	35	20OCT83	21:34	1186	18	29	TZ	184
3530	35	20OCT83	21:34	1186	18	29	TZ	184
3531	35	20OCT83	21:34	1186	18	29	TZ	185
3532	35	20OCT83	21:34	1186	18	29	TZ	186
3533	35	20OCT83	21:34	1186	18	29	TZ	190
3534	35	20OCT83	21:34	1186	18	29	TZ	190
3535	35	20OCT83	21:34	1186	18	29	TZ	191
3536	35	20OCT83	21:34	1186	18	29	TZ	194
3537	35	20OCT83	21:34	1186	18	29	TZ	202
3538	35	20OCT83	21:58	1187	18	29	TZ	81
3539	35	20OCT83	21:58	1187	18	29	TZ	135
3540	35	20OCT83	21:58	1187	18	29	TZ	148
3541	35	20OCT83	21:58	1187	18	29	TZ	148
3542	35	20OCT83	21:58	1187	18	29	TZ	150
3543	35	20OCT83	21:58	1187	18	29	TZ	152
3544	35	20OCT83	21:58	1187	18	29	TZ	152
3545	35	20OCT83	21:58	1187	18	29	TZ	153
3546	35	20OCT83	21:58	1187	18	29	TZ	155
3547	35	20OCT83	21:58	1187	18	29	TZ	155
3548	35	20OCT83	21:58	1187	18	29	TZ	155
3549	35	20OCT83	21:58	1187	18	29	TZ	157
3550	35	20OCT83	21:58	1187	18	29	TZ	159
3551	35	20OCT83	21:58	1187	18	29	TZ	160
3552	35	20OCT83	21:58	1187	18	29	TZ	160
3553	35	20OCT83	21:58	1187	18	29	TZ	160
3554	35	20OCT83	21:58	1187	18	29	TZ	160
3555	35	20OCT83	21:58	1187	18	29	TZ	162
3556	35	20OCT83	21:58	1187	18	29	TZ	163
3557	35	20OCT83	21:58	1187	18	29	TZ	165
3558	35	20OCT83	21:58	1187	18	29	TZ	165
3559	35	20OCT83	21:58	1187	18	29	TZ	166
3560	35	20OCT83	21:58	1187	18	29	TZ	168
3561	35	20OCT83	21:58	1187	18	29	TZ	168
3562	35	20OCT83	21:58	1187	18	29	TZ	170
3563	35	20OCT83	21:58	1187	18	29	TZ	170
3564	35	20OCT83	21:58	1187	18	29	TZ	170

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3565	35	20OCT83	21:58	1187	18	29	TZ	171
3566	35	20OCT83	21:58	1187	18	29	TZ	172
3567	35	20OCT83	21:58	1187	18	29	TZ	172
3568	35	20OCT83	21:58	1187	18	29	TZ	173
3569	35	20OCT83	21:58	1187	18	29	TZ	174
3570	35	20OCT83	21:58	1187	18	29	TZ	175
3571	35	20OCT83	21:58	1187	18	29	TZ	175
3572	35	20OCT83	21:58	1187	18	29	TZ	176
3573	35	20OCT83	21:58	1187	18	29	TZ	176
3574	35	20OCT83	21:58	1187	18	29	TZ	177
3575	35	20OCT83	21:58	1187	18	29	TZ	177
3576	35	20OCT83	21:58	1187	18	29	TZ	177
3577	35	20OCT83	21:58	1187	18	29	TZ	178
3578	35	20OCT83	21:58	1187	18	29	TZ	178
3579	35	20OCT83	21:58	1187	18	29	TZ	179
3580	35	20OCT83	21:58	1187	18	29	TZ	180
3581	35	20OCT83	21:58	1187	18	29	TZ	180
3582	35	20OCT83	21:58	1187	18	29	TZ	180
3583	35	20OCT83	21:58	1187	18	29	TZ	180
3584	35	20OCT83	21:58	1187	18	29	TZ	181
3585	35	20OCT83	21:58	1187	18	29	TZ	181
3586	35	20OCT83	21:58	1187	18	29	TZ	182
3587	35	20OCT83	21:58	1187	18	29	TZ	182
3588	35	20OCT83	21:58	1187	18	29	TZ	182
3589	35	20OCT83	21:58	1187	18	29	TZ	183
3590	35	20OCT83	21:58	1187	18	29	TZ	183
3591	35	20OCT83	21:58	1187	18	29	TZ	183
3592	35	20OCT83	21:58	1187	18	29	TZ	184
3593	35	20OCT83	21:58	1187	18	29	TZ	185
3594	35	20OCT83	21:58	1187	18	29	TZ	185
3595	35	20OCT83	21:58	1187	18	29	TZ	185
3596	35	20OCT83	21:58	1187	18	29	TZ	186
3597	35	20OCT83	21:58	1187	18	29	TZ	187
3598	35	20OCT83	21:58	1187	18	29	TZ	188
3599	35	20OCT83	21:58	1187	18	29	TZ	188
3600	35	20OCT83	21:58	1187	18	29	TZ	190
3601	35	20OCT83	21:58	1187	18	29	TZ	190
3602	35	20OCT83	21:58	1187	18	29	TZ	190
3603	35	20OCT83	21:58	1187	18	29	TZ	190
3604	35	20OCT83	21:58	1187	18	29	TZ	192
3605	35	20OCT83	21:58	1187	18	29	TZ	196
3606	35	20OCT83	21:58	1187	18	29	TZ	197
3607	35	20OCT83	21:58	1187	18	29	TZ	202
3608	35	04OCT83	21:51	1034	50	27	TZ	150
3609	35	04OCT83	21:51	1034	50	27	TZ	153
3610	35	04OCT83	21:51	1034	50	27	TZ	170
3611	35	04OCT83	21:51	1034	50	27	TZ	171
3612	35	04OCT83	21:51	1034	50	27	TZ	176
3613	35	04OCT83	21:51	1034	50	27	TZ	187
3614	35	04OCT83	21:51	1034	50	27	TZ	188
3615	35	04OCT83	21:51	1034	50	27	TZ	189
3616	35	04OCT83	21:51	1034	50	27	TZ	194
3617	35	04OCT83	21:51	1034	50	27	TZ	195
3618	35	04OCT83	21:51	1034	50	27	TZ	204

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3619	35	04OCT83	21:51	1034	50	27	TZ	205
3620	35	04OCT83	22:25	1035	50	27	TZ	173
3621	35	04OCT83	22:25	1035	50	27	TZ	179
3622	35	04OCT83	22:25	1035	50	27	TZ	180
3623	35	04OCT83	22:25	1035	50	27	TZ	183
3624	35	04OCT83	22:25	1035	50	27	TZ	185
3625	35	04OCT83	22:25	1035	50	27	TZ	189
3626	35	04OCT83	22:25	1035	50	27	TZ	190
3627	35	04OCT83	22:25	1035	50	27	TZ	193
3628	35	04OCT83	22:25	1035	50	27	TZ	195
3629	35	04OCT83	22:25	1035	50	27	TZ	195
3630	35	04OCT83	22:25	1035	50	27	TZ	199
3631	35	04OCT83	22:25	1035	50	27	TZ	200
3632	35	04OCT83	22:25	1035	50	27	TZ	200
3633	35	04OCT83	22:25	1035	50	27	TZ	208
3634	35	04OCT83	23:00	1036	50	28	TZ	152
3635	35	04OCT83	23:00	1036	50	28	TZ	154
3636	35	04OCT83	23:00	1036	50	28	TZ	155
3637	35	04OCT83	23:00	1036	50	28	TZ	158
3638	35	04OCT83	23:00	1036	50	28	TZ	165
3639	35	04OCT83	23:00	1036	50	28	TZ	168
3640	35	04OCT83	23:00	1036	50	28	TZ	171
3641	35	04OCT83	23:00	1036	50	28	TZ	172
3642	35	04OCT83	23:00	1036	50	28	TZ	172
3643	35	04OCT83	23:00	1036	50	28	TZ	172
3644	35	04OCT83	23:00	1036	50	28	TZ	174
3645	35	04OCT83	23:00	1036	50	28	TZ	174
3646	35	04OCT83	23:00	1036	50	28	TZ	174
3647	35	04OCT83	23:00	1036	50	28	TZ	175
3648	35	04OCT83	23:00	1036	50	28	TZ	175
3649	35	04OCT83	23:00	1036	50	28	TZ	175
3650	35	04OCT83	23:00	1036	50	28	TZ	178
3651	35	04OCT83	23:00	1036	50	28	TZ	178
3652	35	04OCT83	23:00	1036	50	28	TZ	179
3653	35	04OCT83	23:00	1036	50	28	TZ	182
3654	35	04OCT83	23:00	1036	50	28	TZ	182
3655	35	04OCT83	23:00	1036	50	28	TZ	184
3656	35	04OCT83	23:00	1036	50	28	TZ	184
3657	35	04OCT83	23:00	1036	50	28	TZ	185
3658	35	04OCT83	23:00	1036	50	28	TZ	185
3659	35	04OCT83	23:00	1036	50	28	TZ	185
3660	35	04OCT83	23:00	1036	50	28	TZ	185
3661	35	04OCT83	23:00	1036	50	28	TZ	185
3662	35	04OCT83	23:00	1036	50	28	TZ	186
3663	35	04OCT83	23:00	1036	50	28	TZ	186
3664	35	04OCT83	23:00	1036	50	28	TZ	186
3665	35	04OCT83	23:00	1036	50	28	TZ	186
3666	35	04OCT83	23:00	1036	50	28	TZ	187
3667	35	04OCT83	23:00	1036	50	28	TZ	189
3668	35	04OCT83	23:00	1036	50	28	TZ	189
3669	35	04OCT83	23:00	1036	50	28	TZ	191
3670	35	04OCT83	23:00	1036	50	28	TZ	192
3671	35	04OCT83	23:00	1036	50	28	TZ	196
3672	35	04OCT83	23:00	1036	50	28	TZ	197

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3673	35	04OCT83	23:00	1036	50	28	TZ	200
3674	35	04OCT83	23:00	1036	50	28	TZ	203
3675	35	04OCT83	23:00	1036	50	28	TZ	205
3676	35	04OCT83	23:00	1036	50	28	TZ	206
3677	35	04OCT83	23:00	1036	50	28	TZ	208
3678	35	04OCT83	24:00	1037	50	28	TZ	152
3679	35	04OCT83	24:00	1037	50	28	TZ	153
3680	35	04OCT83	24:00	1037	50	28	TZ	153
3681	35	04OCT83	24:00	1037	50	28	TZ	154
3682	35	04OCT83	24:00	1037	50	28	TZ	160
3683	35	04OCT83	24:00	1037	50	28	TZ	164
3684	35	04OCT83	24:00	1037	50	28	TZ	165
3685	35	04OCT83	24:00	1037	50	28	TZ	166
3686	35	04OCT83	24:00	1037	50	28	TZ	166
3687	35	04OCT83	24:00	1037	50	28	TZ	167
3688	35	04OCT83	24:00	1037	50	28	TZ	168
3689	35	04OCT83	24:00	1037	50	28	TZ	168
3690	35	04OCT83	24:00	1037	50	28	TZ	171
3691	35	04OCT83	24:00	1037	50	28	TZ	172
3692	35	04OCT83	24:00	1037	50	28	TZ	175
3693	35	04OCT83	24:00	1037	50	28	TZ	177
3694	35	04OCT83	24:00	1037	50	28	TZ	177
3695	35	04OCT83	24:00	1037	50	28	TZ	178
3696	35	04OCT83	24:00	1037	50	28	TZ	180
3697	35	04OCT83	24:00	1037	50	28	TZ	180
3698	35	04OCT83	24:00	1037	50	28	TZ	181
3699	35	04OCT83	24:00	1037	50	28	TZ	181
3700	35	04OCT83	24:00	1037	50	28	TZ	181
3701	35	04OCT83	24:00	1037	50	28	TZ	181
3702	35	04OCT83	24:00	1037	50	28	TZ	181
3703	35	04OCT83	24:00	1037	50	28	TZ	182
3704	35	04OCT83	24:00	1037	50	28	TZ	182
3705	35	04OCT83	24:00	1037	50	28	TZ	184
3706	35	04OCT83	24:00	1037	50	28	TZ	185
3707	35	04OCT83	24:00	1037	50	28	TZ	186
3708	35	04OCT83	24:00	1037	50	28	TZ	186
3709	35	04OCT83	24:00	1037	50	28	TZ	187
3710	35	04OCT83	24:00	1037	50	28	TZ	187
3711	35	04OCT83	24:00	1037	50	28	TZ	187
3712	35	04OCT83	24:00	1037	50	28	TZ	189
3713	35	04OCT83	24:00	1037	50	28	TZ	193
3714	35	04OCT83	24:00	1037	50	28	TZ	193
3715	35	04OCT83	24:00	1037	50	28	TZ	195
3716	35	04OCT83	24:00	1037	50	28	TZ	195
3717	35	04OCT83	24:00	1037	50	28	TZ	196
3718	35	04OCT83	24:00	1037	50	28	TZ	208
3719	35	04OCT83	24:00	1037	50	28	TZ	227
3720	35	05OCT83	2:26	1040	50	29	TZ	137
3721	35	05OCT83	2:26	1040	50	29	TZ	146
3722	35	05OCT83	2:26	1040	50	29	TZ	147
3723	35	05OCT83	2:26	1040	50	29	TZ	157
3724	35	05OCT83	2:26	1040	50	29	TZ	158
3725	35	05OCT83	2:26	1040	50	29	TZ	158
3726	35	05OCT83	2:26	1040	50	29	TZ	159

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3727	35	050CT83	2:26	1040	50	29	TZ	162
3728	35	050CT83	2:26	1040	50	29	TZ	166
3729	35	050CT83	2:26	1040	50	29	TZ	171
3730	35	050CT83	2:26	1040	50	29	TZ	172
3731	35	050CT83	2:26	1040	50	29	TZ	174
3732	35	050CT83	2:26	1040	50	29	TZ	178
3733	35	050CT83	2:26	1040	50	29	TZ	181
3734	35	050CT83	2:26	1040	50	29	TZ	182
3735	35	050CT83	2:26	1040	50	29	TZ	183
3736	35	050CT83	2:26	1040	50	29	TZ	187
3737	35	050CT83	2:26	1040	50	29	TZ	190
3738	35	050CT83	2:26	1040	50	29	TZ	191
3739	35	050CT83	2:26	1040	50	29	TZ	196
3740	35	050CT83	2:26	1040	50	29	TZ	197
3741	35	050CT83	2:26	1040	50	29	TZ	209
3742	35	050CT83	3:04	1041	50	29	TZ	154
3743	35	050CT83	3:04	1041	50	29	TZ	170
3744	35	050CT83	3:04	1041	50	29	TZ	177
3745	35	050CT83	3:04	1041	50	29	TZ	181
3746	35	050CT83	3:04	1041	50	29	TZ	187
3747	35	050CT83	3:31	1042	50	29	TZ	112
3748	35	050CT83	3:31	1042	50	29	TZ	162
3749	35	050CT83	3:31	1042	50	29	TZ	163
3750	35	050CT83	3:31	1042	50	29	TZ	168
3751	35	050CT83	3:31	1042	50	29	TZ	171
3752	35	050CT83	3:31	1042	50	29	TZ	176
3753	35	050CT83	3:31	1042	50	29	TZ	183
3754	35	050CT83	3:31	1042	50	29	TZ	205
3755	35	060CT83	19:21	1043	50	25	TZ	163
3756	35	060CT83	19:21	1043	50	25	TZ	164
3757	35	060CT83	19:21	1043	50	25	TZ	170
3758	35	060CT83	19:21	1043	50	25	TZ	172
3759	35	060CT83	19:21	1043	50	25	TZ	172
3760	35	060CT83	19:21	1043	50	25	TZ	173
3761	35	060CT83	19:21	1043	50	25	TZ	174
3762	35	060CT83	19:21	1043	50	25	TZ	174
3763	35	060CT83	19:21	1043	50	25	TZ	176
3764	35	060CT83	19:21	1043	50	25	TZ	176
3765	35	060CT83	19:21	1043	50	25	TZ	178
3766	35	060CT83	19:21	1043	50	25	TZ	180
3767	35	060CT83	19:21	1043	50	25	TZ	180
3768	35	060CT83	19:21	1043	50	25	TZ	187
3769	35	060CT83	19:21	1043	50	25	TZ	190
3770	35	060CT83	19:21	1043	50	25	TZ	194
3771	35	060CT83	19:21	1043	50	25	TZ	195
3772	35	060CT83	19:21	1043	50	25	TZ	198
3773	35	060CT83	19:21	1043	50	25	TZ	198
3774	35	060CT83	19:21	1043	50	25	TZ	199
3775	35	060CT83	19:21	1043	50	25	TZ	200
3776	35	060CT83	19:52	1044	50	27	TZ	145
3777	35	060CT83	19:52	1044	50	27	TZ	150
3778	35	060CT83	19:52	1044	50	27	TZ	150
3779	35	060CT83	19:52	1044	50	27	TZ	153
3780	35	060CT83	19:52	1044	50	27	TZ	155

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3781	35	06OCT83	19:52	1044	50	27	TZ	155
3782	35	06OCT83	19:52	1044	50	27	TZ	155
3783	35	06OCT83	19:52	1044	50	27	TZ	155
3784	35	06OCT83	19:52	1044	50	27	TZ	158
3785	35	06OCT83	19:52	1044	50	27	TZ	158
3786	35	06OCT83	19:52	1044	50	27	TZ	158
3787	35	06OCT83	19:52	1044	50	27	TZ	160
3788	35	06OCT83	19:52	1044	50	27	TZ	160
3789	35	06OCT83	19:52	1044	50	27	TZ	160
3790	35	06OCT83	19:52	1044	50	27	TZ	160
3791	35	06OCT83	19:52	1044	50	27	TZ	163
3792	35	06OCT83	19:52	1044	50	27	TZ	163
3793	35	06OCT83	19:52	1044	50	27	TZ	164
3794	35	06OCT83	19:52	1044	50	27	TZ	164
3795	35	06OCT83	19:52	1044	50	27	TZ	165
3796	35	06OCT83	19:52	1044	50	27	TZ	165
3797	35	06OCT83	19:52	1044	50	27	TZ	165
3798	35	06OCT83	19:52	1044	50	27	TZ	165
3799	35	06OCT83	19:52	1044	50	27	TZ	165
3800	35	06OCT83	19:52	1044	50	27	TZ	165
3801	35	06OCT83	19:52	1044	50	27	TZ	165
3802	35	06OCT83	19:52	1044	50	27	TZ	165
3803	35	06OCT83	19:52	1044	50	27	TZ	165
3804	35	06OCT83	19:52	1044	50	27	TZ	166
3805	35	06OCT83	19:52	1044	50	27	TZ	167
3806	35	06OCT83	19:52	1044	50	27	TZ	168
3807	35	06OCT83	19:52	1044	50	27	TZ	168
3808	35	06OCT83	19:52	1044	50	27	TZ	168
3809	35	06OCT83	19:52	1044	50	27	TZ	168
3810	35	06OCT83	19:52	1044	50	27	TZ	170
3811	35	06OCT83	19:52	1044	50	27	TZ	170
3812	35	06OCT83	19:52	1044	50	27	TZ	170
3813	35	06OCT83	19:52	1044	50	27	TZ	170
3814	35	06OCT83	19:52	1044	50	27	TZ	170
3815	35	06OCT83	19:52	1044	50	27	TZ	172
3816	35	06OCT83	19:52	1044	50	27	TZ	172
3817	35	06OCT83	19:52	1044	50	27	TZ	172
3818	35	06OCT83	19:52	1044	50	27	TZ	173
3819	35	06OCT83	19:52	1044	50	27	TZ	173
3820	35	06OCT83	19:52	1044	50	27	TZ	174
3821	35	06OCT83	19:52	1044	50	27	TZ	175
3822	35	06OCT83	19:52	1044	50	27	TZ	175
3823	35	06OCT83	19:52	1044	50	27	TZ	175
3824	35	06OCT83	19:52	1044	50	27	TZ	175
3825	35	06OCT83	19:52	1044	50	27	TZ	175
3826	35	06OCT83	19:52	1044	50	27	TZ	175
3827	35	06OCT83	19:52	1044	50	27	TZ	175
3828	35	06OCT83	19:52	1044	50	27	TZ	177
3829	35	06OCT83	19:52	1044	50	27	TZ	178
3830	35	06OCT83	19:52	1044	50	27	TZ	178
3831	35	06OCT83	19:52	1044	50	27	TZ	178
3832	35	06OCT83	19:52	1044	50	27	TZ	180
3833	35	06OCT83	19:52	1044	50	27	TZ	180
3834	35	06OCT83	19:52	1044	50	27	TZ	180

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3835	35	06OCT83	19:52	1044	50	27	TZ	180
3836	35	06OCT83	19:52	1044	50	27	TZ	180
3837	35	06OCT83	19:52	1044	50	27	TZ	180
3838	35	06OCT83	19:52	1044	50	27	TZ	180
3839	35	06OCT83	19:52	1044	50	27	TZ	180
3840	35	06OCT83	19:52	1044	50	27	TZ	180
3841	35	06OCT83	19:52	1044	50	27	TZ	180
3842	35	06OCT83	19:52	1044	50	27	TZ	182
3843	35	06OCT83	19:52	1044	50	27	TZ	182
3844	35	06OCT83	19:52	1044	50	27	TZ	182
3845	35	06OCT83	19:52	1044	50	27	TZ	182
3846	35	06OCT83	19:52	1044	50	27	TZ	182
3847	35	06OCT83	19:52	1044	50	27	TZ	182
3848	35	06OCT83	19:52	1044	50	27	TZ	183
3849	35	06OCT83	19:52	1044	50	27	TZ	183
3850	35	06OCT83	19:52	1044	50	27	TZ	183
3851	35	06OCT83	19:52	1044	50	27	TZ	185
3852	35	06OCT83	19:52	1044	50	27	TZ	185
3853	35	06OCT83	19:52	1044	50	27	TZ	185
3854	35	06OCT83	19:52	1044	50	27	TZ	185
3855	35	06OCT83	19:52	1044	50	27	TZ	185
3856	35	06OCT83	19:52	1044	50	27	TZ	185
3857	35	06OCT83	19:52	1044	50	27	TZ	185
3858	35	06OCT83	19:52	1044	50	27	TZ	185
3859	35	06OCT83	19:52	1044	50	27	TZ	185
3860	35	06OCT83	19:52	1044	50	27	TZ	185
3861	35	06OCT83	19:52	1044	50	27	TZ	187
3862	35	06OCT83	19:52	1044	50	27	TZ	187
3863	35	06OCT83	19:52	1044	50	27	TZ	188
3864	35	06OCT83	19:52	1044	50	27	TZ	188
3865	35	06OCT83	19:52	1044	50	27	TZ	188
3866	35	06OCT83	19:52	1044	50	27	TZ	190
3867	35	06OCT83	19:52	1044	50	27	TZ	190
3868	35	06OCT83	19:52	1044	50	27	TZ	190
3869	35	06OCT83	19:52	1044	50	27	TZ	190
3870	35	06OCT83	19:52	1044	50	27	TZ	190
3871	35	06OCT83	19:52	1044	50	27	TZ	190
3872	35	06OCT83	19:52	1044	50	27	TZ	190
3873	35	06OCT83	19:52	1044	50	27	TZ	190
3874	35	06OCT83	19:52	1044	50	27	TZ	190
3875	35	06OCT83	19:52	1044	50	27	TZ	190
3876	35	06OCT83	19:52	1044	50	27	TZ	190
3877	35	06OCT83	19:52	1044	50	27	TZ	192
3878	35	06OCT83	19:52	1044	50	27	TZ	192
3879	35	06OCT83	19:52	1044	50	27	TZ	192
3880	35	06OCT83	19:52	1044	50	27	TZ	192
3881	35	06OCT83	19:52	1044	50	27	TZ	192
3882	35	06OCT83	19:52	1044	50	27	TZ	193
3883	35	06OCT83	19:52	1044	50	27	TZ	195
3884	35	06OCT83	19:52	1044	50	27	TZ	195
3885	35	06OCT83	19:52	1044	50	27	TZ	195
3886	35	06OCT83	19:52	1044	50	27	TZ	197
3887	35	06OCT83	19:52	1044	50	27	TZ	197
3888	35	06OCT83	19:52	1044	50	27	TZ	197

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3889	35	06OCT83	19:52	1044	50	27	TZ	198
3890	35	06OCT83	19:52	1044	50	27	TZ	198
3891	35	06OCT83	19:52	1044	50	27	TZ	198
3892	35	06OCT83	19:52	1044	50	27	TZ	200
3893	35	06OCT83	19:52	1044	50	27	TZ	203
3894	35	06OCT83	19:52	1044	50	27	TZ	203
3895	35	06OCT83	20:22	1045	50	27	TZ	157
3896	35	06OCT83	20:22	1045	50	27	TZ	157
3897	35	06OCT83	20:22	1045	50	27	TZ	160
3898	35	06OCT83	20:22	1045	50	27	TZ	162
3899	35	06OCT83	20:22	1045	50	27	TZ	170
3900	35	06OCT83	20:22	1045	50	27	TZ	170
3901	35	06OCT83	20:22	1045	50	27	TZ	173
3902	35	06OCT83	20:22	1045	50	27	TZ	173
3903	35	06OCT83	20:22	1045	50	27	TZ	173
3904	35	06OCT83	20:22	1045	50	27	TZ	176
3905	35	06OCT83	20:22	1045	50	27	TZ	177
3906	35	06OCT83	20:22	1045	50	27	TZ	178
3907	35	06OCT83	20:22	1045	50	27	TZ	180
3908	35	06OCT83	20:22	1045	50	27	TZ	180
3909	35	06OCT83	20:22	1045	50	27	TZ	180
3910	35	06OCT83	20:22	1045	50	27	TZ	182
3911	35	06OCT83	20:22	1045	50	27	TZ	183
3912	35	06OCT83	20:22	1045	50	27	TZ	187
3913	35	06OCT83	20:22	1045	50	27	TZ	190
3914	35	06OCT83	20:22	1045	50	27	TZ	192
3915	35	06OCT83	20:22	1045	50	27	TZ	192
3916	35	06OCT83	20:22	1045	50	27	TZ	193
3917	35	06OCT83	20:22	1045	50	27	TZ	193
3918	35	06OCT83	20:22	1045	50	27	TZ	195
3919	35	06OCT83	20:22	1045	50	27	TZ	200
3920	35	06OCT83	20:22	1045	50	27	TZ	200
3921	35	06OCT83	20:22	1045	50	27	TZ	203
3922	35	06OCT83	20:22	1045	50	27	TZ	220
3923	35	06OCT83	20:38	1046	50	27	TZ	153
3924	35	06OCT83	20:38	1046	50	27	TZ	157
3925	35	06OCT83	20:38	1046	50	27	TZ	163
3926	35	06OCT83	20:38	1046	50	27	TZ	163
3927	35	06OCT83	20:38	1046	50	27	TZ	163
3928	35	06OCT83	20:38	1046	50	27	TZ	169
3929	35	06OCT83	20:38	1046	50	27	TZ	170
3930	35	06OCT83	20:38	1046	50	27	TZ	172
3931	35	06OCT83	20:38	1046	50	27	TZ	174
3932	35	06OCT83	20:38	1046	50	27	TZ	177
3933	35	06OCT83	20:38	1046	50	27	TZ	177
3934	35	06OCT83	20:38	1046	50	27	TZ	180
3935	35	06OCT83	20:38	1046	50	27	TZ	181
3936	35	06OCT83	20:38	1046	50	27	TZ	182
3937	35	06OCT83	20:38	1046	50	27	TZ	184
3938	35	06OCT83	20:38	1046	50	27	TZ	186
3939	35	06OCT83	20:38	1046	50	27	TZ	186
3940	35	06OCT83	20:38	1046	50	27	TZ	187
3941	35	06OCT83	20:38	1046	50	27	TZ	201
3942	35	06OCT83	21:21	1047	50	28	TZ	165

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3943	35	06OCT83	21:21	1047	50	28	TZ	168
3944	35	06OCT83	21:21	1047	50	28	TZ	177
3945	35	06OCT83	21:21	1047	50	28	TZ	180
3946	35	06OCT83	21:21	1047	50	28	TZ	183
3947	35	06OCT83	21:21	1047	50	28	TZ	184
3948	35	06OCT83	21:21	1047	50	28	TZ	184
3949	35	06OCT83	21:21	1047	50	28	TZ	187
3950	35	06OCT83	21:21	1047	50	28	TZ	187
3951	35	06OCT83	21:21	1047	50	28	TZ	191
3952	35	06OCT83	21:21	1047	50	28	TZ	200
3953	35	06OCT83	21:21	1047	50	28	TZ	203
3954	35	06OCT83	21:39	1048	50	28	TZ	150
3955	35	06OCT83	21:39	1048	50	28	TZ	170
3956	35	06OCT83	21:39	1048	50	28	TZ	177
3957	35	06OCT83	21:39	1048	50	28	TZ	180
3958	35	06OCT83	21:39	1048	50	28	TZ	180
3959	35	06OCT83	21:39	1048	50	28	TZ	183
3960	35	06OCT83	21:39	1048	50	28	TZ	185
3961	35	06OCT83	21:39	1048	50	28	TZ	185
3962	35	06OCT83	21:39	1048	50	28	TZ	195
3963	35	06OCT83	22:23	1049	50	29	TZ	164
3964	35	06OCT83	22:23	1049	50	29	TZ	164
3965	35	06OCT83	22:23	1049	50	29	TZ	176
3966	35	06OCT83	22:23	1049	50	29	TZ	180
3967	35	06OCT83	22:23	1049	50	29	TZ	180
3968	35	06OCT83	22:23	1049	50	29	TZ	181
3969	35	06OCT83	22:23	1049	50	29	TZ	183
3970	35	06OCT83	22:23	1049	50	29	TZ	184
3971	35	06OCT83	22:23	1049	50	29	TZ	187
3972	35	06OCT83	22:23	1049	50	29	TZ	188
3973	35	06OCT83	22:23	1049	50	29	TZ	190
3974	35	06OCT83	22:23	1049	50	29	TZ	190
3975	35	06OCT83	22:23	1049	50	29	TZ	191
3976	35	06OCT83	22:23	1049	50	29	TZ	192
3977	35	06OCT83	22:23	1049	50	29	TZ	200
3978	35	06OCT83	22:46	1050	50	29	TZ	148
3979	35	06OCT83	22:46	1050	50	29	TZ	149
3980	35	06OCT83	22:46	1050	50	29	TZ	162
3981	35	06OCT83	22:46	1050	50	29	TZ	162
3982	35	06OCT83	22:46	1050	50	29	TZ	165
3983	35	06OCT83	22:46	1050	50	29	TZ	174
3984	35	06OCT83	22:46	1050	50	29	TZ	175
3985	35	06OCT83	22:46	1050	50	29	TZ	177
3986	35	06OCT83	22:46	1050	50	29	TZ	177
3987	35	06OCT83	22:46	1050	50	29	TZ	178
3988	35	06OCT83	22:46	1050	50	29	TZ	178
3989	35	06OCT83	22:46	1050	50	29	TZ	180
3990	35	06OCT83	22:46	1050	50	29	TZ	181
3991	35	06OCT83	22:46	1050	50	29	TZ	186
3992	35	06OCT83	22:46	1050	50	29	TZ	189
3993	35	06OCT83	22:46	1050	50	29	TZ	190
3994	35	06OCT83	22:46	1050	50	29	TZ	191
3995	35	06OCT83	22:46	1050	50	29	TZ	191
3996	35	06OCT83	22:46	1050	50	29	TZ	191

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
3997	35	060CT83	22:46	1050	50	29	TZ	191
3998	35	060CT83	22:46	1050	50	29	TZ	192
3999	35	060CT83	22:46	1050	50	29	TZ	195
4000	35	060CT83	22:46	1050	50	29	TZ	195
4001	35	060CT83	22:46	1050	50	29	TZ	196
4002	35	060CT83	22:46	1050	50	29	TZ	199
4003	35	060CT83	22:46	1050	50	29	TZ	208
4004	35	060CT83	22:46	1050	50	29	TZ	209
4005	35	060CT83	22:46	1050	50	29	TZ	213
4006	35	060CT83	22:46	1050	50	29	TZ	214
4007	35	060CT83	23:10	1051	50	29	TZ	162
4008	35	060CT83	23:10	1051	50	29	TZ	164
4009	35	060CT83	23:10	1051	50	29	TZ	172
4010	35	060CT83	23:10	1051	50	29	TZ	172
4011	35	060CT83	23:10	1051	50	29	TZ	175
4012	35	060CT83	23:10	1051	50	29	TZ	182
4013	35	060CT83	23:10	1051	50	29	TZ	182
4014	35	060CT83	23:10	1051	50	29	TZ	182
4015	35	060CT83	23:10	1051	50	29	TZ	183
4016	35	060CT83	23:10	1051	50	29	TZ	186
4017	35	060CT83	23:10	1051	50	29	TZ	188
4018	35	060CT83	23:10	1051	50	29	TZ	189
4019	35	060CT83	23:10	1051	50	29	TZ	190
4020	35	060CT83	23:10	1051	50	29	TZ	190
4021	35	060CT83	23:10	1051	50	29	TZ	190
4022	35	060CT83	23:10	1051	50	29	TZ	192
4023	35	060CT83	23:10	1051	50	29	TZ	192
4024	35	060CT83	23:10	1051	50	29	TZ	192
4025	35	060CT83	23:10	1051	50	29	TZ	193
4026	35	060CT83	23:10	1051	50	29	TZ	195
4027	35	060CT83	23:10	1051	50	29	TZ	199
4028	35	060CT83	23:10	1051	50	29	TZ	200
4029	35	060CT83	23:42	1052	50	29	TZ	168
4030	35	060CT83	23:42	1052	50	29	TZ	176
4031	35	060CT83	23:42	1052	50	29	TZ	177
4032	35	060CT83	23:42	1052	50	29	TZ	181
4033	35	060CT83	23:42	1052	50	29	TZ	181
4034	35	060CT83	23:42	1052	50	29	TZ	186
4035	35	060CT83	23:42	1052	50	29	TZ	192
4036	35	060CT83	23:42	1052	50	29	TZ	200
4037	35	060CT83	23:42	1052	50	29	TZ	210
4038	35	070CT83	1:22	1055	50	30	TZ	148
4039	35	070CT83	1:22	1055	50	30	TZ	154
4040	35	070CT83	1:22	1055	50	30	TZ	160
4041	35	070CT83	1:22	1055	50	30	TZ	160
4042	35	070CT83	1:22	1055	50	30	TZ	162
4043	35	070CT83	1:22	1055	50	30	TZ	163
4044	35	070CT83	1:22	1055	50	30	TZ	165
4045	35	070CT83	1:22	1055	50	30	TZ	167
4046	35	070CT83	1:22	1055	50	30	TZ	167
4047	35	070CT83	1:22	1055	50	30	TZ	167
4048	35	070CT83	1:22	1055	50	30	TZ	167
4049	35	070CT83	1:22	1055	50	30	TZ	168
4050	35	070CT83	1:22	1055	50	30	TZ	168

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4051	35	07OCT83	1:22	1055	50	30	TZ	168
4052	35	07OCT83	1:22	1055	50	30	TZ	168
4053	35	07OCT83	1:22	1055	50	30	TZ	169
4054	35	07OCT83	1:22	1055	50	30	TZ	171
4055	35	07OCT83	1:22	1055	50	30	TZ	171
4056	35	07OCT83	1:22	1055	50	30	TZ	171
4057	35	07OCT83	1:22	1055	50	30	TZ	172
4058	35	07OCT83	1:22	1055	50	30	TZ	173
4059	35	07OCT83	1:22	1055	50	30	TZ	173
4060	35	07OCT83	1:22	1055	50	30	TZ	174
4061	35	07OCT83	1:22	1055	50	30	TZ	175
4062	35	07OCT83	1:22	1055	50	30	TZ	175
4063	35	07OCT83	1:22	1055	50	30	TZ	175
4064	35	07OCT83	1:22	1055	50	30	TZ	180
4065	35	07OCT83	1:22	1055	50	30	TZ	180
4066	35	07OCT83	1:22	1055	50	30	TZ	181
4067	35	07OCT83	1:22	1055	50	30	TZ	181
4068	35	07OCT83	1:22	1055	50	30	TZ	182
4069	35	07OCT83	1:22	1055	50	30	TZ	182
4070	35	07OCT83	1:22	1055	50	30	TZ	182
4071	35	07OCT83	1:22	1055	50	30	TZ	184
4072	35	07OCT83	1:22	1055	50	30	TZ	184
4073	35	07OCT83	1:22	1055	50	30	TZ	185
4074	35	07OCT83	1:22	1055	50	30	TZ	187
4075	35	07OCT83	1:22	1055	50	30	TZ	187
4076	35	07OCT83	1:22	1055	50	30	TZ	188
4077	35	07OCT83	1:22	1055	50	30	TZ	189
4078	35	07OCT83	1:22	1055	50	30	TZ	189
4079	35	07OCT83	1:22	1055	50	30	TZ	190
4080	35	07OCT83	1:22	1055	50	30	TZ	190
4081	35	07OCT83	1:22	1055	50	30	TZ	190
4082	35	07OCT83	1:22	1055	50	30	TZ	193
4083	35	07OCT83	1:22	1055	50	30	TZ	194
4084	35	07OCT83	1:22	1055	50	30	TZ	194
4085	35	07OCT83	1:22	1055	50	30	TZ	194
4086	35	07OCT83	1:22	1055	50	30	TZ	195
4087	35	07OCT83	1:22	1055	50	30	TZ	195
4088	35	07OCT83	1:22	1055	50	30	TZ	195
4089	35	07OCT83	1:22	1055	50	30	TZ	195
4090	35	07OCT83	1:22	1055	50	30	TZ	195
4091	35	07OCT83	1:22	1055	50	30	TZ	195
4092	35	07OCT83	1:22	1055	50	30	TZ	195
4093	35	07OCT83	1:22	1055	50	30	TZ	196
4094	35	07OCT83	1:22	1055	50	30	TZ	196
4095	35	07OCT83	1:22	1055	50	30	TZ	199
4096	35	07OCT83	1:22	1055	50	30	TZ	199
4097	35	07OCT83	1:22	1055	50	30	TZ	201
4098	35	07OCT83	1:22	1055	50	30	TZ	202
4099	35	07OCT83	1:22	1055	50	30	TZ	204
4100	35	07OCT83	1:22	1055	50	30	TZ	204
4101	35	07OCT83	1:22	1055	50	30	TZ	204
4102	35	07OCT83	1:22	1055	50	30	TZ	205
4103	35	07OCT83	2:01	1056	50	30	TZ	90
4104	35	07OCT83	2:01	1056	50	30	TZ	125

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4105	35	07OCT83	2:01	1056	50	30	TZ	150
4106	35	07OCT83	2:01	1056	50	30	TZ	151
4107	35	07OCT83	2:01	1056	50	30	TZ	153
4108	35	07OCT83	2:01	1056	50	30	TZ	157
4109	35	07OCT83	2:01	1056	50	30	TZ	157
4110	35	07OCT83	2:01	1056	50	30	TZ	158
4111	35	07OCT83	2:01	1056	50	30	TZ	158
4112	35	07OCT83	2:01	1056	50	30	TZ	160
4113	35	07OCT83	2:01	1056	50	30	TZ	162
4114	35	07OCT83	2:01	1056	50	30	TZ	162
4115	35	07OCT83	2:01	1056	50	30	TZ	163
4116	35	07OCT83	2:01	1056	50	30	TZ	163
4117	35	07OCT83	2:01	1056	50	30	TZ	163
4118	35	07OCT83	2:01	1056	50	30	TZ	165
4119	35	07OCT83	2:01	1056	50	30	TZ	167
4120	35	07OCT83	2:01	1056	50	30	TZ	167
4121	35	07OCT83	2:01	1056	50	30	TZ	167
4122	35	07OCT83	2:01	1056	50	30	TZ	168
4123	35	07OCT83	2:01	1056	50	30	TZ	170
4124	35	07OCT83	2:01	1056	50	30	TZ	170
4125	35	07OCT83	2:01	1056	50	30	TZ	170
4126	35	07OCT83	2:01	1056	50	30	TZ	170
4127	35	07OCT83	2:01	1056	50	30	TZ	171
4128	35	07OCT83	2:01	1056	50	30	TZ	171
4129	35	07OCT83	2:01	1056	50	30	TZ	171
4130	35	07OCT83	2:01	1056	50	30	TZ	171
4131	35	07OCT83	2:01	1056	50	30	TZ	172
4132	35	07OCT83	2:01	1056	50	30	TZ	172
4133	35	07OCT83	2:01	1056	50	30	TZ	172
4134	35	07OCT83	2:01	1056	50	30	TZ	172
4135	35	07OCT83	2:01	1056	50	30	TZ	172
4136	35	07OCT83	2:01	1056	50	30	TZ	173
4137	35	07OCT83	2:01	1056	50	30	TZ	173
4138	35	07OCT83	2:01	1056	50	30	TZ	173
4139	35	07OCT83	2:01	1056	50	30	TZ	174
4140	35	07OCT83	2:01	1056	50	30	TZ	174
4141	35	07OCT83	2:01	1056	50	30	TZ	175
4142	35	07OCT83	2:01	1056	50	30	TZ	175
4143	35	07OCT83	2:01	1056	50	30	TZ	175
4144	35	07OCT83	2:01	1056	50	30	TZ	176
4145	35	07OCT83	2:01	1056	50	30	TZ	177
4146	35	07OCT83	2:01	1056	50	30	TZ	177
4147	35	07OCT83	2:01	1056	50	30	TZ	177
4148	35	07OCT83	2:01	1056	50	30	TZ	177
4149	35	07OCT83	2:01	1056	50	30	TZ	177
4150	35	07OCT83	2:01	1056	50	30	TZ	177
4151	35	07OCT83	2:01	1056	50	30	TZ	178
4152	35	07OCT83	2:01	1056	50	30	TZ	178
4153	35	07OCT83	2:01	1056	50	30	TZ	178
4154	35	07OCT83	2:01	1056	50	30	TZ	178
4155	35	07OCT83	2:01	1056	50	30	TZ	179
4156	35	07OCT83	2:01	1056	50	30	TZ	180
4157	35	07OCT83	2:01	1056	50	30	TZ	180
4158	35	07OCT83	2:01	1056	50	30	TZ	180

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4159	35	07OCT83	2:01	1056	50	30	TZ	181
4160	35	07OCT83	2:01	1056	50	30	TZ	181
4161	35	07OCT83	2:01	1056	50	30	TZ	181
4162	35	07OCT83	2:01	1056	50	30	TZ	182
4163	35	07OCT83	2:01	1056	50	30	TZ	182
4164	35	07OCT83	2:01	1056	50	30	TZ	183
4165	35	07OCT83	2:01	1056	50	30	TZ	183
4166	35	07OCT83	2:01	1056	50	30	TZ	183
4167	35	07OCT83	2:01	1056	50	30	TZ	183
4168	35	07OCT83	2:01	1056	50	30	TZ	183
4169	35	07OCT83	2:01	1056	50	30	TZ	184
4170	35	07OCT83	2:01	1056	50	30	TZ	185
4171	35	07OCT83	2:01	1056	50	30	TZ	185
4172	35	07OCT83	2:01	1056	50	30	TZ	185
4173	35	07OCT83	2:01	1056	50	30	TZ	185
4174	35	07OCT83	2:01	1056	50	30	TZ	185
4175	35	07OCT83	2:01	1056	50	30	TZ	185
4176	35	07OCT83	2:01	1056	50	30	TZ	185
4177	35	07OCT83	2:01	1056	50	30	TZ	185
4178	35	07OCT83	2:01	1056	50	30	TZ	186
4179	35	07OCT83	2:01	1056	50	30	TZ	187
4180	35	07OCT83	2:01	1056	50	30	TZ	187
4181	35	07OCT83	2:01	1056	50	30	TZ	187
4182	35	07OCT83	2:01	1056	50	30	TZ	187
4183	35	07OCT83	2:01	1056	50	30	TZ	188
4184	35	07OCT83	2:01	1056	50	30	TZ	188
4185	35	07OCT83	2:01	1056	50	30	TZ	188
4186	35	07OCT83	2:01	1056	50	30	TZ	188
4187	35	07OCT83	2:01	1056	50	30	TZ	190
4188	35	07OCT83	2:01	1056	50	30	TZ	190
4189	35	07OCT83	2:01	1056	50	30	TZ	190
4190	35	07OCT83	2:01	1056	50	30	TZ	190
4191	35	07OCT83	2:01	1056	50	30	TZ	191
4192	35	07OCT83	2:01	1056	50	30	TZ	191
4193	35	07OCT83	2:01	1056	50	30	TZ	192
4194	35	07OCT83	2:01	1056	50	30	TZ	193
4195	35	07OCT83	2:01	1056	50	30	TZ	193
4196	35	07OCT83	2:01	1056	50	30	TZ	195
4197	35	07OCT83	2:01	1056	50	30	TZ	195
4198	35	07OCT83	2:01	1056	50	30	TZ	200
4199	35	07OCT83	2:01	1056	50	30	TZ	200
4200	35	07OCT83	2:01	1056	50	30	TZ	200
4201	35	07OCT83	2:01	1056	50	30	TZ	202
4202	35	07OCT83	2:01	1056	50	30	TZ	205
4203	35	07OCT83	2:01	1056	50	30	TZ	205
4204	35	07OCT83	2:01	1056	50	30	TZ	205
4205	35	07OCT83	2:01	1056	50	30	TZ	206
4206	35	07OCT83	2:01	1056	50	30	TZ	208
4207	35	07OCT83	2:01	1056	50	30	TZ	208
4208	35	17OCT83	20:29	2	50	38	CH	112
4209	35	17OCT83	20:29	2	50	38	CH	116
4210	35	17OCT83	20:29	2	50	38	CH	119
4211	35	17OCT83	20:29	2	50	38	CH	122
4212	35	17OCT83	20:29	2	50	38	CH	124

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4213	35	17OCT83	20:29	2	50	38	CH	125
4214	35	17OCT83	20:29	2	50	38	CH	128
4215	35	17OCT83	20:29	2	50	38	CH	128
4216	35	17OCT83	20:29	2	50	38	CH	132
4217	35	17OCT83	20:29	2	50	38	CH	135
4218	35	17OCT83	20:29	2	50	38	CH	135
4219	35	17OCT83	20:29	2	50	38	CH	135
4220	35	17OCT83	20:29	2	50	38	CH	136
4221	35	17OCT83	20:29	2	50	38	CH	136
4222	35	17OCT83	20:29	2	50	38	CH	136
4223	35	17OCT83	20:29	2	50	38	CH	137
4224	35	17OCT83	20:29	2	50	38	CH	137
4225	35	17OCT83	20:29	2	50	38	CH	138
4226	35	17OCT83	20:29	2	50	38	CH	138
4227	35	17OCT83	20:29	2	50	38	CH	138
4228	35	17OCT83	20:29	2	50	38	CH	139
4229	35	17OCT83	20:29	2	50	38	CH	140
4230	35	17OCT83	20:29	2	50	38	CH	140
4231	35	17OCT83	20:29	2	50	38	CH	141
4232	35	17OCT83	20:29	2	50	38	CH	141
4233	35	17OCT83	20:29	2	50	38	CH	142
4234	35	17OCT83	20:29	2	50	38	CH	143
4235	35	17OCT83	20:29	2	50	38	CH	144
4236	35	17OCT83	20:29	2	50	38	CH	145
4237	35	17OCT83	20:29	2	50	38	CH	145
4238	35	17OCT83	20:29	2	50	38	CH	145
4239	35	17OCT83	20:29	2	50	38	CH	145
4240	35	17OCT83	20:29	2	50	38	CH	145
4241	35	17OCT83	20:29	2	50	38	CH	145
4242	35	17OCT83	20:29	2	50	38	CH	146
4243	35	17OCT83	20:29	2	50	38	CH	146
4244	35	17OCT83	20:29	2	50	38	CH	146
4245	35	17OCT83	20:29	2	50	38	CH	146
4246	35	17OCT83	20:29	2	50	38	CH	146
4247	35	17OCT83	20:29	2	50	38	CH	146
4248	35	17OCT83	20:29	2	50	38	CH	147
4249	35	17OCT83	20:29	2	50	38	CH	147
4250	35	17OCT83	20:29	2	50	38	CH	147
4251	35	17OCT83	20:29	2	50	38	CH	147
4252	35	17OCT83	20:29	2	50	38	CH	147
4253	35	17OCT83	20:29	2	50	38	CH	147
4254	35	17OCT83	20:29	2	50	38	CH	147
4255	35	17OCT83	20:29	2	50	38	CH	147
4256	35	17OCT83	20:29	2	50	38	CH	147
4257	35	17OCT83	20:29	2	50	38	CH	147
4258	35	17OCT83	20:29	2	50	38	CH	147
4259	35	17OCT83	20:29	2	50	38	CH	148
4260	35	17OCT83	20:29	2	50	38	CH	148
4261	35	17OCT83	20:29	2	50	38	CH	148
4262	35	17OCT83	20:29	2	50	38	CH	148
4263	35	17OCT83	20:29	2	50	38	CH	148
4264	35	17OCT83	20:29	2	50	38	CH	148
4265	35	17OCT83	20:29	2	50	38	CH	148
4266	35	17OCT83	20:29	2	50	38	CH	148

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4267	35	17OCT83	20:29	2	50	38	CH	149
4268	35	17OCT83	20:29	2	50	38	CH	149
4269	35	17OCT83	20:29	2	50	38	CH	149
4270	35	17OCT83	20:29	2	50	38	CH	150
4271	35	17OCT83	20:29	2	50	38	CH	150
4272	35	17OCT83	20:29	2	50	38	CH	150
4273	35	17OCT83	20:29	2	50	38	CH	150
4274	35	17OCT83	20:29	2	50	38	CH	150
4275	35	17OCT83	20:29	2	50	38	CH	150
4276	35	17OCT83	20:29	2	50	38	CH	150
4277	35	17OCT83	20:29	2	50	38	CH	150
4278	35	17OCT83	20:29	2	50	38	CH	151
4279	35	17OCT83	20:29	2	50	38	CH	151
4280	35	17OCT83	20:29	2	50	38	CH	151
4281	35	17OCT83	20:29	2	50	38	CH	151
4282	35	17OCT83	20:29	2	50	38	CH	151
4283	35	17OCT83	20:29	2	50	38	CH	152
4284	35	17OCT83	20:29	2	50	38	CH	152
4285	35	17OCT83	20:29	2	50	38	CH	152
4286	35	17OCT83	20:29	2	50	38	CH	152
4287	35	17OCT83	20:29	2	50	38	CH	152
4288	35	17OCT83	20:29	2	50	38	CH	153
4289	35	17OCT83	20:29	2	50	38	CH	153
4290	35	17OCT83	20:29	2	50	38	CH	153
4291	35	17OCT83	20:29	2	50	38	CH	153
4292	35	17OCT83	20:29	2	50	38	CH	153
4293	35	17OCT83	20:29	2	50	38	CH	153
4294	35	17OCT83	20:29	2	50	38	CH	153
4295	35	17OCT83	20:29	2	50	38	CH	153
4296	35	17OCT83	20:29	2	50	38	CH	153
4297	35	17OCT83	20:29	2	50	38	CH	154
4298	35	17OCT83	20:29	2	50	38	CH	154
4299	35	17OCT83	20:29	2	50	38	CH	154
4300	35	17OCT83	20:29	2	50	38	CH	154
4301	35	17OCT83	20:29	2	50	38	CH	154
4302	35	17OCT83	20:29	2	50	38	CH	154
4303	35	17OCT83	20:29	2	50	38	CH	155
4304	35	17OCT83	20:29	2	50	38	CH	155
4305	35	17OCT83	20:29	2	50	38	CH	155
4306	35	17OCT83	20:29	2	50	38	CH	155
4307	35	17OCT83	20:29	2	50	38	CH	155
4308	35	17OCT83	20:29	2	50	38	CH	155
4309	35	17OCT83	20:29	2	50	38	CH	156
4310	35	17OCT83	20:29	2	50	38	CH	156
4311	35	17OCT83	20:29	2	50	38	CH	156
4312	35	17OCT83	20:29	2	50	38	CH	156
4313	35	17OCT83	20:29	2	50	38	CH	157
4314	35	17OCT83	20:29	2	50	38	CH	157
4315	35	17OCT83	20:29	2	50	38	CH	157
4316	35	17OCT83	20:29	2	50	38	CH	157
4317	35	17OCT83	20:29	2	50	38	CH	157
4318	35	17OCT83	20:29	2	50	38	CH	157
4319	35	17OCT83	20:29	2	50	38	CH	157
4320	35	17OCT83	20:29	2	50	38	CH	158

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4321	35	17OCT83	20:29	2	50	38	CH	158
4322	35	17OCT83	20:29	2	50	38	CH	158
4323	35	17OCT83	20:29	2	50	38	CH	158
4324	35	17OCT83	20:29	2	50	38	CH	158
4325	35	17OCT83	20:29	2	50	38	CH	158
4326	35	17OCT83	20:29	2	50	38	CH	159
4327	35	17OCT83	20:29	2	50	38	CH	159
4328	35	17OCT83	20:29	2	50	38	CH	159
4329	35	17OCT83	20:29	2	50	38	CH	159
4330	35	17OCT83	20:29	2	50	38	CH	160
4331	35	17OCT83	20:29	2	50	38	CH	160
4332	35	17OCT83	20:29	2	50	38	CH	160
4333	35	17OCT83	20:29	2	50	38	CH	160
4334	35	17OCT83	20:29	2	50	38	CH	160
4335	35	17OCT83	20:29	2	50	38	CH	160
4336	35	17OCT83	20:29	2	50	38	CH	160
4337	35	17OCT83	20:29	2	50	38	CH	161
4338	35	17OCT83	20:29	2	50	38	CH	161
4339	35	17OCT83	20:29	2	50	38	CH	161
4340	35	17OCT83	20:29	2	50	38	CH	161
4341	35	17OCT83	20:29	2	50	38	CH	162
4342	35	17OCT83	20:29	2	50	38	CH	162
4343	35	17OCT83	20:29	2	50	38	CH	162
4344	35	17OCT83	20:29	2	50	38	CH	162
4345	35	17OCT83	20:29	2	50	38	CH	163
4346	35	17OCT83	20:29	2	50	38	CH	163
4347	35	17OCT83	20:29	2	50	38	CH	163
4348	35	17OCT83	20:29	2	50	38	CH	163
4349	35	17OCT83	20:29	2	50	38	CH	163
4350	35	17OCT83	20:29	2	50	38	CH	163
4351	35	17OCT83	20:29	2	50	38	CH	163
4352	35	17OCT83	20:29	2	50	38	CH	164
4353	35	17OCT83	20:29	2	50	38	CH	164
4354	35	17OCT83	20:29	2	50	38	CH	164
4355	35	17OCT83	20:29	2	50	38	CH	164
4356	35	17OCT83	20:29	2	50	38	CH	164
4357	35	17OCT83	20:29	2	50	38	CH	165
4358	35	17OCT83	20:29	2	50	38	CH	165
4359	35	17OCT83	20:29	2	50	38	CH	165
4360	35	17OCT83	20:29	2	50	38	CH	165
4361	35	17OCT83	20:29	2	50	38	CH	165
4362	35	17OCT83	20:29	2	50	38	CH	166
4363	35	17OCT83	20:29	2	50	38	CH	166
4364	35	17OCT83	20:29	2	50	38	CH	166
4365	35	17OCT83	20:29	2	50	38	CH	166
4366	35	17OCT83	20:29	2	50	38	CH	167
4367	35	17OCT83	20:29	2	50	38	CH	167
4368	35	17OCT83	20:29	2	50	38	CH	167
4369	35	17OCT83	20:29	2	50	38	CH	167
4370	35	17OCT83	20:29	2	50	38	CH	167
4371	35	17OCT83	20:29	2	50	38	CH	167
4372	35	17OCT83	20:29	2	50	38	CH	167
4373	35	17OCT83	20:29	2	50	38	CH	168
4374	35	17OCT83	20:29	2	50	38	CH	168

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4375	35	17OCT83	20:29	2	50	38	CH	168
4376	35	17OCT83	20:29	2	50	38	CH	168
4377	35	17OCT83	20:29	2	50	38	CH	168
4378	35	17OCT83	20:29	2	50	38	CH	168
4379	35	17OCT83	20:29	2	50	38	CH	168
4380	35	17OCT83	20:29	2	50	38	CH	168
4381	35	17OCT83	20:29	2	50	38	CH	168
4382	35	17OCT83	20:29	2	50	38	CH	169
4383	35	17OCT83	20:29	2	50	38	CH	169
4384	35	17OCT83	20:29	2	50	38	CH	169
4385	35	17OCT83	20:29	2	50	38	CH	169
4386	35	17OCT83	20:29	2	50	38	CH	169
4387	35	17OCT83	20:29	2	50	38	CH	169
4388	35	17OCT83	20:29	2	50	38	CH	170
4389	35	17OCT83	20:29	2	50	38	CH	170
4390	35	17OCT83	20:29	2	50	38	CH	170
4391	35	17OCT83	20:29	2	50	38	CH	170
4392	35	17OCT83	20:29	2	50	38	CH	170
4393	35	17OCT83	20:29	2	50	38	CH	171
4394	35	17OCT83	20:29	2	50	38	CH	171
4395	35	17OCT83	20:29	2	50	38	CH	171
4396	35	17OCT83	20:29	2	50	38	CH	171
4397	35	17OCT83	20:29	2	50	38	CH	171
4398	35	17OCT83	20:29	2	50	38	CH	171
4399	35	17OCT83	20:29	2	50	38	CH	172
4400	35	17OCT83	20:29	2	50	38	CH	172
4401	35	17OCT83	20:29	2	50	38	CH	172
4402	35	17OCT83	20:29	2	50	38	CH	172
4403	35	17OCT83	20:29	2	50	38	CH	172
4404	35	17OCT83	20:29	2	50	38	CH	172
4405	35	17OCT83	20:29	2	50	38	CH	172
4406	35	17OCT83	20:29	2	50	38	CH	172
4407	35	17OCT83	20:29	2	50	38	CH	173
4408	35	17OCT83	20:29	2	50	38	CH	173
4409	35	17OCT83	20:29	2	50	38	CH	173
4410	35	17OCT83	20:29	2	50	38	CH	173
4411	35	17OCT83	20:29	2	50	38	CH	173
4412	35	17OCT83	20:29	2	50	38	CH	173
4413	35	17OCT83	20:29	2	50	38	CH	173
4414	35	17OCT83	20:29	2	50	38	CH	174
4415	35	17OCT83	20:29	2	50	38	CH	174
4416	35	17OCT83	20:29	2	50	38	CH	174
4417	35	17OCT83	20:29	2	50	38	CH	174
4418	35	17OCT83	20:29	2	50	38	CH	174
4419	35	17OCT83	20:29	2	50	38	CH	174
4420	35	17OCT83	20:29	2	50	38	CH	175
4421	35	17OCT83	20:29	2	50	38	CH	175
4422	35	17OCT83	20:29	2	50	38	CH	175
4423	35	17OCT83	20:29	2	50	38	CH	175
4424	35	17OCT83	20:29	2	50	38	CH	175
4425	35	17OCT83	20:29	2	50	38	CH	175
4426	35	17OCT83	20:29	2	50	38	CH	175
4427	35	17OCT83	20:29	2	50	38	CH	176
4428	35	17OCT83	20:29	2	50	38	CH	176

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4429	35	17OCT83	20:29	2	50	38	CH	176
4430	35	17OCT83	20:29	2	50	38	CH	176
4431	35	17OCT83	20:29	2	50	38	CH	176
4432	35	17OCT83	20:29	2	50	38	CH	177
4433	35	17OCT83	20:29	2	50	38	CH	177
4434	35	17OCT83	20:29	2	50	38	CH	177
4435	35	17OCT83	20:29	2	50	38	CH	177
4436	35	17OCT83	20:29	2	50	38	CH	178
4437	35	17OCT83	20:29	2	50	38	CH	178
4438	35	17OCT83	20:29	2	50	38	CH	178
4439	35	17OCT83	20:29	2	50	38	CH	179
4440	35	17OCT83	20:29	2	50	38	CH	180
4441	35	17OCT83	20:29	2	50	38	CH	180
4442	35	17OCT83	20:29	2	50	38	CH	180
4443	35	17OCT83	20:29	2	50	38	CH	180
4444	35	17OCT83	20:29	2	50	38	CH	181
4445	35	17OCT83	20:29	2	50	38	CH	181
4446	35	17OCT83	20:29	2	50	38	CH	182
4447	35	17OCT83	20:29	2	50	38	CH	183
4448	35	17OCT83	20:29	2	50	38	CH	183
4449	35	17OCT83	20:29	2	50	38	CH	184
4450	35	17OCT83	20:29	2	50	38	CH	184
4451	35	17OCT83	20:29	2	50	38	CH	185
4452	35	17OCT83	20:29	2	50	38	CH	185
4453	35	17OCT83	20:29	2	50	38	CH	187
4454	35	17OCT83	20:29	2	50	38	CH	187
4455	35	17OCT83	20:29	2	50	38	CH	187
4456	35	17OCT83	20:29	2	50	38	CH	188
4457	35	17OCT83	20:29	2	50	38	CH	190
4458	35	17OCT83	20:29	2	50	38	CH	191
4459	35	17OCT83	20:29	2	50	38	CH	191
4460	35	17OCT83	20:29	2	50	38	CH	191
4461	35	17OCT83	20:29	2	50	38	CH	192
4462	35	17OCT83	20:29	2	50	38	CH	193
4463	35	17OCT83	20:29	2	50	38	CH	195
4464	35	17OCT83	20:29	2	50	38	CH	195
4465	35	17OCT83	20:29	2	50	38	CH	196
4466	35	17OCT83	20:29	2	50	38	CH	196
4467	35	17OCT83	20:29	2	50	38	CH	198
4468	35	17OCT83	20:29	2	50	38	CH	201
4469	35	17OCT83	20:29	2	50	38	CH	203
4470	35	17OCT83	20:29	2	50	38	CH	204
4471	35	17OCT83	20:51	3	50	38	CH	110
4472	35	17OCT83	20:51	3	50	38	CH	116
4473	35	17OCT83	20:51	3	50	38	CH	117
4474	35	17OCT83	20:51	3	50	38	CH	125
4475	35	17OCT83	20:51	3	50	38	CH	127
4476	35	17OCT83	20:51	3	50	38	CH	130
4477	35	17OCT83	20:51	3	50	38	CH	135
4478	35	17OCT83	20:51	3	50	38	CH	137
4479	35	17OCT83	20:51	3	50	38	CH	138
4480	35	17OCT83	20:51	3	50	38	CH	139
4481	35	17OCT83	20:51	3	50	38	CH	139
4482	35	17OCT83	20:51	3	50	38	CH	140

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4483	35	17OCT83	20:51	3	50	38	CH	140
4484	35	17OCT83	20:51	3	50	38	CH	141
4485	35	17OCT83	20:51	3	50	38	CH	141
4486	35	17OCT83	20:51	3	50	38	CH	141
4487	35	17OCT83	20:51	3	50	38	CH	141
4488	35	17OCT83	20:51	3	50	38	CH	141
4489	35	17OCT83	20:51	3	50	38	CH	142
4490	35	17OCT83	20:51	3	50	38	CH	142
4491	35	17OCT83	20:51	3	50	38	CH	143
4492	35	17OCT83	20:51	3	50	38	CH	143
4493	35	17OCT83	20:51	3	50	38	CH	145
4494	35	17OCT83	20:51	3	50	38	CH	146
4495	35	17OCT83	20:51	3	50	38	CH	148
4496	35	17OCT83	20:51	3	50	38	CH	148
4497	35	17OCT83	20:51	3	50	38	CH	149
4498	35	17OCT83	20:51	3	50	38	CH	149
4499	35	17OCT83	20:51	3	50	38	CH	149
4500	35	17OCT83	20:51	3	50	38	CH	149
4501	35	17OCT83	20:51	3	50	38	CH	150
4502	35	17OCT83	20:51	3	50	38	CH	150
4503	35	17OCT83	20:51	3	50	38	CH	150
4504	35	17OCT83	20:51	3	50	38	CH	150
4505	35	17OCT83	20:51	3	50	38	CH	151
4506	35	17OCT83	20:51	3	50	38	CH	151
4507	35	17OCT83	20:51	3	50	38	CH	151
4508	35	17OCT83	20:51	3	50	38	CH	152
4509	35	17OCT83	20:51	3	50	38	CH	152
4510	35	17OCT83	20:51	3	50	38	CH	152
4511	35	17OCT83	20:51	3	50	38	CH	152
4512	35	17OCT83	20:51	3	50	38	CH	153
4513	35	17OCT83	20:51	3	50	38	CH	153
4514	35	17OCT83	20:51	3	50	38	CH	154
4515	35	17OCT83	20:51	3	50	38	CH	154
4516	35	17OCT83	20:51	3	50	38	CH	154
4517	35	17OCT83	20:51	3	50	38	CH	155
4518	35	17OCT83	20:51	3	50	38	CH	155
4519	35	17OCT83	20:51	3	50	38	CH	155
4520	35	17OCT83	20:51	3	50	38	CH	155
4521	35	17OCT83	20:51	3	50	38	CH	155
4522	35	17OCT83	20:51	3	50	38	CH	155
4523	35	17OCT83	20:51	3	50	38	CH	156
4524	35	17OCT83	20:51	3	50	38	CH	156
4525	35	17OCT83	20:51	3	50	38	CH	156
4526	35	17OCT83	20:51	3	50	38	CH	157
4527	35	17OCT83	20:51	3	50	38	CH	158
4528	35	17OCT83	20:51	3	50	38	CH	158
4529	35	17OCT83	20:51	3	50	38	CH	158
4530	35	17OCT83	20:51	3	50	38	CH	159
4531	35	17OCT83	20:51	3	50	38	CH	159
4532	35	17OCT83	20:51	3	50	38	CH	159
4533	35	17OCT83	20:51	3	50	38	CH	159
4534	35	17OCT83	20:51	3	50	38	CH	160
4535	35	17OCT83	20:51	3	50	38	CH	160
4536	35	17OCT83	20:51	3	50	38	CH	160

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4537	35	170CT83	20:51	3	50	38	CH	160
4538	35	170CT83	20:51	3	50	38	CH	160
4539	35	170CT83	20:51	3	50	38	CH	160
4540	35	170CT83	20:51	3	50	38	CH	161
4541	35	170CT83	20:51	3	50	38	CH	161
4542	35	170CT83	20:51	3	50	38	CH	162
4543	35	170CT83	20:51	3	50	38	CH	162
4544	35	170CT83	20:51	3	50	38	CH	162
4545	35	170CT83	20:51	3	50	38	CH	163
4546	35	170CT83	20:51	3	50	38	CH	165
4547	35	170CT83	20:51	3	50	38	CH	165
4548	35	170CT83	20:51	3	50	38	CH	165
4549	35	170CT83	20:51	3	50	38	CH	165
4550	35	170CT83	20:51	3	50	38	CH	166
4551	35	170CT83	20:51	3	50	38	CH	167
4552	35	170CT83	20:51	3	50	38	CH	168
4553	35	170CT83	20:51	3	50	38	CH	168
4554	35	170CT83	20:51	3	50	38	CH	168
4555	35	170CT83	20:51	3	50	38	CH	168
4556	35	170CT83	20:51	3	50	38	CH	168
4557	35	170CT83	20:51	3	50	38	CH	168
4558	35	170CT83	20:51	3	50	38	CH	168
4559	35	170CT83	20:51	3	50	38	CH	169
4560	35	170CT83	20:51	3	50	38	CH	170
4561	35	170CT83	20:51	3	50	38	CH	170
4562	35	170CT83	20:51	3	50	38	CH	170
4563	35	170CT83	20:51	3	50	38	CH	171
4564	35	170CT83	20:51	3	50	38	CH	173
4565	35	170CT83	20:51	3	50	38	CH	174
4566	35	170CT83	20:51	3	50	38	CH	174
4567	35	170CT83	20:51	3	50	38	CH	175
4568	35	170CT83	20:51	3	50	38	CH	175
4569	35	170CT83	20:51	3	50	38	CH	175
4570	35	170CT83	20:51	3	50	38	CH	176
4571	35	170CT83	20:51	3	50	38	CH	176
4572	35	170CT83	20:51	3	50	38	CH	176
4573	35	170CT83	20:51	3	50	38	CH	177
4574	35	170CT83	20:51	3	50	38	CH	178
4575	35	170CT83	20:51	3	50	38	CH	180
4576	35	170CT83	20:51	3	50	38	CH	182
4577	35	170CT83	20:51	3	50	38	CH	188
4578	35	170CT83	20:51	3	50	38	CH	188
4579	35	170CT83	20:51	3	50	38	CH	192
4580	35	170CT83	20:51	3	50	38	CH	192
4581	35	170CT83	20:51	3	50	38	CH	193
4582	35	170CT83	21:55	4	50	38	CH	116
4583	35	170CT83	21:55	4	50	38	CH	117
4584	35	170CT83	21:55	4	50	38	CH	117
4585	35	170CT83	21:55	4	50	38	CH	121
4586	35	170CT83	21:55	4	50	38	CH	123
4587	35	170CT83	21:55	4	50	38	CH	127
4588	35	170CT83	21:55	4	50	38	CH	129
4589	35	170CT83	21:55	4	50	38	CH	130
4590	35	170CT83	21:55	4	50	38	CH	132

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4591	35	170C183	21:55	4	50	38	CH	137
4592	35	170C183	21:55	4	50	38	CH	138
4593	35	170C183	21:55	4	50	38	CH	140
4594	35	170C183	21:55	4	50	38	CH	140
4595	35	170C183	21:55	4	50	38	CH	140
4596	35	170C183	21:55	4	50	38	CH	141
4597	35	170C183	21:55	4	50	38	CH	141
4598	35	170C183	21:55	4	50	38	CH	141
4599	35	170C183	21:55	4	50	38	CH	142
4600	35	170C183	21:55	4	50	38	CH	142
4601	35	170C183	21:55	4	50	38	CH	143
4602	35	170C183	21:55	4	50	38	CH	143
4603	35	170C183	21:55	4	50	38	CH	145
4604	35	170C183	21:55	4	50	38	CH	146
4605	35	170C183	21:55	4	50	38	CH	146
4606	35	170C183	21:55	4	50	38	CH	146
4607	35	170C183	21:55	4	50	38	CH	146
4608	35	170C183	21:55	4	50	38	CH	147
4609	35	170C183	21:55	4	50	38	CH	149
4610	35	170C183	21:55	4	50	38	CH	152
4611	35	170C183	21:55	4	50	38	CH	152
4612	35	170C183	21:55	4	50	38	CH	152
4613	35	170C183	21:55	4	50	38	CH	153
4614	35	170C183	21:55	4	50	38	CH	153
4615	35	170C183	21:55	4	50	38	CH	155
4616	35	170C183	21:55	4	50	38	CH	155
4617	35	170C183	21:55	4	50	38	CH	156
4618	35	170C183	21:55	4	50	38	CH	156
4619	35	170C183	21:55	4	50	38	CH	157
4620	35	170C183	21:55	4	50	38	CH	157
4621	35	170C183	21:55	4	50	38	CH	157
4622	35	170C183	21:55	4	50	38	CH	158
4623	35	170C183	21:55	4	50	38	CH	158
4624	35	170C183	21:55	4	50	38	CH	160
4625	35	170C183	21:55	4	50	38	CH	161
4626	35	170C183	21:55	4	50	38	CH	161
4627	35	170C183	21:55	4	50	38	CH	162
4628	35	170C183	21:55	4	50	38	CH	162
4629	35	170C183	21:55	4	50	38	CH	162
4630	35	170C183	21:55	4	50	38	CH	162
4631	35	170C183	21:55	4	50	38	CH	162
4632	35	170C183	21:55	4	50	38	CH	162
4633	35	170C183	21:55	4	50	38	CH	163
4634	35	170C183	21:55	4	50	38	CH	164
4635	35	170C183	21:55	4	50	38	CH	164
4636	35	170C183	21:55	4	50	38	CH	165
4637	35	170C183	21:55	4	50	38	CH	166
4638	35	170C183	21:55	4	50	38	CH	166
4639	35	170C183	21:55	4	50	38	CH	167
4640	35	170C183	21:55	4	50	38	CH	167
4641	35	170C183	21:55	4	50	38	CH	167
4642	35	170C183	21:55	4	50	38	CH	168
4643	35	170C183	21:55	4	50	38	CH	168
4644	35	170C183	21:55	4	50	38	CH	168

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4645	35	170CT83	21:55	4	50	38	CH	170
4646	35	170CT83	21:55	4	50	38	CH	170
4647	35	170CT83	21:55	4	50	38	CH	170
4648	35	170CT83	21:55	4	50	38	CH	171
4649	35	170CT83	21:55	4	50	38	CH	172
4650	35	170CT83	21:55	4	50	38	CH	172
4651	35	170CT83	21:55	4	50	38	CH	172
4652	35	170CT83	21:55	4	50	38	CH	173
4653	35	170CT83	21:55	4	50	38	CH	173
4654	35	170CT83	21:55	4	50	38	CH	174
4655	35	170CT83	21:55	4	50	38	CH	174
4656	35	170CT83	21:55	4	50	38	CH	175
4657	35	170CT83	21:55	4	50	38	CH	175
4658	35	170CT83	21:55	4	50	38	CH	175
4659	35	170CT83	21:55	4	50	38	CH	176
4660	35	170CT83	21:55	4	50	38	CH	176
4661	35	170CT83	21:55	4	50	38	CH	178
4662	35	170CT83	21:55	4	50	38	CH	181
4663	35	170CT83	21:55	4	50	38	CH	181
4664	35	170CT83	21:55	4	50	38	CH	181
4665	35	170CT83	21:55	4	50	38	CH	181
4666	35	170CT83	21:55	4	50	38	CH	181
4667	35	170CT83	21:55	4	50	38	CH	182
4668	35	170CT83	21:55	4	50	38	CH	183
4669	35	170CT83	21:55	4	50	38	CH	184
4670	35	170CT83	21:55	4	50	38	CH	190
4671	35	170CT83	21:55	4	50	38	CH	195
4672	35	170CT83	21:55	4	50	38	CH	196
4673	35	170CT83	21:55	4	50	38	CH	197
4674	35	170CT83	22:10	5	50	38	CH	112
4675	35	170CT83	22:10	5	50	38	CH	116
4676	35	170CT83	22:10	5	50	38	CH	117
4677	35	170CT83	22:10	5	50	38	CH	120
4678	35	170CT83	22:10	5	50	38	CH	120
4679	35	170CT83	22:10	5	50	38	CH	121
4680	35	170CT83	22:10	5	50	38	CH	121
4681	35	170CT83	22:10	5	50	38	CH	125
4682	35	170CT83	22:10	5	50	38	CH	127
4683	35	170CT83	22:10	5	50	38	CH	130
4684	35	170CT83	22:10	5	50	38	CH	137
4685	35	170CT83	22:10	5	50	38	CH	140
4686	35	170CT83	22:10	5	50	38	CH	140
4687	35	170CT83	22:10	5	50	38	CH	141
4688	35	170CT83	22:10	5	50	38	CH	142
4689	35	170CT83	22:10	5	50	38	CH	143
4690	35	170CT83	22:10	5	50	38	CH	143
4691	35	170CT83	22:10	5	50	38	CH	143
4692	35	170CT83	22:10	5	50	38	CH	143
4693	35	170CT83	22:10	5	50	38	CH	144
4694	35	170CT83	22:10	5	50	38	CH	146
4695	35	170CT83	22:10	5	50	38	CH	146
4696	35	170CT83	22:10	5	50	38	CH	146
4697	35	170CT83	22:10	5	50	38	CH	146
4698	35	170CT83	22:10	5	50	38	CH	147

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4699	35	17OCT83	22:10	5	50	38	CH	147
4700	35	17OCT83	22:10	5	50	38	CH	148
4701	35	17OCT83	22:10	5	50	38	CH	148
4702	35	17OCT83	22:10	5	50	38	CH	150
4703	35	17OCT83	22:10	5	50	38	CH	150
4704	35	17OCT83	22:10	5	50	38	CH	150
4705	35	17OCT83	22:10	5	50	38	CH	150
4706	35	17OCT83	22:10	5	50	38	CH	150
4707	35	17OCT83	22:10	5	50	38	CH	150
4708	35	17OCT83	22:10	5	50	38	CH	150
4709	35	17OCT83	22:10	5	50	38	CH	151
4710	35	17OCT83	22:10	5	50	38	CH	151
4711	35	17OCT83	22:10	5	50	38	CH	151
4712	35	17OCT83	22:10	5	50	38	CH	152
4713	35	17OCT83	22:10	5	50	38	CH	153
4714	35	17OCT83	22:10	5	50	38	CH	153
4715	35	17OCT83	22:10	5	50	38	CH	153
4716	35	17OCT83	22:10	5	50	38	CH	153
4717	35	17OCT83	22:10	5	50	38	CH	156
4718	35	17OCT83	22:10	5	50	38	CH	156
4719	35	17OCT83	22:10	5	50	38	CH	156
4720	35	17OCT83	22:10	5	50	38	CH	156
4721	35	17OCT83	22:10	5	50	38	CH	156
4722	35	17OCT83	22:10	5	50	38	CH	158
4723	35	17OCT83	22:10	5	50	38	CH	158
4724	35	17OCT83	22:10	5	50	38	CH	159
4725	35	17OCT83	22:10	5	50	38	CH	160
4726	35	17OCT83	22:10	5	50	38	CH	160
4727	35	17OCT83	22:10	5	50	38	CH	161
4728	35	17OCT83	22:10	5	50	38	CH	161
4729	35	17OCT83	22:10	5	50	38	CH	161
4730	35	17OCT83	22:10	5	50	38	CH	162
4731	35	17OCT83	22:10	5	50	38	CH	163
4732	35	17OCT83	22:10	5	50	38	CH	163
4733	35	17OCT83	22:10	5	50	38	CH	163
4734	35	17OCT83	22:10	5	50	38	CH	164
4735	35	17OCT83	22:10	5	50	38	CH	166
4736	35	17OCT83	22:10	5	50	38	CH	167
4737	35	17OCT83	22:10	5	50	38	CH	168
4738	35	17OCT83	22:10	5	50	38	CH	168
4739	35	17OCT83	22:10	5	50	38	CH	169
4740	35	17OCT83	22:10	5	50	38	CH	170
4741	35	17OCT83	22:10	5	50	38	CH	170
4742	35	17OCT83	22:10	5	50	38	CH	170
4743	35	17OCT83	22:10	5	50	38	CH	171
4744	35	17OCT83	22:10	5	50	38	CH	172
4745	35	17OCT83	22:10	5	50	38	CH	172
4746	35	17OCT83	22:10	5	50	38	CH	172
4747	35	17OCT83	22:10	5	50	38	CH	174
4748	35	17OCT83	22:10	5	50	38	CH	175
4749	35	17OCT83	22:10	5	50	38	CH	175
4750	35	17OCT83	22:10	5	50	38	CH	177
4751	35	17OCT83	22:10	5	50	38	CH	177
4752	35	17OCT83	22:10	5	50	38	CH	179

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4753	35	170CT83	22:10	5	50	38	CH	179
4754	35	170CT83	22:10	5	50	38	CH	179
4755	35	170CT83	22:10	5	50	38	CH	180
4756	35	170CT83	22:10	5	50	38	CH	182
4757	35	170CT83	22:10	5	50	38	CH	183
4758	35	170CT83	22:10	5	50	38	CH	183
4759	35	170CT83	22:10	5	50	38	CH	183
4760	35	170CT83	22:10	5	50	38	CH	184
4761	35	170CT83	22:10	5	50	38	CH	185
4762	35	170CT83	22:10	5	50	38	CH	190
4763	35	170CT83	22:10	5	50	38	CH	197
4764	35	170CT83	22:10	5	50	38	CH	223
4765	35	170CT83	22:49	6	50	37	CH	125
4766	35	170CT83	22:49	6	50	37	CH	126
4767	35	170CT83	22:49	6	50	37	CH	128
4768	35	170CT83	22:49	6	50	37	CH	128
4769	35	170CT83	22:49	6	50	37	CH	132
4770	35	170CT83	22:49	6	50	37	CH	135
4771	35	170CT83	22:49	6	50	37	CH	135
4772	35	170CT83	22:49	6	50	37	CH	135
4773	35	170CT83	22:49	6	50	37	CH	136
4774	35	170CT83	22:49	6	50	37	CH	136
4775	35	170CT83	22:49	6	50	37	CH	137
4776	35	170CT83	22:49	6	50	37	CH	137
4777	35	170CT83	22:49	6	50	37	CH	137
4778	35	170CT83	22:49	6	50	37	CH	138
4779	35	170CT83	22:49	6	50	37	CH	139
4780	35	170CT83	22:49	6	50	37	CH	140
4781	35	170CT83	22:49	6	50	37	CH	141
4782	35	170CT83	22:49	6	50	37	CH	141
4783	35	170CT83	22:49	6	50	37	CH	141
4784	35	170CT83	22:49	6	50	37	CH	141
4785	35	170CT83	22:49	6	50	37	CH	141
4786	35	170CT83	22:49	6	50	37	CH	142
4787	35	170CT83	22:49	6	50	37	CH	143
4788	35	170CT83	22:49	6	50	37	CH	144
4789	35	170CT83	22:49	6	50	37	CH	144
4790	35	170CT83	22:49	6	50	37	CH	144
4791	35	170CT83	22:49	6	50	37	CH	144
4792	35	170CT83	22:49	6	50	37	CH	145
4793	35	170CT83	22:49	6	50	37	CH	145
4794	35	170CT83	22:49	6	50	37	CH	145
4795	35	170CT83	22:49	6	50	37	CH	145
4796	35	170CT83	22:49	6	50	37	CH	146
4797	35	170CT83	22:49	6	50	37	CH	146
4798	35	170CT83	22:49	6	50	37	CH	146
4799	35	170CT83	22:49	6	50	37	CH	146
4800	35	170CT83	22:49	6	50	37	CH	146
4801	35	170CT83	22:49	6	50	37	CH	147
4802	35	170CT83	22:49	6	50	37	CH	147
4803	35	170CT83	22:49	6	50	37	CH	148
4804	35	170CT83	22:49	6	50	37	CH	148
4805	35	170CT83	22:49	6	50	37	CH	148
4806	35	170CT83	22:49	6	50	37	CH	148

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4807	35	170CT83	22:49	6	50	37	CH	148
4808	35	170CT83	22:49	6	50	37	CH	148
4809	35	170CT83	22:49	6	50	37	CH	149
4810	35	170CT83	22:49	6	50	37	CH	149
4811	35	170CT83	22:49	6	50	37	CH	149
4812	35	170CT83	22:49	6	50	37	CH	149
4813	35	170CT83	22:49	6	50	37	CH	149
4814	35	170CT83	22:49	6	50	37	CH	150
4815	35	170CT83	22:49	6	50	37	CH	150
4816	35	170CT83	22:49	6	50	37	CH	151
4817	35	170CT83	22:49	6	50	37	CH	151
4818	35	170CT83	22:49	6	50	37	CH	151
4819	35	170CT83	22:49	6	50	37	CH	151
4820	35	170CT83	22:49	6	50	37	CH	151
4821	35	170CT83	22:49	6	50	37	CH	151
4822	35	170CT83	22:49	6	50	37	CH	151
4823	35	170CT83	22:49	6	50	37	CH	152
4824	35	170CT83	22:49	6	50	37	CH	154
4825	35	170CT83	22:49	6	50	37	CH	154
4826	35	170CT83	22:49	6	50	37	CH	154
4827	35	170CT83	22:49	6	50	37	CH	155
4828	35	170CT83	22:49	6	50	37	CH	155
4829	35	170CT83	22:49	6	50	37	CH	155
4830	35	170CT83	22:49	6	50	37	CH	155
4831	35	170CT83	22:49	6	50	37	CH	155
4832	35	170CT83	22:49	6	50	37	CH	155
4833	35	170CT83	22:49	6	50	37	CH	156
4834	35	170CT83	22:49	6	50	37	CH	156
4835	35	170CT83	22:49	6	50	37	CH	156
4836	35	170CT83	22:49	6	50	37	CH	156
4837	35	170CT83	22:49	6	50	37	CH	157
4838	35	170CT83	22:49	6	50	37	CH	157
4839	35	170CT83	22:49	6	50	37	CH	157
4840	35	170CT83	22:49	6	50	37	CH	157
4841	35	170CT83	22:49	6	50	37	CH	157
4842	35	170CT83	22:49	6	50	37	CH	158
4843	35	170CT83	22:49	6	50	37	CH	158
4844	35	170CT83	22:49	6	50	37	CH	158
4845	35	170CT83	22:49	6	50	37	CH	159
4846	35	170CT83	22:49	6	50	37	CH	159
4847	35	170CT83	22:49	6	50	37	CH	159
4848	35	170CT83	22:49	6	50	37	CH	160
4849	35	170CT83	22:49	6	50	37	CH	160
4850	35	170CT83	22:49	6	50	37	CH	161
4851	35	170CT83	22:49	6	50	37	CH	161
4852	35	170CT83	22:49	6	50	37	CH	161
4853	35	170CT83	22:49	6	50	37	CH	161
4854	35	170CT83	22:49	6	50	37	CH	161
4855	35	170CT83	22:49	6	50	37	CH	162
4856	35	170CT83	22:49	6	50	37	CH	162
4857	35	170CT83	22:49	6	50	37	CH	162
4858	35	170CT83	22:49	6	50	37	CH	162
4859	35	170CT83	22:49	6	50	37	CH	162
4860	35	170CT83	22:49	6	50	37	CH	163

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4861	35	17OCT83	22:49	6	50	37	CH	163
4862	35	17OCT83	22:49	6	50	37	CH	163
4863	35	17OCT83	22:49	6	50	37	CH	163
4864	35	17OCT83	22:49	6	50	37	CH	163
4865	35	17OCT83	22:49	6	50	37	CH	164
4866	35	17OCT83	22:49	6	50	37	CH	164
4867	35	17OCT83	22:49	6	50	37	CH	164
4868	35	17OCT83	22:49	6	50	37	CH	165
4869	35	17OCT83	22:49	6	50	37	CH	165
4870	35	17OCT83	22:49	6	50	37	CH	165
4871	35	17OCT83	22:49	6	50	37	CH	166
4872	35	17OCT83	22:49	6	50	37	CH	167
4873	35	17OCT83	22:49	6	50	37	CH	167
4874	35	17OCT83	22:49	6	50	37	CH	167
4875	35	17OCT83	22:49	6	50	37	CH	167
4876	35	17OCT83	22:49	6	50	37	CH	167
4877	35	17OCT83	22:49	6	50	37	CH	168
4878	35	17OCT83	22:49	6	50	37	CH	168
4879	35	17OCT83	22:49	6	50	37	CH	169
4880	35	17OCT83	22:49	6	50	37	CH	169
4881	35	17OCT83	22:49	6	50	37	CH	170
4882	35	17OCT83	22:49	6	50	37	CH	170
4883	35	17OCT83	22:49	6	50	37	CH	171
4884	35	17OCT83	22:49	6	50	37	CH	171
4885	35	17OCT83	22:49	6	50	37	CH	171
4886	35	17OCT83	22:49	6	50	37	CH	172
4887	35	17OCT83	22:49	6	50	37	CH	172
4888	35	17OCT83	22:49	6	50	37	CH	172
4889	35	17OCT83	22:49	6	50	37	CH	173
4890	35	17OCT83	22:49	6	50	37	CH	173
4891	35	17OCT83	22:49	6	50	37	CH	173
4892	35	17OCT83	22:49	6	50	37	CH	174
4893	35	17OCT83	22:49	6	50	37	CH	174
4894	35	17OCT83	22:49	6	50	37	CH	175
4895	35	17OCT83	22:49	6	50	37	CH	175
4896	35	17OCT83	22:49	6	50	37	CH	175
4897	35	17OCT83	22:49	6	50	37	CH	176
4898	35	17OCT83	22:49	6	50	37	CH	176
4899	35	17OCT83	22:49	6	50	37	CH	176
4900	35	17OCT83	22:49	6	50	37	CH	177
4901	35	17OCT83	22:49	6	50	37	CH	178
4902	35	17OCT83	22:49	6	50	37	CH	178
4903	35	17OCT83	22:49	6	50	37	CH	179
4904	35	17OCT83	22:49	6	50	37	CH	180
4905	35	17OCT83	22:49	6	50	37	CH	180
4906	35	17OCT83	22:49	6	50	37	CH	183
4907	35	17OCT83	22:49	6	50	37	CH	187
4908	35	17OCT83	22:49	6	50	37	CH	187
4909	35	17OCT83	22:49	6	50	37	CH	188
4910	35	17OCT83	22:49	6	50	37	CH	189
4911	35	17OCT83	22:49	6	50	37	CH	189
4912	35	17OCT83	22:49	6	50	37	CH	192
4913	35	17OCT83	22:49	6	50	37	CH	193
4914	35	17OCT83	22:49	6	50	37	CH	195

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4915	35	17OCT83	22:49	6	50	37	CH	195
4916	35	17OCT83	23:09	7	50	36	CH	102
4917	35	17OCT83	23:09	7	50	36	CH	105
4918	35	17OCT83	23:09	7	50	36	CH	109
4919	35	17OCT83	23:09	7	50	36	CH	110
4920	35	17OCT83	23:09	7	50	36	CH	111
4921	35	17OCT83	23:09	7	50	36	CH	112
4922	35	17OCT83	23:09	7	50	36	CH	112
4923	35	17OCT83	23:09	7	50	36	CH	112
4924	35	17OCT83	23:09	7	50	36	CH	112
4925	35	17OCT83	23:09	7	50	36	CH	112
4926	35	17OCT83	23:09	7	50	36	CH	112
4927	35	17OCT83	23:09	7	50	36	CH	113
4928	35	17OCT83	23:09	7	50	36	CH	115
4929	35	17OCT83	23:09	7	50	36	CH	115
4930	35	17OCT83	23:09	7	50	36	CH	115
4931	35	17OCT83	23:09	7	50	36	CH	115
4932	35	17OCT83	23:09	7	50	36	CH	115
4933	35	17OCT83	23:09	7	50	36	CH	115
4934	35	17OCT83	23:09	7	50	36	CH	115
4935	35	17OCT83	23:09	7	50	36	CH	116
4936	35	17OCT83	23:09	7	50	36	CH	116
4937	35	17OCT83	23:09	7	50	36	CH	116
4938	35	17OCT83	23:09	7	50	36	CH	116
4939	35	17OCT83	23:09	7	50	36	CH	117
4940	35	17OCT83	23:09	7	50	36	CH	117
4941	35	17OCT83	23:09	7	50	36	CH	117
4942	35	17OCT83	23:09	7	50	36	CH	117
4943	35	17OCT83	23:09	7	50	36	CH	117
4944	35	17OCT83	23:09	7	50	36	CH	118
4945	35	17OCT83	23:09	7	50	36	CH	118
4946	35	17OCT83	23:09	7	50	36	CH	118
4947	35	17OCT83	23:09	7	50	36	CH	118
4948	35	17OCT83	23:09	7	50	36	CH	119
4949	35	17OCT83	23:09	7	50	36	CH	120
4950	35	17OCT83	23:09	7	50	36	CH	120
4951	35	17OCT83	23:09	7	50	36	CH	120
4952	35	17OCT83	23:09	7	50	36	CH	120
4953	35	17OCT83	23:09	7	50	36	CH	120
4954	35	17OCT83	23:09	7	50	36	CH	120
4955	35	17OCT83	23:09	7	50	36	CH	121
4956	35	17OCT83	23:09	7	50	36	CH	121
4957	35	17OCT83	23:09	7	50	36	CH	121
4958	35	17OCT83	23:09	7	50	36	CH	121
4959	35	17OCT83	23:09	7	50	36	CH	121
4960	35	17OCT83	23:09	7	50	36	CH	122
4961	35	17OCT83	23:09	7	50	36	CH	122
4962	35	17OCT83	23:09	7	50	36	CH	122
4963	35	17OCT83	23:09	7	50	36	CH	122
4964	35	17OCT83	23:09	7	50	36	CH	122
4965	35	17OCT83	23:09	7	50	36	CH	122
4966	35	17OCT83	23:09	7	50	36	CH	122
4967	35	17OCT83	23:09	7	50	36	CH	123
4968	35	17OCT83	23:09	7	50	36	CH	123

OCTOBER 1983 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
4969	35	17OCT83	23:09	7	50	36	CH	123
4970	35	17OCT83	23:09	7	50	36	CH	123
4971	35	17OCT83	23:09	7	50	36	CH	123
4972	35	17OCT83	23:09	7	50	36	CH	123
4973	35	17OCT83	23:09	7	50	36	CH	123
4974	35	17OCT83	23:09	7	50	36	CH	124
4975	35	17OCT83	23:09	7	50	36	CH	124
4976	35	17OCT83	23:09	7	50	36	CH	124
4977	35	17OCT83	23:09	7	50	36	CH	124
4978	35	17OCT83	23:09	7	50	36	CH	125
4979	35	17OCT83	23:09	7	50	36	CH	125
4980	35	17OCT83	23:09	7	50	36	CH	125
4981	35	17OCT83	23:09	7	50	36	CH	125
4982	35	17OCT83	23:09	7	50	36	CH	125
4983	35	17OCT83	23:09	7	50	36	CH	126
4984	35	17OCT83	23:09	7	50	36	CH	126
4985	35	17OCT83	23:09	7	50	36	CH	127
4986	35	17OCT83	23:09	7	50	36	CH	127
4987	35	17OCT83	23:09	7	50	36	CH	127
4988	35	17OCT83	23:09	7	50	36	CH	127
4989	35	17OCT83	23:09	7	50	36	CH	130
4990	35	17OCT83	23:09	7	50	36	CH	130
4991	35	17OCT83	23:09	7	50	36	CH	130
4992	35	17OCT83	23:09	7	50	36	CH	130
4993	35	17OCT83	23:09	7	50	36	CH	130
4994	35	17OCT83	23:09	7	50	36	CH	130
4995	35	17OCT83	23:09	7	50	36	CH	131
4996	35	17OCT83	23:09	7	50	36	CH	132
4997	35	17OCT83	23:09	7	50	36	CH	132
4998	35	17OCT83	23:09	7	50	36	CH	132
4999	35	17OCT83	23:09	7	50	36	CH	132
5000	35	17OCT83	23:09	7	50	36	CH	133
5001	35	17OCT83	23:09	7	50	36	CH	133
5002	35	17OCT83	23:09	7	50	36	CH	134
5003	35	17OCT83	23:09	7	50	36	CH	134
5004	35	17OCT83	23:09	7	50	36	CH	134
5005	35	17OCT83	23:09	7	50	36	CH	134
5006	35	17OCT83	23:09	7	50	36	CH	134
5007	35	17OCT83	23:09	7	50	36	CH	135
5008	35	17OCT83	23:09	7	50	36	CH	135
5009	35	17OCT83	23:09	7	50	36	CH	135
5010	35	17OCT83	23:09	7	50	36	CH	135
5011	35	17OCT83	23:09	7	50	36	CH	135
5012	35	17OCT83	23:09	7	50	36	CH	136
5013	35	17OCT83	23:09	7	50	36	CH	136
5014	35	17OCT83	23:09	7	50	36	CH	136
5015	35	17OCT83	23:09	7	50	36	CH	137
5016	35	17OCT83	23:09	7	50	36	CH	137
5017	35	17OCT83	23:09	7	50	36	CH	138
5018	35	17OCT83	23:09	7	50	36	CH	138
5019	35	17OCT83	23:09	7	50	36	CH	138
5020	35	17OCT83	23:09	7	50	36	CH	138
5021	35	17OCT83	23:09	7	50	36	CH	138
5022	35	17OCT83	23:09	7	50	36	CH	138

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
5023	35	17OCT83	23:09	7	50	36	CH	138
5024	35	17OCT83	23:09	7	50	36	CH	138
5025	35	17OCT83	23:09	7	50	36	CH	139
5026	35	17OCT83	23:09	7	50	36	CH	139
5027	35	17OCT83	23:09	7	50	36	CH	140
5028	35	17OCT83	23:09	7	50	36	CH	140
5029	35	17OCT83	23:09	7	50	36	CH	140
5030	35	17OCT83	23:09	7	50	36	CH	140
5031	35	17OCT83	23:09	7	50	36	CH	140
5032	35	17OCT83	23:09	7	50	36	CH	140
5033	35	17OCT83	23:09	7	50	36	CH	140
5034	35	17OCT83	23:09	7	50	36	CH	141
5035	35	17OCT83	23:09	7	50	36	CH	141
5036	35	17OCT83	23:09	7	50	36	CH	141
5037	35	17OCT83	23:09	7	50	36	CH	141
5038	35	17OCT83	23:09	7	50	36	CH	142
5039	35	17OCT83	23:09	7	50	36	CH	142
5040	35	17OCT83	23:09	7	50	36	CH	142
5041	35	17OCT83	23:09	7	50	36	CH	142
5042	35	17OCT83	23:09	7	50	36	CH	143
5043	35	17OCT83	23:09	7	50	36	CH	143
5044	35	17OCT83	23:09	7	50	36	CH	143
5045	35	17OCT83	23:09	7	50	36	CH	143
5046	35	17OCT83	23:09	7	50	36	CH	144
5047	35	17OCT83	23:09	7	50	36	CH	145
5048	35	17OCT83	23:09	7	50	36	CH	145
5049	35	17OCT83	23:09	7	50	36	CH	145
5050	35	17OCT83	23:09	7	50	36	CH	145
5051	35	17OCT83	23:09	7	50	36	CH	145
5052	35	17OCT83	23:09	7	50	36	CH	145
5053	35	17OCT83	23:09	7	50	36	CH	145
5054	35	17OCT83	23:09	7	50	36	CH	146
5055	35	17OCT83	23:09	7	50	36	CH	146
5056	35	17OCT83	23:09	7	50	36	CH	146
5057	35	17OCT83	23:09	7	50	36	CH	146
5058	35	17OCT83	23:09	7	50	36	CH	147
5059	35	17OCT83	23:09	7	50	36	CH	147
5060	35	17OCT83	23:09	7	50	36	CH	147
5061	35	17OCT83	23:09	7	50	36	CH	147
5062	35	17OCT83	23:09	7	50	36	CH	147
5063	35	17OCT83	23:09	7	50	36	CH	147
5064	35	17OCT83	23:09	7	50	36	CH	147
5065	35	17OCT83	23:09	7	50	36	CH	147
5066	35	17OCT83	23:09	7	50	36	CH	148
5067	35	17OCT83	23:09	7	50	36	CH	148
5068	35	17OCT83	23:09	7	50	36	CH	148
5069	35	17OCT83	23:09	7	50	36	CH	149
5070	35	17OCT83	23:09	7	50	36	CH	149
5071	35	17OCT83	23:09	7	50	36	CH	149
5072	35	17OCT83	23:09	7	50	36	CH	149
5073	35	17OCT83	23:09	7	50	36	CH	150
5074	35	17OCT83	23:09	7	50	36	CH	150
5075	35	17OCT83	23:09	7	50	36	CH	150
5076	35	17OCT83	23:09	7	50	36	CH	150

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
5077	35	17OCT83	23:09	7	50	36	CH	150
5078	35	17OCT83	23:09	7	50	36	CH	150
5079	35	17OCT83	23:09	7	50	36	CH	150
5080	35	17OCT83	23:09	7	50	36	CH	150
5081	35	17OCT83	23:09	7	50	36	CH	150
5082	35	17OCT83	23:09	7	50	36	CH	150
5083	35	17OCT83	23:09	7	50	36	CH	151
5084	35	17OCT83	23:09	7	50	36	CH	151
5085	35	17OCT83	23:09	7	50	36	CH	151
5086	35	17OCT83	23:09	7	50	36	CH	152
5087	35	17OCT83	23:09	7	50	36	CH	152
5088	35	17OCT83	23:09	7	50	36	CH	152
5089	35	17OCT83	23:09	7	50	36	CH	152
5090	35	17OCT83	23:09	7	50	36	CH	153
5091	35	17OCT83	23:09	7	50	36	CH	153
5092	35	17OCT83	23:09	7	50	36	CH	154
5093	35	17OCT83	23:09	7	50	36	CH	154
5094	35	17OCT83	23:09	7	50	36	CH	154
5095	35	17OCT83	23:09	7	50	36	CH	154
5096	35	17OCT83	23:09	7	50	36	CH	155
5097	35	17OCT83	23:09	7	50	36	CH	155
5098	35	17OCT83	23:09	7	50	36	CH	155
5099	35	17OCT83	23:09	7	50	36	CH	155
5100	35	17OCT83	23:09	7	50	36	CH	155
5101	35	17OCT83	23:09	7	50	36	CH	155
5102	35	17OCT83	23:09	7	50	36	CH	155
5103	35	17OCT83	23:09	7	50	36	CH	155
5104	35	17OCT83	23:09	7	50	36	CH	155
5105	35	17OCT83	23:09	7	50	36	CH	156
5106	35	17OCT83	23:09	7	50	36	CH	156
5107	35	17OCT83	23:09	7	50	36	CH	156
5108	35	17OCT83	23:09	7	50	36	CH	157
5109	35	17OCT83	23:09	7	50	36	CH	157
5110	35	17OCT83	23:09	7	50	36	CH	158
5111	35	17OCT83	23:09	7	50	36	CH	158
5112	35	17OCT83	23:09	7	50	36	CH	159
5113	35	17OCT83	23:09	7	50	36	CH	160
5114	35	17OCT83	23:09	7	50	36	CH	160
5115	35	17OCT83	23:09	7	50	36	CH	161
5116	35	17OCT83	23:09	7	50	36	CH	161
5117	35	17OCT83	23:09	7	50	36	CH	161
5118	35	17OCT83	23:09	7	50	36	CH	161
5119	35	17OCT83	23:09	7	50	36	CH	161
5120	35	17OCT83	23:09	7	50	36	CH	161
5121	35	17OCT83	23:09	7	50	36	CH	162
5122	35	17OCT83	23:09	7	50	36	CH	162
5123	35	17OCT83	23:09	7	50	36	CH	162
5124	35	17OCT83	23:09	7	50	36	CH	162
5125	35	17OCT83	23:09	7	50	36	CH	162
5126	35	17OCT83	23:09	7	50	36	CH	162
5127	35	17OCT83	23:09	7	50	36	CH	162
5128	35	17OCT83	23:09	7	50	36	CH	163
5129	35	17OCT83	23:09	7	50	36	CH	163
5130	35	17OCT83	23:09	7	50	36	CH	163

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
5131	35	17OCT83	23:09	7	50	36	CH	163
5132	35	17OCT83	23:09	7	50	36	CH	163
5133	35	17OCT83	23:09	7	50	36	CH	163
5134	35	17OCT83	23:09	7	50	36	CH	164
5135	35	17OCT83	23:09	7	50	36	CH	164
5136	35	17OCT83	23:09	7	50	36	CH	165
5137	35	17OCT83	23:09	7	50	36	CH	165
5138	35	17OCT83	23:09	7	50	36	CH	165
5139	35	17OCT83	23:09	7	50	36	CH	165
5140	35	17OCT83	23:09	7	50	36	CH	166
5141	35	17OCT83	23:09	7	50	36	CH	166
5142	35	17OCT83	23:09	7	50	36	CH	167
5143	35	17OCT83	23:09	7	50	36	CH	168
5144	35	17OCT83	23:09	7	50	36	CH	168
5145	35	17OCT83	23:09	7	50	36	CH	168
5146	35	17OCT83	23:09	7	50	36	CH	168
5147	35	17OCT83	23:09	7	50	36	CH	170
5148	35	17OCT83	23:09	7	50	36	CH	170
5149	35	17OCT83	23:09	7	50	36	CH	170
5150	35	17OCT83	23:09	7	50	36	CH	170
5151	35	17OCT83	23:09	7	50	36	CH	171
5152	35	17OCT83	23:09	7	50	36	CH	172
5153	35	17OCT83	23:09	7	50	36	CH	174
5154	35	17OCT83	23:09	7	50	36	CH	174
5155	35	17OCT83	23:09	7	50	36	CH	174
5156	35	17OCT83	23:09	7	50	36	CH	174
5157	35	17OCT83	23:09	7	50	36	CH	175
5158	35	17OCT83	23:09	7	50	36	CH	176
5159	35	17OCT83	23:09	7	50	36	CH	177
5160	35	17OCT83	23:09	7	50	36	CH	177
5161	35	17OCT83	23:09	7	50	36	CH	177
5162	35	17OCT83	23:09	7	50	36	CH	178
5163	35	17OCT83	23:09	7	50	36	CH	178
5164	35	17OCT83	23:09	7	50	36	CH	180
5165	35	17OCT83	23:09	7	50	36	CH	180
5166	35	17OCT83	23:09	7	50	36	CH	180
5167	35	17OCT83	23:09	7	50	36	CH	182
5168	35	17OCT83	23:09	7	50	36	CH	182
5169	35	17OCT83	23:09	7	50	36	CH	182
5170	35	17OCT83	23:09	7	50	36	CH	182
5171	35	17OCT83	23:09	7	50	36	CH	184
5172	35	17OCT83	23:09	7	50	36	CH	186
5173	35	17OCT83	23:09	7	50	36	CH	187
5174	35	17OCT83	23:09	7	50	36	CH	191
5175	35	17OCT83	23:09	7	50	36	CH	192
5176	35	17OCT83	23:09	7	50	36	CH	193
5177	35	17OCT83	23:09	7	50	36	CH	194
5178	35	17OCT83	23:09	7	50	36	CH	195
5179	35	17OCT83	23:09	7	50	36	CH	206
5180	35	17OCT83	23:09	7	50	36	CH	210
5181	35	17OCT83	23:09	7	50	36	CH	211
5182	35	18OCT83	19:08	12	50	35	CH	77
5183	35	18OCT83	19:08	12	50	35	CH	137
5184	35	18OCT83	19:08	12	50	35	CH	137

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) AND WHITE PERCH(TAXON=35) LENGTH DATA
FOR 3M BEAM TRAWL (GEAR=18) AND 6.2M HIGH-RISE TRAWL (GEAR=50)

OBS	TAXON	DATE	TIME	SAMPLE	GEAR	RIV_MILE	REGION	LENGTH
5185	35	18OCT83	19:08	12	50	35	CH	138
5186	35	18OCT83	19:08	12	50	35	CH	142
5187	35	18OCT83	19:08	12	50	35	CH	144
5188	35	18OCT83	19:08	12	50	35	CH	146
5189	35	18OCT83	19:08	12	50	35	CH	147
5190	35	18OCT83	19:08	12	50	35	CH	148
5191	35	18OCT83	19:08	12	50	35	CH	151
5192	35	18OCT83	19:08	12	50	35	CH	151
5193	35	18OCT83	19:08	12	50	35	CH	153
5194	35	18OCT83	19:08	12	50	35	CH	153
5195	35	18OCT83	19:08	12	50	35	CH	154
5196	35	18OCT83	19:08	12	50	35	CH	155
5197	35	18OCT83	19:08	12	50	35	CH	155
5198	35	18OCT83	19:08	12	50	35	CH	156
5199	35	18OCT83	19:08	12	50	35	CH	157
5200	35	18OCT83	19:08	12	50	35	CH	159
5201	35	18OCT83	19:08	12	50	35	CH	161
5202	35	18OCT83	19:08	12	50	35	CH	163
5203	35	18OCT83	19:08	12	50	35	CH	163
5204	35	18OCT83	19:08	12	50	35	CH	165
5205	35	18OCT83	19:08	12	50	35	CH	165
5206	35	18OCT83	19:08	12	50	35	CH	165
5207	35	18OCT83	19:08	12	50	35	CH	165
5208	35	18OCT83	19:08	12	50	35	CH	165
5209	35	18OCT83	19:08	12	50	35	CH	165
5210	35	18OCT83	19:08	12	50	35	CH	166
5211	35	18OCT83	19:08	12	50	35	CH	166
5212	35	18OCT83	19:08	12	50	35	CH	168
5213	35	18OCT83	19:08	12	50	35	CH	169
5214	35	18OCT83	19:08	12	50	35	CH	169
5215	35	18OCT83	19:08	12	50	35	CH	169
5216	35	18OCT83	19:08	12	50	35	CH	170
5217	35	18OCT83	19:08	12	50	35	CH	171
5218	35	18OCT83	19:08	12	50	35	CH	171
5219	35	18OCT83	19:08	12	50	35	CH	172
5220	35	18OCT83	19:08	12	50	35	CH	172
5221	35	18OCT83	19:08	12	50	35	CH	173
5222	35	18OCT83	19:08	12	50	35	CH	173
5223	35	18OCT83	19:08	12	50	35	CH	173
5224	35	18OCT83	19:08	12	50	35	CH	173
5225	35	18OCT83	19:08	12	50	35	CH	177
5226	35	18OCT83	19:08	12	50	35	CH	177
5227	35	18OCT83	19:08	12	50	35	CH	178
5228	35	18OCT83	19:08	12	50	35	CH	183
5229	35	18OCT83	19:08	12	50	35	CH	194

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 1 METER SQUARE EPIBENTHIC SLED.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
1	10/05/83	20:26	6133	64	1	10	13	4	CH	37	6	2	1.5	5.0	355.25	343.44
2	10/05/83	20:35	6143	64	1	10	13	4	CH	37	6	2	1.5	5.0	387.83	374.94
3	10/05/83	20:44	6153	64	1	10	12	4	CH	37	6	2	1.5	5.0	402.99	389.60
4	10/05/83	20:54	6163	64	1	10	12	3	CH	36	6	2	1.5	5.0	405.75	392.26
5	10/05/83	21:04	6173	64	1	10	11	3	CH	35	6	2	1.5	5.0	490.36	474.06
6	10/05/83	21:18	6183	64	1	10	11	3	CH	35	6	2	1.5	5.0	419.10	405.16
7	10/05/83	21:27	6193	64	1	10	12	3	CH	35	6	2	1.5	5.0	392.70	379.65
8	10/05/83	21:40	6203	64	1	10	11	3	CH	35	6	2	1.5	5.0	379.30	366.69
9	10/05/83	21:53	6213	64	1	10	14	3	CH	34	6	2	1.5	5.0	356.85	344.98
10	10/05/83	22:01	6223	64	1	10	13	3	CH	34	6	2	1.5	5.0	413.29	399.55
11	10/05/83	22:08	6233	64	1	10	13	3	CH	34	6	2	1.5	5.0	430.54	416.23
12	10/05/83	23:12	6293	64	1	10	15	2	TZ	31	4	2	1.5	5.0	441.07	426.40
13	10/05/83	23:19	6303	64	1	10	14	2	TZ	30	4	2	1.5	5.0	405.25	391.78
14	10/05/83	23:28	6313	64	1	10	13	2	TZ	30	4	2	1.5	5.0	431.49	417.15
15	10/05/83	23:45	6323	64	1	10	11	2	TZ	30	6	2	1.5	5.0	467.26	451.72
16	10/05/83	23:58	6333	64	1	10	11	2	TZ	31	6	2	1.5	5.0	449.98	435.02
17	10/06/83	0:11	6343	64	1	10	10	3	TZ	32	6	1	1.5	5.0	491.52	475.18
18	10/06/83	0:18	6353	64	1	10	9	3	TZ	32	6	1	1.5	5.0	414.77	400.98
19	10/06/83	0:27	6363	64	1	10	13	3	TZ	33	6	1	1.5	5.0	381.38	368.70
20	10/06/83	1:14	6393	64	1	10	12	4	CH	34	6	1	1.5	5.0	395.12	381.98
21	10/06/83	1:25	6403	64	1	10	16	3	CH	35	6	1	1.5	5.0	405.45	391.97
22	10/06/83	1:54	6433	64	1	10	12	2	CH	36	6	1	1.5	5.0	396.94	383.74
23	10/06/83	2:02	6443	64	1	10	10	2	CH	36	6	1	1.5	5.0	435.43	420.95
24	10/06/83	2:08	6453	64	1	10	10	2	CH	36	6	1	1.5	5.0	407.18	393.65
25	10/06/83	2:38	6483	64	1	10	7	1	CH	36	4	1	1.5	5.0	342.14	330.77
26	10/06/83	19:58	6523	64	1	10	9	4	TZ	30	6	1	1.5	5.0	393.05	379.98
27	10/06/83	20:08	10013	64	1	10	8	3	TZ	30	6	1	1.5	5.0	405.20	391.73
28	10/06/83	20:37	10043	64	1	10	8	3	TZ	28	6	1	1.5	5.0	406.22	392.71
29	10/06/83	21:13	10073	64	1	10	11	3	TZ	30	4	2	1.5	5.0	408.00	394.43
30	10/06/83	21:21	10083	64	1	10	11	3	TZ	30	4	2	1.5	5.0	460.67	445.35
31	10/06/83	21:27	10093	64	1	10	13	2	TZ	30	4	2	1.5	5.0	398.61	385.35
32	10/06/83	21:33	10103	64	1	10	11	2	TZ	30	4	2	1.5	5.0	406.98	393.45
33	10/06/83	21:40	11753	64	1	10	12	2	TZ	29	4	2	1.5	5.0	377.03	364.50
34	10/06/83	21:47	11763	64	1	10	12	2	TZ	29	4	2	1.5	5.0	419.16	405.22
35	10/06/83	21:53	11773	64	1	10	11	2	TZ	29	4	2	1.5	5.0	367.11	354.90
36	10/06/83	21:58	11783	64	1	10	10	2	TZ	29	4	2	1.5	5.0	371.36	359.02
37	10/06/83	22:08	11793	64	1	10	12	2	TZ	28	4	2	1.5	5.0	427.77	413.54
38	10/06/83	22:14	11803	64	1	10	12	2	TZ	28	4	2	1.5	5.0	402.97	389.57
39	10/06/83	23:12	11813	64	1	10	12	2	TZ	27	4	2	1.5	5.0	396.18	383.01
40	10/06/83	23:18	11823	64	1	10	12	2	TZ	27	4	2	1.5	5.0	409.01	395.41
41	10/06/83	23:35	11833	64	1	10	14	2	TZ	26	6	2	1.5	5.0	438.32	423.75
42	10/06/83	23:59	11863	64	1	10	13	2	TZ	26	6	2	1.5	5.0	418.38	404.47
43	10/07/83	0:05	11873	64	1	10	12	2	TZ	25	6	2	1.5	5.0	392.10	379.06
44	10/07/83	0:36	11903	64	1	10	12	2	TZ	27	4	2	1.5	5.0	414.43	400.65
45	10/07/83	0:43	11913	64	1	10	11	2	TZ	26	4	2	1.5	5.0	389.76	376.80
46	10/07/83	0:50	11923	64	1	10	14	2	TZ	25	4	2	1.5	5.0	415.27	401.46
47	10/07/83	0:55	9863	64	1	9	17	1	YK	16	4	1	1.5	5.0	355.54	343.72
48	10/07/83	1:02	11933	64	1	10	15	2	TZ	25	4	2	1.5	5.0	387.67	374.78
49	10/07/83	1:03	9873	64	1	9	18	1	YK	17	4	1	1.5	5.0	372.91	360.51
50	10/07/83	1:08	9883	64	1	9	17	1	YK	18	4	1	1.5	5.0	370.02	357.71
51	10/07/83	1:15	9893	64	1	9	15	1	YK	18	4	1	1.5	5.0	399.70	386.41
52	10/07/83	1:42	9923	64	1	9	17	1	YK	21	4	1	1.5	5.0	345.21	333.73
53	10/07/83	2:10	9953	64	1	9	14	1	YK	22	4	1	1.5	5.0	405.70	392.22
54	10/07/83	2:24	9973	64	1	10	13	1	TZ	24	4	1	1.5	5.0	336.18	325.00
55	10/19/83	22:16	11313	64	1	10	11	1	CH	38	6	2	1.5	5.0	300.21	290.23

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 1 METER SQUARE EPIBENTHIC SLED.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
56	10/19/83	22:22	11323	64	1	10	11	1	CH	38	6	2	1.5	5.0	430.82	416.50
57	10/19/83	22:28	11333	64	1	10	13	1	CH	38	6	2	1.5	5.0	451.82	436.80
58	10/19/83	23:06	11383	64	1	10	15	2	CH	37	4	2	1.5	5.0	391.02	378.02
59	10/19/83	23:12	11393	64	1	10	14	2	CH	37	4	2	1.5	5.0	381.86	369.16
60	10/19/83	23:21	11403	64	1	10	17	2	CH	36	4	2	1.5	5.0	399.78	386.49
61	10/19/83	23:47	11433	64	1	10	11	2	CH	37	6	2	1.5	5.0	384.82	372.02
62	10/19/83	23:53	11443	64	1	10	11	2	CH	36	6	2	1.5	5.0	426.05	411.88
63	10/19/83	23:59	11453	64	1	10	11	2	CH	36	6	2	1.5	5.0	278.31	269.05
64	10/20/83	0:06	11463	64	1	10	10	2	CH	35	6	2	1.5	5.0	286.72	277.19
65	10/20/83	0:14	11473	64	1	10	11	2	CH	34	6	2	1.5	5.0	411.44	397.76
66	10/20/83	0:22	11483	64	1	10	12	2	CH	34	6	2	1.5	5.0	288.34	278.75
67	10/20/83	0:29	11493	64	1	10	11	2	CH	34	6	2	1.5	5.0	408.18	394.61
68	10/20/83	0:32	11503	64	1	10	12	2	CH	34	6	2	1.5	5.0	415.07	401.27
69	10/20/83	1:00	11533	64	1	10	18	3	CH	34	4	1	1.5	5.0	354.47	342.68
70	10/20/83	1:07	11543	64	1	10	13	3	CH	34	4	1	1.5	5.0	367.10	354.89
71	10/20/83	2:02	11583	64	1	10	13	3	TZ	27	4	1	1.5	5.0	314.27	303.82
72	10/20/83	2:08	11593	64	1	10	15	3	TZ	27	4	1	1.5	5.0	307.57	297.34
73	10/20/83	2:35	11633	64	1	10	10	3	TZ	28	6	1	1.5	5.0	350.09	338.45
74	10/20/83	2:41	11643	64	1	10	8	3	TZ	29	6	1	1.5	5.0	381.80	369.10
75	10/20/83	2:51	11653	64	1	10	11	3	TZ	28	4	1	1.5	5.0	340.23	328.92
76	10/20/83	2:57	11663	64	1	10	13	3	TZ	29	4	1	1.5	5.0	395.85	382.69
77	10/20/83	3:04	11673	64	1	10	12	3	TZ	29	4	1	1.5	5.0	357.70	345.81
78	10/20/83	3:11	11683	64	1	10	13	2	TZ	30	4	1	1.5	5.0	645.57	624.10
79	10/20/83	3:28	11703	64	1	10	10	3	TZ	30	6	1	1.5	5.0	425.45	411.31
80	10/20/83	3:34	11713	64	1	10	8	3	TZ	30	6	1	1.5	5.0	387.83	374.94
81	10/20/83	3:41	11723	64	1	10	8	3	TZ	31	6	1	1.5	5.0	356.87	345.01
82	10/20/83	3:52	11733	64	1	10	17	3	TZ	30	4	1	1.5	5.0	346.61	335.09
83	10/20/83	3:58	11743	64	1	10	13	3	TZ	30	4	1	1.5	5.0	337.70	326.47
84	10/20/83	4:04	11963	64	1	10	11	3	TZ	30	4	1	1.5	5.0	378.43	365.85
85	10/20/83	4:11	11973	64	1	10	14	3	TZ	30	4	1	1.5	5.0	450.61	435.63
86	10/20/83	4:17	11983	64	1	10	14	3	TZ	30	4	1	1.5	5.0	263.93	255.16
87	10/20/83	5:17	12063	64	1	10	9	3	TZ	32	6	1	1.5	5.0	346.10	334.59
88	10/20/83	5:23	12073	64	1	10	8	3	TZ	32	6	1	1.5	5.0	403.64	390.22
89	10/20/83	5:30	12083	64	1	10	10	3	TZ	32	6	1	1.5	5.0	384.49	371.71
90	10/20/83	5:37	12093	64	1	10	10	3	TZ	32	6	1	1.5	5.0	366.43	354.25
91	10/20/83	5:42	12103	64	1	10	12	3	TZ	32	6	1	1.5	5.0	357.84	345.94
92	10/20/83	20:09	12133	64	1	9	13	1	TZ	26	6	2	1.5	5.0	419.35	405.41
93	10/20/83	20:20	12143	64	1	9	10	1	TZ	26	4	2	1.5	5.0	386.91	374.05
94	10/20/83	20:26	12153	64	1	9	10	1	TZ	26	4	2	1.5	5.0	397.32	384.11
95	10/20/83	20:33	12163	64	1	9	10	1	TZ	26	4	2	1.5	5.0	393.15	380.08
96	10/20/83	20:39	12173	64	1	9	6	1	TZ	25	4	2	1.5	5.0	381.94	369.24
97	10/20/83	20:50	12183	64	1	9	14	1	TZ	26	4	2	1.5	5.0	387.17	374.29
98	10/20/83	20:56	12193	64	1	9	13	1	TZ	26	4	2	1.5	5.0	391.50	378.48
99	10/20/83	21:32	12233	64	1	9	17	1	TZ	25	4	2	1.5	5.0	400.36	387.05
100	10/20/83	21:40	12243	64	1	9	15	1	TZ	24	4	2	1.5	5.0	397.91	384.68
101	10/20/83	22:01	12253	64	1	9	18	1	YK	20	6	2	1.5	5.0	357.81	345.91
102	10/20/83	22:11	12263	64	1	9	15	1	YK	20	4	2	1.5	5.0	378.04	365.48
103	10/20/83	23:01	12313	64	1	9	17	1	YK	16	4	2	1.5	5.0	422.50	408.46
104	10/20/83	23:09	12323	64	1	9	15	1	YK	14	4	2	1.5	5.0	409.06	395.46
105	10/20/83	23:16	12333	64	1	9	17	1	YK	14	4	2	1.5	5.0	421.50	407.48
106	10/20/83	23:22	12343	64	1	9	16	1	YK	14	4	2	1.5	5.0	428.46	414.22
107	10/20/83	23:29	12353	64	1	9	13	1	YK	14	4	2	1.5	4.0	215.34	208.18

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 6.2 METER HIGH-RISE TRAWL
AND 3 METER BEAM TRAWL.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	COMMENTS	VESL_CD	ENG_RPM	DPTH_RIV	BOTM_TYP	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_DIST	TOW_AREA	VOLUME
1	04OCT83	20:09	1072	18	2	.	17	1000	10	2	1	TZ	25	4	2	1.5	10	.	.	.
2	04OCT83	20:09	1032	50	2	1	16	2200	10	2	1	TZ	25	4	2	1.5	10	.	.	.
3	04OCT83	21:09	1073	18	2	.	17	1000	10	2	1	TZ	27	4	2	1.5	5	.	.	.
4	04OCT83	21:09	1033	50	2	1	16	2500	12	2	1	TZ	27	4	2	1.5	5	.	.	.
5	04OCT83	21:51	1074	18	2	1	17	1000	12	2	1	TZ	27	4	2	1.5	5	.	.	.
6	04OCT83	21:51	1034	50	2	1	16	2300	15	2	1	TZ	27	4	2	1.5	5	.	.	.
7	04OCT83	22:25	1075	18	2	1	17	1000	12	2	1	TZ	27	4	2	1.5	5	.	.	.
8	04OCT83	22:25	1035	50	2	1	16	2300	15	2	1	TZ	27	4	2	1.5	5	.	.	.
9	04OCT83	23:00	1076	18	2	1	17	1000	12	2	1	TZ	28	4	2	1.5	10	.	.	.
10	04OCT83	23:00	1036	50	2	.	16	2400	15	2	1	TZ	28	4	2	1.5	10	.	.	.
11	04OCT83	24:00	1077	18	2	1	17	1000	15	2	1	TZ	28	4	1	1.5	10	.	.	.
12	04OCT83	24:00	1037	50	2	1	16	2400	15	2	1	TZ	28	4	1	1.5	10	.	.	.
13	05OCT83	0:54	1078	18	2	1	17	1000	10	2	1	TZ	29	4	1	1.5	10	.	.	.
14	05OCT83	0:54	1038	50	2	.	16	2300	15	2	1	TZ	29	4	1	1.5	10	.	.	.
15	05OCT83	1:15	1079	18	2	1	17	1000	10	2	1	TZ	29	4	1	1.5	12	.	.	.
16	05OCT83	1:15	1039	50	5	1	16	2200	12	2	1	TZ	29	4	1	1.5	8	.	.	.
17	05OCT83	2:26	1080	18	2	1	17	1000	10	2	1	TZ	29	4	1	1.5	10	.	.	.
18	05OCT83	2:26	1040	50	2	1	16	2200	12	2	1	TZ	29	4	1	1.5	10	.	.	.
19	05OCT83	3:04	1081	18	2	1	17	1000	11	2	2	TZ	29	4	1	1.5	5	.	.	.
20	05OCT83	3:04	1041	50	2	1	16	2200	15	2	2	TZ	29	4	1	1.5	5	.	.	.
21	05OCT83	3:31	1082	18	2	1	17	1000	20	2	2	TZ	29	4	1	1.5	5	.	.	.
22	05OCT83	3:31	1042	50	2	1	16	2200	18	2	2	TZ	29	4	1	1.5	5	.	.	.
23	06OCT83	19:21	1083	18	1	.	17	1000	11	2	2	TZ	25	4	2	1.5	10	690	2103.12	1381.75
24	06OCT83	19:21	1043	50	1	.	16	2500	11	2	2	TZ	25	4	2	1.5	10	690	3036.00	5000.29
25	06OCT83	19:52	1084	18	1	.	17	.	11	2	4	TZ	27	4	2	1.5	5	350	1066.80	700.89
26	06OCT83	19:52	1044	50	1	.	16	2500	11	2	4	TZ	27	4	2	1.5	5	350	1540.00	2536.38
27	06OCT83	20:22	1085	18	1	.	17	1000	14	2	2	TZ	27	4	2	1.5	5	340	1036.32	680.86
28	06OCT83	20:22	1045	50	1	.	16	2400	14	2	2	TZ	27	4	2	1.5	5	340	1496.00	2463.91
29	06OCT83	20:38	1086	18	1	.	17	1000	15	2	2	TZ	27	4	2	1.5	10	710	2164.08	1421.80
30	06OCT83	20:38	1046	50	1	.	16	2400	15	2	2	TZ	27	4	2	1.5	10	710	3124.00	5145.23
31	06OCT83	21:21	1087	18	1	.	17	1200	15	2	2	TZ	28	4	2	1.5	5	360	1097.28	720.91
32	06OCT83	21:21	1047	50	1	.	16	2500	15	2	2	TZ	28	4	2	1.5	5	360	1584.00	2608.85
33	06OCT83	21:39	1088	18	1	.	17	1200	15	2	2	TZ	28	4	2	1.5	10	710	2164.08	1421.80
34	06OCT83	21:39	1048	50	1	.	16	2700	15	2	2	TZ	28	4	2	1.5	10	710	3124.00	5145.23
35	06OCT83	22:23	1089	18	1	.	17	1200	15	2	1	TZ	29	4	2	1.5	5	440	1341.12	881.12
36	06OCT83	22:23	1049	50	1	.	16	2500	15	2	1	TZ	29	4	2	1.5	5	440	1936.00	3188.59
37	06OCT83	22:46	1090	18	1	.	17	1200	15	2	1	TZ	29	4	2	1.5	10	760	2316.48	1521.93
38	06OCT83	22:46	1050	50	1	.	16	2500	15	2	1	TZ	29	4	2	1.5	10	760	3344.00	5507.57
39	06OCT83	23:10	1091	18	1	.	17	1150	16	2	2	TZ	29	4	2	1.5	10	780	2377.44	1561.98
40	06OCT83	23:10	1051	50	1	.	16	2700	16	2	2	TZ	29	4	2	1.5	10	780	3432.00	5652.50
41	06OCT83	23:42	1092	18	1	.	17	1200	15	2	2	TZ	29	4	2	1.5	5	420	1280.16	841.07
42	06OCT83	23:42	1052	50	1	.	16	2500	15	2	2	TZ	29	4	2	1.5	5	420	1848.00	3043.66
43	07OCT83	0:21	1093	18	5	1	17	1200	12	2	2	TZ	30	4	1	1.5	10	960	2926.08	1922.43
44	07OCT83	0:21	1053	50	1	1	16	2500	12	2	2	TZ	30	4	1	1.5	10	960	4224.00	6956.93
45	07OCT83	0:46	1094	18	1	.	17	1200	15	2	1	TZ	30	4	2	1.5	10	930	2834.64	1862.36
46	07OCT83	0:46	1054	50	5	1	16	2600	15	2	1	TZ	30	4	2	1.5	10	930	4092.00	6739.52
47	07OCT83	1:22	1095	18	1	.	17	1200	14	2	2	TZ	30	4	1	1.5	10	730	2225.04	1461.85

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 6.2 METER HIGH-RISE TRAWL
AND 3 METER BEAM TRAWL.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	COMMENTS	VESL_CD	ENG_RPM	DPTH_RIV	BOTM_TYP	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_DIST	TOW_AREA	VOLUME
48	07OCT83	1:22	1055	50	1	.	16	2300	14	2	2	TZ	30	4	1	1.5	10	730	3212.00	5290.16
49	07OCT83	2:01	1096	18	1	.	17	1200	12	2	2	TZ	30	4	1	1.5	10	750	2286.00	1501.90
50	07OCT83	2:01	1056	50	1	.	16	2300	12	2	2	TZ	30	4	1	1.5	10	750	3300.00	5435.10
51	07OCT83	3:13	1097	18	1	.	17	1200	15	2	2	TZ	30	4	1	1.5	5	360	1097.28	720.91
52	07OCT83	3:13	1057	50	1	.	16	2500	15	2	2	TZ	30	4	1	1.5	5	360	1584.00	2608.85
53	07OCT83	3:53	1098	18	1	1	17	1200	10	2	1	TZ	30	4	1	1.5	5	390	1188.72	780.99
54	07OCT83	3:53	1058	50	1	.	16	2400	10	2	1	TZ	30	4	1	1.5	5	390	1716.00	2826.25
55	07OCT83	4:22	1099	18	1	.	17	1200	10	2	1	TZ	30	4	1	1.5	5	360	1097.28	720.91
56	07OCT83	4:22	1059	50	1	.	16	2400	10	2	1	TZ	30	4	1	1.5	5	360	1584.00	2608.85
57	07OCT83	4:39	1100	18	1	.	17	1200	10	2	1	TZ	30	4	1	1.5	5	330	1005.84	660.84
58	07OCT83	4:39	1060	50	1	1	16	2300	10	2	1	TZ	30	4	1	1.5	5	330	1452.00	2391.44
59	07OCT83	5:02	1101	18	1	.	17	1150	12	2	1	TZ	30	4	1	1.5	10	560	1706.88	1121.42
60	07OCT83	5:02	1061	50	1	1	16	2500	10	2	1	TZ	30	4	1	1.5	10	560	2464.00	4058.21
61	07OCT83	5:30	1102	18	5	1	17	1200	14	2	1	TZ	31	4	1	1.5	10	600	1828.80	1201.52
62	07OCT83	5:30	1062	50	1	.	16	2500	14	2	1	TZ	31	4	1	1.5	10	600	2640.00	4348.08
63	07OCT83	21:26	1103	18	1	.	17	1200	15	2	1	TZ	31	4	2	1.5	10	820	2499.36	1642.08
64	07OCT83	21:26	1063	50	1	.	16	2700	15	2	1	TZ	31	4	2	1.5	10	820	3608.00	5942.38
65	07OCT83	22:16	1104	18	1	.	17	1200	15	2	1	TZ	31	6	2	1.5	10	760	2316.48	1521.93
66	07OCT83	22:16	1064	50	1	.	16	2600	15	2	1	TZ	31	6	2	1.5	10	760	3344.00	5507.57
67	07OCT83	22:53	1105	18	1	.	17	1200	12	2	1	TZ	31	6	2	1.5	5	380	1158.24	760.96
68	07OCT83	22:53	1065	50	1	.	16	2500	12	2	1	TZ	31	6	2	1.5	5	380	1672.00	2753.78
69	07OCT83	23:16	1106	18	1	.	17	1100	10	2	1	TZ	32	6	2	1.5	10	750	2286.00	1501.90
70	07OCT83	23:16	1066	50	1	.	16	2400	12	2	1	TZ	32	6	2	1.5	10	750	3300.00	5435.10
71	08OCT83	0:08	1107	18	1	.	17	1000	10	2	1	TZ	32	6	2	1.5	5	430	1310.64	861.09
72	08OCT83	0:08	1067	50	1	.	16	2500	10	2	1	TZ	32	6	2	1.5	5	430	1892.00	3116.12
73	08OCT83	0:32	1108	18	1	.	17	1000	11	2	1	TZ	32	6	2	1.5	5	350	1066.80	700.89
74	08OCT83	0:32	1068	50	1	.	16	2700	10	2	1	TZ	32	6	2	1.5	5	350	1540.00	2536.38
75	08OCT83	1:10	1109	18	1	.	17	1200	10	2	1	TZ	33	6	2	1.5	5	410	1249.68	821.04
76	08OCT83	1:10	1069	50	1	.	16	2700	10	2	1	TZ	33	6	2	1.5	5	410	1804.00	2971.19
77	08OCT83	1:33	1110	18	2	1	17	1100	11	2	1	TZ	33	6	2	1.5	10	930	2834.64	1862.36
78	08OCT83	1:33	1070	50	1	.	16	2500	12	2	1	TZ	33	6	2	1.5	10	930	4092.00	6739.52
79	08OCT83	1:57	1111	18	1	.	17	1000	10	2	1	TZ	33	6	2	1.5	10	870	2651.76	1742.21
80	08OCT83	2:36	1112	18	1	.	17	1000	11	2	1	CH	34	6	1	1.5	10	680	2072.64	1361.72
81	08OCT83	2:36	1071	50	1	.	16	2500	10	2	1	CH	34	6	1	1.5	10	680	2992.00	4927.82
82	08OCT83	3:28	1132	50	5	1	16	.	10	2	1	CH	34	6	1	1.5	5	60	264.00	434.81
83	08OCT83	3:51	1113	18	1	.	17	1000	11	2	1	CH	34	6	1	1.5	5	390	1188.72	780.99
84	08OCT83	3:51	1133	50	1	.	16	2500	10	2	1	CH	34	6	1	1.5	5	390	1716.00	2826.25
85	08OCT83	4:33	1114	18	5	1	17	1000	10	2	1	CH	34	6	1	1.5	2	.	.	.
86	08OCT83	4:33	1134	50	1	.	16	2500	10	2	1	CH	34	6	1	1.5	10	840	3696.00	6087.31
87	08OCT83	4:56	1115	18	5	1	17	1000	11	2	1	CH	34	6	1	.	10	.	.	.
88	08OCT83	6:14	1116	18	1	.	17	1000	10	2	1	CH	34	6	1	1.5	10	750	2286.00	1501.90
89	08OCT83	20:16	1117	18	1	.	17	1000	9	2	2	CH	35	6	2	1.5	5	400	1219.20	801.01
90	08OCT83	20:16	1135	50	1	1	16	2400	10	2	2	CH	35	6	2	1.5	5	400	1760.00	2898.72
91	08OCT83	20:45	1118	18	1	.	17	1000	10	2	2	CH	35	6	2	1.5	10	860	2621.28	1722.18
92	08OCT83	20:45	1136	50	1	.	16	2500	8	2	2	CH	35	6	2	1.5	10	860	3784.00	6232.25
93	08OCT83	21:11	1119	18	1	.	17	1000	10	2	1	CH	35	6	2	1.5	10	850	2590.80	1702.16
94	08OCT83	21:11	1137	50	1	.	16	2500	8	2	1	CH	35	6	2	1.5	10	850	3740.00	6159.78

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 6.2 METER HIGH-RISE TRAWL
AND 3 METER BEAM TRAWL.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	COMMENTS	VESL_CD	ENG_RPM	DPTH_RIV	BOTM_TYP	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_DIST	TOW_AREA	VOLUME
95	08OCT83	21:44	1120	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	5	420	1280.16	841.07
96	08OCT83	21:44	1138	50	1	.	16	2500	8	2	1	CH	36	6	2	1.5	5	420	1848.00	3043.66
97	08OCT83	22:03	1121	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	5	440	1341.12	881.12
98	08OCT83	22:03	1139	50	1	.	16	2500	10	2	1	CH	36	6	2	1.5	5	440	1936.00	3188.59
99	08OCT83	22:22	1122	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	5	400	1219.20	801.01
100	08OCT83	22:22	1140	50	1	.	16	2400	10	2	1	CH	36	6	2	1.5	5	400	1760.00	2898.72
101	08OCT83	23:03	1123	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	10	750	2286.00	1501.90
102	08OCT83	23:03	1141	50	1	.	16	2300	12	2	1	CH	36	6	2	1.5	10	750	3300.00	5435.10
103	08OCT83	23:24	1124	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	5	400	1219.20	801.01
104	08OCT83	23:24	1142	50	1	.	16	2300	12	2	1	CH	36	6	2	1.5	5	400	1760.00	2898.72
105	08OCT83	23:42	1125	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	10	770	2346.96	1541.95
106	08OCT83	23:42	1143	50	1	.	16	2300	12	2	1	CH	36	6	2	1.5	10	770	3388.00	5580.04
107	09OCT83	0:15	1126	18	1	.	17	1000	10	2	1	CH	36	6	2	1.5	10	810	2468.88	1622.05
108	09OCT83	0:15	1144	50	1	.	16	2400	12	2	1	CH	36	6	2	1.5	10	810	3564.00	5869.91
109	09OCT83	0:43	1127	18	1	.	17	1000	10	2	1	CH	37	6	2	1.5	10	780	2377.44	1561.98
110	09OCT83	0:43	1145	50	1	.	16	2500	12	2	1	CH	37	6	2	1.5	10	780	3432.00	5652.50
111	09OCT83	1:09	1128	18	1	.	17	1000	10	2	1	CH	37	6	2	1.5	5	380	1158.24	760.96
112	09OCT83	1:09	1146	50	1	.	16	2400	12	2	1	CH	37	6	2	1.5	5	380	1672.00	2753.78
113	17OCT83	19:51	1129	18	1	.	17	1000	11	2	1	CH	38	6	2	1.5	10	780	2377.44	1561.98
114	17OCT83	19:51	1	50	5	1	16	2200	10	2	1	CH	38	6	2	1.5	3	.	.	.
115	17OCT83	20:29	2	50	1	.	16	2200	12	2	1	CH	38	6	2	1.5	10	780	3432.00	5652.50
116	17OCT83	20:51	1130	18	1	.	17	1000	11	2	1	CH	38	6	2	1.5	5	410	1249.68	821.04
117	17OCT83	20:51	3	50	1	.	16	2200	12	2	1	CH	38	6	2	1.5	5	410	1804.00	2971.19
118	17OCT83	21:47	1131	18	1	.	17	1000	12	2	1	CH	38	6	2	1.5	5	420	1280.16	841.07
119	17OCT83	21:55	4	50	1	.	16	2200	14	2	1	CH	38	6	2	1.5	5	420	1848.00	3043.66
120	17OCT83	22:10	1153	18	1	.	17	1000	11	2	1	CH	38	6	2	1.5	5	440	1341.12	881.12
121	17OCT83	22:10	5	50	1	.	16	2200	12	2	1	CH	38	6	2	1.5	5	440	1936.00	3188.59
122	17OCT83	22:49	1154	18	1	.	17	1000	10	2	1	CH	37	6	1	1.5	10	880	2682.24	1762.23
123	17OCT83	22:49	6	50	1	.	16	2200	12	2	1	CH	37	6	1	1.5	10	880	3872.00	6377.18
124	17OCT83	23:09	1155	18	1	.	17	1000	10	2	1	CH	36	6	1	1.5	10	870	2651.76	1742.21
125	17OCT83	23:09	7	50	1	.	16	2300	10	2	1	CH	36	6	1	1.5	10	870	3828.00	6304.72
126	18OCT83	0:10	1156	18	1	.	17	1000	10	2	1	CH	36	6	1	1.5	10	810	2468.88	1622.05
127	18OCT83	0:10	8	50	1	.	16	2200	10	2	1	CH	36	6	1	1.5	10	810	3564.00	5869.91
128	18OCT83	0:36	1157	18	1	.	17	1000	10	2	1	CH	36	6	1	1.5	10	740	2255.52	1481.88
129	18OCT83	0:36	9	50	1	.	16	2300	10	2	1	CH	36	6	1	1.5	10	740	3256.00	5362.63
130	18OCT83	1:04	1158	18	1	.	17	1000	10	2	1	CH	36	6	1	1.5	5	400	1219.20	801.01
131	18OCT83	1:04	10	50	1	.	16	2300	10	2	1	CH	36	6	1	1.5	5	400	1760.00	2898.72
132	18OCT83	1:29	1159	18	1	.	17	1000	10	2	1	CH	34	6	1	1.5	5	430	1310.64	861.09
133	18OCT83	1:29	11	50	1	.	16	2300	10	2	1	CH	34	6	1	1.5	5	430	1892.00	3116.12
134	18OCT83	19:08	1160	18	1	.	17	1000	12	2	1	CH	35	6	1	1.5	5	480	1463.04	961.22
135	18OCT83	19:08	12	50	1	.	16	2300	11	2	1	CH	35	6	1	1.5	5	480	2112.00	3478.46
136	18OCT83	19:26	1161	18	1	.	17	1000	10	2	1	CH	35	6	1	1.5	5	500	1524.00	1001.27
137	18OCT83	19:26	13	50	1	.	16	2300	10	2	1	CH	35	6	1	1.5	5	500	2200.00	3623.40
138	18OCT83	20:06	1162	18	1	.	17	1000	11	2	1	CH	34	6	2	1.5	10	770	2346.96	1541.95
139	18OCT83	20:06	14	50	2	1	16	2200	10	2	1	CH	34	6	2	1.5	9	660	2904.00	4782.89
140	18OCT83	20:31	15	50	1	.	16	2300	10	2	1	CH	34	6	2	1.5	10	770	3388.00	5580.04
141	18OCT83	20:54	1163	18	1	.	17	1000	11	2	1	CH	34	6	2	1.5	5	380	1158.24	760.96

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 6.2 METER HIGH-RISE TRAWL
AND 3 METER BEAM TRAWL.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	COMMENTS	VESL_CD	ENG_RPM	DPTH_RIV	BOTM_TYP	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_DIST	TOW_AREA	VOLUME
142	18OCT83	20:54	16	50	1	1	16	2300	10	2	1	CH	34	6	2	1.5	5	380	1672.00	2753.78
143	18OCT83	21:14	1164	18	1	.	17	1000	11	2	1	TZ	33	6	2	1.5	10	800	2438.40	1602.03
144	18OCT83	21:14	17	50	1	1	16	2200	10	2	1	TZ	33	6	2	1.5	10	800	3520.00	5797.44
145	18OCT83	21:58	1165	18	1	.	17	1000	10	2	1	TZ	32	6	2	1.5	5	440	1341.12	881.12
146	18OCT83	21:58	18	50	1	1	16	2300	10	2	1	TZ	32	6	2	1.5	5	440	1936.00	3188.59
147	18OCT83	22:13	1166	18	1	.	17	1000	10	2	1	TZ	32	6	2	1.5	10	740	2255.52	1481.88
148	18OCT83	22:13	19	50	1	1	16	2300	10	2	1	TZ	32	6	2	1.5	10	740	3256.00	5362.63
149	18OCT83	22:38	1167	18	1	.	17	1000	11	2	1	TZ	32	6	2	1.5	5	390	1188.72	780.99
150	18OCT83	22:38	20	50	1	1	16	2300	10	2	1	TZ	32	6	2	1.5	5	390	1716.00	2826.25
151	18OCT83	23:02	1168	18	1	.	17	1000	10	2	2	TZ	32	6	2	1.5	10	950	2895.60	1902.41
152	18OCT83	23:02	21	50	1	1	16	2300	10	2	2	TZ	32	6	2	1.5	10	950	4180.00	6884.46
153	18OCT83	23:21	1169	18	1	.	17	1000	10	2	1	TZ	32	6	1	1.5	10	810	2468.88	1622.05
154	18OCT83	23:21	22	50	1	1	16	2300	10	2	1	TZ	32	6	1	1.5	10	810	3564.00	5869.91
155	18OCT83	23:45	1170	18	1	.	17	1000	10	2	2	TZ	32	6	1	1.5	5	410	1249.68	821.04
156	18OCT83	23:45	1147	50	1	.	16	.	10	2	2	TZ	32	6	1	1.5	5	410	1804.00	2971.19
157	19OCT83	19:41	1171	18	1	.	17	1000	10	2	1	YK	20	4	2	1.5	10	590	1798.32	1181.50
158	19OCT83	19:41	1148	50	1	.	16	2100	10	2	1	YK	20	4	2	1.5	10	590	2596.00	4275.61
159	19OCT83	20:02	79	18	2	.	17	1000	10	2	1	YK	19	4	2	1.5	5	40	121.92	80.10
160	19OCT83	20:02	1149	50	2	1	16	2100	10	2	1	YK	19	4	2	1.5	5	40	176.00	289.87
161	19OCT83	20:32	80	18	1	.	17	1000	10	2	2	YK	21	4	2	1.5	10	620	1889.76	1241.57
162	19OCT83	20:32	1151	50	1	.	16	2100	10	2	2	YK	21	4	2	1.5	10	620	2728.00	4493.02
163	19OCT83	21:15	81	18	1	.	17	1000	10	2	2	YK	22	4	2	1.5	10	650	1981.20	1301.65
164	19OCT83	21:15	1150	50	1	.	16	2100	10	2	2	YK	22	4	2	1.5	10	650	2860.00	4710.42
165	19OCT83	21:50	82	18	1	.	17	1000	10	2	2	YK	22	4	2	1.5	5	300	914.40	600.76
166	19OCT83	21:50	1152	50	1	.	16	2200	10	2	2	YK	22	4	2	1.5	5	300	1320.00	2174.04
167	19OCT83	22:39	83	18	1	.	17	1000	10	2	2	TZ	25	4	1	1.5	5	430	1310.64	861.09
168	19OCT83	22:39	1192	50	1	.	16	2200	10	2	2	TZ	25	4	1	1.5	5	430	1892.00	3116.12
169	19OCT83	22:58	84	18	1	.	17	1000	15	2	2	TZ	26	4	1	1.5	10	830	2529.84	1662.10
170	19OCT83	22:58	1193	50	1	.	16	2200	15	2	2	TZ	26	4	1	1.5	10	830	3652.00	6014.84
171	19OCT83	23:21	85	18	1	.	17	1000	10	2	2	TZ	26	4	1	1.5	10	740	2255.52	1481.88
172	19OCT83	23:21	1194	50	1	.	16	2100	10	2	2	TZ	26	4	1	1.5	10	740	3256.00	5362.63
173	20OCT83	0:01	86	18	2	1	17	1000	15	2	2	TZ	26	4	1	1.5	10	.	.	.
174	20OCT83	0:01	1195	50	1	.	16	2200	15	2	2	TZ	26	4	1	1.5	5	290	1276.00	2101.57
175	20OCT83	0:25	88	18	1	.	17	1000	15	2	2	TZ	26	4	1	1.5	5	290	883.92	580.74
176	20OCT83	1:20	87	18	1	.	17	900	10	2	3	TZ	30	4	1	1.5	10	520	1584.96	1041.32
177	20OCT83	1:20	1196	50	1	.	16	2000	10	2	3	TZ	30	4	1	1.5	10	520	2288.00	3768.34
178	20OCT83	2:03	89	18	1	.	17	1000	10	2	2	TZ	30	4	1	1.5	5	270	822.96	540.68
179	20OCT83	2:03	1197	50	1	.	16	2100	10	2	2	TZ	30	4	1	1.5	5	270	1188.00	1956.64
180	20OCT83	2:23	90	18	1	.	17	1000	10	2	2	TZ	30	4	1	1.5	10	620	1889.76	1241.57
181	20OCT83	2:23	1198	50	1	.	16	2200	10	2	2	TZ	30	4	1	1.5	10	620	2728.00	4493.02
182	20OCT83	19:23	1181	18	1	.	17	1000	10	2	1	TZ	31	6	2	1.5	10	870	2651.76	1742.21
183	20OCT83	19:23	1172	50	1	.	16	2300	10	2	1	TZ	31	6	2	1.5	10	870	3828.00	6304.72
184	20OCT83	20:01	1182	18	1	.	17	1000	12	2	1	TZ	30	6	2	1.5	10	760	2316.48	1521.93
185	20OCT83	20:01	1173	50	1	1	16	2300	10	2	1	TZ	30	6	2	1.5	10	760	3344.00	5507.57
186	20OCT83	20:33	1183	18	1	.	17	1000	12	2	1	TZ	30	4	2	1.5	5	330	1005.84	660.84
187	20OCT83	20:33	1174	50	1	.	16	.	15	2	1	TZ	30	4	2	1.5	5	330	1452.00	2391.44
188	20OCT83	20:53	1184	18	1	.	17	1000	12	2	1	TZ	30	4	2	1.5	10	740	2255.52	1481.88

OCTOBER 1983 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 6.2 METER HIGH-RISE TRAWL
AND 3 METER BEAM TRAWL.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	COMMENTS	VESL_CD	ENG_RPM	DPTH_RIV	BOTM_TYP	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_DIST	TOW_AREA	VOLUME
189	20OCT83	20:53	1175	50	1	.	16	2200	12	2	1	TZ	30	4	2	1.5	10	740	3256.00	5362.63
190	20OCT83	21:21	1185	18	1	.	17	1000	12	2	2	TZ	30	4	2	1.5	5	330	1005.84	660.84
191	20OCT83	21:21	1176	50	1	.	16	2100	15	2	2	TZ	30	4	2	1.5	5	330	1452.00	2391.44
192	20OCT83	21:34	1186	18	1	.	17	1000	12	2	2	TZ	29	4	2	1.5	5	330	1005.84	660.84
193	20OCT83	21:34	1177	50	1	.	16	2200	10	2	2	TZ	29	4	2	1.5	5	330	1452.00	2391.44
194	20OCT83	21:58	1187	18	1	.	17	1000	12	2	2	TZ	29	4	2	1.5	5	420	1280.16	841.07
195	20OCT83	21:58	1178	50	1	1	16	2200	10	2	2	TZ	29	4	2	1.5	5	420	1848.00	3043.66

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1	2	08/16/84	2149	1	1	CH	5	370	507.29	662.16	202.70	864.86	482.96	147.85	630.81
2	2	08/16/84	2214	2	1	CH	5	390	485.79	415.38	151.28	566.67	333.48	121.45	454.93
3	2	08/16/84	2238	3	1	CH	5	390	424.39	1053.85	105.13	1158.97	968.46	96.61	1065.07
4	2	08/16/84	2251	4	1	CH	5	430	405.70	558.14	100.00	658.14	591.57	105.99	697.56
5	2	08/16/84	2312	5	1	CH	5	410	477.60	534.15	107.32	641.46	458.54	92.13	550.67
6	2	08/16/84	2334	6	1	CH	5	460	415.77	436.96	56.52	493.48	483.44	62.53	545.97
7	2	08/16/84	2352	7	1	CH	5	510	466.06	758.82	90.20	849.02	830.37	98.70	929.07
8	2	08/17/84	17	8	1	CH	5	500	495.16	694.00	46.00	740.00	700.79	46.45	747.24
9	2	08/17/84	35	9	1	CH	5	540	482.45	1037.04	50.00	1087.04	1160.74	55.96	1216.70
10	2	08/17/84	51	10	1	CH	5	520	464.52	375.00	44.23	419.23	419.78	49.51	469.30
11	2	08/17/84	112	11	1	CH	5	530	489.40	235.85	81.13	316.98	255.41	87.86	343.27
12	2	08/17/84	135	12	1	CH	5	510	491.98	356.86	84.31	441.18	369.94	87.40	457.34
13	2	08/17/84	201	13	1	CH	5	590	490.95	691.53	38.98	730.51	831.05	46.85	877.90
14	2	08/17/84	226	14	1	CH	5	540	477.15	994.44	42.59	1037.04	1125.44	48.20	1173.64
15	2	08/17/84	248	15	1	CH	5	550	451.34	1009.09	67.27	1076.36	1229.68	81.98	1311.65
16	2	08/17/84	316	16	1	CH	5	590	442.98	867.80	49.15	916.95	1155.81	65.47	1221.27
17	2	08/17/84	334	17	1	CH	5	540	480.14	527.78	25.93	553.70	593.58	29.16	622.74
18	2	08/17/84	407	18	1	CH	5	410	447.20	902.44	70.73	973.17	827.36	64.85	892.21
19	2	08/17/84	428	19	1	CH	5	450	481.34	1600.00	77.78	1677.78	1495.82	72.71	1568.53
20	2	08/17/84	447	20	1	CH	5	500	488.15	2090.00	70.00	2160.00	2140.74	71.70	2212.44
21	2	08/17/84	2131	21	1	CH	5	400	443.29	465.00	35.00	500.00	419.59	31.58	451.17
22	2	08/17/84	2151	22	1	CH	5	390	486.42	548.72	38.46	587.18	439.95	30.84	470.79
23	2	08/17/84	2210	23	1	CH	5	460	497.19	623.91	36.96	660.87	577.24	34.19	611.43
24	2	08/17/84	2229	24	1	CH	5	410	441.64	360.98	39.02	400.00	335.11	36.23	371.34
25	2	08/17/84	2312	25	1	CH	5	400	436.29	240.00	37.50	277.50	220.04	34.38	254.42
26	2	08/17/84	2330	26	1	CH	5	370	439.67	275.68	18.92	294.59	231.99	15.92	247.91
27	2	08/18/84	15	27	1	CH	5	440	455.92	261.36	22.73	284.09	252.24	21.93	274.17
28	2	08/18/84	38	28	1	CH	5	500	544.59	432.00	26.00	458.00	396.63	23.87	420.50
29	2	08/18/84	57	29	1	CH	5	420	441.93	350.00	45.24	395.24	332.63	42.99	375.62
30	2	08/18/84	114	30	1	CH	5	410	441.64	326.83	31.71	358.54	303.41	29.44	332.85
31	2	08/18/84	132	101	1	CH	5	400	504.47	402.50	27.50	430.00	319.15	21.81	340.95
32	2	08/18/84	152	102	1	IP	5	390	453.49	200.00	23.08	223.08	172.00	19.85	191.85
33	2	08/18/84	210	103	1	IP	5	410	463.13	324.39	53.66	378.05	287.18	47.50	334.68
34	2	08/18/84	229	104	1	IP	5	370	447.20	372.97	43.24	416.22	308.58	35.78	344.36
35	2	08/18/84	247	105	1	IP	5	350	434.67	331.43	20.00	351.43	266.87	16.10	282.97
36	2	08/18/84	305	106	1	IP	5	390	410.33	874.36	28.21	902.56	831.04	26.81	857.85
37	2	08/18/84	323	107	1	CH	5	400	505.10	1570.00	20.00	1590.00	1243.32	15.84	1259.16
38	2	08/18/84	345	108	1	IP	5	390	456.22	2812.82	12.82	2825.64	2404.52	10.96	2415.48
39	2	08/18/84	435	110	1	CH	5	410	470.91	621.95	12.20	634.15	541.50	10.62	552.12
40	2	08/18/84	454	111	1	IP	5	410	464.84	1970.73	17.07	1987.80	1738.24	15.06	1753.30
41	2	08/18/84	512	112	1	CH	5	420	438.89	1952.38	0.00	1952.38	1868.34	0.00	1868.34
42	2	08/18/84	2053	113	1	CH	5	350	443.26	1017.14	11.43	1028.57	803.14	9.02	812.17
43	2	08/18/84	2113	114	1	CH	5	350	428.57	1771.43	0.00	1771.43	1446.68	0.00	1446.68
44	2	08/18/84	2133	115	1	CH	5	330	414.39	927.27	12.12	939.39	738.43	9.65	748.08
45	2	08/18/84	2150	116	1	CH	5	380	426.16	336.84	10.53	347.37	300.35	9.39	309.74
46	2	08/18/84	2207	117	1	CH	5	360	458.43	330.56	5.56	336.11	259.58	4.36	263.94
47	2	08/18/84	2225	118	1	CH	5	320	429.43	303.13	6.25	309.38	225.88	4.66	230.54
48	2	08/18/84	2307	119	1	CH	5	390	415.23	266.67	7.69	274.36	250.46	7.22	257.69
49	2	08/18/84	2325	120	1	CH	5	430	425.03	323.26	2.33	325.58	327.04	2.35	329.39
50	2	08/18/84	2342	121	1	CH	5	410	433.30	187.80	0.00	187.80	177.71	0.00	177.71
51	2	08/19/84	17	123	1	CH	5	420	455.27	385.71	7.14	392.86	355.83	6.59	362.42
52	2	08/19/84	33	124	1	CH	5	380	373.63	310.53	2.63	313.16	315.82	2.68	318.50
53	2	08/19/84	53	125	1	CH	5	460	448.91	267.39	8.70	276.09	273.99	8.91	282.91
54	2	08/19/84	115	126	1	CH	5	370	443.09	381.08	5.41	386.49	318.22	4.51	322.74

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
55	2	08/19/84	136	127	1	CH	5	440	420.84	209.09	4.55	213.64	218.61	4.75	223.36
56	2	08/19/84	156	128	1	CH	5	320	416.74	443.75	0.00	443.75	340.74	0.00	340.74
57	2	08/19/84	216	129	1	CH	5	440	514.32	377.27	2.27	379.55	322.75	1.94	324.70
58	2	08/19/84	235	130	1	CH	5	400	424.26	235.00	0.00	235.00	221.56	0.00	221.56
59	2	08/19/84	301	131	1	CH	5	370	424.55	243.24	2.70	245.95	211.99	2.36	214.34
60	2	08/19/84	321	132	1	CH	5	390	437.66	251.28	2.56	253.85	223.92	2.28	226.20
61	2	08/19/84	2400	122	1	CH	5	460	456.68	173.91	2.17	176.09	175.18	2.19	177.37
62	2	08/29/84	106	170	2	CH	5	380	403.36	1557.89	5.26	1563.16	1467.69	4.96	1472.65
63	2	08/29/84	141	172	2	CH	5	410	473.07	909.76	0.00	909.76	788.46	0.00	788.46
64	2	08/29/84	158	173	2	CH	5	510	488.52	927.45	0.00	927.45	968.24	0.00	968.24
65	2	08/29/84	221	174	2	CH	5	460	524.30	2089.13	13.04	2102.17	1832.93	11.44	1844.38
66	2	08/29/84	239	175	2	CH	5	430	457.18	1818.60	11.63	1830.23	1710.50	10.94	1721.44
67	2	08/29/84	255	176	2	CH	5	450	448.26	1866.67	11.11	1877.78	1873.90	11.15	1885.05
68	2	08/29/84	322	177	2	CH	5	430	494.42	1253.49	25.58	1279.07	1090.17	22.25	1112.42
69	2	08/29/84	338	178	2	CH	5	470	479.01	1234.04	36.17	1270.21	1210.82	35.49	1246.31
70	2	08/29/84	352	179	2	CH	5	440	504.84	979.55	13.64	993.18	853.73	11.88	865.61
71	2	08/29/84	412	180	2	CH	5	450	547.45	1204.44	13.33	1217.78	990.04	10.96	1001.00
72	2	08/29/84	433	181	2	CH	5	450	511.78	911.11	6.67	917.78	801.12	5.86	806.99
73	2	08/29/84	453	182	2	CH	5	390	479.43	1725.64	12.82	1738.46	1403.76	10.43	1414.19
74	2	08/29/84	510	183	2	CH	5	490	563.36	610.20	4.08	614.29	530.74	3.55	534.29
75	2	08/30/84	2129	184	2	CH	5	380	456.86	173.68	5.26	178.95	144.47	4.38	148.84
76	2	08/30/84	2144	185	2	CH	5	380	451.18	155.26	7.89	163.16	130.77	6.65	137.42
77	2	08/30/84	2158	186	2	CH	5	510	452.72	82.35	1.96	84.31	92.77	2.21	94.98
78	2	08/30/84	2211	187	2	CH	5	560	494.67	162.50	0.00	162.50	183.96	0.00	183.96
79	2	08/30/84	2235	188	2	CH	5	520	469.37	73.08	1.92	75.00	80.96	2.13	83.09
80	2	08/30/84	2301	189	2	CH	5	470	483.49	846.81	8.51	855.32	823.19	8.27	831.46
81	2	08/30/84	2315	190	2	CH	5	420	511.76	700.00	7.14	707.14	574.49	5.86	580.35
82	2	08/30/84	2328	191	2	CH	5	430	469.91	727.91	4.65	732.56	666.09	4.26	670.34
83	2	08/30/84	2341	192	2	CH	5	470	492.88	453.19	10.64	463.83	432.15	10.14	442.30
84	2	08/30/84	2353	193	2	CH	5	480	479.92	910.42	27.08	937.50	910.57	27.09	937.65
85	2	08/31/84	4	194	2	CH	5	430	494.81	890.70	16.28	906.98	774.03	14.15	788.18
86	2	08/31/84	18	195	2	CH	5	520	500.38	859.62	25.00	884.62	893.31	25.98	919.29
87	2	08/31/84	34	196	2	CH	5	500	486.37	802.00	14.00	816.00	824.48	14.39	838.88
88	2	08/31/84	45	197	2	CH	5	520	506.34	694.23	7.69	701.92	712.96	7.90	720.86
89	2	08/31/84	59	198	2	CH	5	400	489.77	995.00	35.00	1030.00	812.63	28.58	841.21
90	2	08/31/84	112	199	2	CH	5	470	465.86	670.21	12.77	682.98	676.17	12.88	689.05
91	2	08/31/84	124	200	2	CH	5	470	483.16	634.04	23.40	657.45	616.78	22.77	639.54
92	2	08/31/84	137	201	2	CH	5	380	491.89	678.95	7.89	686.84	524.51	6.10	530.61
93	2	08/31/84	206	202	2	CH	5	430	483.01	1048.84	13.95	1062.79	933.73	12.42	946.15
94	2	08/31/84	244	203	2	CH	5	430	504.02	946.51	6.98	953.49	807.50	5.95	813.46
95	2	08/31/84	301	204	2	CH	5	470	484.46	959.57	4.26	963.83	930.94	4.13	935.07
96	2	08/31/84	316	205	2	CH	5	450	484.32	1308.89	6.67	1315.56	1216.15	6.19	1222.34
97	2	08/31/84	328	206	2	CH	5	380	486.19	1271.05	7.89	1278.95	993.43	6.17	999.60
98	2	08/31/84	342	207	2	CH	5	550	490.49	956.36	1.82	958.18	1072.39	2.04	1074.43
99	2	08/31/84	354	208	2	CH	5	610	499.39	563.93	1.64	565.57	688.84	2.00	690.84
100	2	08/31/84	406	209	2	CH	5	400	517.77	997.50	0.00	997.50	770.61	0.00	770.61
101	2	08/31/84	419	210	2	CH	5	470	494.32	825.53	2.13	827.66	784.91	2.02	786.93
102	2	08/31/84	449	211	2	CH	5	450	534.57	1595.56	2.22	1597.78	1343.14	1.87	1345.01
103	2	08/31/84	510	212	2	CH	5	400	461.61	1625.00	0.00	1625.00	1408.12	0.00	1408.12
104	2	08/31/84	522	213	2	CH	5	440	501.14	1140.91	2.27	1143.18	1001.71	2.00	1003.71
105	2	08/31/84	536	214	2	CH	5	500	526.38	370.00	0.00	370.00	351.46	0.00	351.46
106	2	08/31/84	2038	215	2	CH	5	310	433.21	551.61	6.45	558.06	394.73	4.62	399.35
107	2	08/31/84	2059	216	2	TZ	5	460	470.33	1423.91	45.65	1469.57	1392.65	44.65	1437.30
108	2	08/31/84	2113	217	2	TZ	5	440	492.30	1238.64	43.18	1281.82	1107.04	38.59	1145.64

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
109	2	08/31/84	2128	218	2	TZ	5.0	480	501.28	287.50	0.00	287.50	275.30	0.00	275.30
110	2	08/31/84	2142	219	2	TZ	5.0	510	480.82	1339.22	43.14	1382.35	1420.48	45.75	1466.23
111	2	08/31/84	2204	220	2	CH	5.0	360	473.88	841.67	0.00	841.67	639.41	0.00	639.41
112	2	08/31/84	2245	221	2	CH	5.0	510	511.81	1007.84	0.00	1007.84	1004.28	0.00	1004.28
113	2	08/31/84	2259	222	2	CH	5.0	530	498.32	1650.94	7.55	1658.49	1755.92	8.03	1763.94
114	2	08/31/84	2311	223	2	CH	5.0	460	455.01	1656.52	0.00	1656.52	1674.67	0.00	1674.67
115	2	08/31/84	2357	224	2	CH	5.0	540	487.66	1625.93	5.56	1631.48	1800.42	6.15	1806.58
116	2	09/01/84	10	225	2	CH	5.0	550	491.28	658.18	9.09	667.27	736.86	10.18	747.03
117	2	09/01/84	23	226	2	CH	5.0	550	479.36	925.45	5.45	930.91	1061.83	6.26	1068.09
118	2	09/01/84	38	227	2	CH	5.0	510	490.76	1366.67	1.96	1368.63	1420.24	2.04	1422.27
119	2	09/01/84	51	228	2	CH	5.0	450	478.16	1131.11	0.00	1131.11	1064.49	0.00	1064.49
120	2	09/01/84	106	229	2	CH	5.0	440	468.59	1686.36	4.55	1690.91	1583.47	4.27	1587.74
121	2	09/01/84	121	230	2	CH	5.0	500	496.45	1046.00	8.00	1054.00	1053.47	8.06	1061.53
122	2	09/01/84	134	231	2	CH	5.0	460	478.16	1197.83	0.00	1197.83	1152.33	0.00	1152.33
123	2	09/01/84	149	232	2	CH	5.0	550	478.50	472.73	0.00	472.73	543.36	0.00	543.36
124	2	09/01/84	212	233	2	CH	5.0	480	451.43	1127.08	0.00	1127.08	1198.43	0.00	1198.43
125	2	09/01/84	225	234	2	CH	5.0	460	548.25	767.39	0.00	767.39	643.87	0.00	643.87
126	2	09/01/84	238	235	2	CH	5.0	480	550.88	654.17	0.00	654.17	570.00	0.00	570.00
127	2	09/01/84	252	236	2	CH	5.0	460	520.82	708.70	4.35	713.04	625.94	3.84	629.78
128	2	09/01/84	305	237	2	CH	5.0	420	457.90	776.19	0.00	776.19	711.95	0.00	711.95
129	2	09/01/84	318	238	2	CH	5.0	410	501.57	353.66	0.00	353.66	289.09	0.00	289.09
130	2	09/01/84	332	239	2	CH	5.0	460	450.45	339.13	2.17	341.30	346.32	2.22	348.54
131	2	09/01/84	345	240	2	CH	5.0	410	463.22	419.51	9.76	429.27	371.31	8.64	379.95
132	2	09/01/84	357	241	2	CH	5.0	550	472.28	307.27	3.64	310.91	357.84	4.23	362.07
133	2	09/01/84	410	242	2	CH	5.0	410	463.47	329.27	0.00	329.27	291.28	0.00	291.28
134	2	09/01/84	423	243	2	CH	5.0	510	462.02	409.80	1.96	411.76	452.36	2.16	454.52
135	2	09/01/84	436	244	2	CH	5.0	480	465.53	314.58	0.00	314.58	324.36	0.00	324.36
136	2	09/12/84	2043	306	3	CH	5.0	410	323.79	282.93	0.00	282.93	358.25	0.00	358.25
137	2	09/12/84	2105	307	3	CH	5.0	420	361.99	650.00	0.00	650.00	754.17	0.00	754.17
138	2	09/12/84	2128	308	3	CH	5.0	380	385.28	671.05	0.00	671.05	661.85	0.00	661.85
139	2	09/12/84	2141	309	3	CH	5.0	370	369.58	1151.35	0.00	1151.35	1152.65	0.00	1152.65
140	2	09/12/84	2209	310	3	CH	5.0	390	385.66	2379.49	0.00	2379.49	2406.28	0.00	2406.28
141	2	09/12/84	2221	311	3	CH	5.0	390	376.40	2017.95	0.00	2017.95	2090.84	0.00	2090.84
142	2	09/12/84	2232	312	3	CH	5.0	410	385.53	1497.56	2.44	1500.00	1592.60	2.59	1595.20
143	2	09/12/84	2246	313	3	CH	5.0	380	381.04	839.47	2.63	842.11	837.17	2.62	839.80
144	2	09/12/84	2300	314	3	CH	5.0	350	374.02	1117.14	0.00	1117.14	1045.39	0.00	1045.39
145	2	09/12/84	2312	315	3	CH	5.1	420	394.95	752.38	2.38	754.76	800.11	2.53	802.64
146	2	09/12/84	2323	316	3	CH	5.0	430	405.84	1295.35	9.30	1304.65	1372.45	9.86	1382.30
147	2	09/12/84	2338	317	3	CH	5.1	440	387.92	1409.09	4.55	1413.64	1598.25	5.16	1603.41
148	2	09/12/84	2351	318	3	CH	5.0	440	372.19	1602.27	9.09	1611.36	1894.19	10.75	1904.93
149	2	09/13/84	5	319	3	CH	5.0	390	372.29	700.00	2.56	702.56	733.30	2.69	735.98
150	2	09/13/84	15	320	3	CH	5.1	420	384.34	928.57	0.00	928.57	1014.73	0.00	1014.73
151	2	09/13/84	26	321	3	CH	5.0	380	409.88	2134.21	7.89	2142.11	1978.62	7.32	1985.94
152	2	09/13/84	38	322	3	CH	5.0	420	416.03	2252.38	4.76	2257.14	2273.90	4.81	2278.71
153	2	09/13/84	49	323	3	CH	5.1	450	388.78	3204.44	6.67	3211.11	3709.07	7.72	3716.79
154	2	09/13/84	101	324	3	CH	5.0	440	384.20	1586.36	9.09	1595.45	1816.75	10.41	1827.16
155	2	09/13/84	113	325	3	CH	5.0	430	373.65	1837.21	4.65	1841.86	2114.30	5.35	2119.65
156	2	09/13/84	124	326	3	CH	5.0	440	398.22	3097.73	4.55	3102.27	3422.72	5.02	3427.74
157	2	09/13/84	158	327	3	CH	5.0	430	366.45	811.63	0.00	811.63	952.38	0.00	952.38
158	2	09/13/84	210	328	3	CH	5.0	450	407.00	1457.78	0.00	1457.78	1611.80	0.00	1611.80
159	2	09/13/84	230	329	3	CH	5.0	400	383.63	1007.50	5.00	1012.50	1050.50	5.21	1055.71
160	2	09/13/84	243	330	3	CH	5.1	420	409.26	1240.48	2.38	1242.86	1273.02	2.44	1275.46
161	2	09/13/84	254	331	3	CH	5.0	430	395.69	1053.49	0.00	1053.49	1144.84	0.00	1144.84
162	2	09/13/84	306	332	3	CH	5.0	430	382.35	1048.84	0.00	1048.84	1179.56	0.00	1179.56

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
163	2	09/13/84	319	333	3	CH	5.2	450	411.51	1206.67	2.22	1208.89	1319.54	2.43	1321.97
164	2	09/13/84	330	334	3	CH	5.0	460	381.97	836.96	6.52	843.48	1007.93	7.85	1015.78
165	2	09/13/84	346	335	3	CH	5.0	390	380.39	1071.79	0.00	1071.79	1098.87	0.00	1098.87
166	2	09/13/84	420	336	3	CH	5.0	370	367.38	1035.14	2.70	1037.84	1042.53	2.72	1045.25
167	2	09/13/84	433	337	3	CH	5.0	380	372.52	1265.79	0.00	1265.79	1291.22	0.00	1291.22
168	2	09/13/84	446	338	3	CH	5.0	380	366.67	1252.63	0.00	1252.63	1298.15	0.00	1298.15
169	2	09/13/84	512	339	3	CH	5.0	370	395.04	843.24	2.70	845.95	789.80	2.53	792.33
170	2	09/13/84	525	340	3	CH	5.0	370	383.10	913.51	0.00	913.51	882.28	0.00	882.28
171	2	09/13/84	538	341	3	CH	5.2	380	405.19	860.53	0.00	860.53	807.04	0.00	807.04
172	2	09/13/84	551	342	3	CH	5.0	370	339.52	891.89	0.00	891.89	971.97	0.00	971.97
173	2	09/13/84	604	343	3	CH	5.0	320	341.82	1165.63	0.00	1165.63	1091.21	0.00	1091.21
174	2	09/13/84	2006	344	3	CH	5.0	420	357.47	2395.24	2.38	2397.62	2814.21	2.80	2817.01
175	2	09/13/84	2022	345	3	CH	5.0	430	377.06	2032.56	0.00	2032.56	2317.96	0.00	2317.96
176	2	09/13/84	2036	346	3	CH	5.0	460	396.59	2034.78	0.00	2034.78	2360.11	0.00	2360.11
177	2	09/13/84	2050	347	3	CH	5.0	390	358.50	1092.31	0.00	1092.31	1188.29	0.00	1188.29
178	2	09/13/84	2102	348	3	CH	5.1	390	382.33	1379.49	0.00	1379.49	1407.15	0.00	1407.15
179	2	09/13/84	2117	349	3	CH	5.0	410	362.64	1158.54	0.00	1158.54	1309.85	0.00	1309.85
180	2	09/13/84	2132	350	3	CH	5.1	430	416.96	1223.26	6.98	1230.23	1261.50	7.19	1268.70
181	2	09/13/84	2145	351	3	CH	5.0	460	388.12	1423.91	8.70	1432.61	1687.64	10.31	1697.95
182	2	09/13/84	2159	352	3	CH	5.0	400	383.63	1767.50	0.00	1767.50	1842.94	0.00	1842.94
183	2	09/13/84	2210	353	3	CH	5.0	430	375.02	1488.37	0.00	1488.37	1706.55	0.00	1706.55
184	2	09/13/84	2221	354	3	CH	5.0	380	366.80	2397.37	2.63	2400.00	2483.64	2.73	2486.37
185	2	09/13/84	2234	355	3	CH	5.0	410	366.07	2426.83	0.00	2426.83	2718.04	0.00	2718.04
186	2	09/13/84	2246	356	3	CH	5.0	410	375.38	1619.51	14.63	1634.15	1768.89	15.98	1784.88
187	2	09/13/84	2257	357	3	CH	5.0	400	365.85	1307.50	5.00	1312.50	1429.56	5.47	1435.03
188	2	09/13/84	2320	358	3	CH	5.0	410	426.56	1200.00	12.20	1212.20	1153.42	11.72	1165.14
189	2	09/13/84	2334	359	3	CH	5.0	410	374.12	863.41	4.88	868.29	946.21	5.35	951.56
190	2	09/13/84	2351	360	3	CH	5.0	410	371.56	1302.44	4.88	1307.32	1437.17	5.38	1442.55
191	2	09/14/84	8	361	3	CH	5.0	420	379.99	3071.43	11.90	3083.33	3394.82	13.16	3407.98
192	2	09/14/84	22	362	3	CH	5.0	400	369.38	1537.50	0.00	1537.50	1664.94	0.00	1664.94
193	2	09/14/84	35	363	3	CH	5.0	380	342.83	2076.32	7.89	2084.21	2301.46	8.75	2310.21
194	2	09/14/84	49	364	3	CH	5.0	440	383.55	1029.55	0.00	1029.55	1181.07	0.00	1181.07
195	2	09/14/84	101	365	3	CH	5.0	400	386.08	857.50	0.00	857.50	888.41	0.00	888.41
196	2	09/14/84	111	366	3	CH	5.0	420	386.86	950.00	0.00	950.00	1031.38	0.00	1031.38
197	2	09/14/84	121	367	3	CH	5.0	410	386.16	1378.05	2.44	1380.49	1463.13	2.59	1465.72
198	2	09/14/84	121	426	3	CH	5.0	390	481.00	182.05	0.00	182.05	147.61	0.00	147.61
199	2	09/14/84	134	368	3	CH	5.0	430	418.41	2306.98	0.00	2306.98	2370.89	0.00	2370.89
200	2	09/14/84	147	369	3	CH	5.0	450	375.25	1344.44	2.22	1346.67	1612.26	2.66	1614.92
201	2	09/14/84	205	370	3	CH	5.0	350	358.30	908.57	0.00	908.57	887.53	0.00	887.53
202	2	09/14/84	216	371	3	CH	5.0	420	386.94	647.62	0.00	647.62	702.96	0.00	702.96
203	2	09/14/84	226	372	3	CH	5.0	360	361.86	802.78	2.78	805.56	798.65	2.76	801.42
204	2	09/14/84	236	373	3	CH	5.0	440	389.44	1238.64	2.27	1240.91	1399.43	2.57	1402.00
205	2	09/14/84	247	374	3	CH	5.0	420	389.32	1642.86	0.00	1642.86	1772.33	0.00	1772.33
206	2	09/14/84	259	375	3	CH	5.0	410	358.47	2197.56	4.88	2202.44	2513.43	5.58	2519.01
207	2	09/14/84	309	376	3	CH	5.0	420	381.75	2850.00	7.14	2857.14	3135.60	7.86	3143.45
208	2	09/14/84	321	377	3	CH	5.0	380	377.68	2752.63	15.79	2768.42	2769.52	15.89	2785.40
209	2	09/14/84	335	378	3	CH	5.0	450	387.44	1660.00	0.00	1660.00	1928.05	0.00	1928.05
210	2	09/14/84	2059	438	3	CH	5.0	360	238.68	8.33	19.44	27.78	12.57	29.33	41.90
211	2	09/14/84	2117	380	3	CH	5.0	390	406.05	69.23	0.00	69.23	66.50	0.00	66.50
212	2	09/14/84	2117	439	3	CH	5.0	420	496.21	7.14	7.14	14.29	6.05	6.05	12.09
213	2	09/14/84	2137	440	3	CH	5.0	390	481.75	10.26	5.13	15.38	8.30	4.15	12.45
214	2	09/14/84	2206	385	3	CH	5.1	450	393.52	393.33	4.44	397.78	449.79	5.08	454.87
215	2	09/14/84	2211	441	3	CH	5.0	400	452.57	2.50	0.00	2.50	2.21	0.00	2.21
216	2	09/14/84	2234	383	3	CH	5.0	500	376.73	64.00	0.00	64.00	84.94	0.00	84.94

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
217	2	09/14/84	2249	384	3	CH	5.0	390	373.70	61.54	0.00	61.54	64.22	0.00	64.22
218	2	09/14/84	2249	443	3	CH	5.0	390	533.96	7.69	2.56	10.26	5.62	1.87	7.49
219	2	09/14/84	2331	445	3	CH	5.0	390	525.19	7.69	0.00	7.69	5.71	0.00	5.71
220	2	09/15/84	38	387	3	CH	5.0	380	368.30	452.63	10.53	463.16	467.01	10.86	477.87
221	2	09/15/84	53	388	3	CH	5.0	460	366.90	367.39	41.30	408.70	460.62	51.79	512.40
222	2	09/15/84	151	389	3	TZ	5.0	350	394.06	768.57	14.29	782.86	682.64	12.69	695.33
223	2	09/15/84	151	448	3	TZ	5.0	380	496.13	26.32	0.00	26.32	20.16	0.00	20.16
224	2	09/15/84	207	390	3	TZ	5.0	350	349.50	542.86	2.86	545.71	543.64	2.86	546.50
225	2	09/15/84	207	449	3	TZ	5.0	370	497.06	29.73	2.70	32.43	22.13	2.01	24.14
226	2	09/15/84	220	391	3	TZ	5.0	390	372.19	494.87	10.26	505.13	518.55	10.75	529.30
227	2	09/15/84	220	450	3	TZ	5.0	370	458.59	27.03	0.00	27.03	21.81	0.00	21.81
228	2	09/15/84	242	392	3	TZ	5.0	390	372.32	764.10	15.38	779.49	800.39	16.12	816.51
229	2	09/15/84	242	451	3	TZ	5.0	420	471.72	26.19	0.00	26.19	23.32	0.00	23.32
230	2	09/15/84	258	393	3	TZ	5.0	460	409.81	502.17	0.00	502.17	563.68	0.00	563.68
231	2	09/15/84	258	452	3	TZ	5.0	390	447.98	33.33	0.00	33.33	29.02	0.00	29.02
232	2	09/15/84	326	394	3	TZ	5.0	390	490.80	233.33	0.00	233.33	185.41	0.00	185.41
233	2	09/15/84	326	453	3	TZ	5.0	380	522.54	42.11	0.00	42.11	30.62	0.00	30.62
234	2	09/15/84	343	395	3	TZ	5.0	430	379.76	1106.98	2.33	1109.30	1253.41	2.63	1256.04
235	2	09/15/84	343	454	3	TZ	5.0	400	485.06	57.50	2.50	60.00	47.42	2.06	49.48
236	2	09/15/84	356	455	3	TZ	5.0	380	508.72	21.05	0.00	21.05	15.73	0.00	15.73
237	2	09/15/84	358	469	3	TZ	5.0	470	396.14	1682.98	2.13	1685.11	1996.77	2.52	1999.29
238	2	09/15/84	422	456	3	TZ	5.0	460	489.29	56.52	0.00	56.52	53.14	0.00	53.14
239	2	09/15/84	422	470	3	TZ	5.1	490	390.01	724.49	2.04	726.53	910.24	2.56	912.81
240	2	09/15/84	440	471	3	TZ	5.0	470	390.57	1482.98	0.00	1482.98	1784.56	0.00	1784.56
241	2	09/15/84	453	458	3	TZ	5.0	380	446.44	92.11	0.00	92.11	78.40	0.00	78.40
242	2	09/15/84	453	472	3	TZ	5.0	380	359.53	1621.05	2.63	1623.68	1713.36	2.78	1716.14
243	2	09/15/84	537	459	3	CH	5.0	270	452.23	37.04	0.00	37.04	22.11	0.00	22.11
244	2	09/15/84	537	473	3	CH	5.1	320	359.99	1137.50	0.00	1137.50	1011.14	0.00	1011.14
245	2	09/15/84	2004	474	3	IP	5.1	340	373.96	1300.00	0.00	1300.00	1181.96	0.00	1181.96
246	2	09/15/84	2024	475	3	CH	5.2	310	384.42	1141.94	3.23	1145.16	920.88	2.60	923.48
247	2	09/15/84	2048	476	3	CH	5.0	360	352.00	1625.00	0.00	1625.00	1661.91	0.00	1661.91
248	2	09/15/84	2231	479	3	CH	5.0	490	413.77	1563.27	4.08	1567.35	1851.25	4.83	1856.09
249	2	09/15/84	2247	480	3	CH	5.1	410	404.02	2253.66	0.00	2253.66	2287.00	0.00	2287.00
250	2	09/15/84	2300	481	3	CH	5.0	410	393.84	1675.61	0.00	1675.61	1744.37	0.00	1744.37
251	2	09/15/84	2316	482	3	CH	5.0	410	364.92	1629.27	0.00	1629.27	1830.54	0.00	1830.54
252	2	09/16/84	30	484	3	TZ	5.2	400	350.04	265.00	5.00	270.00	302.82	5.71	308.53
253	2	09/16/84	43	485	3	TZ	5.2	390	412.84	230.77	10.26	241.03	218.00	9.69	227.69
254	2	09/16/84	43	503	3	TZ	5.0	330	504.52	60.61	0.00	60.61	39.64	0.00	39.64
255	2	09/24/84	1939	486	4	CH	5.0	380	396.52	4107.89	0.00	4107.89	3936.76	0.00	3936.76
256	2	09/24/84	1959	487	4	CH	5.0	330	365.24	7687.88	0.00	7687.88	6946.16	0.00	6946.16
257	2	09/24/84	2015	488	4	CH	5.1	350	417.65	7731.43	0.00	7731.43	6479.15	0.00	6479.15
258	2	09/24/84	2028	489	4	CH	5.0	420	425.39	3228.57	0.00	3228.57	3187.66	0.00	3187.66
259	2	09/24/84	2045	490	4	CH	5.0	410	438.36	2792.68	0.00	2792.68	2612.01	0.00	2612.01
260	2	09/24/84	2100	491	4	CH	5.0	420	462.68	2364.29	0.00	2364.29	2146.17	0.00	2146.17
261	2	09/24/84	2115	492	4	CH	5.5	430	457.26	2388.37	0.00	2388.37	2245.97	0.00	2245.97
262	2	09/24/84	2138	493	4	CH	5.0	370	413.44	1740.54	0.00	1740.54	1557.66	0.00	1557.66
263	2	09/24/84	2153	494	4	CH	5.0	390	448.70	2671.79	0.00	2671.79	2322.28	0.00	2322.28
264	2	09/24/84	2214	495	4	CH	5.0	390	432.65	1805.13	0.00	1805.13	1627.20	0.00	1627.20
265	2	09/24/84	2235	496	4	CH	5.0	380	438.63	1607.89	0.00	1607.89	1392.96	0.00	1392.96
266	2	09/24/84	2309	497	4	CH	5.0	430	446.53	1453.49	0.00	1453.49	1399.67	0.00	1399.67
267	2	09/24/84	2328	498	4	CH	5.0	420	432.37	1650.00	2.38	1652.38	1602.78	2.31	1605.10
268	2	09/24/84	2345	499	4	CH	5.0	410	437.42	1592.68	12.20	1604.88	1492.86	11.43	1504.29
269	2	09/25/84	4	500	4	CH	5.0	410	445.49	1956.10	0.00	1956.10	1800.26	0.00	1800.26
270	2	09/25/84	29	504	4	CH	5.0	390	442.81	2407.69	2.56	2410.26	2120.56	2.26	2122.82

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
271	2	09/25/84	47	505	4	CH	5.0	390	453.72	2228.21	5.13	2233.33	1915.30	4.41	1919.71
272	2	09/25/84	108	506	4	CH	5.0	390	444.75	2571.79	2.56	2574.36	2255.22	2.25	2257.47
273	2	09/25/84	122	507	4	CH	5.0	400	462.56	2027.50	0.00	2027.50	1753.28	0.00	1753.28
274	2	09/25/84	143	508	4	CH	5.0	400	452.17	1917.50	5.00	1922.50	1696.25	4.42	1700.67
275	2	09/25/84	204	509	4	CH	5.0	400	434.58	2397.50	2.50	2400.00	2206.71	2.30	2209.01
276	2	09/25/84	223	510	4	CH	5.0	420	445.04	2007.14	7.14	2014.29	1894.19	6.74	1900.94
277	2	09/25/84	256	511	4	CH	5.0	380	440.35	2500.00	7.89	2507.89	2157.38	6.81	2164.20
278	2	09/25/84	314	512	4	CH	5.0	400	435.45	3257.50	2.50	3260.00	2992.28	2.30	2994.58
279	2	09/25/84	336	513	4	CH	5.6	450	508.13	2508.89	2.22	2511.11	2221.86	1.97	2223.83
280	2	09/25/84	1920	514	4	CH	5.0	400	438.36	382.50	2.50	385.00	349.03	2.28	351.31
281	2	09/25/84	1937	515	4	CH	5.0	410	431.60	609.76	0.00	609.76	579.24	0.00	579.24
282	2	09/25/84	1952	516	4	CH	5.0	390	413.91	1517.95	5.13	1523.08	1430.26	4.83	1435.09
283	2	09/25/84	2007	517	4	CH	5.0	380	425.96	4215.79	7.89	4223.68	3760.90	7.04	3767.94
284	2	09/25/84	2023	518	4	CH	5.0	380	427.28	3926.32	5.26	3931.58	3491.86	4.68	3496.54
285	2	09/25/84	2125	520	4	CH	5.0	370	427.25	2821.62	0.00	2821.62	2443.51	0.00	2443.51
286	2	09/25/84	2140	521	4	CH	5.0	440	429.17	2125.00	6.82	2131.82	2178.64	6.99	2185.63
287	2	09/25/84	2157	522	4	CH	5.0	450	448.90	2100.00	4.44	2104.44	2105.17	4.46	2109.62
288	2	09/25/84	2222	523	4	CH	5.0	400	438.46	1617.50	2.50	1620.00	1475.62	2.28	1477.90
289	2	09/25/84	2237	524	4	CH	5.0	380	437.52	1936.84	7.89	1944.74	1682.23	6.86	1689.08
290	2	09/25/84	2251	525	4	CH	5.0	420	439.13	1219.05	9.52	1228.57	1165.94	9.11	1175.05
291	2	09/25/84	2306	526	4	CH	5.0	460	439.75	1956.52	6.52	1963.04	2046.61	6.82	2053.43
292	2	09/25/84	2325	527	4	CH	5.0	440	437.12	2345.45	13.64	2359.09	2360.92	13.73	2374.64
293	2	09/25/84	2343	528	4	CH	5.0	490	453.81	1724.49	6.12	1730.61	1861.99	6.61	1868.60
294	2	09/26/84	1	529	4	CH	5.0	380	422.14	2021.05	21.05	2042.11	1819.32	18.95	1838.27
295	2	09/26/84	16	530	4	CH	5.0	420	423.53	1733.33	9.52	1742.86	1718.90	9.44	1728.34
296	2	09/26/84	36	531	4	CH	5.0	440	435.28	2579.55	13.64	2593.18	2607.52	13.78	2621.30
297	2	09/26/84	54	532	4	CH	5.0	470	423.70	3114.89	12.77	3127.66	3455.27	14.16	3469.43
298	2	09/26/84	111	533	4	CH	5.0	400	430.68	2665.00	12.50	2677.50	2475.14	11.61	2486.75
299	2	09/26/84	128	534	4	CH	5.0	400	426.14	2342.50	25.00	2367.50	2198.83	23.47	2222.30
300	2	09/26/84	147	535	4	CH	5.0	380	427.68	2686.84	23.68	2710.53	2387.32	21.04	2408.36
301	2	09/26/84	209	536	4	CH	5.0	450	424.45	2773.33	24.44	2797.78	2940.30	25.92	2966.22
302	2	09/26/84	228	537	4	CH	5.0	460	414.16	2658.70	10.87	2669.57	2952.96	12.07	2965.04
303	2	09/26/84	248	538	4	CH	5.0	400	436.67	2505.00	10.00	2515.00	2294.63	9.16	2303.79
304	2	09/26/84	304	539	4	CH	5.0	370	423.78	2797.30	10.81	2808.11	2442.33	9.44	2451.77
305	2	09/26/84	324	540	4	CH	5.0	390	442.44	3474.36	20.51	3494.87	3062.60	18.08	3080.68
306	2	09/26/84	342	541	4	CH	5.0	370	418.09	3800.00	2.70	3802.70	3362.95	2.39	3365.34
307	2	09/26/84	402	542	4	CH	5.0	470	403.95	3189.36	2.13	3191.49	3710.87	2.48	3713.35
308	2	09/26/84	420	543	4	CH	5.0	460	427.53	4373.91	15.22	4389.13	4706.13	16.37	4722.50
309	2	09/26/84	456	545	4	CH	5.0	360	430.29	3511.11	8.33	3519.44	2937.59	6.97	2944.56
310	2	09/26/84	2222	546	4	CH	5.0	490	434.41	155.10	0.00	155.10	174.95	0.00	174.95
311	2	09/26/84	2240	547	4	CH	5.0	360	513.45	333.33	2.78	336.11	233.71	1.95	235.66
312	2	09/26/84	2253	548	4	CH	5.0	370	450.29	345.95	0.00	345.95	284.26	0.00	284.26
313	2	09/26/84	2308	549	4	CH	5.0	360	435.20	2052.78	0.00	2052.78	1698.05	0.00	1698.05
314	2	09/26/84	2324	550	4	CH	5.0	350	416.17	6002.86	0.00	6002.86	5048.39	0.00	5048.39
315	2	09/26/84	2340	551	4	CH	5.0	360	420.20	7108.33	2.78	7111.11	6089.99	2.38	6092.37
316	2	09/27/84	2024	664	4	CH	5.0	490	509.40	1991.84	0.00	1991.84	1915.97	0.00	1915.97
317	2	09/27/84	2041	665	4	CH	5.0	500	483.99	1342.00	0.00	1342.00	1386.39	0.00	1386.39
318	2	09/27/84	2055	666	4	CH	5.0	480	486.52	2112.50	4.17	2116.67	2084.20	4.11	2088.31
319	2	09/27/84	2111	667	4	CH	5.0	400	501.83	1330.00	5.00	1335.00	1060.13	3.99	1064.11
320	2	09/27/84	2131	668	4	CH	5.0	380	433.05	1697.37	0.00	1697.37	1489.45	0.00	1489.45
321	3	08/16/84	2149	1	1	CH	5.0	370	507.29	5.41	0.00	5.41	3.94	0.00	3.94
322	3	08/16/84	2214	2	1	CH	5.0	390	485.79	10.26	0.00	10.26	8.23	0.00	8.23
323	3	08/16/84	2238	3	1	CH	5.0	390	424.39	2.56	0.00	2.56	2.36	0.00	2.36
324	3	08/16/84	2251	4	1	CH	5.0	430	405.70	4.65	0.00	4.65	4.93	0.00	4.93

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
325	3	08/16/84	2334	6	1	CH	5	460	415.77	2.17	0	2.17	2.41	0	2.41
326	3	08/16/84	2352	7	1	CH	5	510	466.06	3.92	0	3.92	4.29	0	4.29
327	3	08/17/84	17	8	1	CH	5	500	495.16	6.00	0	6.00	6.06	0	6.06
328	3	08/17/84	35	9	1	CH	5	540	482.45	1.85	0	1.85	2.07	0	2.07
329	3	08/17/84	135	12	1	CH	5	510	491.98	1.96	0	1.96	2.03	0	2.03
330	3	08/17/84	201	13	1	CH	5	590	490.95	1.69	0	1.69	2.04	0	2.04
331	3	08/17/84	248	15	1	CH	5	550	451.34	1.82	0	1.82	2.22	0	2.22
332	3	08/17/84	2131	21	1	CH	5	400	443.29	10.00	0	10.00	9.02	0	9.02
333	3	08/17/84	2151	22	1	CH	5	390	486.42	12.82	0	12.82	10.28	0	10.28
334	3	08/17/84	2210	23	1	CH	5	460	497.19	8.70	0	8.70	8.05	0	8.05
335	3	08/17/84	2229	24	1	CH	5	410	441.64	4.88	0	4.88	4.53	0	4.53
336	3	08/17/84	2312	25	1	CH	5	400	436.29	5.00	0	5.00	4.58	0	4.58
337	3	08/17/84	2330	26	1	CH	5	370	439.67	5.41	0	5.41	4.55	0	4.55
338	3	08/18/84	15	27	1	CH	5	440	455.92	6.82	0	6.82	6.58	0	6.58
339	3	08/18/84	38	28	1	CH	5	500	544.59	6.00	0	6.00	5.51	0	5.51
340	3	08/18/84	57	29	1	CH	5	420	441.93	2.38	0	2.38	2.26	0	2.26
341	3	08/18/84	152	102	1	IP	5	390	453.49	2.56	0	2.56	2.21	0	2.21
342	3	08/18/84	229	104	1	IP	5	370	447.20	2.70	0	2.70	2.24	0	2.24
343	3	08/18/84	305	106	1	IP	5	390	410.33	2.56	0	2.56	2.44	0	2.44
344	3	08/18/84	323	107	1	CH	5	400	505.10	2.50	0	2.50	1.98	0	1.98
345	3	08/18/84	435	110	1	CH	5	410	470.91	2.44	0	2.44	2.12	0	2.12
346	3	08/18/84	512	112	1	CH	5	420	438.89	4.76	0	4.76	4.56	0	4.56
347	3	08/18/84	2053	113	1	CH	5	350	443.26	2.86	0	2.86	2.26	0	2.26
348	3	08/18/84	2113	114	1	CH	5	350	428.57	11.43	0	11.43	9.33	0	9.33
349	3	08/18/84	2150	116	1	CH	5	380	426.16	2.63	0	2.63	2.35	0	2.35
350	3	08/18/84	2207	117	1	CH	5	360	458.43	2.78	0	2.78	2.18	0	2.18
351	3	08/18/84	2225	118	1	CH	5	320	429.43	6.25	0	6.25	4.66	0	4.66
352	3	08/19/84	136	127	1	CH	5	440	420.84	2.27	0	2.27	2.38	0	2.38
353	3	08/19/84	216	129	1	CH	5	440	514.32	2.27	0	2.27	1.94	0	1.94
354	3	08/19/84	321	132	1	CH	5	390	437.66	2.56	0	2.56	2.28	0	2.28
355	3	08/29/84	239	175	2	CH	5	430	457.18	2.33	0	2.33	2.19	0	2.19
356	3	08/29/84	255	176	2	CH	5	450	448.26	2.22	0	2.22	2.23	0	2.23
357	3	08/29/84	352	179	2	CH	5	440	504.84	2.27	0	2.27	1.98	0	1.98
358	3	08/29/84	433	181	2	CH	5	450	511.78	2.22	0	2.22	1.95	0	1.95
359	3	08/29/84	510	183	2	CH	5	490	563.36	2.04	0	2.04	1.78	0	1.78
360	3	08/30/84	2129	184	2	CH	5	380	456.86	2.63	0	2.63	2.19	0	2.19
361	3	08/30/84	2144	185	2	CH	5	380	451.18	2.63	0	2.63	2.22	0	2.22
362	3	08/30/84	2235	188	2	CH	5	520	469.37	1.92	0	1.92	2.13	0	2.13
363	3	08/31/84	34	196	2	CH	5	500	486.37	2.00	0	2.00	2.06	0	2.06
364	3	08/31/84	112	199	2	CH	5	470	465.86	2.13	0	2.13	2.15	0	2.15
365	3	08/31/84	124	200	2	CH	5	470	483.16	4.26	0	4.26	4.14	0	4.14
366	3	08/31/84	206	202	2	CH	5	430	483.01	2.33	0	2.33	2.07	0	2.07
367	3	08/31/84	316	205	2	CH	5	450	484.32	4.44	0	4.44	4.13	0	4.13
368	3	08/31/84	328	206	2	CH	5	380	486.19	5.26	0	5.26	4.11	0	4.11
369	3	08/31/84	406	209	2	CH	5	400	517.77	2.50	0	2.50	1.93	0	1.93
370	3	08/31/84	2059	216	2	TZ	5	460	470.33	2.17	0	2.17	2.13	0	2.13
371	3	08/31/84	2259	222	2	CH	5	530	498.32	1.89	0	1.89	2.01	0	2.01
372	3	08/31/84	2311	223	2	CH	5	460	455.01	4.35	0	4.35	4.40	0	4.40
373	3	08/31/84	2357	224	2	CH	5	540	487.66	7.41	0	7.41	8.20	0	8.20
374	3	09/01/84	10	225	2	CH	5	550	491.28	7.27	0	7.27	8.14	0	8.14
375	3	09/01/84	23	226	2	CH	5	550	479.36	5.45	0	5.45	6.26	0	6.26
376	3	09/01/84	38	227	2	CH	5	510	490.76	5.88	0	5.88	6.11	0	6.11
377	3	09/01/84	51	228	2	CH	5	450	478.16	11.11	0	11.11	10.46	0	10.46
378	3	09/01/84	106	229	2	CH	5	440	468.59	4.55	0	4.55	4.27	0	4.27

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FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
379	3	09/01/84	121	230	2	CH	5.0	500	496.45	6.00	0	6.00	6.04	0	6.04
380	3	09/01/84	212	233	2	CH	5.0	480	451.43	6.25	0	6.25	6.65	0	6.65
381	3	09/01/84	225	234	2	CH	5.0	460	548.25	2.17	0	2.17	1.82	0	1.82
382	3	09/01/84	238	235	2	CH	5.0	480	550.88	2.08	0	2.08	1.82	0	1.82
383	3	09/01/84	252	236	2	CH	5.0	460	520.82	17.39	0	17.39	15.36	0	15.36
384	3	09/01/84	305	237	2	CH	5.0	420	457.90	7.14	0	7.14	6.55	0	6.55
385	3	09/01/84	332	239	2	CH	5.0	460	450.45	2.17	0	2.17	2.22	0	2.22
386	3	09/01/84	345	240	2	CH	5.0	410	463.22	12.20	0	12.20	10.79	0	10.79
387	3	09/01/84	357	241	2	CH	5.0	550	472.28	12.73	0	12.73	14.82	0	14.82
388	3	09/01/84	410	242	2	CH	5.0	410	463.47	4.88	0	4.88	4.32	0	4.32
389	3	09/01/84	423	243	2	CH	5.0	510	462.02	9.80	0	9.80	10.82	0	10.82
390	3	09/01/84	436	244	2	CH	5.0	480	465.53	14.58	0	14.58	15.04	0	15.04
391	3	09/12/84	2128	308	3	CH	5.0	380	385.28	2.63	0	2.63	2.60	0	2.60
392	3	09/12/84	2338	317	3	CH	5.1	440	387.92	2.27	0	2.27	2.58	0	2.58
393	3	09/13/84	420	336	3	CH	5.0	370	367.38	2.70	0	2.70	2.72	0	2.72
394	3	09/13/84	2006	344	3	CH	5.0	420	357.47	2.38	0	2.38	2.80	0	2.80
395	3	09/13/84	2145	351	3	CH	5.0	460	388.12	2.17	0	2.17	2.58	0	2.58
396	3	09/13/84	2159	352	3	CH	5.0	400	383.63	2.50	0	2.50	2.61	0	2.61
397	3	09/13/84	2210	353	3	CH	5.0	430	375.02	4.65	0	4.65	5.33	0	5.33
398	3	09/13/84	2234	355	3	CH	5.0	410	366.07	2.44	0	2.44	2.73	0	2.73
399	3	09/13/84	2351	360	3	CH	5.0	410	371.56	2.44	0	2.44	2.69	0	2.69
400	3	09/14/84	8	361	3	CH	5.0	420	379.99	2.38	0	2.38	2.63	0	2.63
401	3	09/14/84	101	365	3	CH	5.0	400	386.08	5.00	0	5.00	5.18	0	5.18
402	3	09/15/84	2300	481	3	CH	5.0	410	393.84	2.44	0	2.44	2.54	0	2.54
403	3	09/15/84	2331	483	3	CH	5.0	430	382.80	981.40	0	981.40	1102.40	0	1102.40
404	3	09/24/84	2015	488	4	CH	5.1	350	417.65	2.86	0	2.86	2.39	0	2.39
405	3	09/24/84	2214	495	4	CH	5.0	390	432.65	5.13	0	5.13	4.62	0	4.62
406	3	09/24/84	2235	496	4	CH	5.0	380	438.63	7.89	0	7.89	6.84	0	6.84
407	3	09/24/84	2345	499	4	CH	5.0	410	437.42	7.32	0	7.32	6.86	0	6.86
408	3	09/25/84	29	504	4	CH	5.0	390	442.81	2.56	0	2.56	2.26	0	2.26
409	3	09/25/84	108	506	4	CH	5.0	390	444.75	2.56	0	2.56	2.25	0	2.25
410	3	09/25/84	122	507	4	CH	5.0	400	462.56	7.50	0	7.50	6.49	0	6.49
411	3	09/26/84	36	531	4	CH	5.0	440	435.28	2.27	0	2.27	2.30	0	2.30
412	3	09/27/84	2055	666	4	CH	5.0	480	486.52	2.08	0	2.08	2.06	0	2.06
413	3	09/27/84	2131	668	4	CH	5.0	380	433.05	2.63	0	2.63	2.31	0	2.31
414	4	08/16/84	2149	1	1	CH	5.0	370	507.29	5.41	0	5.41	3.94	0	3.94
415	4	08/16/84	2214	2	1	CH	5.0	390	485.79	7.69	0	7.69	6.18	0	6.18
416	4	08/16/84	2251	4	1	CH	5.0	430	405.70	2.33	0	2.33	2.46	0	2.46
417	4	08/16/84	2352	7	1	CH	5.0	510	466.06	3.92	0	3.92	4.29	0	4.29
418	4	08/17/84	35	9	1	CH	5.0	540	482.45	3.70	0	3.70	4.15	0	4.15
419	4	08/17/84	248	15	1	CH	5.0	550	451.34	1.82	0	1.82	2.22	0	2.22
420	4	08/17/84	428	19	1	CH	5.0	450	481.34	2.22	0	2.22	2.08	0	2.08
421	4	08/18/84	38	28	1	CH	5.0	500	544.59	2.00	0	2.00	1.84	0	1.84
422	4	08/18/84	210	103	1	IP	5.0	410	463.13	2.44	0	2.44	2.16	0	2.16
423	4	08/18/84	435	110	1	CH	5.0	410	470.91	2.44	0	2.44	2.12	0	2.12
424	4	08/18/84	2225	118	1	CH	5.0	320	429.43	3.13	0	3.13	2.33	0	2.33
425	4	08/19/84	17	123	1	CH	5.0	420	455.27	2.38	0	2.38	2.20	0	2.20
426	4	08/29/84	141	172	2	CH	5.0	410	473.07	2.44	0	2.44	2.11	0	2.11
427	4	08/29/84	221	174	2	CH	5.0	460	524.30	2.17	0	2.17	1.91	0	1.91
428	4	08/29/84	338	178	2	CH	5.0	470	479.01	2.13	0	2.13	2.09	0	2.09
429	4	08/29/84	412	180	2	CH	5.0	450	547.45	6.67	0	6.67	5.48	0	5.48
430	4	08/29/84	453	182	2	CH	5.0	390	479.43	2.56	0	2.56	2.09	0	2.09
431	4	08/29/84	510	183	2	CH	5.0	490	563.36	2.04	0	2.04	1.78	0	1.78
432	4	08/31/84	4	194	2	CH	5.0	430	494.81	2.33	0	2.33	2.02	0	2.02

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
433	4	08/31/84	301	204	2	CH	5	470	484.46	2.13	0.00	2.13	2.06	0.00	2.06
434	4	08/31/84	449	211	2	CH	5	450	534.57	2.22	0.00	2.22	1.87	0.00	1.87
435	4	08/31/84	2113	217	2	TZ	5	440	492.30	2.27	0.00	2.27	2.03	0.00	2.03
436	4	09/01/84	10	225	2	CH	5	550	491.28	1.82	0.00	1.82	2.04	0.00	2.04
437	4	09/01/84	23	226	2	CH	5	550	479.36	1.82	0.00	1.82	2.09	0.00	2.09
438	4	09/01/84	410	242	2	CH	5	410	463.47	2.44	0.00	2.44	2.16	0.00	2.16
439	4	09/13/84	5	319	3	CH	5	390	372.29	2.56	0.00	2.56	2.69	0.00	2.69
440	4	09/14/84	2234	442	3	CH	5	440	509.60	2.27	0.00	2.27	1.96	0.00	1.96
441	4	09/14/84	2331	445	3	CH	5	390	525.19	2.56	0.00	2.56	1.90	0.00	1.90
442	4	09/15/84	258	452	3	TZ	5	390	447.98	2.56	0.00	2.56	2.23	0.00	2.23
443	4	09/15/84	2316	482	3	CH	5	410	364.92	2.44	0.00	2.44	2.74	0.00	2.74
444	4	09/16/84	43	503	3	TZ	5	330	504.52	3.03	0.00	3.03	1.98	0.00	1.98
445	4	09/25/84	2007	517	4	CH	5	380	425.96	2.63	0.00	2.63	2.35	0.00	2.35
446	4	09/26/84	128	534	4	CH	5	400	426.14	2.50	0.00	2.50	2.35	0.00	2.35
447	6	08/30/84	2211	187	2	CH	5	560	494.67	0.00	7.14	7.14	0.00	8.09	8.09
448	10	08/16/84	2149	1	1	CH	5	370	507.29	0.00	5.41	5.41	0.00	3.94	3.94
449	10	08/16/84	2214	2	1	CH	5	390	485.79	0.00	2.56	2.56	0.00	2.06	2.06
450	10	08/16/84	2238	3	1	CH	5	390	424.39	0.00	7.69	7.69	0.00	7.07	7.07
451	10	08/16/84	2251	4	1	CH	5	430	405.70	0.00	13.95	13.95	0.00	14.79	14.79
452	10	08/16/84	2312	5	1	CH	5	410	477.60	0.00	19.51	19.51	0.00	16.75	16.75
453	10	08/16/84	2334	6	1	CH	5	460	415.77	0.00	13.04	13.04	0.00	14.43	14.43
454	10	08/16/84	2352	7	1	CH	5	510	466.06	0.00	1.96	1.96	0.00	2.15	2.15
455	10	08/17/84	135	12	1	CH	5	510	491.98	0.00	1.96	1.96	0.00	2.03	2.03
456	10	08/17/84	201	13	1	CH	5	590	490.95	0.00	1.69	1.69	0.00	2.04	2.04
457	10	08/17/84	2131	21	1	CH	5	400	443.29	0.00	2.50	2.50	0.00	2.26	2.26
458	10	08/17/84	2151	22	1	CH	5	390	486.42	0.00	2.56	2.56	0.00	2.06	2.06
459	10	08/17/84	2210	23	1	CH	5	460	497.19	0.00	2.17	2.17	0.00	2.01	2.01
460	10	08/18/84	2133	115	1	CH	5	330	414.39	0.00	3.03	3.03	0.00	2.41	2.41
461	10	08/18/84	2150	116	1	CH	5	380	426.16	0.00	2.63	2.63	0.00	2.35	2.35
462	10	08/19/84	53	125	1	CH	5	460	448.91	0.00	2.17	2.17	0.00	2.23	2.23
463	10	08/19/84	136	127	1	CH	5	440	420.84	0.00	4.55	4.55	0.00	4.75	4.75
464	10	08/19/84	216	129	1	CH	5	440	514.32	0.00	4.55	4.55	0.00	3.89	3.89
465	10	08/19/84	235	130	1	CH	5	400	424.26	0.00	7.50	7.50	0.00	7.07	7.07
466	10	08/29/84	141	172	2	CH	5	410	473.07	0.00	2.44	2.44	0.00	2.11	2.11
467	10	08/30/84	2211	187	2	CH	5	560	494.67	0.00	1.79	1.79	0.00	2.02	2.02
468	10	08/30/84	2235	188	2	CH	5	520	469.37	0.00	3.85	3.85	0.00	4.26	4.26
469	10	08/31/84	536	214	2	CH	5	500	526.38	0.00	2.00	2.00	0.00	1.90	1.90
470	10	09/01/84	23	226	2	CH	5	550	479.36	0.00	1.82	1.82	0.00	2.09	2.09
471	10	09/01/84	252	236	2	CH	5	460	520.82	0.00	2.17	2.17	0.00	1.92	1.92
472	10	09/01/84	357	241	2	CH	5	550	472.28	0.00	1.82	1.82	0.00	2.12	2.12
473	10	09/13/84	26	321	3	CH	5	380	409.88	0.00	2.63	2.63	0.00	2.44	2.44
474	10	09/14/84	2249	384	3	CH	5	390	373.70	0.00	2.56	2.56	0.00	2.68	2.68
475	10	09/15/84	53	388	3	CH	5	460	366.90	0.00	6.52	6.52	0.00	8.18	8.18
476	10	09/24/84	2345	499	4	CH	5	410	437.42	0.00	2.44	2.44	0.00	2.29	2.29
477	10	09/25/84	143	508	4	CH	5	400	452.17	0.00	2.50	2.50	0.00	2.21	2.21
478	10	09/26/84	16	530	4	CH	5	420	423.53	0.00	4.76	4.76	0.00	4.72	4.72
479	10	09/26/84	402	542	4	CH	5	470	403.95	0.00	2.13	2.13	0.00	2.48	2.48
480	10	09/26/84	2240	547	4	CH	5	360	513.45	0.00	25.00	25.00	0.00	17.53	17.53
481	10	09/26/84	2253	548	4	CH	5	370	450.29	0.00	13.51	13.51	0.00	11.10	11.10
482	10	09/26/84	2324	550	4	CH	5	350	416.17	0.00	22.86	22.86	0.00	19.22	19.22
483	10	09/26/84	2340	551	4	CH	5	360	420.20	0.00	2.78	2.78	0.00	2.38	2.38
484	10	09/27/84	2041	665	4	CH	5	500	483.99	0.00	2.00	2.00	0.00	2.07	2.07
485	13	08/16/84	2149	1	1	CH	5	370	507.29	0.00	2.70	2.70	0.00	1.97	1.97
486	13	08/16/84	2214	2	1	CH	5	390	485.79	0.00	2.56	2.56	0.00	2.06	2.06

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487	13	08/16/84	2238	3	1	CH	5.0	390	424.39	0.00	2.56	2.56	0.00	2.36	2.36
488	13	08/16/84	2312	5	1	CH	5.0	410	477.60	0.00	2.44	2.44	0.00	2.09	2.09
489	13	08/16/84	2352	7	1	CH	5.0	510	466.06	0.00	3.92	3.92	0.00	4.29	4.29
490	13	08/17/84	112	11	1	CH	5.0	530	489.40	0.00	1.89	1.89	0.00	2.04	2.04
491	13	08/17/84	135	12	1	CH	5.0	510	491.98	0.00	3.92	3.92	0.00	4.07	4.07
492	13	08/17/84	201	13	1	CH	5.0	590	490.95	0.00	3.39	3.39	0.00	4.07	4.07
493	13	08/17/84	226	14	1	CH	5.0	540	477.15	0.00	1.85	1.85	0.00	2.10	2.10
494	13	08/17/84	248	15	1	CH	5.0	550	451.34	0.00	5.45	5.45	0.00	6.65	6.65
495	13	08/17/84	316	16	1	CH	5.0	590	442.98	0.00	1.69	1.69	0.00	2.26	2.26
496	13	08/17/84	2151	22	1	CH	5.0	390	486.42	0.00	2.56	2.56	0.00	2.06	2.06
497	13	08/17/84	2330	26	1	CH	5.0	370	439.67	0.00	2.70	2.70	0.00	2.27	2.27
498	13	08/18/84	305	106	1	IP	5.0	390	410.33	0.00	5.13	5.13	0.00	4.87	4.87
499	13	08/18/84	323	107	1	CH	5.0	400	505.10	0.00	2.50	2.50	0.00	1.98	1.98
500	13	08/18/84	2053	113	1	CH	5.0	350	443.26	2.86	0.00	2.86	2.26	0.00	2.26
501	13	08/18/84	2113	114	1	CH	5.0	350	428.57	0.00	2.86	2.86	0.00	2.33	2.33
502	13	08/18/84	2207	117	1	CH	5.0	360	458.43	0.00	5.56	5.56	0.00	4.36	4.36
503	13	08/19/84	321	132	1	CH	5.0	390	437.66	0.00	2.56	2.56	0.00	2.28	2.28
504	13	08/29/84	322	177	2	CH	5.0	430	494.42	0.00	2.33	2.33	0.00	2.02	2.02
505	13	08/29/84	412	180	2	CH	5.0	450	547.45	0.00	6.67	6.67	0.00	5.48	5.48
506	13	08/29/84	453	182	2	CH	5.0	390	479.43	0.00	10.26	10.26	0.00	8.34	8.34
507	13	08/29/84	510	183	2	CH	5.0	490	563.36	0.00	8.16	8.16	0.00	7.10	7.10
508	13	08/30/84	2315	190	2	CH	5.0	420	511.76	0.00	2.38	2.38	0.00	1.95	1.95
509	13	08/31/84	34	196	2	CH	5.0	500	486.37	0.00	2.00	2.00	0.00	2.06	2.06
510	13	08/31/84	45	197	2	CH	5.0	520	506.34	0.00	3.85	3.85	0.00	3.95	3.95
511	13	08/31/84	301	204	2	CH	5.0	470	484.46	0.00	6.38	6.38	0.00	6.19	6.19
512	13	08/31/84	328	206	2	CH	5.0	380	486.19	0.00	15.79	15.79	0.00	12.34	12.34
513	13	08/31/84	354	208	2	CH	5.0	610	499.39	0.00	1.64	1.64	0.00	2.00	2.00
514	13	08/31/84	2142	219	2	TZ	5.0	510	480.82	0.00	1.96	1.96	0.00	2.08	2.08
515	13	08/31/84	2259	222	2	CH	5.0	530	498.32	0.00	1.89	1.89	0.00	2.01	2.01
516	13	08/31/84	2357	224	2	CH	5.0	540	487.66	0.00	1.85	1.85	0.00	2.05	2.05
517	13	09/01/84	23	226	2	CH	5.0	550	479.36	0.00	3.64	3.64	0.00	4.17	4.17
518	13	09/01/84	38	227	2	CH	5.0	510	490.76	0.00	1.96	1.96	0.00	2.04	2.04
519	13	09/01/84	106	229	2	CH	5.0	440	468.59	0.00	2.27	2.27	0.00	2.13	2.13
520	13	09/01/84	121	230	2	CH	5.0	500	496.45	0.00	2.00	2.00	0.00	2.01	2.01
521	13	09/01/84	134	231	2	CH	5.0	460	478.16	0.00	2.17	2.17	0.00	2.09	2.09
522	13	09/01/84	212	233	2	CH	5.0	480	451.43	0.00	2.08	2.08	0.00	2.22	2.22
523	13	09/01/84	252	236	2	CH	5.0	460	520.82	0.00	4.35	4.35	0.00	3.84	3.84
524	13	09/01/84	305	237	2	CH	5.0	420	457.90	0.00	2.38	2.38	0.00	2.18	2.18
525	13	09/01/84	345	240	2	CH	5.0	410	463.22	0.00	4.88	4.88	0.00	4.32	4.32
526	13	09/01/84	357	241	2	CH	5.0	550	472.28	0.00	1.82	1.82	0.00	2.12	2.12
527	13	09/01/84	436	244	2	CH	5.0	480	465.53	0.00	4.17	4.17	0.00	4.30	4.30
528	13	09/12/84	2043	306	3	CH	5.0	410	323.79	0.00	2.44	2.44	0.00	3.09	3.09
529	13	09/12/84	2105	307	3	CH	5.0	420	361.99	0.00	2.38	2.38	0.00	2.76	2.76
530	13	09/12/84	2209	310	3	CH	5.0	390	385.66	0.00	2.56	2.56	0.00	2.59	2.59
531	13	09/12/84	2221	311	3	CH	5.0	390	376.40	0.00	7.69	7.69	0.00	7.97	7.97
532	13	09/12/84	2246	313	3	CH	5.0	380	381.04	0.00	2.63	2.63	0.00	2.62	2.62
533	13	09/12/84	2338	317	3	CH	5.1	440	387.92	0.00	4.55	4.55	0.00	5.16	5.16
534	13	09/12/84	2351	318	3	CH	5.0	440	372.19	0.00	2.27	2.27	0.00	2.69	2.69
535	13	09/13/84	5	319	3	CH	5.0	390	372.29	0.00	2.56	2.56	0.00	2.69	2.69
536	13	09/13/84	15	320	3	CH	5.1	420	384.34	0.00	4.76	4.76	0.00	5.20	5.20
537	13	09/13/84	26	321	3	CH	5.0	380	409.88	0.00	2.63	2.63	0.00	2.44	2.44
538	13	09/13/84	38	322	3	CH	5.0	420	416.03	0.00	2.38	2.38	0.00	2.40	2.40
539	13	09/13/84	49	323	3	CH	5.1	450	388.78	0.00	2.22	2.22	0.00	2.57	2.57
540	13	09/13/84	113	325	3	CH	5.0	430	373.65	0.00	4.65	4.65	0.00	5.35	5.35

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
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USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
541	13	09/13/84	124	326	3	CH	5.0	440	398.22	0	4.55	4.55	0	5.02	5.02
542	13	09/13/84	346	335	3	CH	5.0	390	380.39	0	2.56	2.56	0	2.63	2.63
543	13	09/13/84	2006	344	3	CH	5.0	420	357.47	0	2.38	2.38	0	2.80	2.80
544	13	09/13/84	2022	345	3	CH	5.0	430	377.06	0	2.33	2.33	0	2.65	2.65
545	13	09/13/84	2117	349	3	CH	5.0	410	362.64	0	2.44	2.44	0	2.76	2.76
546	13	09/13/84	2145	351	3	CH	5.0	460	388.12	0	2.17	2.17	0	2.58	2.58
547	13	09/13/84	2159	352	3	CH	5.0	400	383.63	0	7.50	7.50	0	7.82	7.82
548	13	09/13/84	2210	353	3	CH	5.0	430	375.02	0	11.63	11.63	0	13.33	13.33
549	13	09/13/84	2234	355	3	CH	5.0	410	366.07	0	4.88	4.88	0	5.46	5.46
550	13	09/13/84	2351	360	3	CH	5.0	410	371.56	0	4.88	4.88	0	5.38	5.38
551	13	09/14/84	49	364	3	CH	5.0	440	383.55	0	2.27	2.27	0	2.61	2.61
552	13	09/14/84	101	365	3	CH	5.0	400	386.08	0	2.50	2.50	0	2.59	2.59
553	13	09/14/84	121	367	3	CH	5.0	410	386.16	0	4.88	4.88	0	5.18	5.18
554	13	09/14/84	134	368	3	CH	5.0	430	418.41	0	4.65	4.65	0	4.78	4.78
555	13	09/14/84	216	371	3	CH	5.0	420	386.94	0	4.76	4.76	0	5.17	5.17
556	13	09/14/84	247	374	3	CH	5.0	420	389.32	0	4.76	4.76	0	5.14	5.14
557	13	09/14/84	259	375	3	CH	5.0	410	358.47	0	2.44	2.44	0	2.79	2.79
558	13	09/14/84	309	376	3	CH	5.0	420	381.75	0	11.90	11.90	0	13.10	13.10
559	13	09/14/84	321	377	3	CH	5.0	380	377.68	0	2.63	2.63	0	2.65	2.65
560	13	09/14/84	2059	438	3	CH	5.0	360	238.68	0	11.11	11.11	0	16.76	16.76
561	13	09/14/84	2117	380	3	CH	5.0	390	406.05	0	2.56	2.56	0	2.46	2.46
562	13	09/14/84	2137	440	3	CH	5.0	390	481.75	0	5.13	5.13	0	4.15	4.15
563	13	09/14/84	2211	441	3	CH	5.0	400	452.57	0	10.00	10.00	0	8.84	8.84
564	13	09/14/84	2249	443	3	CH	5.0	390	533.96	0	2.56	2.56	0	1.87	1.87
565	13	09/14/84	2331	445	3	CH	5.0	390	525.19	0	2.56	2.56	0	1.90	1.90
566	13	09/15/84	258	452	3	TZ	5.0	390	447.98	0	2.56	2.56	0	2.23	2.23
567	13	09/15/84	440	471	3	TZ	5.0	470	390.57	0	2.13	2.13	0	2.56	2.56
568	13	09/15/84	537	459	3	CH	5.0	270	452.23	0	29.63	29.63	0	17.69	17.69
569	13	09/15/84	537	473	3	CH	5.1	320	359.99	0	3.13	3.13	0	2.78	2.78
570	13	09/15/84	2024	475	3	CH	5.2	310	384.42	0	3.23	3.23	0	2.60	2.60
571	13	09/15/84	2231	479	3	CH	5.0	490	413.77	0	4.08	4.08	0	4.83	4.83
572	13	09/16/84	30	484	3	TZ	5.2	400	350.04	0	5.00	5.00	0	5.71	5.71
573	13	09/16/84	43	485	3	TZ	5.2	390	412.84	0	2.56	2.56	0	2.42	2.42
574	13	09/16/84	43	503	3	TZ	5.0	330	504.52	0	3.03	3.03	0	1.98	1.98
575	13	09/24/84	1959	487	4	CH	5.0	330	365.24	0	3.03	3.03	0	2.74	2.74
576	13	09/24/84	2138	493	4	CH	5.0	370	413.44	0	2.70	2.70	0	2.42	2.42
577	13	09/24/84	2214	495	4	CH	5.0	390	432.65	0	2.56	2.56	0	2.31	2.31
578	13	09/24/84	2309	497	4	CH	5.0	430	446.53	0	2.33	2.33	0	2.24	2.24
579	13	09/24/84	2328	498	4	CH	5.0	420	432.37	0	2.38	2.38	0	2.31	2.31
580	13	09/24/84	2345	499	4	CH	5.0	410	437.42	0	4.88	4.88	0	4.57	4.57
581	13	09/25/84	47	505	4	CH	5.0	390	453.72	0	2.56	2.56	0	2.20	2.20
582	13	09/25/84	108	506	4	CH	5.0	390	444.75	0	5.13	5.13	0	4.50	4.50
583	13	09/25/84	122	507	4	CH	5.0	400	462.56	0	5.00	5.00	0	4.32	4.32
584	13	09/25/84	223	510	4	CH	5.0	420	445.04	0	2.38	2.38	0	2.25	2.25
585	13	09/25/84	314	512	4	CH	5.0	400	435.45	0	2.50	2.50	0	2.30	2.30
586	13	09/25/84	2007	517	4	CH	5.0	380	425.96	0	2.63	2.63	0	2.35	2.35
587	13	09/25/84	2125	520	4	CH	5.0	370	427.25	0	5.41	5.41	0	4.68	4.68
588	13	09/25/84	2140	521	4	CH	5.0	440	429.17	0	2.27	2.27	0	2.33	2.33
589	13	09/25/84	2237	524	4	CH	5.0	380	437.52	0	2.63	2.63	0	2.29	2.29
590	13	09/26/84	36	531	4	CH	5.0	440	435.28	0	2.27	2.27	0	2.30	2.30
591	13	09/26/84	54	532	4	CH	5.0	470	423.70	0	2.13	2.13	0	2.36	2.36
592	13	09/26/84	111	533	4	CH	5.0	400	430.68	0	2.50	2.50	0	2.32	2.32
593	13	09/26/84	128	534	4	CH	5.0	400	426.14	0	2.50	2.50	0	2.35	2.35
594	13	09/26/84	209	536	4	CH	5.0	450	424.45	0	2.22	2.22	0	2.36	2.36

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
595	13	09/26/84	228	537	4	CH	5	460	414.16	0.00	4.35	4.35	0.00	4.83	4.83
596	13	09/26/84	402	542	4	CH	5	470	403.95	0.00	6.38	6.38	0.00	7.43	7.43
597	13	09/26/84	420	543	4	CH	5	460	427.53	0.00	2.17	2.17	0.00	2.34	2.34
598	13	09/26/84	456	545	4	CH	5	360	430.29	0.00	2.78	2.78	0.00	2.32	2.32
599	13	09/26/84	2222	546	4	CH	5	490	434.41	0.00	4.08	4.08	0.00	4.60	4.60
600	13	09/26/84	2240	547	4	CH	5	360	513.45	0.00	5.56	5.56	0.00	3.90	3.90
601	13	09/26/84	2253	548	4	CH	5	370	450.29	0.00	8.11	8.11	0.00	6.66	6.66
602	13	09/26/84	2324	550	4	CH	5	350	416.17	2.86	2.86	5.71	2.40	2.40	4.81
603	13	09/26/84	2340	551	4	CH	5	360	420.20	11.11	13.89	25.00	9.52	11.90	21.42
604	13	09/27/84	2055	666	4	CH	5	480	486.52	0.00	2.08	2.08	0.00	2.06	2.06
605	14	08/19/84	235	130	1	CH	5	400	424.26	2.50	0.00	2.50	2.36	0.00	2.36
606	19	09/01/84	134	231	2	CH	5	460	478.16	2.17	0.00	2.17	2.09	0.00	2.09
607	19	09/26/84	2324	550	4	CH	5	350	416.17	2.86	0.00	2.86	2.40	0.00	2.40
608	22	08/16/84	2149	1	1	CH	5	370	507.29	24.32	0.00	24.32	17.74	0.00	17.74
609	22	08/16/84	2214	2	1	CH	5	390	485.79	10.26	0.00	10.26	8.23	0.00	8.23
610	22	08/16/84	2238	3	1	CH	5	390	424.39	5.13	0.00	5.13	4.71	0.00	4.71
611	22	08/16/84	2251	4	1	CH	5	430	405.70	4.65	0.00	4.65	4.93	0.00	4.93
612	22	08/16/84	2312	5	1	CH	5	410	477.60	9.76	0.00	9.76	8.38	0.00	8.38
613	22	08/16/84	2352	7	1	CH	5	510	466.06	1.96	0.00	1.96	2.15	0.00	2.15
614	22	08/17/84	51	10	1	CH	5	520	464.52	1.92	0.00	1.92	2.15	0.00	2.15
615	22	08/17/84	112	11	1	CH	5	530	489.40	1.89	0.00	1.89	2.04	0.00	2.04
616	22	08/17/84	226	14	1	CH	5	540	477.15	1.85	0.00	1.85	2.10	0.00	2.10
617	22	08/17/84	428	19	1	CH	5	450	481.34	6.67	0.00	6.67	6.23	0.00	6.23
618	22	08/17/84	447	20	1	CH	5	500	488.15	4.00	0.00	4.00	4.10	0.00	4.10
619	22	08/17/84	2131	21	1	CH	5	400	443.29	2.50	0.00	2.50	2.26	0.00	2.26
620	22	08/17/84	2151	22	1	CH	5	390	486.42	7.69	0.00	7.69	6.17	0.00	6.17
621	22	08/17/84	2229	24	1	CH	5	410	441.64	2.44	0.00	2.44	2.26	0.00	2.26
622	22	08/18/84	15	27	1	CH	5	440	455.92	2.27	0.00	2.27	2.19	0.00	2.19
623	22	08/18/84	132	101	1	CH	5	400	504.47	5.00	0.00	5.00	3.96	0.00	3.96
624	22	08/18/84	152	102	1	IP	5	390	453.49	2.56	0.00	2.56	2.21	0.00	2.21
625	22	08/18/84	229	104	1	IP	5	370	447.20	2.70	0.00	2.70	2.24	0.00	2.24
626	22	08/18/84	305	106	1	IP	5	390	410.33	2.56	0.00	2.56	2.44	0.00	2.44
627	22	08/18/84	323	107	1	CH	5	400	505.10	2.50	0.00	2.50	1.98	0.00	1.98
628	22	08/18/84	435	110	1	CH	5	410	470.91	2.44	0.00	2.44	2.12	0.00	2.12
629	22	08/18/84	2133	115	1	CH	5	330	414.39	3.03	0.00	3.03	2.41	0.00	2.41
630	22	08/18/84	2150	116	1	CH	5	380	426.16	2.63	0.00	2.63	2.35	0.00	2.35
631	22	08/18/84	2225	118	1	CH	5	320	429.43	3.13	0.00	3.13	2.33	0.00	2.33
632	22	08/18/84	2307	119	1	CH	5	390	415.23	5.13	0.00	5.13	4.82	0.00	4.82
633	22	08/19/84	17	123	1	CH	5	420	455.27	2.38	0.00	2.38	2.20	0.00	2.20
634	22	08/19/84	33	124	1	CH	5	380	373.63	5.26	0.00	5.26	5.35	0.00	5.35
635	22	08/19/84	53	125	1	CH	5	460	448.91	4.35	0.00	4.35	4.46	0.00	4.46
636	22	08/19/84	301	131	1	CH	5	370	424.55	2.70	0.00	2.70	2.36	0.00	2.36
637	22	08/19/84	321	132	1	CH	5	390	437.66	2.56	0.00	2.56	2.28	0.00	2.28
638	22	08/29/84	106	170	2	CH	5	380	403.36	5.26	0.00	5.26	4.96	0.00	4.96
639	22	08/29/84	221	174	2	CH	5	460	524.30	2.17	0.00	2.17	1.91	0.00	1.91
640	22	08/29/84	352	179	2	CH	5	440	504.84	2.27	0.00	2.27	1.98	0.00	1.98
641	22	08/29/84	433	181	2	CH	5	450	511.78	2.22	0.00	2.22	1.95	0.00	1.95
642	22	08/31/84	124	200	2	CH	5	470	483.16	4.26	0.00	4.26	4.14	0.00	4.14
643	22	08/31/84	301	204	2	CH	5	470	484.46	2.13	0.00	2.13	2.06	0.00	2.06
644	22	08/31/84	328	206	2	CH	5	380	486.19	7.89	0.00	7.89	6.17	0.00	6.17
645	22	08/31/84	2245	221	2	CH	5	510	511.81	1.96	0.00	1.96	1.95	0.00	1.95
646	22	08/31/84	2259	222	2	CH	5	530	498.32	1.89	0.00	1.89	2.01	0.00	2.01
647	22	08/31/84	2357	224	2	CH	5	540	487.66	3.70	0.00	3.70	4.10	0.00	4.10
648	22	09/01/84	10	225	2	CH	5	550	491.28	3.64	0.00	3.64	4.07	0.00	4.07

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
649	22	09/01/84	134	231	2	CH	5.0	460	478.16	2.17	0.00	2.17	2.09	0.00	2.09
650	22	09/01/84	149	232	2	CH	5.0	550	478.50	1.82	0.00	1.82	2.09	0.00	2.09
651	22	09/01/84	318	238	2	CH	5.0	410	501.57	2.44	0.00	2.44	1.99	0.00	1.99
652	22	09/01/84	332	239	2	CH	5.0	460	450.45	2.17	0.00	2.17	2.22	0.00	2.22
653	22	09/12/84	2105	307	3	CH	5.0	420	361.99	2.38	0.00	2.38	2.76	0.00	2.76
654	22	09/12/84	2338	317	3	CH	5.1	440	387.92	4.55	0.00	4.55	5.16	0.00	5.16
655	22	09/12/84	2351	318	3	CH	5.0	440	372.19	2.27	0.00	2.27	2.69	0.00	2.69
656	22	09/13/84	26	321	3	CH	5.0	380	409.88	5.26	0.00	5.26	4.88	0.00	4.88
657	22	09/13/84	38	322	3	CH	5.0	420	416.03	2.38	0.00	2.38	2.40	0.00	2.40
658	22	09/13/84	49	323	3	CH	5.1	450	388.78	8.89	0.00	8.89	10.29	0.00	10.29
659	22	09/13/84	101	324	3	CH	5.0	440	384.20	4.55	0.00	4.55	5.21	0.00	5.21
660	22	09/13/84	113	325	3	CH	5.0	430	373.65	4.65	0.00	4.65	5.35	0.00	5.35
661	22	09/13/84	124	326	3	CH	5.0	440	398.22	2.27	0.00	2.27	2.51	0.00	2.51
662	22	09/13/84	210	328	3	CH	5.0	450	407.00	4.44	0.00	4.44	4.91	0.00	4.91
663	22	09/13/84	420	336	3	CH	5.0	370	367.38	2.70	0.00	2.70	2.72	0.00	2.72
664	22	09/13/84	2006	344	3	CH	5.0	420	357.47	2.38	0.00	2.38	2.80	0.00	2.80
665	22	09/13/84	2022	345	3	CH	5.0	430	377.06	6.98	0.00	6.98	7.96	0.00	7.96
666	22	09/13/84	2036	346	3	CH	5.0	460	396.59	2.17	0.00	2.17	2.52	0.00	2.52
667	22	09/13/84	2102	348	3	CH	5.1	390	382.33	2.56	0.00	2.56	2.62	0.00	2.62
668	22	09/13/84	2117	349	3	CH	5.0	410	362.64	4.88	0.00	4.88	5.52	0.00	5.52
669	22	09/13/84	2159	352	3	CH	5.0	400	383.63	2.50	0.00	2.50	2.61	0.00	2.61
670	22	09/13/84	2221	354	3	CH	5.0	380	366.80	5.26	0.00	5.26	5.45	0.00	5.45
671	22	09/13/84	2246	356	3	CH	5.0	410	375.38	2.44	0.00	2.44	2.66	0.00	2.66
672	22	09/13/84	2351	360	3	CH	5.0	410	371.56	2.44	0.00	2.44	2.69	0.00	2.69
673	22	09/14/84	8	361	3	CH	5.0	420	379.99	2.38	0.00	2.38	2.63	0.00	2.63
674	22	09/14/84	101	365	3	CH	5.0	400	386.08	7.50	0.00	7.50	7.77	0.00	7.77
675	22	09/14/84	259	375	3	CH	5.0	410	358.47	2.44	0.00	2.44	2.79	0.00	2.79
676	22	09/14/84	309	376	3	CH	5.0	420	381.75	2.38	0.00	2.38	2.62	0.00	2.62
677	22	09/15/84	2231	479	3	CH	5.0	490	413.77	4.08	0.00	4.08	4.83	0.00	4.83
678	22	09/15/84	2247	480	3	CH	5.1	410	404.02	2.44	0.00	2.44	2.48	0.00	2.48
679	22	09/15/84	2300	481	3	CH	5.0	410	393.84	2.44	0.00	2.44	2.54	0.00	2.54
680	22	09/24/84	2345	499	4	CH	5.0	410	437.42	4.88	0.00	4.88	4.57	0.00	4.57
681	22	09/25/84	4	500	4	CH	5.0	410	445.49	4.88	0.00	4.88	4.49	0.00	4.49
682	22	09/25/84	122	507	4	CH	5.0	400	462.56	5.00	0.00	5.00	4.32	0.00	4.32
683	22	09/25/84	223	510	4	CH	5.0	420	445.04	2.38	0.00	2.38	2.25	0.00	2.25
684	22	09/26/84	2222	546	4	CH	5.0	490	434.41	2.04	0.00	2.04	2.30	0.00	2.30
685	22	09/27/84	2024	664	4	CH	5.0	490	509.40	2.04	0.00	2.04	1.96	0.00	1.96
686	22	09/27/84	2055	666	4	CH	5.0	480	486.52	2.08	0.00	2.08	2.06	0.00	2.06
687	25	08/19/84	115	126	1	CH	5.0	370	443.09	2.70	0.00	2.70	2.26	0.00	2.26
688	25	08/30/84	2129	184	2	CH	5.0	380	456.86	2.63	0.00	2.63	2.19	0.00	2.19
689	29	08/17/84	248	15	1	CH	5.0	550	451.34	0.00	1.82	1.82	0.00	2.22	2.22
690	30	08/16/84	2149	1	1	CH	5.0	370	507.29	10.81	0.00	10.81	7.89	0.00	7.89
691	30	08/16/84	2214	2	1	CH	5.0	390	485.79	25.64	0.00	25.64	20.59	0.00	20.59
692	30	08/16/84	2238	3	1	CH	5.0	390	424.39	2.56	0.00	2.56	2.36	0.00	2.36
693	30	08/16/84	2251	4	1	CH	5.0	430	405.70	13.95	0.00	13.95	14.79	0.00	14.79
694	30	08/16/84	2312	5	1	CH	5.0	410	477.60	31.71	0.00	31.71	27.22	0.00	27.22
695	30	08/16/84	2334	6	1	CH	5.0	460	415.77	10.87	2.17	13.04	12.03	2.41	14.43
696	30	08/16/84	2352	7	1	CH	5.0	510	466.06	11.76	0.00	11.76	12.87	0.00	12.87
697	30	08/17/84	17	8	1	CH	5.0	500	495.16	4.00	0.00	4.00	4.04	0.00	4.04
698	30	08/17/84	51	10	1	CH	5.0	520	464.52	3.85	0.00	3.85	4.31	0.00	4.31
699	30	08/17/84	112	11	1	CH	5.0	530	489.40	1.89	1.89	3.77	2.04	2.04	4.09
700	30	08/17/84	135	12	1	CH	5.0	510	491.98	5.88	0.00	5.88	6.10	0.00	6.10
701	30	08/17/84	201	13	1	CH	5.0	590	490.95	5.08	0.00	5.08	6.11	0.00	6.11
702	30	08/17/84	226	14	1	CH	5.0	540	477.15	5.56	0.00	5.56	6.29	0.00	6.29

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
703	30	08/17/84	248	15	1	CH	5	550	451.34	10.91	1.82	12.73	13.29	2.22	15.51
704	30	08/17/84	407	18	1	CH	5	410	447.20	2.44	0.00	2.44	2.24	0.00	2.24
705	30	08/17/84	2131	21	1	CH	5	400	443.29	2.50	0.00	2.50	2.26	0.00	2.26
706	30	08/17/84	2151	22	1	CH	5	390	486.42	12.82	0.00	12.82	10.28	0.00	10.28
707	30	08/17/84	2210	23	1	CH	5	460	497.19	6.52	0.00	6.52	6.03	0.00	6.03
708	30	08/17/84	2229	24	1	CH	5	410	441.64	12.20	0.00	12.20	11.32	0.00	11.32
709	30	08/17/84	2312	25	1	CH	5	400	436.29	2.50	0.00	2.50	2.29	0.00	2.29
710	30	08/17/84	2330	26	1	CH	5	370	439.67	8.11	0.00	8.11	6.82	0.00	6.82
711	30	08/18/84	38	28	1	CH	5	500	544.59	8.00	0.00	8.00	7.34	0.00	7.34
712	30	08/18/84	114	30	1	CH	5	410	441.64	7.32	0.00	7.32	6.79	0.00	6.79
713	30	08/18/84	210	103	1	IP	5	410	463.13	4.88	0.00	4.88	4.32	0.00	4.32
714	30	08/18/84	305	106	1	IP	5	390	410.33	5.13	0.00	5.13	4.87	0.00	4.87
715	30	08/18/84	2053	113	1	CH	5	350	443.26	8.57	0.00	8.57	6.77	0.00	6.77
716	30	08/18/84	2113	114	1	CH	5	350	428.57	17.14	0.00	17.14	14.00	0.00	14.00
717	30	08/18/84	2133	115	1	CH	5	330	414.39	6.06	0.00	6.06	4.83	0.00	4.83
718	30	08/18/84	2150	116	1	CH	5	380	426.16	2.63	0.00	2.63	2.35	0.00	2.35
719	30	08/18/84	2207	117	1	CH	5	360	458.43	8.33	0.00	8.33	6.54	0.00	6.54
720	30	08/18/84	2225	118	1	CH	5	320	429.43	9.38	0.00	9.38	6.99	0.00	6.99
721	30	08/18/84	2307	119	1	CH	5	390	415.23	2.56	0.00	2.56	2.41	0.00	2.41
722	30	08/18/84	2342	121	1	CH	5	410	433.30	4.88	0.00	4.88	4.62	0.00	4.62
723	30	08/19/84	33	124	1	CH	5	380	373.63	7.89	0.00	7.89	8.03	0.00	8.03
724	30	08/19/84	53	125	1	CH	5	460	448.91	2.17	0.00	2.17	2.23	0.00	2.23
725	30	08/19/84	115	126	1	CH	5	370	443.09	8.11	0.00	8.11	6.77	0.00	6.77
726	30	08/19/84	136	127	1	CH	5	440	420.84	2.27	0.00	2.27	2.38	0.00	2.38
727	30	08/19/84	156	128	1	CH	5	320	416.74	3.13	0.00	3.13	2.40	0.00	2.40
728	30	08/19/84	235	130	1	CH	5	400	424.26	7.50	0.00	7.50	7.07	0.00	7.07
729	30	08/19/84	301	131	1	CH	5	370	424.55	5.41	0.00	5.41	4.71	0.00	4.71
730	30	08/19/84	2400	122	1	CH	5	460	456.68	6.52	0.00	6.52	6.57	0.00	6.57
731	30	08/29/84	412	180	2	CH	5	450	547.45	4.44	0.00	4.44	3.65	0.00	3.65
732	30	08/29/84	453	182	2	CH	5	390	479.43	2.56	0.00	2.56	2.09	0.00	2.09
733	30	08/29/84	510	183	2	CH	5	490	563.36	4.08	0.00	4.08	3.55	0.00	3.55
734	30	08/30/84	2158	186	2	CH	5	510	452.72	1.96	0.00	1.96	2.21	0.00	2.21
735	30	08/30/84	2211	187	2	CH	5	560	494.67	5.36	0.00	5.36	6.06	0.00	6.06
736	30	08/30/84	2235	188	2	CH	5	520	469.37	3.85	0.00	3.85	4.26	0.00	4.26
737	30	08/31/84	4	194	2	CH	5	430	494.81	2.33	0.00	2.33	2.02	0.00	2.02
738	30	08/31/84	45	197	2	CH	5	520	506.34	1.92	0.00	1.92	1.97	0.00	1.97
739	30	08/31/84	112	199	2	CH	5	470	465.86	2.13	0.00	2.13	2.15	0.00	2.15
740	30	08/31/84	124	200	2	CH	5	470	483.16	36.17	0.00	36.17	35.19	0.00	35.19
741	30	08/31/84	244	203	2	CH	5	430	504.02	2.33	0.00	2.33	1.98	0.00	1.98
742	30	08/31/84	301	204	2	CH	5	470	484.46	8.51	0.00	8.51	8.26	0.00	8.26
743	30	08/31/84	316	205	2	CH	5	450	484.32	2.22	0.00	2.22	2.06	0.00	2.06
744	30	08/31/84	328	206	2	CH	5	380	486.19	15.79	0.00	15.79	12.34	0.00	12.34
745	30	08/31/84	2245	221	2	CH	5	510	511.81	5.88	0.00	5.88	5.86	0.00	5.86
746	30	08/31/84	2259	222	2	CH	5	530	498.32	3.77	0.00	3.77	4.01	0.00	4.01
747	30	08/31/84	2311	223	2	CH	5	460	455.01	6.52	0.00	6.52	6.59	0.00	6.59
748	30	08/31/84	2357	224	2	CH	5	540	487.66	3.70	0.00	3.70	4.10	0.00	4.10
749	30	09/01/84	10	225	2	CH	5	550	491.28	14.55	3.64	18.18	16.28	4.07	20.35
750	30	09/01/84	23	226	2	CH	5	550	479.36	16.36	0.00	16.36	18.78	0.00	18.78
751	30	09/01/84	38	227	2	CH	5	510	490.76	31.37	0.00	31.37	32.60	0.00	32.60
752	30	09/01/84	51	228	2	CH	5	450	478.16	4.44	0.00	4.44	4.18	0.00	4.18
753	30	09/01/84	106	229	2	CH	5	440	468.59	4.55	0.00	4.55	4.27	0.00	4.27
754	30	09/01/84	121	230	2	CH	5	500	496.45	4.00	0.00	4.00	4.03	0.00	4.03
755	30	09/01/84	134	231	2	CH	5	460	478.16	23.91	0.00	23.91	23.00	0.00	23.00
756	30	09/01/84	149	232	2	CH	5	550	478.50	3.64	0.00	3.64	4.18	0.00	4.18

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757	30	09/01/84	238	235	2	CH	5.0	480	550.88	4.17	0.00	4.17	3.63	0.00	3.63
758	30	09/01/84	252	236	2	CH	5.0	460	520.82	4.35	0.00	4.35	3.84	0.00	3.84
759	30	09/01/84	332	239	2	CH	5.0	460	450.45	4.35	0.00	4.35	4.44	0.00	4.44
760	30	09/01/84	345	240	2	CH	5.0	410	463.22	21.95	0.00	21.95	19.43	0.00	19.43
761	30	09/01/84	357	241	2	CH	5.0	550	472.28	52.73	0.00	52.73	61.40	0.00	61.40
762	30	09/01/84	423	243	2	CH	5.0	510	462.02	3.92	0.00	3.92	4.33	0.00	4.33
763	30	09/01/84	436	244	2	CH	5.0	480	465.53	4.17	0.00	4.17	4.30	0.00	4.30
764	30	09/12/84	2246	313	3	CH	5.0	380	381.04	2.63	0.00	2.63	2.62	0.00	2.62
765	30	09/12/84	2338	317	3	CH	5.1	440	387.92	11.36	2.27	13.64	12.89	2.58	15.47
766	30	09/12/84	2351	318	3	CH	5.0	440	372.19	9.09	0.00	9.09	10.75	0.00	10.75
767	30	09/13/84	5	319	3	CH	5.0	390	372.29	5.13	0.00	5.13	5.37	0.00	5.37
768	30	09/13/84	38	322	3	CH	5.0	420	416.03	0.00	2.38	2.38	0.00	2.40	2.40
769	30	09/13/84	49	323	3	CH	5.1	450	388.78	8.89	0.00	8.89	10.29	0.00	10.29
770	30	09/13/84	101	324	3	CH	5.0	440	384.20	2.27	0.00	2.27	2.60	0.00	2.60
771	30	09/13/84	113	325	3	CH	5.0	430	373.65	2.33	0.00	2.33	2.68	0.00	2.68
772	30	09/13/84	2022	345	3	CH	5.0	430	377.06	2.33	0.00	2.33	2.65	0.00	2.65
773	30	09/13/84	2036	346	3	CH	5.0	460	396.59	2.17	0.00	2.17	2.52	0.00	2.52
774	30	09/13/84	2102	348	3	CH	5.1	390	382.33	2.56	0.00	2.56	2.62	0.00	2.62
775	30	09/13/84	2159	352	3	CH	5.0	400	383.63	5.00	0.00	5.00	5.21	0.00	5.21
776	30	09/13/84	2334	359	3	CH	5.0	410	374.12	2.44	0.00	2.44	2.67	0.00	2.67
777	30	09/14/84	101	365	3	CH	5.0	400	386.08	2.50	0.00	2.50	2.59	0.00	2.59
778	30	09/14/84	247	374	3	CH	5.0	420	389.32	4.76	0.00	4.76	5.14	0.00	5.14
779	30	09/14/84	2206	385	3	CH	5.1	450	393.52	2.22	0.00	2.22	2.54	0.00	2.54
780	30	09/14/84	2234	383	3	CH	5.0	500	376.73	2.00	0.00	2.00	2.65	0.00	2.65
781	30	09/14/84	2234	442	3	CH	5.0	440	509.60	2.27	0.00	2.27	1.96	0.00	1.96
782	30	09/14/84	2249	443	3	CH	5.0	390	533.96	10.26	0.00	10.26	7.49	0.00	7.49
783	30	09/14/84	2331	445	3	CH	5.0	390	525.19	2.56	0.00	2.56	1.90	0.00	1.90
784	30	09/15/84	53	388	3	CH	5.0	460	366.90	8.70	0.00	8.70	10.90	0.00	10.90
785	30	09/15/84	151	448	3	TZ	5.0	380	496.13	10.53	0.00	10.53	8.06	0.00	8.06
786	30	09/15/84	242	451	3	TZ	5.0	420	471.72	2.38	0.00	2.38	2.12	0.00	2.12
787	30	09/15/84	258	452	3	TZ	5.0	390	447.98	20.51	0.00	20.51	17.86	0.00	17.86
788	30	09/15/84	326	453	3	TZ	5.0	380	522.54	2.63	0.00	2.63	1.91	0.00	1.91
789	30	09/15/84	453	458	3	TZ	5.0	380	446.44	5.26	0.00	5.26	4.48	0.00	4.48
790	30	09/15/84	537	459	3	CH	5.0	270	452.23	14.81	0.00	14.81	8.85	0.00	8.85
791	30	09/15/84	2231	479	3	CH	5.0	490	413.77	4.08	0.00	4.08	4.83	0.00	4.83
792	30	09/16/84	30	484	3	TZ	5.2	400	350.04	2.50	0.00	2.50	2.86	0.00	2.86
793	30	09/16/84	43	503	3	TZ	5.0	330	504.52	6.06	0.00	6.06	3.96	0.00	3.96
794	30	09/24/84	2115	492	4	CH	5.5	430	457.26	2.33	0.00	2.33	2.19	0.00	2.19
795	30	09/24/84	2138	493	4	CH	5.0	370	413.44	2.70	0.00	2.70	2.42	0.00	2.42
796	30	09/24/84	2153	494	4	CH	5.0	390	448.70	5.13	0.00	5.13	4.46	0.00	4.46
797	30	09/24/84	2214	495	4	CH	5.0	390	432.65	2.56	0.00	2.56	2.31	0.00	2.31
798	30	09/24/84	2235	496	4	CH	5.0	380	438.63	2.63	0.00	2.63	2.28	0.00	2.28
799	30	09/24/84	2345	499	4	CH	5.0	410	437.42	9.76	0.00	9.76	9.14	0.00	9.14
800	30	09/25/84	4	500	4	CH	5.0	410	445.49	21.95	0.00	21.95	20.20	0.00	20.20
801	30	09/25/84	29	504	4	CH	5.0	390	442.81	10.26	0.00	10.26	9.03	0.00	9.03
802	30	09/25/84	47	505	4	CH	5.0	390	453.72	7.69	0.00	7.69	6.61	0.00	6.61
803	30	09/25/84	108	506	4	CH	5.0	390	444.75	2.56	0.00	2.56	2.25	0.00	2.25
804	30	09/25/84	143	508	4	CH	5.0	400	452.17	2.50	0.00	2.50	2.21	0.00	2.21
805	30	09/25/84	2007	517	4	CH	5.0	380	425.96	2.63	0.00	2.63	2.35	0.00	2.35
806	30	09/25/84	2325	527	4	CH	5.0	440	437.12	15.91	0.00	15.91	16.01	0.00	16.01
807	30	09/25/84	2343	528	4	CH	5.0	490	453.81	2.04	0.00	2.04	2.20	0.00	2.20
808	30	09/26/84	1	529	4	CH	5.0	380	422.14	5.26	0.00	5.26	4.74	0.00	4.74
809	30	09/26/84	16	530	4	CH	5.0	420	423.53	9.52	0.00	9.52	9.44	0.00	9.44
810	30	09/26/84	36	531	4	CH	5.0	440	435.28	6.82	0.00	6.82	6.89	0.00	6.89

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
811	30	09/26/84	54	532	4	CH	5	470	423.70	2.13	0.00	2.13	2.36	0.00	2.36
812	30	09/26/84	111	533	4	CH	5	400	430.68	2.50	0.00	2.50	2.32	0.00	2.32
813	30	09/26/84	128	534	4	CH	5	400	426.14	5.00	0.00	5.00	4.69	0.00	4.69
814	30	09/26/84	147	535	4	CH	5	380	427.68	2.63	0.00	2.63	2.34	0.00	2.34
815	30	09/26/84	209	536	4	CH	5	450	424.45	13.33	0.00	13.33	14.14	0.00	14.14
816	30	09/26/84	248	538	4	CH	5	400	436.67	2.50	0.00	2.50	2.29	0.00	2.29
817	30	09/26/84	402	542	4	CH	5	470	403.95	6.38	0.00	6.38	7.43	0.00	7.43
818	30	09/26/84	420	543	4	CH	5	460	427.53	10.87	0.00	10.87	11.70	0.00	11.70
819	30	09/26/84	2222	546	4	CH	5	490	434.41	2.04	0.00	2.04	2.30	0.00	2.30
820	30	09/26/84	2240	547	4	CH	5	360	513.45	5.56	2.78	8.33	3.90	1.95	5.84
821	30	09/26/84	2253	548	4	CH	5	370	450.29	10.81	0.00	10.81	8.88	0.00	8.88
822	30	09/26/84	2308	549	4	CH	5	360	435.20	16.67	0.00	16.67	13.79	0.00	13.79
823	30	09/26/84	2324	550	4	CH	5	350	416.17	74.29	0.00	74.29	62.47	0.00	62.47
824	30	09/26/84	2340	551	4	CH	5	360	420.20	22.22	0.00	22.22	19.04	0.00	19.04
825	30	09/27/84	2041	665	4	CH	5	500	483.99	2.00	0.00	2.00	2.07	0.00	2.07
826	30	09/27/84	2055	666	4	CH	5	480	486.52	2.08	2.08	4.17	2.06	2.06	4.11
827	32	08/19/84	17	123	1	CH	5	420	455.27	2.38	0.00	2.38	2.20	0.00	2.20
828	32	09/14/84	2249	384	3	CH	5	390	373.70	2.56	0.00	2.56	2.68	0.00	2.68
829	34	08/16/84	2149	1	1	CH	5	370	507.29	0.00	5.41	5.41	0.00	3.94	3.94
830	34	08/16/84	2214	2	1	CH	5	390	485.79	0.00	2.56	2.56	0.00	2.06	2.06
831	34	08/16/84	2251	4	1	CH	5	430	405.70	0.00	6.98	6.98	0.00	7.39	7.39
832	34	08/16/84	2312	5	1	CH	5	410	477.60	0.00	9.76	9.76	0.00	8.38	8.38
833	34	08/16/84	2334	6	1	CH	5	460	415.77	0.00	4.35	4.35	0.00	4.81	4.81
834	34	08/17/84	35	9	1	CH	5	540	482.45	0.00	1.85	1.85	0.00	2.07	2.07
835	34	08/17/84	51	10	1	CH	5	520	464.52	0.00	1.92	1.92	0.00	2.15	2.15
836	34	08/17/84	112	11	1	CH	5	530	489.40	0.00	1.89	1.89	0.00	2.04	2.04
837	34	08/17/84	135	12	1	CH	5	510	491.98	0.00	1.96	1.96	0.00	2.03	2.03
838	34	08/17/84	226	14	1	CH	5	540	477.15	0.00	1.85	1.85	0.00	2.10	2.10
839	34	08/17/84	334	17	1	CH	5	540	480.14	0.00	3.70	3.70	0.00	4.17	4.17
840	34	08/17/84	447	20	1	CH	5	500	488.15	0.00	2.00	2.00	0.00	2.05	2.05
841	34	08/17/84	2131	21	1	CH	5	400	443.29	0.00	5.00	5.00	0.00	4.51	4.51
842	34	08/18/84	15	27	1	CH	5	440	455.92	0.00	6.82	6.82	0.00	6.58	6.58
843	34	08/18/84	38	28	1	CH	5	500	544.59	0.00	2.00	2.00	0.00	1.84	1.84
844	34	08/18/84	132	101	1	CH	5	400	504.47	0.00	2.50	2.50	0.00	1.98	1.98
845	34	08/18/84	152	102	1	IP	5	390	453.49	0.00	2.56	2.56	0.00	2.21	2.21
846	34	08/18/84	210	103	1	IP	5	410	463.13	0.00	2.44	2.44	0.00	2.16	2.16
847	34	08/18/84	454	111	1	IP	5	410	464.84	0.00	2.44	2.44	0.00	2.15	2.15
848	34	08/18/84	2053	113	1	CH	5	350	443.26	0.00	2.86	2.86	0.00	2.26	2.26
849	34	08/18/84	2225	118	1	CH	5	320	429.43	0.00	6.25	6.25	0.00	4.66	4.66
850	34	08/18/84	2307	119	1	CH	5	390	415.23	0.00	2.56	2.56	0.00	2.41	2.41
851	34	08/19/84	17	123	1	CH	5	420	455.27	0.00	2.38	2.38	0.00	2.20	2.20
852	34	08/29/84	255	176	2	CH	5	450	448.26	0.00	2.22	2.22	0.00	2.23	2.23
853	34	08/29/84	322	177	2	CH	5	430	494.42	0.00	2.33	2.33	0.00	2.02	2.02
854	34	08/29/84	338	178	2	CH	5	470	479.01	0.00	2.13	2.13	0.00	2.09	2.09
855	34	08/29/84	433	181	2	CH	5	450	511.78	0.00	2.22	2.22	0.00	1.95	1.95
856	34	08/30/84	2129	184	2	CH	5	380	456.86	0.00	5.26	5.26	0.00	4.38	4.38
857	34	08/30/84	2235	188	2	CH	5	520	469.37	0.00	5.77	5.77	0.00	6.39	6.39
858	34	08/30/84	2301	189	2	CH	5	470	483.49	0.00	2.13	2.13	0.00	2.07	2.07
859	34	08/31/84	301	204	2	CH	5	470	484.46	0.00	2.13	2.13	0.00	2.06	2.06
860	34	08/31/84	328	206	2	CH	5	380	486.19	0.00	2.63	2.63	0.00	2.06	2.06
861	34	08/31/84	354	208	2	CH	5	610	499.39	0.00	1.64	1.64	0.00	2.00	2.00
862	34	08/31/84	449	211	2	CH	5	450	534.57	0.00	4.44	4.44	0.00	3.74	3.74
863	34	08/31/84	510	212	2	CH	5	400	461.61	0.00	5.00	5.00	0.00	4.33	4.33
864	34	08/31/84	522	213	2	CH	5	440	501.14	0.00	2.27	2.27	0.00	2.00	2.00

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
865	34	08/31/84	2142	219	2	TZ	5.0	510	480.82	0	1.96	1.96	0	2.08	2.08
866	34	08/31/84	2245	221	2	CH	5.0	510	511.81	0	3.92	3.92	0	3.91	3.91
867	34	08/31/84	2311	223	2	CH	5.0	460	455.01	0	4.35	4.35	0	4.40	4.40
868	34	08/31/84	2357	224	2	CH	5.0	540	487.66	0	1.85	1.85	0	2.05	2.05
869	34	09/01/84	23	226	2	CH	5.0	550	479.36	0	1.82	1.82	0	2.09	2.09
870	34	09/01/84	51	228	2	CH	5.0	450	478.16	0	2.22	2.22	0	2.09	2.09
871	34	09/01/84	134	231	2	CH	5.0	460	478.16	0	2.17	2.17	0	2.09	2.09
872	34	09/01/84	149	232	2	CH	5.0	550	478.50	0	1.82	1.82	0	2.09	2.09
873	34	09/01/84	252	236	2	CH	5.0	460	520.82	0	2.17	2.17	0	1.92	1.92
874	34	09/01/84	305	237	2	CH	5.0	420	457.90	0	2.38	2.38	0	2.18	2.18
875	34	09/01/84	357	241	2	CH	5.0	550	472.28	0	5.45	5.45	0	6.35	6.35
876	34	09/01/84	436	244	2	CH	5.0	480	465.53	0	4.17	4.17	0	4.30	4.30
877	34	09/12/84	2338	317	3	CH	5.1	440	387.92	0	4.55	4.55	0	5.16	5.16
878	34	09/13/84	49	323	3	CH	5.1	450	388.78	0	2.22	2.22	0	2.57	2.57
879	34	09/13/84	124	326	3	CH	5.0	440	398.22	0	2.27	2.27	0	2.51	2.51
880	34	09/13/84	158	327	3	CH	5.0	430	366.45	0	2.33	2.33	0	2.73	2.73
881	34	09/13/84	2006	344	3	CH	5.0	420	357.47	0	2.38	2.38	0	2.80	2.80
882	34	09/13/84	2117	349	3	CH	5.0	410	362.64	0	2.44	2.44	0	2.76	2.76
883	34	09/14/84	205	370	3	CH	5.0	350	358.30	0	2.86	2.86	0	2.79	2.79
884	34	09/14/84	2059	438	3	CH	5.0	360	238.68	0	19.44	19.44	0	29.33	29.33
885	34	09/14/84	2117	439	3	CH	5.0	420	496.21	0	9.52	9.52	0	8.06	8.06
886	34	09/14/84	2137	440	3	CH	5.0	390	481.75	0	2.56	2.56	0	2.08	2.08
887	34	09/14/84	2211	441	3	CH	5.0	400	452.57	0	12.50	12.50	0	11.05	11.05
888	34	09/14/84	2234	442	3	CH	5.0	440	509.60	0	4.55	4.55	0	3.92	3.92
889	34	09/14/84	2249	384	3	CH	5.0	390	373.70	0	7.69	7.69	0	8.03	8.03
890	34	09/14/84	2249	443	3	CH	5.0	390	533.96	0	5.13	5.13	0	3.75	3.75
891	34	09/14/84	2331	445	3	CH	5.0	390	525.19	0	7.69	7.69	0	5.71	5.71
892	34	09/15/84	38	387	3	CH	5.0	380	368.30	0	5.26	5.26	0	5.43	5.43
893	34	09/15/84	53	388	3	CH	5.0	460	366.90	0	2.17	2.17	0	2.73	2.73
894	34	09/15/84	537	459	3	CH	5.0	270	452.23	0	3.70	3.70	0	2.21	2.21
895	34	09/15/84	2300	481	3	CH	5.0	410	393.84	0	2.44	2.44	0	2.54	2.54
896	34	09/24/84	2345	499	4	CH	5.0	410	437.42	0	2.44	2.44	0	2.29	2.29
897	34	09/25/84	4	500	4	CH	5.0	410	445.49	0	2.44	2.44	0	2.24	2.24
898	34	09/25/84	29	504	4	CH	5.0	390	442.81	0	2.56	2.56	0	2.26	2.26
899	34	09/25/84	47	505	4	CH	5.0	390	453.72	0	2.56	2.56	0	2.20	2.20
900	34	09/25/84	108	506	4	CH	5.0	390	444.75	0	2.56	2.56	0	2.25	2.25
901	34	09/25/84	336	513	4	CH	5.6	450	508.13	0	2.22	2.22	0	1.97	1.97
902	34	09/25/84	1937	515	4	CH	5.0	410	431.60	0	4.88	4.88	0	4.63	4.63
903	34	09/25/84	2306	526	4	CH	5.0	460	439.75	0	2.17	2.17	0	2.27	2.27
904	34	09/25/84	2325	527	4	CH	5.0	440	437.12	0	2.27	2.27	0	2.29	2.29
905	34	09/25/84	2343	528	4	CH	5.0	490	453.81	0	4.08	4.08	0	4.41	4.41
906	34	09/26/84	1	529	4	CH	5.0	380	422.14	0	2.63	2.63	0	2.37	2.37
907	34	09/26/84	128	534	4	CH	5.0	400	426.14	0	2.50	2.50	0	2.35	2.35
908	34	09/26/84	147	535	4	CH	5.0	380	427.68	0	2.63	2.63	0	2.34	2.34
909	34	09/26/84	209	536	4	CH	5.0	450	424.45	0	4.44	4.44	0	4.71	4.71
910	34	09/26/84	228	537	4	CH	5.0	460	414.16	0	2.17	2.17	0	2.41	2.41
911	34	09/26/84	248	538	4	CH	5.0	400	436.67	0	2.50	2.50	0	2.29	2.29
912	34	09/26/84	2222	546	4	CH	5.0	490	434.41	0	4.08	4.08	0	4.60	4.60
913	34	09/26/84	2240	547	4	CH	5.0	360	513.45	0	2.78	2.78	0	1.95	1.95
914	34	09/26/84	2308	549	4	CH	5.0	360	435.20	0	5.56	5.56	0	4.60	4.60
915	34	09/26/84	2324	550	4	CH	5.0	350	416.17	0	5.71	5.71	0	4.81	4.81
916	34	09/26/84	2340	551	4	CH	5.0	360	420.20	0	2.78	2.78	0	2.38	2.36
917	34	09/27/84	2024	664	4	CH	5.0	490	509.40	0	2.04	2.04	0	1.96	1.96
918	34	09/27/84	2055	666	4	CH	5.0	480	486.52	0	2.08	2.08	0	2.06	2.06

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
919	35	08/16/84	2149	1	1	CH	5	370	507.29	0.00	5.41	5.41	0.00	3.94	3.94
920	35	08/16/84	2214	2	1	CH	5	390	485.79	2.56	17.95	20.51	2.06	14.41	16.47
921	35	08/16/84	2312	5	1	CH	5	410	477.60	0.00	4.88	4.88	0.00	4.19	4.19
922	35	08/16/84	2334	6	1	CH	5	460	415.77	0.00	8.70	8.70	0.00	9.62	9.62
923	35	08/16/84	2352	7	1	CH	5	510	466.06	0.00	11.76	11.76	0.00	12.87	12.87
924	35	08/17/84	17	8	1	CH	5	500	495.16	0.00	10.00	10.00	0.00	10.10	10.10
925	35	08/17/84	35	9	1	CH	5	540	482.45	0.00	9.26	9.26	0.00	10.36	10.36
926	35	08/17/84	51	10	1	CH	5	520	464.52	0.00	1.92	1.92	0.00	2.15	2.15
927	35	08/17/84	135	12	1	CH	5	510	491.98	0.00	5.88	5.88	0.00	6.10	6.10
928	35	08/17/84	201	13	1	CH	5	590	490.95	0.00	5.08	5.08	0.00	6.11	6.11
929	35	08/17/84	226	14	1	CH	5	540	477.15	0.00	5.56	5.56	0.00	6.29	6.29
930	35	08/17/84	2131	21	1	CH	5	400	443.29	0.00	5.00	5.00	0.00	4.51	4.51
931	35	08/17/84	2151	22	1	CH	5	390	486.42	0.00	5.13	5.13	0.00	4.11	4.11
932	35	08/17/84	2210	23	1	CH	5	460	497.19	0.00	6.52	6.52	0.00	6.03	6.03
933	35	08/17/84	2229	24	1	CH	5	410	441.64	0.00	2.44	2.44	0.00	2.26	2.26
934	35	08/17/84	2330	26	1	CH	5	370	439.67	0.00	2.70	2.70	0.00	2.27	2.27
935	35	08/18/84	38	28	1	CH	5	500	544.59	0.00	6.00	6.00	0.00	5.51	5.51
936	35	08/18/84	57	29	1	CH	5	420	441.93	0.00	2.38	2.38	0.00	2.26	2.26
937	35	08/18/84	114	30	1	CH	5	410	441.64	0.00	2.44	2.44	0.00	2.26	2.26
938	35	08/18/84	132	101	1	CH	5	400	504.47	0.00	5.00	5.00	0.00	3.96	3.96
939	35	08/18/84	210	103	1	IP	5	410	463.13	0.00	2.44	2.44	0.00	2.16	2.16
940	35	08/18/84	323	107	1	CH	5	400	505.10	2.50	2.50	5.00	1.98	1.98	3.96
941	35	08/18/84	454	111	1	IP	5	410	464.84	0.00	2.44	2.44	0.00	2.15	2.15
942	35	08/18/84	2113	114	1	CH	5	350	428.57	0.00	2.86	2.86	0.00	2.33	2.33
943	35	08/18/84	2307	119	1	CH	5	390	415.23	0.00	2.56	2.56	0.00	2.41	2.41
944	35	08/18/84	2342	121	1	CH	5	410	433.30	0.00	2.44	2.44	0.00	2.31	2.31
945	35	08/19/84	33	124	1	CH	5	380	373.63	0.00	2.63	2.63	0.00	2.68	2.68
946	35	08/19/84	53	125	1	CH	5	460	448.91	0.00	4.35	4.35	0.00	4.46	4.46
947	35	08/19/84	115	126	1	CH	5	370	443.09	0.00	2.70	2.70	0.00	2.26	2.26
948	35	08/19/84	136	127	1	CH	5	440	420.84	0.00	2.27	2.27	0.00	2.38	2.38
949	35	08/29/84	221	174	2	CH	5	460	524.30	0.00	4.35	4.35	0.00	3.81	3.81
950	35	08/29/84	239	175	2	CH	5	430	457.18	0.00	9.30	9.30	0.00	8.75	8.75
951	35	08/29/84	338	178	2	CH	5	470	479.01	0.00	21.28	21.28	0.00	20.88	20.88
952	35	08/29/84	352	179	2	CH	5	440	504.84	0.00	36.36	36.36	0.00	31.69	31.69
953	35	08/29/84	412	180	2	CH	5	450	547.45	0.00	17.78	17.78	0.00	14.61	14.61
954	35	08/29/84	433	181	2	CH	5	450	511.78	0.00	15.56	15.56	0.00	13.68	13.68
955	35	08/29/84	453	182	2	CH	5	390	479.43	0.00	17.95	17.95	0.00	14.60	14.60
956	35	08/29/84	510	183	2	CH	5	490	563.36	0.00	24.49	24.49	0.00	21.30	21.30
957	35	08/30/84	2129	184	2	CH	5	380	456.86	2.63	0.00	2.63	2.19	0.00	2.19
958	35	08/30/84	2211	187	2	CH	5	560	494.67	1.79	1.79	3.57	2.02	2.02	4.04
959	35	08/30/84	2301	189	2	CH	5	470	483.49	0.00	4.26	4.26	0.00	4.14	4.14
960	35	08/30/84	2315	190	2	CH	5	420	511.76	0.00	2.38	2.38	0.00	1.95	1.95
961	35	08/31/84	45	197	2	CH	5	520	506.34	0.00	13.46	13.46	0.00	13.82	13.82
962	35	08/31/84	124	200	2	CH	5	470	483.16	0.00	8.51	8.51	0.00	8.28	8.28
963	35	08/31/84	206	202	2	CH	5	430	483.01	0.00	9.30	9.30	0.00	8.28	8.28
964	35	08/31/84	244	203	2	CH	5	430	504.02	0.00	9.30	9.30	0.00	7.94	7.94
965	35	08/31/84	301	204	2	CH	5	470	484.46	2.13	6.38	8.51	2.06	6.19	8.26
966	35	08/31/84	316	205	2	CH	5	450	484.32	2.22	2.22	4.44	2.06	2.06	4.13
967	35	08/31/84	328	206	2	CH	5	380	486.19	0.00	7.89	7.89	0.00	6.17	6.17
968	35	08/31/84	510	212	2	CH	5	400	461.61	0.00	2.50	2.50	0.00	2.17	2.17
969	35	08/31/84	522	213	2	CH	5	440	501.14	0.00	2.27	2.27	0.00	2.00	2.00
970	35	08/31/84	2142	219	2	TZ	5	510	480.82	0.00	1.96	1.96	0.00	2.08	2.08
971	35	08/31/84	2204	220	2	CH	5	360	473.88	0.00	8.33	8.33	0.00	6.33	6.33
972	35	08/31/84	2245	221	2	CH	5	510	511.81	0.00	3.92	3.92	0.00	3.91	3.91

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FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
973	35	08/31/84	2259	222	2	CH	5.0	530	498.32	0.00	7.55	7.55	0.00	8.03	8.03
974	35	08/31/84	2311	223	2	CH	5.0	460	455.01	0.00	6.52	6.52	0.00	6.59	6.59
975	35	08/31/84	2357	224	2	CH	5.0	540	487.66	0.00	5.56	5.56	0.00	6.15	6.15
976	35	09/01/84	10	225	2	CH	5.0	550	491.28	0.00	9.09	9.09	0.00	10.18	10.18
977	35	09/01/84	23	226	2	CH	5.0	550	479.36	0.00	5.45	5.45	0.00	6.26	6.26
978	35	09/01/84	38	227	2	CH	5.0	510	490.76	0.00	9.80	9.80	0.00	10.19	10.19
979	35	09/01/84	51	228	2	CH	5.0	450	478.16	0.00	2.22	2.22	0.00	2.09	2.09
980	35	09/01/84	121	230	2	CH	5.0	500	496.45	0.00	2.00	2.00	0.00	2.01	2.01
981	35	09/01/84	134	231	2	CH	5.0	460	478.16	0.00	10.87	10.87	0.00	10.46	10.46
982	35	09/01/84	149	232	2	CH	5.0	550	478.50	0.00	3.64	3.64	0.00	4.18	4.18
983	35	09/01/84	225	234	2	CH	5.0	460	548.25	0.00	2.17	2.17	0.00	1.82	1.82
984	35	09/01/84	305	237	2	CH	5.0	420	457.90	2.38	2.38	4.76	2.18	2.18	4.37
985	35	09/01/84	318	238	2	CH	5.0	410	501.57	0.00	2.44	2.44	0.00	1.99	1.99
986	35	09/01/84	345	240	2	CH	5.0	410	463.22	0.00	7.32	7.32	0.00	6.48	6.48
987	35	09/01/84	357	241	2	CH	5.0	550	472.28	3.64	3.64	7.27	4.23	4.23	8.47
988	35	09/01/84	410	242	2	CH	5.0	410	463.47	0.00	2.44	2.44	0.00	2.16	2.16
989	35	09/12/84	2105	307	3	CH	5.0	420	361.99	0.00	2.38	2.38	0.00	2.76	2.76
990	35	09/12/84	2128	308	3	CH	5.0	380	385.28	0.00	5.26	5.26	0.00	5.19	5.19
991	35	09/12/84	2209	310	3	CH	5.0	390	385.66	0.00	2.56	2.56	0.00	2.59	2.59
992	35	09/12/84	2312	315	3	CH	5.1	420	394.95	0.00	2.38	2.38	0.00	2.53	2.53
993	35	09/12/84	2338	317	3	CH	5.1	440	387.92	0.00	11.36	11.36	0.00	12.89	12.89
994	35	09/12/84	2351	318	3	CH	5.0	440	372.19	2.27	20.45	22.73	2.69	24.18	26.87
995	35	09/13/84	15	320	3	CH	5.1	420	384.34	0.00	2.38	2.38	0.00	2.60	2.60
996	35	09/13/84	38	322	3	CH	5.0	420	416.03	0.00	4.76	4.76	0.00	4.81	4.81
997	35	09/13/84	49	323	3	CH	5.1	450	388.78	2.22	13.33	15.56	2.57	15.43	18.01
998	35	09/13/84	101	324	3	CH	5.0	440	384.20	2.27	9.09	11.36	2.60	10.41	13.01
999	35	09/13/84	113	325	3	CH	5.0	430	373.65	0.00	6.98	6.98	0.00	8.03	8.03
1000	35	09/13/84	124	326	3	CH	5.0	440	398.22	0.00	20.45	20.45	0.00	22.60	22.60
1001	35	09/13/84	2006	344	3	CH	5.0	420	357.47	0.00	2.38	2.38	0.00	2.80	2.80
1002	35	09/13/84	2050	347	3	CH	5.0	390	358.50	0.00	2.56	2.56	0.00	2.79	2.79
1003	35	09/13/84	2117	349	3	CH	5.0	410	362.64	0.00	7.32	7.32	0.00	8.27	8.27
1004	35	09/13/84	2132	350	3	CH	5.1	430	416.96	0.00	6.98	6.98	0.00	7.19	7.19
1005	35	09/13/84	2145	351	3	CH	5.0	460	388.12	0.00	13.04	13.04	0.00	15.46	15.46
1006	35	09/13/84	2159	352	3	CH	5.0	400	383.63	0.00	2.50	2.50	0.00	2.61	2.61
1007	35	09/13/84	2210	353	3	CH	5.0	430	375.02	2.33	2.33	4.65	2.67	2.67	5.33
1008	35	09/13/84	2221	354	3	CH	5.0	380	366.80	0.00	2.63	2.63	0.00	2.73	2.73
1009	35	09/13/84	2246	356	3	CH	5.0	410	375.38	0.00	4.88	4.88	0.00	5.33	5.33
1010	35	09/14/84	22	362	3	CH	5.0	400	369.38	0.00	2.50	2.50	0.00	2.71	2.71
1011	35	09/14/84	121	426	3	CH	5.0	390	481.00	0.00	7.69	7.69	0.00	6.24	6.24
1012	35	09/14/84	134	368	3	CH	5.0	430	418.41	0.00	2.33	2.33	0.00	2.39	2.39
1013	35	09/14/84	236	373	3	CH	5.0	440	389.44	0.00	2.27	2.27	0.00	2.57	2.57
1014	35	09/14/84	247	374	3	CH	5.0	420	389.32	0.00	4.76	4.76	0.00	5.14	5.14
1015	35	09/14/84	259	375	3	CH	5.0	410	358.47	0.00	2.44	2.44	0.00	2.79	2.79
1016	35	09/14/84	309	376	3	CH	5.0	420	381.75	0.00	7.14	7.14	0.00	7.86	7.86
1017	35	09/14/84	335	378	3	CH	5.0	450	387.44	2.22	6.67	8.89	2.58	7.74	10.32
1018	35	09/14/84	2059	438	3	CH	5.0	360	238.68	0.00	333.33	333.33	0.00	502.77	502.77
1019	35	09/14/84	2117	380	3	CH	5.0	390	406.05	0.00	2.56	2.56	0.00	2.46	2.46
1020	35	09/14/84	2117	439	3	CH	5.0	420	496.21	0.00	54.76	54.76	0.00	46.35	46.35
1021	35	09/14/84	2137	440	3	CH	5.0	390	481.75	0.00	10.26	10.26	0.00	8.30	8.30
1022	35	09/14/84	2206	385	3	CH	5.1	450	393.52	0.00	4.44	4.44	0.00	5.08	5.08
1023	35	09/14/84	2211	441	3	CH	5.0	400	452.57	0.00	42.50	42.50	0.00	37.56	37.56
1024	35	09/14/84	2234	383	3	CH	5.0	500	376.73	0.00	6.00	6.00	0.00	7.96	7.96
1025	35	09/14/84	2234	442	3	CH	5.0	440	509.60	0.00	59.09	59.09	0.00	51.02	51.02
1026	35	09/14/84	2249	384	3	CH	5.0	390	373.70	0.00	48.72	48.72	0.00	50.84	50.84

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1027	35	09/14/84	2249	443	3	CH	5.0	390	533.96	0.00	7.69	7.69	0.00	5.62	5.62
1028	35	09/14/84	2331	445	3	CH	5.0	390	525.19	0.00	94.87	94.87	0.00	70.45	70.45
1029	35	09/15/84	53	388	3	CH	5.0	460	366.90	0.00	54.35	54.35	0.00	68.14	68.14
1030	35	09/15/84	151	448	3	TZ	5.0	380	496.13	0.00	5.26	5.26	0.00	4.03	4.03
1031	35	09/15/84	242	451	3	TZ	5.0	420	471.72	0.00	9.52	9.52	0.00	8.48	8.48
1032	35	09/15/84	258	452	3	TZ	5.0	390	447.98	0.00	28.21	28.21	0.00	24.55	24.55
1033	35	09/15/84	326	453	3	TZ	5.0	380	522.54	0.00	2.63	2.63	0.00	1.91	1.91
1034	35	09/15/84	343	454	3	TZ	5.0	400	485.06	0.00	2.50	2.50	0.00	2.06	2.06
1035	35	09/15/84	453	458	3	TZ	5.0	380	446.44	0.00	5.26	5.26	0.00	4.48	4.48
1036	35	09/15/84	537	459	3	CH	5.0	270	452.23	0.00	151.85	151.85	0.00	90.66	90.66
1037	35	09/15/84	2231	479	3	CH	5.0	490	413.77	0.00	16.33	16.33	0.00	19.33	19.33
1038	35	09/15/84	2247	480	3	CH	5.1	410	404.02	0.00	7.32	7.32	0.00	7.43	7.43
1039	35	09/15/84	2300	481	3	CH	5.0	410	393.84	0.00	2.44	2.44	0.00	2.54	2.54
1040	35	09/16/84	30	484	3	TZ	5.2	400	350.04	0.00	12.50	12.50	0.00	14.28	14.28
1041	35	09/16/84	43	503	3	TZ	5.0	330	504.52	0.00	15.15	15.15	0.00	9.91	9.91
1042	35	09/24/84	2100	491	4	CH	5.0	420	462.68	0.00	2.38	2.38	0.00	2.16	2.16
1043	35	09/24/84	2153	494	4	CH	5.0	390	448.70	0.00	5.13	5.13	0.00	4.46	4.46
1044	35	09/24/84	2309	497	4	CH	5.0	430	446.53	2.33	0.00	2.33	2.24	0.00	2.24
1045	35	09/24/84	2328	498	4	CH	5.0	420	432.37	0.00	2.38	2.38	0.00	2.31	2.31
1046	35	09/24/84	2345	499	4	CH	5.0	410	437.42	2.44	2.44	4.88	2.29	2.29	4.57
1047	35	09/25/84	4	500	4	CH	5.0	410	445.49	0.00	4.88	4.88	0.00	4.49	4.49
1048	35	09/25/84	29	504	4	CH	5.0	390	442.81	0.00	5.13	5.13	0.00	4.52	4.52
1049	35	09/25/84	47	505	4	CH	5.0	390	453.72	5.13	7.69	12.82	4.41	6.61	11.02
1050	35	09/25/84	122	507	4	CH	5.0	400	462.56	0.00	2.50	2.50	0.00	2.16	2.16
1051	35	09/25/84	336	513	4	CH	5.6	450	508.13	0.00	6.67	6.67	0.00	5.90	5.90
1052	35	09/25/84	1937	515	4	CH	5.0	410	431.60	0.00	2.44	2.44	0.00	2.32	2.32
1053	35	09/25/84	2007	517	4	CH	5.0	380	425.96	0.00	2.63	2.63	0.00	2.35	2.35
1054	35	09/25/84	2023	518	4	CH	5.0	380	427.28	0.00	7.89	7.89	0.00	7.02	7.02
1055	35	09/25/84	2125	520	4	CH	5.0	370	427.25	0.00	2.70	2.70	0.00	2.34	2.34
1056	35	09/25/84	2157	522	4	CH	5.0	450	448.90	2.22	0.00	2.22	2.23	0.00	2.23
1057	35	09/25/84	2325	527	4	CH	5.0	440	437.12	0.00	38.64	38.64	0.00	38.89	38.89
1058	35	09/25/84	2343	528	4	CH	5.0	490	453.81	0.00	4.08	4.08	0.00	4.41	4.41
1059	35	09/26/84	1	529	4	CH	5.0	380	422.14	0.00	13.16	13.16	0.00	11.84	11.84
1060	35	09/26/84	16	530	4	CH	5.0	420	423.53	0.00	11.90	11.90	0.00	11.81	11.81
1061	35	09/26/84	36	531	4	CH	5.0	440	435.28	0.00	18.18	18.18	0.00	18.38	18.38
1062	35	09/26/84	54	532	4	CH	5.0	470	423.70	2.13	0.00	2.13	2.36	0.00	2.36
1063	35	09/26/84	111	533	4	CH	5.0	400	430.68	0.00	7.50	7.50	0.00	6.97	6.97
1064	35	09/26/84	128	534	4	CH	5.0	400	426.14	0.00	7.50	7.50	0.00	7.04	7.04
1065	35	09/26/84	209	536	4	CH	5.0	450	424.45	0.00	8.89	8.89	0.00	9.42	9.42
1066	35	09/26/84	228	537	4	CH	5.0	460	414.16	0.00	8.70	8.70	0.00	9.66	9.66
1067	35	09/26/84	248	538	4	CH	5.0	400	436.67	0.00	12.50	12.50	0.00	11.45	11.45
1068	35	09/26/84	342	541	4	CH	5.0	370	418.09	0.00	2.70	2.70	0.00	2.39	2.39
1069	35	09/26/84	402	542	4	CH	5.0	470	403.95	0.00	53.19	53.19	0.00	61.89	61.89
1070	35	09/26/84	420	543	4	CH	5.0	460	427.53	0.00	10.87	10.87	0.00	11.70	11.70
1071	35	09/26/84	456	545	4	CH	5.0	360	430.29	0.00	5.56	5.56	0.00	4.65	4.65
1072	35	09/26/84	2222	546	4	CH	5.0	490	434.41	0.00	14.29	14.29	0.00	16.11	16.11
1073	35	09/26/84	2240	547	4	CH	5.0	360	513.45	0.00	19.44	19.44	0.00	13.63	13.63
1074	35	09/26/84	2253	548	4	CH	5.0	370	450.29	0.00	27.03	27.03	0.00	22.21	22.21
1075	35	09/26/84	2308	549	4	CH	5.0	360	435.20	0.00	36.11	36.11	0.00	29.87	29.87
1076	35	09/26/84	2324	550	4	CH	5.0	350	416.17	0.00	45.71	45.71	0.00	38.45	38.45
1077	35	09/26/84	2340	551	4	CH	5.0	360	420.20	0.00	8.33	8.33	0.00	7.14	7.14
1078	35	09/27/84	2024	664	4	CH	5.0	490	509.40	0.00	6.12	6.12	0.00	5.89	5.89
1079	35	09/27/84	2041	665	4	CH	5.0	500	483.99	0.00	6.00	6.00	0.00	6.20	6.20
1080	39	08/16/84	2214	2	1	CH	5.0	390	485.79	2.56	0.00	2.56	2.06	0.00	2.06

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1081	39	08/16/84	2251	4	1	CH	5	430	405.70	2.33	0.00	2.33	2.46	0.00	2.46
1082	39	08/16/84	2334	6	1	CH	5	460	415.77	2.17	0.00	2.17	2.41	0.00	2.41
1083	39	08/17/84	35	9	1	CH	5	540	482.45	3.70	0.00	3.70	4.15	0.00	4.15
1084	39	08/17/84	51	10	1	CH	5	520	464.52	1.92	0.00	1.92	2.15	0.00	2.15
1085	39	08/17/84	2312	25	1	CH	5	400	436.29	7.50	0.00	7.50	6.88	0.00	6.88
1086	39	08/18/84	15	27	1	CH	5	440	455.92	2.27	0.00	2.27	2.19	0.00	2.19
1087	39	08/18/84	345	108	1	IP	5	390	456.22	2.56	0.00	2.56	2.19	0.00	2.19
1088	39	08/18/84	2133	115	1	CH	5	330	414.39	3.03	0.00	3.03	2.41	0.00	2.41
1089	39	08/18/84	2207	117	1	CH	5	360	458.43	2.78	0.00	2.78	2.18	0.00	2.18
1090	39	08/18/84	2225	118	1	CH	5	320	429.43	3.13	0.00	3.13	2.33	0.00	2.33
1091	39	08/19/84	33	124	1	CH	5	380	373.63	2.63	0.00	2.63	2.68	0.00	2.68
1092	39	08/29/84	322	177	2	CH	5	430	494.42	2.33	0.00	2.33	2.02	0.00	2.02
1093	39	08/30/84	2211	187	2	CH	5	560	494.67	3.57	0.00	3.57	4.04	0.00	4.04
1094	39	08/30/84	2353	193	2	CH	5	480	479.92	2.08	0.00	2.08	2.08	0.00	2.08
1095	39	08/31/84	34	196	2	CH	5	500	486.37	2.00	0.00	2.00	2.06	0.00	2.06
1096	39	08/31/84	206	202	2	CH	5	430	483.01	0.00	2.33	2.33	0.00	2.07	2.07
1097	39	08/31/84	301	204	2	CH	5	470	484.46	2.13	0.00	2.13	2.06	0.00	2.06
1098	39	08/31/84	316	205	2	CH	5	450	484.32	4.44	0.00	4.44	4.13	0.00	4.13
1099	39	08/31/84	354	208	2	CH	5	610	499.39	4.92	1.64	6.56	6.01	2.00	8.01
1100	39	08/31/84	2142	219	2	TZ	5	510	480.82	1.96	0.00	1.96	2.08	0.00	2.08
1101	39	08/31/84	2259	222	2	CH	5	530	498.32	3.77	0.00	3.77	4.01	0.00	4.01
1102	39	08/31/84	2357	224	2	CH	5	540	487.66	1.85	0.00	1.85	2.05	0.00	2.05
1103	39	09/01/84	10	225	2	CH	5	550	491.28	1.82	0.00	1.82	2.04	0.00	2.04
1104	39	09/01/84	38	227	2	CH	5	510	490.76	7.84	0.00	7.84	8.15	0.00	8.15
1105	39	09/01/84	121	230	2	CH	5	500	496.45	2.00	0.00	2.00	2.01	0.00	2.01
1106	39	09/01/84	134	231	2	CH	5	460	478.16	2.17	0.00	2.17	2.09	0.00	2.09
1107	39	09/01/84	212	233	2	CH	5	480	451.43	2.08	0.00	2.08	2.22	0.00	2.22
1108	39	09/01/84	225	234	2	CH	5	460	548.25	6.52	0.00	6.52	5.47	0.00	5.47
1109	39	09/01/84	238	235	2	CH	5	480	550.88	4.17	0.00	4.17	3.63	0.00	3.63
1110	39	09/01/84	252	236	2	CH	5	460	520.82	2.17	0.00	2.17	1.92	0.00	1.92
1111	39	09/01/84	305	237	2	CH	5	420	457.90	4.76	0.00	4.76	4.37	0.00	4.37
1112	39	09/12/84	2043	306	3	CH	5	410	323.79	2.44	0.00	2.44	3.09	0.00	3.09
1113	39	09/13/84	5	319	3	CH	5	390	372.29	2.56	0.00	2.56	2.69	0.00	2.69
1114	39	09/14/84	236	373	3	CH	5	440	389.44	2.27	0.00	2.27	2.57	0.00	2.57
1115	39	09/14/84	247	374	3	CH	5	420	389.32	2.38	2.38	4.76	2.57	2.57	5.14
1116	39	09/15/84	358	469	3	TZ	5	470	396.14	2.13	0.00	2.13	2.52	0.00	2.52
1117	39	09/15/84	2331	483	3	CH	5	430	382.80	2.33	0.00	2.33	2.61	0.00	2.61
1118	39	09/24/84	2328	498	4	CH	5	420	432.37	2.38	0.00	2.38	2.31	0.00	2.31
1119	39	09/25/84	108	506	4	CH	5	390	444.75	2.56	0.00	2.56	2.25	0.00	2.25
1120	39	09/25/84	223	510	4	CH	5	420	445.04	2.38	0.00	2.38	2.25	0.00	2.25
1121	39	09/25/84	314	512	4	CH	5	400	435.45	2.50	0.00	2.50	2.30	0.00	2.30
1122	39	09/25/84	2023	518	4	CH	5	380	427.28	2.63	0.00	2.63	2.34	0.00	2.34
1123	39	09/26/84	36	531	4	CH	5	440	435.28	2.27	0.00	2.27	2.30	0.00	2.30
1124	39	09/26/84	111	533	4	CH	5	400	430.68	2.50	0.00	2.50	2.32	0.00	2.32
1125	39	09/26/84	128	534	4	CH	5	400	426.14	2.50	0.00	2.50	2.35	0.00	2.35
1126	39	09/26/84	209	536	4	CH	5	450	424.45	2.22	0.00	2.22	2.36	0.00	2.36
1127	39	09/26/84	2308	549	4	CH	5	360	435.20	2.78	0.00	2.78	2.30	0.00	2.30
1128	39	09/26/84	2324	550	4	CH	5	350	416.17	8.57	0.00	8.57	7.21	0.00	7.21
1129	39	09/26/84	2340	551	4	CH	5	360	420.20	2.78	0.00	2.78	2.38	0.00	2.38
1130	42	09/14/84	2117	380	3	CH	5	390	406.05	2.56	0.00	2.56	2.46	0.00	2.46
1131	42	09/14/84	2211	441	3	CH	5	400	452.57	0.00	2.50	2.50	0.00	2.21	2.21
1132	42	09/14/84	2249	384	3	CH	5	390	373.70	2.56	0.00	2.56	2.68	0.00	2.68
1133	45	08/16/84	2149	1	1	CH	5	370	507.29	40.54	0.00	40.54	29.57	0.00	29.57
1134	45	08/16/84	2214	2	1	CH	5	390	485.79	38.46	0.00	38.46	30.88	0.00	30.88

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1135	45	08/16/84	2238	3	1	CH	5	390	424.39	38.46	0	38.46	35.34	0	35.34
1136	45	08/16/84	2251	4	1	CH	5	430	405.70	16.28	0	16.28	17.25	0	17.25
1137	45	08/16/84	2312	5	1	CH	5	410	477.60	21.95	0	21.95	18.84	0	18.84
1138	45	08/16/84	2334	6	1	CH	5	460	415.77	10.87	0	10.87	12.03	0	12.03
1139	45	08/16/84	2352	7	1	CH	5	510	466.06	47.06	0	47.06	51.50	0	51.50
1140	45	08/17/84	17	8	1	CH	5	500	495.16	2.00	0	2.00	2.02	0	2.02
1141	45	08/17/84	51	10	1	CH	5	520	464.52	3.85	0	3.85	4.31	0	4.31
1142	45	08/17/84	112	11	1	CH	5	530	489.40	9.43	0	9.43	10.22	0	10.22
1143	45	08/17/84	135	12	1	CH	5	510	491.98	9.80	0	9.80	10.16	0	10.16
1144	45	08/17/84	201	13	1	CH	5	590	490.95	3.39	0	3.39	4.07	0	4.07
1145	45	08/17/84	248	15	1	CH	5	550	451.34	10.91	0	10.91	13.29	0	13.29
1146	45	08/17/84	447	20	1	CH	5	500	488.15	6.00	0	6.00	6.15	0	6.15
1147	45	08/17/84	2131	21	1	CH	5	400	443.29	10.00	0	10.00	9.02	0	9.02
1148	45	08/17/84	2151	22	1	CH	5	390	486.42	23.08	0	23.08	18.50	0	18.50
1149	45	08/17/84	2210	23	1	CH	5	460	497.19	26.09	0	26.09	24.14	0	24.14
1150	45	08/17/84	2229	24	1	CH	5	410	441.64	21.95	0	21.95	20.38	0	20.38
1151	45	08/17/84	2312	25	1	CH	5	400	436.29	12.50	0	12.50	11.46	0	11.46
1152	45	08/17/84	2330	26	1	CH	5	370	439.67	10.81	0	10.81	9.10	0	9.10
1153	45	08/18/84	57	29	1	CH	5	420	441.93	14.29	0	14.29	13.58	0	13.58
1154	45	08/18/84	114	30	1	CH	5	410	441.64	9.76	0	9.76	9.06	0	9.06
1155	45	08/18/84	132	101	1	CH	5	400	504.47	15.00	0	15.00	11.89	0	11.89
1156	45	08/18/84	210	103	1	IP	5	410	463.13	4.88	0	4.88	4.32	0	4.32
1157	45	08/18/84	2113	114	1	CH	5	350	428.57	2.86	0	2.86	2.33	0	2.33
1158	45	08/18/84	2133	115	1	CH	5	330	414.39	12.12	0	12.12	9.65	0	9.65
1159	45	08/18/84	2150	116	1	CH	5	380	426.16	23.68	0	23.68	21.12	0	21.12
1160	45	08/18/84	2207	117	1	CH	5	360	458.43	16.67	0	16.67	13.09	0	13.09
1161	45	08/18/84	2225	118	1	CH	5	320	429.43	9.38	0	9.38	6.99	0	6.99
1162	45	08/18/84	2307	119	1	CH	5	390	415.23	2.56	0	2.56	2.41	0	2.41
1163	45	08/18/84	2325	120	1	CH	5	430	425.03	6.98	0	6.98	7.06	0	7.06
1164	45	08/18/84	2342	121	1	CH	5	410	433.30	2.44	0	2.44	2.31	0	2.31
1165	45	08/19/84	17	123	1	CH	5	420	455.27	2.38	0	2.38	2.20	0	2.20
1166	45	08/19/84	33	124	1	CH	5	380	373.63	2.63	0	2.63	2.68	0	2.68
1167	45	08/19/84	53	125	1	CH	5	460	448.91	8.70	0	8.70	8.91	0	8.91
1168	45	08/19/84	115	126	1	CH	5	370	443.09	2.70	0	2.70	2.26	0	2.26
1169	45	08/19/84	136	127	1	CH	5	440	420.84	2.27	0	2.27	2.38	0	2.38
1170	45	08/19/84	156	128	1	CH	5	320	416.74	6.25	0	6.25	4.80	0	4.80
1171	45	08/19/84	216	129	1	CH	5	440	514.32	6.82	0	6.82	5.83	0	5.83
1172	45	08/19/84	235	130	1	CH	5	400	424.26	7.50	0	7.50	7.07	0	7.07
1173	45	08/19/84	301	131	1	CH	5	370	424.55	5.41	0	5.41	4.71	0	4.71
1174	45	08/19/84	321	132	1	CH	5	390	437.66	2.56	0	2.56	2.28	0	2.28
1175	45	08/19/84	2400	122	1	CH	5	460	456.68	2.17	0	2.17	2.19	0	2.19
1176	45	08/29/84	141	172	2	CH	5	410	473.07	2.44	0	2.44	2.11	0	2.11
1177	45	08/29/84	158	173	2	CH	5	510	488.52	1.96	0	1.96	2.05	0	2.05
1178	45	08/29/84	221	174	2	CH	5	460	524.30	6.52	0	6.52	5.72	0	5.72
1179	45	08/29/84	255	176	2	CH	5	450	448.26	6.67	0	6.67	6.69	0	6.69
1180	45	08/29/84	338	178	2	CH	5	470	479.01	2.13	0	2.13	2.09	0	2.09
1181	45	08/29/84	412	180	2	CH	5	450	547.45	2.22	0	2.22	1.83	0	1.83
1182	45	08/29/84	433	181	2	CH	5	450	511.78	2.22	0	2.22	1.95	0	1.95
1183	45	08/29/84	453	182	2	CH	5	390	479.43	2.56	0	2.56	2.09	0	2.09
1184	45	08/29/84	510	183	2	CH	5	490	563.36	4.08	0	4.08	3.55	0	3.55
1185	45	08/30/84	2129	184	2	CH	5	380	456.86	5.26	0	5.26	4.38	0	4.38
1186	45	08/30/84	2158	186	2	CH	5	510	452.72	3.92	0	3.92	4.42	0	4.42
1187	45	08/30/84	2235	188	2	CH	5	520	469.37	1.92	0	1.92	2.13	0	2.13
1188	45	08/30/84	2301	189	2	CH	5	470	483.49	2.13	0	2.13	2.07	0	2.07

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR 1 METER SQUARE EPIBENTHIC SLED,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	REGION	DURATION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1189	45	08/30/84	2315	190	2	CH	5.0	420	511.76	2.38	0.00	2.38	1.95	0.00	1.95
1190	45	08/30/84	2328	191	2	CH	5.0	430	469.91	4.65	0.00	4.65	4.26	0.00	4.26
1191	45	08/31/84	316	205	2	CH	5.0	450	484.32	4.44	0.00	4.44	4.13	0.00	4.13
1192	45	09/01/84	121	230	2	CH	5.0	500	496.45	2.00	0.00	2.00	2.01	0.00	2.01
1193	45	09/01/84	212	233	2	CH	5.0	480	451.43	2.08	0.00	2.08	2.22	0.00	2.22
1194	45	09/01/84	345	240	2	CH	5.0	410	463.22	2.44	0.00	2.44	2.16	0.00	2.16
1195	45	09/14/84	2331	445	3	CH	5.0	390	525.19	2.56	0.00	2.56	1.90	0.00	1.90
1196	45	09/15/84	537	459	3	CH	5.0	270	452.23	11.11	0.00	11.11	6.63	0.00	6.63
1197	45	09/15/84	2024	475	3	CH	5.2	310	384.42	6.45	0.00	6.45	5.20	0.00	5.20
1198	45	09/15/84	2231	479	3	CH	5.0	490	413.77	2.04	0.00	2.04	2.42	0.00	2.42
1199	45	09/25/84	2343	528	4	CH	5.0	490	453.81	2.04	0.00	2.04	2.20	0.00	2.20
1200	45	09/26/84	111	533	4	CH	5.0	400	430.68	2.50	0.00	2.50	2.32	0.00	2.32
1201	45	09/26/84	420	543	4	CH	5.0	460	427.53	2.17	0.00	2.17	2.34	0.00	2.34
1202	45	09/26/84	2340	551	4	CH	5.0	360	420.20	2.78	0.00	2.78	2.38	0.00	2.38
1203	73	09/01/84	357	241	2	CH	5.0	550	472.28	0.00	1.82	1.82	0.00	2.12	2.12
1204	80	08/17/84	407	18	1	CH	5.0	410	447.20	2.44	0.00	2.44	2.24	0.00	2.24
1205	80	09/01/84	318	238	2	CH	5.0	410	501.57	2.44	0.00	2.44	1.99	0.00	1.99
1206	80	09/14/84	2234	442	3	CH	5.0	440	509.60	0.00	2.27	2.27	0.00	1.96	1.96
1207	80	09/14/84	2331	445	3	CH	5.0	390	525.19	0.00	5.13	5.13	0.00	3.81	3.81
1208	104	08/29/84	143	172	2	CH	5.0	410	473.07	0.00	2.44	2.44	0.00	2.11	2.11
1209	104	08/31/84	2113	217	2	TZ	5.0	440	492.30	2.27	0.00	2.27	2.03	0.00	2.03
1210	104	08/31/84	2357	224	2	CH	5.0	540	487.66	3.70	0.00	3.70	4.10	0.00	4.10
1211	104	09/01/84	10	225	2	CH	5.0	550	491.28	1.82	0.00	1.82	2.04	0.00	2.04
1212	104	09/01/84	51	228	2	CH	5.0	450	478.16	2.22	0.00	2.22	2.09	0.00	2.09
1213	104	09/01/84	121	230	2	CH	5.0	500	496.45	2.00	0.00	2.00	2.01	0.00	2.01
1214	104	09/01/84	225	234	2	CH	5.0	460	548.25	2.17	0.00	2.17	1.82	0.00	1.82
1215	104	09/01/84	252	236	2	CH	5.0	460	520.82	2.17	0.00	2.17	1.92	0.00	1.92
1216	104	09/01/84	305	237	2	CH	5.0	420	457.90	2.38	0.00	2.38	2.18	0.00	2.18
1217	104	09/01/84	345	240	2	CH	5.0	410	463.22	2.44	0.00	2.44	2.16	0.00	2.16
1218	104	09/15/84	343	395	3	TZ	5.0	430	379.76	0.00	2.33	2.33	0.00	2.63	2.63
1219	104	09/25/84	47	505	4	CH	5.0	390	453.72	2.56	0.00	2.56	2.20	0.00	2.20
1220	104	09/25/84	204	509	4	CH	5.0	400	434.58	2.50	0.00	2.50	2.30	0.00	2.30

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1	08/16/84	2149	1	38	CH	48
2	08/16/84	2149	1	38	CH	55
3	08/16/84	2149	1	38	CH	57
4	08/16/84	2149	1	38	CH	67
5	08/16/84	2214	2	38	CH	45
6	08/16/84	2214	2	38	CH	47
7	08/16/84	2214	2	38	CH	48
8	08/16/84	2214	2	38	CH	63
9	08/16/84	2214	2	38	CH	64
10	08/16/84	2214	2	38	CH	67
11	08/16/84	2214	2	38	CH	68
12	08/16/84	2214	2	38	CH	70
13	08/16/84	2214	2	38	CH	72
14	08/16/84	2238	3	38	CH	52
15	08/16/84	2251	4	38	CH	40
16	08/16/84	2251	4	38	CH	40
17	08/16/84	2251	4	38	CH	45
18	08/16/84	2251	4	38	CH	58
19	08/16/84	2251	4	38	CH	63
20	08/16/84	2251	4	38	CH	65
21	08/16/84	2312	5	38	CH	42
22	08/16/84	2312	5	38	CH	42
23	08/16/84	2312	5	38	CH	44
24	08/16/84	2312	5	38	CH	46
25	08/16/84	2312	5	38	CH	48
26	08/16/84	2312	5	38	CH	61
27	08/16/84	2312	5	38	CH	66
28	08/16/84	2312	5	38	CH	67
29	08/16/84	2312	5	38	CH	69
30	08/16/84	2312	5	38	CH	70
31	08/16/84	2312	5	38	CH	70
32	08/16/84	2312	5	38	CH	75
33	08/16/84	2312	5	38	CH	76
34	08/16/84	2334	6	38	CH	51
35	08/16/84	2334	6	38	CH	55
36	08/16/84	2334	6	38	CH	57
37	08/16/84	2334	6	38	CH	60
38	08/16/84	2334	6	38	CH	62
39	08/16/84	2352	7	38	CH	44
40	08/16/84	2352	7	38	CH	48
41	08/16/84	2352	7	38	CH	51
42	08/16/84	2352	7	38	CH	52
43	08/16/84	2352	7	38	CH	70
44	08/16/84	2352	7	38	CH	71
45	08/17/84	17	8	37	CH	49
46	08/17/84	17	8	37	CH	53
47	08/17/84	51	10	38	CH	34
48	08/17/84	51	10	38	CH	68
49	08/17/84	112	11	38	CH	47
50	08/17/84	135	12	38	CH	38
51	08/17/84	135	12	38	CH	52
52	08/17/84	135	12	38	CH	79
53	08/17/84	201	13	38	CH	41

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
54	08/17/84	201	13	38	CH	55
55	08/17/84	201	13	38	CH	56
56	08/17/84	226	14	38	CH	55
57	08/17/84	226	14	38	CH	57
58	08/17/84	226	14	38	CH	60
59	08/17/84	248	15	38	CH	42
60	08/17/84	248	15	38	CH	51
61	08/17/84	248	15	38	CH	56
62	08/17/84	248	15	38	CH	63
63	08/17/84	248	15	38	CH	66
64	08/17/84	248	15	38	CH	66
65	08/17/84	407	18	38	CH	56
66	08/17/84	2131	21	38	CH	57
67	08/17/84	2151	22	38	CH	41
68	08/17/84	2151	22	38	CH	61
69	08/17/84	2151	22	38	CH	63
70	08/17/84	2151	22	38	CH	64
71	08/17/84	2151	22	38	CH	69
72	08/17/84	2210	23	38	CH	44
73	08/17/84	2210	23	38	CH	55
74	08/17/84	2210	23	38	CH	62
75	08/17/84	2229	24	38	CH	40
76	08/17/84	2229	24	38	CH	48
77	08/17/84	2229	24	38	CH	55
78	08/17/84	2229	24	38	CH	65
79	08/17/84	2229	24	38	CH	70
80	08/17/84	2312	25	38	CH	58
81	08/17/84	2330	26	38	CH	57
82	08/17/84	2330	26	38	CH	65
83	08/17/84	2330	26	38	CH	76
84	08/18/84	38	28	38	CH	58
85	08/18/84	38	28	38	CH	64
86	08/18/84	38	28	38	CH	69
87	08/18/84	38	28	38	CH	72
88	08/18/84	114	30	38	CH	46
89	08/18/84	114	30	38	CH	66
90	08/18/84	114	30	38	CH	70
91	08/18/84	210	103	39	IP	54
92	08/18/84	210	103	39	IP	70
93	08/18/84	305	106	39	IP	61
94	08/18/84	305	106	39	IP	71
95	08/18/84	2053	113	38	CH	56
96	08/18/84	2053	113	38	CH	58
97	08/18/84	2053	113	38	CH	70
98	08/18/84	2113	114	38	CH	47
99	08/18/84	2113	114	38	CH	58
100	08/18/84	2113	114	38	CH	59
101	08/18/84	2113	114	38	CH	61
102	08/18/84	2113	114	38	CH	62
103	08/18/84	2113	114	38	CH	64
104	08/18/84	2133	115	38	CH	32
105	08/18/84	2133	115	38	CH	53
106	08/18/84	2150	116	38	CH	38

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
107	08/18/84	2207	117	38	CH	56
108	08/18/84	2207	117	38	CH	62
109	08/18/84	2207	117	38	CH	63
110	08/18/84	2225	118	38	CH	47
111	08/18/84	2225	118	38	CH	47
112	08/18/84	2225	118	38	CH	61
113	08/18/84	2307	119	38	CH	65
114	08/18/84	2342	121	38	CH	55
115	08/18/84	2342	121	38	CH	56
116	08/19/84	33	124	38	CH	44
117	08/19/84	33	124	38	CH	57
118	08/19/84	33	124	38	CH	63
119	08/19/84	53	125	38	CH	55
120	08/19/84	115	126	38	CH	52
121	08/19/84	115	126	38	CH	57
122	08/19/84	115	126	38	CH	73
123	08/19/84	136	127	38	CH	69
124	08/19/84	156	128	38	CH	70
125	08/19/84	235	130	38	CH	56
126	08/19/84	235	130	38	CH	65
127	08/19/84	235	130	38	CH	66
128	08/19/84	301	131	38	CH	61
129	08/19/84	301	131	38	CH	68
130	08/19/84	2400	122	38	CH	64
131	08/19/84	2400	122	38	CH	65
132	08/19/84	2400	122	38	CH	71
133	08/29/84	412	180	35	CH	62
134	08/29/84	412	180	35	CH	78
135	08/29/84	453	182	35	CH	71
136	08/29/84	510	183	36	CH	58
137	08/29/84	510	183	36	CH	62
138	08/30/84	2158	186	38	CH	61
139	08/30/84	2211	187	38	CH	70
140	08/30/84	2211	187	38	CH	71
141	08/30/84	2211	187	38	CH	77
142	08/30/84	2235	188	37	CH	81
143	08/30/84	2235	188	37	CH	83
144	08/31/84	4	194	35	CH	68
145	08/31/84	45	197	36	CH	74
146	08/31/84	112	199	35	CH	63
147	08/31/84	124	200	35	CH	49
148	08/31/84	124	200	35	CH	52
149	08/31/84	124	200	35	CH	56
150	08/31/84	124	200	35	CH	56
151	08/31/84	124	200	35	CH	60
152	08/31/84	124	200	35	CH	61
153	08/31/84	124	200	35	CH	61
154	08/31/84	124	200	35	CH	62
155	08/31/84	124	200	35	CH	62
156	08/31/84	124	200	35	CH	63
157	08/31/84	124	200	35	CH	64
158	08/31/84	124	200	35	CH	64
159	08/31/84	124	200	35	CH	68

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
160	08/31/84	124	200	35	CH	68
161	08/31/84	124	200	35	CH	69
162	08/31/84	124	200	35	CH	72
163	08/31/84	124	200	35	CH	74
164	08/31/84	244	203	36	CH	59
165	08/31/84	301	204	36	CH	60
166	08/31/84	301	204	36	CH	66
167	08/31/84	301	204	36	CH	68
168	08/31/84	301	204	36	CH	75
169	08/31/84	316	205	36	CH	68
170	08/31/84	328	206	36	CH	55
171	08/31/84	328	206	36	CH	61
172	08/31/84	328	206	36	CH	66
173	08/31/84	328	206	36	CH	66
174	08/31/84	328	206	36	CH	79
175	08/31/84	328	206	36	CH	82
176	08/31/84	2245	221	35	CH	61
177	08/31/84	2245	221	35	CH	74
178	08/31/84	2245	221	35	CH	79
179	08/31/84	2259	222	35	CH	55
180	08/31/84	2259	222	35	CH	61
181	08/31/84	2311	223	35	CH	62
182	08/31/84	2311	223	35	CH	69
183	08/31/84	2311	223	35	CH	74
184	08/31/84	2357	224	35	CH	63
185	08/31/84	2357	224	35	CH	70
186	09/01/84	10	225	35	CH	60
187	09/01/84	10	225	35	CH	61
188	09/01/84	10	225	35	CH	64
189	09/01/84	10	225	35	CH	67
190	09/01/84	10	225	35	CH	70
191	09/01/84	10	225	35	CH	71
192	09/01/84	10	225	35	CH	77
193	09/01/84	10	225	35	CH	83
194	09/01/84	23	226	35	CH	56
195	09/01/84	23	226	35	CH	61
196	09/01/84	23	226	35	CH	70
197	09/01/84	23	226	35	CH	71
198	09/01/84	23	226	35	CH	79
199	09/01/84	23	226	35	CH	80
200	09/01/84	23	226	35	CH	80
201	09/01/84	23	226	35	CH	82
202	09/01/84	23	226	35	CH	86
203	09/01/84	38	227	35	CH	56
204	09/01/84	38	227	35	CH	58
205	09/01/84	38	227	35	CH	59
206	09/01/84	38	227	35	CH	60
207	09/01/84	38	227	35	CH	61
208	09/01/84	38	227	35	CH	62
209	09/01/84	38	227	35	CH	64
210	09/01/84	38	227	35	CH	69
211	09/01/84	38	227	35	CH	69
212	09/01/84	38	227	35	CH	70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
213	09/01/84	38	227	35	CH	73
214	09/01/84	38	227	35	CH	73
215	09/01/84	38	227	35	CH	73
216	09/01/84	38	227	35	CH	75
217	09/01/84	38	227	35	CH	80
218	09/01/84	38	227	35	CH	89
219	09/01/84	51	228	35	CH	57
220	09/01/84	51	228	35	CH	58
221	09/01/84	106	229	35	CH	49
222	09/01/84	106	229	35	CH	79
223	09/01/84	121	230	35	CH	48
224	09/01/84	121	230	35	CH	53
225	09/01/84	134	231	35	CH	53
226	09/01/84	134	231	35	CH	54
227	09/01/84	134	231	35	CH	56
228	09/01/84	134	231	35	CH	57
229	09/01/84	134	231	35	CH	58
230	09/01/84	134	231	35	CH	61
231	09/01/84	134	231	35	CH	65
232	09/01/84	134	231	35	CH	69
233	09/01/84	134	231	35	CH	74
234	09/01/84	134	231	35	CH	75
235	09/01/84	134	231	35	CH	82
236	09/01/84	149	232	35	CH	61
237	09/01/84	149	232	35	CH	88
238	09/01/84	238	235	35	CH	61
239	09/01/84	238	235	35	CH	71
240	09/01/84	252	236	35	CH	58
241	09/01/84	252	236	35	CH	65
242	09/01/84	332	239	35	CH	50
243	09/01/84	332	239	35	CH	73
244	09/01/84	345	240	35	CH	57
245	09/01/84	345	240	35	CH	60
246	09/01/84	345	240	35	CH	62
247	09/01/84	345	240	35	CH	65
248	09/01/84	345	240	35	CH	70
249	09/01/84	345	240	35	CH	72
250	09/01/84	345	240	35	CH	75
251	09/01/84	345	240	35	CH	81
252	09/01/84	345	240	35	CH	97
253	09/01/84	357	241	35	CH	52
254	09/01/84	357	241	35	CH	52
255	09/01/84	357	241	35	CH	56
256	09/01/84	357	241	35	CH	58
257	09/01/84	357	241	35	CH	58
258	09/01/84	357	241	35	CH	63
259	09/01/84	357	241	35	CH	64
260	09/01/84	357	241	35	CH	65
261	09/01/84	357	241	35	CH	65
262	09/01/84	357	241	35	CH	67
263	09/01/84	357	241	35	CH	68
264	09/01/84	357	241	35	CH	68
265	09/01/84	357	241	35	CH	68

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
266	09/01/84	357	241	35	CH	69
267	09/01/84	357	241	35	CH	72
268	09/01/84	357	241	35	CH	72
269	09/01/84	357	241	35	CH	72
270	09/01/84	357	241	35	CH	73
271	09/01/84	357	241	35	CH	73
272	09/01/84	357	241	35	CH	74
273	09/01/84	357	241	35	CH	74
274	09/01/84	357	241	35	CH	75
275	09/01/84	357	241	35	CH	76
276	09/01/84	357	241	35	CH	76
277	09/01/84	357	241	35	CH	77
278	09/01/84	357	241	35	CH	79
279	09/01/84	357	241	35	CH	81
280	09/01/84	357	241	35	CH	83
281	09/01/84	357	241	35	CH	91
282	09/01/84	423	243	35	CH	63
283	09/01/84	423	243	35	CH	72
284	09/01/84	436	244	35	CH	76
285	09/01/84	436	244	35	CH	84
286	09/12/84	2246	313	35	CH	70
287	09/12/84	2338	317	36	CH	73
288	09/12/84	2338	317	36	CH	80
289	09/12/84	2338	317	36	CH	81
290	09/12/84	2338	317	36	CH	82
291	09/12/84	2338	317	36	CH	83
292	09/12/84	2351	318	36	CH	71
293	09/12/84	2351	318	36	CH	89
294	09/12/84	2351	318	36	CH	89
295	09/12/84	2351	318	36	CH	91
296	09/13/84	5	319	36	CH	62
297	09/13/84	5	319	36	CH	82
298	09/13/84	49	323	36	CH	70
299	09/13/84	49	323	36	CH	75
300	09/13/84	49	323	36	CH	80
301	09/13/84	49	323	36	CH	83
302	09/13/84	101	324	37	CH	79
303	09/13/84	113	325	37	CH	101
304	09/13/84	2022	345	35	CH	66
305	09/13/84	2036	346	35	CH	90
306	09/13/84	2102	348	35	CH	73
307	09/13/84	2159	352	37	CH	65
308	09/13/84	2159	352	37	CH	75
309	09/13/84	2334	359	35	CH	71
310	09/14/84	101	365	35	CH	90
311	09/14/84	247	374	36	CH	75
312	09/14/84	247	374	36	CH	82
313	09/14/84	2206	385	36	CH	78
314	09/14/84	2234	383	36	CH	74
315	09/14/84	2234	442	36	CH	63
316	09/14/84	2249	443	36	CH	41
317	09/14/84	2249	443	36	CH	78
318	09/14/84	2249	443	36	CH	78

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
319	09/14/84	2249	443	36	CH	113
320	09/14/84	2331	445	36	CH	65
321	09/15/84	53	388	34	CH	57
322	09/15/84	53	388	34	CH	67
323	09/15/84	53	388	34	CH	79
324	09/15/84	53	388	34	CH	94
325	09/15/84	151	448	33	TZ	75
326	09/15/84	151	448	33	TZ	77
327	09/15/84	151	448	33	TZ	80
328	09/15/84	151	448	33	TZ	90
329	09/15/84	242	451	33	TZ	89
330	09/15/84	258	452	33	TZ	66
331	09/15/84	258	452	33	TZ	67
332	09/15/84	258	452	33	TZ	71
333	09/15/84	258	452	33	TZ	74
334	09/15/84	258	452	33	TZ	80
335	09/15/84	258	452	33	TZ	81
336	09/15/84	258	452	33	TZ	84
337	09/15/84	258	452	33	TZ	85
338	09/15/84	326	453	33	TZ	71
339	09/15/84	453	458	31	TZ	68
340	09/15/84	453	458	31	TZ	79
341	09/15/84	537	459	34	CH	61
342	09/15/84	537	459	34	CH	64
343	09/15/84	537	459	34	CH	95
344	09/15/84	537	459	34	CH	96
345	09/15/84	2231	479	36	CH	71
346	09/15/84	2231	479	36	CH	78
347	09/16/84	30	484	30	TZ	104
348	09/16/84	43	503	30	TZ	65
349	09/16/84	43	503	30	TZ	94
350	09/24/84	2115	492	35	CH	94
351	09/24/84	2138	493	35	CH	70
352	09/24/84	2153	494	35	CH	69
353	09/24/84	2153	494	35	CH	88
354	09/24/84	2214	495	35	CH	82
355	09/24/84	2235	496	35	CH	107
356	09/24/84	2345	499	35	CH	81
357	09/24/84	2345	499	35	CH	85
358	09/24/84	2345	499	35	CH	92
359	09/24/84	2345	499	35	CH	96
360	09/25/84	4	500	35	CH	78
361	09/25/84	4	500	35	CH	78
362	09/25/84	4	500	35	CH	78
363	09/25/84	4	500	35	CH	81
364	09/25/84	4	500	35	CH	85
365	09/25/84	4	500	35	CH	87
366	09/25/84	4	500	35	CH	87
367	09/25/84	4	500	35	CH	88
368	09/25/84	4	500	35	CH	106
369	09/25/84	29	504	35	CH	78
370	09/25/84	29	504	35	CH	80
371	09/25/84	29	504	35	CH	98

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
372	09/25/84	29	504	35	CH	104
373	09/25/84	47	505	35	CH	71
374	09/25/84	47	505	35	CH	72
375	09/25/84	47	505	35	CH	73
376	09/25/84	108	506	35	CH	107
377	09/25/84	143	508	35	CH	68
378	09/25/84	2007	517	36	CH	76
379	09/25/84	2325	527	36	CH	75
380	09/25/84	2325	527	36	CH	82
381	09/25/84	2325	527	36	CH	86
382	09/25/84	2325	527	36	CH	87
383	09/25/84	2325	527	36	CH	90
384	09/25/84	2325	527	36	CH	94
385	09/25/84	2325	527	36	CH	103
386	09/25/84	2343	528	37	CH	77
387	09/26/84	1	529	37	CH	83
388	09/26/84	1	529	37	CH	85
389	09/26/84	16	530	37	CH	69
390	09/26/84	16	530	37	CH	80
391	09/26/84	16	530	37	CH	84
392	09/26/84	16	530	37	CH	93
393	09/26/84	36	531	36	CH	73
394	09/26/84	36	531	36	CH	73
395	09/26/84	36	531	36	CH	88
396	09/26/84	54	532	36	CH	85
397	09/26/84	111	533	36	CH	95
398	09/26/84	128	534	37	CH	82
399	09/26/84	128	534	37	CH	87
400	09/26/84	209	536	37	CH	84
401	09/26/84	209	536	37	CH	86
402	09/26/84	209	536	37	CH	87
403	09/26/84	209	536	37	CH	93
404	09/26/84	209	536	37	CH	94
405	09/26/84	209	536	37	CH	102
406	09/26/84	248	538	36	CH	82
407	09/26/84	402	542	37	CH	81
408	09/26/84	402	542	37	CH	81
409	09/26/84	402	542	37	CH	138
410	09/26/84	420	543	37	CH	72
411	09/26/84	420	543	37	CH	74
412	09/26/84	420	543	37	CH	87
413	09/26/84	420	543	37	CH	99
414	09/26/84	420	543	37	CH	103
415	09/26/84	2222	546	38	CH	100
416	09/26/84	2240	547	38	CH	70
417	09/26/84	2240	547	38	CH	95
418	09/26/84	2240	547	38	CH	154
419	09/26/84	2253	548	38	CH	70
420	09/26/84	2253	548	38	CH	71
421	09/26/84	2253	548	38	CH	78
422	09/26/84	2253	548	38	CH	89
423	09/26/84	2308	549	38	CH	76
424	09/26/84	2308	549	38	CH	78

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 1 METER SQUARE EPIBENTHIC SLED (GEAR=64),
USE CODE 1 SAMPLES.

OBS	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
425	09/26/84	2308	549	38	CH	82
426	09/26/84	2308	549	38	CH	85
427	09/26/84	2308	549	38	CH	102
428	09/26/84	2308	549	38	CH	103
429	09/26/84	2324	550	37	CH	69
430	09/26/84	2324	550	37	CH	78
431	09/26/84	2324	550	37	CH	82
432	09/26/84	2324	550	37	CH	82
433	09/26/84	2324	550	37	CH	82
434	09/26/84	2324	550	37	CH	82
435	09/26/84	2324	550	37	CH	83
436	09/26/84	2324	550	37	CH	83
437	09/26/84	2324	550	37	CH	84
438	09/26/84	2324	550	37	CH	84
439	09/26/84	2324	550	37	CH	86
440	09/26/84	2324	550	37	CH	86
441	09/26/84	2324	550	37	CH	87
442	09/26/84	2324	550	37	CH	87
443	09/26/84	2324	550	37	CH	88
444	09/26/84	2324	550	37	CH	89
445	09/26/84	2324	550	37	CH	89
446	09/26/84	2324	550	37	CH	89
447	09/26/84	2324	550	37	CH	90
448	09/26/84	2324	550	37	CH	92
449	09/26/84	2324	550	37	CH	93
450	09/26/84	2324	550	37	CH	97
451	09/26/84	2324	550	37	CH	98
452	09/26/84	2324	550	37	CH	118
453	09/26/84	2340	551	37	CH	71
454	09/26/84	2340	551	37	CH	76
455	09/26/84	2340	551	37	CH	78
456	09/26/84	2340	551	37	CH	82
457	09/26/84	2340	551	37	CH	87
458	09/26/84	2340	551	37	CH	94
459	09/26/84	2340	551	37	CH	95
460	09/26/84	2340	551	37	CH	98
461	09/27/84	2041	665	37	CH	87
462	09/27/84	2055	666	36	CH	82

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1	2	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	5.60	1.60	7.20	5.49	1.57	7.06
2	2	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	4.69	3.91	8.59	5.59	4.65	10.24
3	2	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	1.73	6.91	8.63	1.85	7.42	9.27
4	2	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	7.20	3.20	10.40	7.40	3.29	10.69
5	2	08/16/84	2334	36	1	5.2	CH	1432.56	1248.29	4.89	3.49	8.38	5.61	4.01	9.61
6	2	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	2.79	2.09	4.89	3.18	2.38	5.56
7	2	08/17/84	35	39	1	5.2	CH	1584.96	1305.97	6.31	0.00	6.31	7.66	0.00	7.66
8	2	08/17/84	51	40	1	5.7	CH	1463.04	1227.16	0.00	3.42	3.42	0.00	4.07	4.07
9	2	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	0.63	3.79	4.42	0.71	4.28	4.99
10	2	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	0.00	2.48	2.48	0.00	3.03	3.03
11	2	08/17/84	201	43	1	5.5	CH	1645.92	1339.06	1.22	2.43	3.65	1.49	2.99	4.48
12	2	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	0.00	1.82	1.82	0.00	2.20	2.20
13	2	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	1.22	1.82	3.04	1.53	2.29	3.82
14	2	08/17/84	316	46	1	5.5	CH	1615.44	1339.54	1.24	4.95	6.19	1.49	5.97	7.47
15	2	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	1.82	0.00	1.82	1.63	0.00	1.63
16	2	08/17/84	407	48	1	5.5	CH	1371.60	1212.48	0.73	0.73	1.46	0.82	0.82	1.65
17	2	08/17/84	428	49	1	5.5	CH	1371.60	1158.66	1.46	2.19	3.65	1.73	2.59	4.32
18	2	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	3.20	2.40	5.60	3.21	2.41	5.63
19	2	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	1.60	0.00	1.60	1.60	0.00	1.60
20	2	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	1.73	1.73	3.45	1.58	1.58	3.15
21	2	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	0.00	2.81	2.81	0.00	2.57	2.57
22	2	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	0.00	0.80	0.80	0.00	0.82	0.82
23	2	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	0.00	1.53	1.53	0.00	1.76	1.76
24	2	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	1.40	0.00	1.40	1.54	0.00	1.54
25	2	08/18/84	114	60	1	5.5	CH	1097.28	1134.77	0.91	0.00	0.91	0.88	0.00	0.88
26	2	08/18/84	132	61	1	5.5	CH	1158.24	1098.80	0.86	0.86	1.73	0.91	0.91	1.82
27	2	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	0.96	0.96	1.93	0.83	0.83	1.67
28	2	08/18/84	210	63	1	5.5	IP	1158.24	1151.17	6.91	3.45	10.36	6.95	3.47	10.42
29	2	08/18/84	229	64	1	5.5	IP	975.36	1070.49	3.08	0.00	3.08	2.80	0.00	2.80
30	2	08/18/84	247	65	1	5.5	IP	1036.32	1186.59	1.93	2.89	4.82	1.69	2.53	4.21
31	2	08/18/84	305	66	1	5.5	IP	975.36	1030.14	2.05	3.08	5.13	1.94	2.91	4.85
32	2	08/18/84	323	67	1	5.5	CH	1005.84	1205.81	7.95	0.00	7.95	6.63	0.00	6.63
33	2	08/18/84	412	69	1	5.5	CH	1219.20	1223.75	0.00	0.82	0.82	0.00	0.82	0.82
34	2	08/18/84	435	70	1	5.5	CH	1188.72	1173.02	5.89	0.00	5.89	5.97	0.00	5.97
35	2	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	1.68	0.00	1.68	1.62	0.00	1.62
36	2	08/18/84	2053	73	1	5.5	CH	1158.24	1158.11	8.63	0.00	8.63	8.63	0.00	8.63
37	2	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	31.78	1.03	32.81	26.66	0.86	27.52
38	2	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	2.89	1.93	4.82	2.77	1.85	4.62
39	2	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	6.91	0.00	6.91	6.38	0.00	6.38
40	2	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	0.00	0.91	0.91	0.00	0.77	0.77
41	2	08/18/84	2307	79	1	5.5	CH	1158.24	1159.90	0.86	0.00	0.86	0.86	0.00	0.86
42	2	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	2.29	0.00	2.29	2.32	0.00	2.32
43	2	08/18/84	2342	81	1	5.5	CH	1371.60	1241.79	2.92	0.00	2.92	3.22	0.00	3.22
44	2	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	0.89	0.00	0.89	0.99	0.00	0.99
45	2	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	0.89	0.00	0.89	0.83	0.00	0.83
46	2	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	0.94	0.00	0.94	0.99	0.00	0.99
47	2	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	2.66	0.00	2.66	2.45	0.00	2.45
48	2	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	0.94	0.00	0.94	0.89	0.00	0.89
49	2	08/19/84	301	91	1	5.5	CH	1066.80	998.28	0.94	0.00	0.94	1.00	0.00	1.00
50	2	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	1.77	0.00	1.77	1.61	0.00	1.61
51	2	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	1.60	0.00	1.60	1.69	0.00	1.69
52	2	08/29/84	106	93	2	5.0	CH	1280.16	1338.81	17.97	0.00	17.97	17.18	0.00	17.18
53	2	08/29/84	121	94	2	5.0	CH	762.00	1297.23	57.74	0.00	57.74	33.92	0.00	33.92
54	2	08/29/84	141	95	2	5.0	CH	1158.24	1371.31	20.72	1.73	22.45	17.50	1.46	18.96

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
55	2	08/29/84	158	96	2	5.0	CH	1524.00	1578.74	85.96	0.00	85.96	82.98	0.00	82.98
56	2	08/29/84	221	97	2	5.0	CH	1432.56	1565.21	20.94	0.00	20.94	19.17	0.00	19.17
57	2	08/29/84	239	98	2	5.0	CH	1584.96	1413.68	16.40	0.00	16.40	18.39	0.00	18.39
58	2	08/29/84	255	99	2	5.0	CH	1737.36	1494.88	20.72	0.00	20.72	24.08	0.00	24.08
59	2	08/29/84	322	100	2	5.0	CH	1341.12	1538.44	10.44	0.75	11.18	9.10	0.65	9.75
60	2	08/29/84	338	133	2	5.0	CH	1554.48	1546.17	1.93	0.00	1.93	1.94	0.00	1.94
61	2	08/29/84	352	134	2	5.0	CH	1097.28	1460.94	16.40	0.00	16.40	12.32	0.00	12.32
62	2	08/29/84	412	135	2	5.0	CH	1554.48	1401.89	2.57	1.29	3.86	2.85	1.43	4.28
63	2	08/29/84	433	136	2	5.0	CH	1280.16	1366.96	7.81	0.00	7.81	7.32	0.00	7.32
64	2	08/29/84	453	137	2	5.0	CH	1524.00	1421.53	6.56	0.00	6.56	7.03	0.00	7.03
65	2	08/30/84	2129	139	2	5.0	CH	1493.52	1411.24	2.01	0.00	2.01	2.13	0.00	2.13
66	2	08/30/84	2211	142	2	5.0	CH	1402.08	1495.95	1.43	0.00	1.43	1.34	0.00	1.34
67	2	08/30/84	2235	143	2	5.0	CH	1584.96	1472.73	2.52	0.63	3.15	2.72	0.68	3.40
68	2	08/30/84	2301	144	2	5.0	CH	1341.12	1458.84	10.44	0.00	10.44	9.60	0.00	9.60
69	2	08/30/84	2315	145	2	5.0	CH	1341.12	1443.33	5.22	0.00	5.22	4.85	0.00	4.85
70	2	08/30/84	2328	146	2	5.0	CH	1402.08	1430.09	4.28	0.71	4.99	4.20	0.70	4.89
71	2	08/30/84	2341	147	2	5.0	CH	1493.52	1489.20	4.02	0.00	4.02	4.03	0.00	4.03
72	2	08/30/84	2353	148	2	5.0	CH	1554.48	646.71	3.22	0.64	3.86	7.73	1.55	9.28
73	2	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	3.05	1.53	4.58	2.91	1.45	4.36
74	2	08/31/84	18	150	2	5.0	CH	1310.64	1492.32	2.29	0.76	3.05	2.01	0.67	2.68
75	2	08/31/84	34	151	2	5.0	CH	1341.12	1514.69	10.44	0.00	10.44	9.24	0.00	9.24
76	2	08/31/84	45	152	2	5.0	CH	1463.04	1518.46	10.94	0.00	10.94	10.54	0.00	10.54
77	2	08/31/84	59	153	2	5.0	CH	1432.56	1477.31	4.89	0.00	4.89	4.74	0.00	4.74
78	2	08/31/84	112	154	2	5.0	CH	1402.08	1531.59	9.27	0.00	9.27	8.49	0.00	8.49
79	2	08/31/84	124	155	2	5.0	CH	1432.56	1467.94	8.38	2.09	10.47	8.17	2.04	10.22
80	2	08/31/84	137	156	2	5.0	CH	1341.12	1423.94	3.73	0.00	3.73	3.51	0.00	3.51
81	2	08/31/84	206	157	2	5.0	CH	1432.56	1493.46	1.40	0.00	1.40	1.34	0.00	1.34
82	2	08/31/84	244	158	2	5.0	CH	1310.64	1449.80	3.81	0.00	3.81	3.45	0.00	3.45
83	2	08/31/84	301	159	2	5.0	CH	1341.12	1426.04	11.18	0.00	11.18	10.52	0.00	10.52
84	2	08/31/84	316	160	2	5.0	CH	1402.08	1518.81	4.99	0.00	4.99	4.61	0.00	4.61
85	2	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	17.41	0.00	17.41	17.36	0.00	17.36
86	2	08/31/84	342	162	2	5.1	CH	1676.40	1496.40	9.54	1.79	11.33	10.69	2.00	12.70
87	2	08/31/84	354	163	2	5.0	CH	1463.04	1521.23	9.57	0.00	9.57	9.20	0.00	9.20
88	2	08/31/84	406	164	2	5.0	CH	1432.56	1508.19	5.58	0.00	5.58	5.30	0.00	5.30
89	2	08/31/84	449	166	2	5.0	CH	1554.48	1527.47	2.57	0.64	3.22	2.62	0.65	3.27
90	2	08/31/84	510	167	2	5.0	CH	1310.64	1401.55	17.55	0.00	17.55	16.41	0.00	16.41
91	2	08/31/84	522	168	2	5.0	CH	1341.12	1450.83	13.42	0.00	13.42	12.41	0.00	12.41
92	2	08/31/84	536	169	2	5.0	CH	1371.60	1536.56	2.19	0.00	2.19	1.95	0.00	1.95
93	2	08/31/84	2038	276	2	5.0	CH	1127.76	1322.98	1.77	0.00	1.77	1.51	0.00	1.51
94	2	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	1.53	6.87	8.39	1.33	6.01	7.34
95	2	08/31/84	2113	278	2	5.0	TZ	1463.04	1610.27	6.84	0.68	7.52	6.21	0.62	6.83
96	2	08/31/84	2128	279	2	5.0	TZ	1432.56	1450.65	5.58	0.70	6.28	5.51	0.69	6.20
97	2	08/31/84	2142	280	2	5.0	TZ	1402.08	1377.93	0.71	0.71	1.43	0.73	0.73	1.45
98	2	08/31/84	2245	282	2	5.0	CH	1341.12	1512.78	2.24	0.00	2.24	1.98	0.00	1.98
99	2	08/31/84	2259	283	2	5.0	CH	1554.48	1538.17	2.57	0.00	2.57	2.60	0.00	2.60
100	2	08/31/84	2357	285	2	5.0	CH	1524.00	1581.65	33.46	0.00	33.46	32.24	0.00	32.24
101	2	09/01/84	10	286	2	5.0	CH	1432.56	1567.33	111.69	0.70	112.39	102.08	0.64	102.72
102	2	09/01/84	23	287	2	5.0	CH	1493.52	1535.10	31.47	0.67	32.14	30.62	0.65	31.27
103	2	09/01/84	38	288	2	5.0	CH	1371.60	1452.14	53.95	0.00	53.95	50.96	0.00	50.96
104	2	09/01/84	51	289	2	5.0	CH	1463.04	1455.76	15.04	2.73	17.77	15.11	2.75	17.86
105	2	09/01/84	106	290	2	5.0	CH	1524.00	1559.75	28.22	0.00	28.22	27.57	0.00	27.57
106	2	09/01/84	121	291	2	5.0	CH	1432.56	1484.44	43.28	0.00	43.28	41.77	0.00	41.77
107	2	09/01/84	134	292	2	5.0	CH	1463.04	1506.41	17.77	0.00	17.77	17.26	0.00	17.26
108	2	09/01/84	149	293	2	5.0	CH	1463.04	1416.40	14.35	1.37	15.72	14.83	1.41	16.24

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
109	2	09/01/84	225	295	2	5.0	CH	1371.60	1224.47	15.31	0.00	15.31	17.15	0.00	17.15
110	2	09/01/84	238	296	2	5.0	CH	1341.12	1464.75	33.55	0.75	34.30	30.72	0.68	31.40
111	2	09/01/84	252	297	2	5.0	CH	1371.60	1339.38	34.27	0.00	34.27	35.09	0.00	35.09
112	2	09/01/84	305	298	2	5.0	CH	1310.64	1392.79	9.92	0.00	9.92	9.33	0.00	9.33
113	2	09/01/84	318	299	2	5.0	CH	1432.56	1440.64	7.68	0.00	7.68	7.64	0.00	7.64
114	2	09/01/84	332	300	2	5.0	CH	1341.12	1429.06	9.69	0.75	10.44	9.10	0.70	9.80
115	2	09/01/84	345	301	2	5.0	CH	1463.04	1336.45	10.25	0.68	10.94	11.22	0.75	11.97
116	2	09/01/84	410	303	2	5.0	CH	1341.12	1464.70	4.47	0.00	4.47	4.10	0.00	4.10
117	2	09/01/84	423	304	2	5.0	CH	1341.12	1458.02	17.15	0.00	17.15	15.77	0.00	15.77
118	2	09/01/84	436	305	2	5.0	CH	1341.12	1403.22	8.20	0.00	8.20	7.84	0.00	7.84
119	2	09/12/84	2128	247	3	5.0	CH	1219.20	1205.78	28.71	0.00	28.71	29.03	0.00	29.03
120	2	09/12/84	2141	248	3	5.0	CH	1097.28	1206.87	33.72	0.00	33.72	30.66	0.00	30.66
121	2	09/12/84	2209	249	3	5.0	CH	1310.64	1337.74	32.05	0.00	32.05	31.40	0.00	31.40
122	2	09/12/84	2221	250	3	5.0	CH	1310.64	1438.27	19.84	0.00	19.84	18.08	0.00	18.08
123	2	09/12/84	2232	251	3	5.0	CH	1280.16	1119.08	32.03	0.00	32.03	36.64	0.00	36.64
124	2	09/12/84	2246	252	3	5.0	CH	1280.16	1374.68	17.97	0.00	17.97	16.73	0.00	16.73
125	2	09/12/84	2300	253	3	5.0	CH	1280.16	1265.97	11.72	0.00	11.72	11.85	0.00	11.85
126	2	09/12/84	2312	254	3	5.0	CH	1280.16	1598.65	7.81	0.00	7.81	6.26	0.00	6.26
127	2	09/12/84	2323	255	3	5.0	CH	1280.16	1294.39	20.31	0.00	20.31	20.09	0.00	20.09
128	2	09/12/84	2338	256	3	5.0	CH	1310.64	1443.25	27.47	0.00	27.47	24.94	0.00	24.94
129	2	09/12/84	2351	257	3	5.0	CH	1341.12	979.77	11.93	0.00	11.93	16.33	0.00	16.33
130	2	09/13/84	5	258	3	5.0	CH	1249.68	1255.40	41.61	0.00	41.61	41.42	0.00	41.42
131	2	09/13/84	15	259	3	5.0	CH	1188.72	1463.62	37.01	0.00	37.01	30.06	0.00	30.06
132	2	09/13/84	26	260	3	5.0	CH	1280.16	1229.16	36.71	0.78	37.50	38.24	0.81	39.05
133	2	09/13/84	38	261	3	5.0	CH	1341.12	1417.96	32.81	0.00	32.81	31.03	0.00	31.03
134	2	09/13/84	49	262	3	5.0	CH	1341.12	1595.44	15.66	0.00	15.66	13.16	0.00	13.16
135	2	09/13/84	101	263	3	5.0	CH	1341.12	1428.18	35.05	0.75	35.79	32.91	0.70	33.61
136	2	09/13/84	113	264	3	5.0	CH	1280.16	1428.32	85.93	0.00	85.93	77.01	0.00	77.01
137	2	09/13/84	124	265	3	5.0	CH	1402.08	1358.52	55.63	1.43	57.06	57.42	1.47	58.89
138	2	09/13/84	158	266	3	5.0	CH	1493.52	1448.49	8.03	0.00	8.03	8.28	0.00	8.28
139	2	09/13/84	230	268	3	5.0	CH	1402.08	1360.64	32.10	0.00	32.10	33.07	0.00	33.07
140	2	09/13/84	243	269	3	5.0	CH	1280.16	1391.72	12.50	0.00	12.50	11.50	0.00	11.50
141	2	09/13/84	254	270	3	5.0	CH	1402.08	1373.86	38.51	0.00	38.51	39.31	0.00	39.31
142	2	09/13/84	306	271	3	5.0	CH	1493.52	1236.79	28.12	1.34	29.46	33.96	1.62	35.58
143	2	09/13/84	319	272	3	5.0	CH	1280.16	1341.69	25.78	0.00	25.78	24.60	0.00	24.60
144	2	09/13/84	330	273	3	5.0	CH	1463.04	1389.81	10.94	0.68	11.62	11.51	0.72	12.23
145	2	09/13/84	346	274	3	5.0	CH	1554.48	1194.40	1.93	0.00	1.93	2.51	0.00	2.51
146	2	09/13/84	420	275	3	5.0	CH	1158.24	1285.05	1.73	0.00	1.73	1.56	0.00	1.56
147	2	09/13/84	446	397	3	5.0	CH	1158.24	1489.93	3.45	0.00	3.45	2.68	0.00	2.68
148	2	09/13/84	512	398	3	5.0	CH	1402.08	1357.84	0.71	0.00	0.71	0.74	0.00	0.74
149	2	09/13/84	525	399	3	5.0	CH	1249.68	1245.79	18.40	0.00	18.40	18.46	0.00	18.46
150	2	09/13/84	538	400	3	5.0	CH	1310.64	1307.20	41.96	0.00	41.96	42.07	0.00	42.07
151	2	09/13/84	551	401	3	5.0	CH	1127.76	1175.25	70.94	0.00	70.94	68.07	0.00	68.07
152	2	09/13/84	604	402	3	5.0	CH	1097.28	1178.86	31.90	0.00	31.90	29.69	0.00	29.69
153	2	09/13/84	2000	403	3	5.0	CH	1066.80	1169.45	15.94	0.00	15.94	14.54	0.00	14.54
154	2	09/13/84	2022	404	3	5.0	CH	1341.12	1256.01	17.90	0.00	17.90	19.11	0.00	19.11
155	2	09/13/84	2036	405	3	5.0	CH	1249.68	1240.61	13.60	0.00	13.60	13.70	0.00	13.70
156	2	09/13/84	2102	407	3	5.0	CH	1097.28	1293.02	10.02	0.00	10.02	8.51	0.00	8.51
157	2	09/13/84	2117	408	3	5.0	CH	1249.68	1200.26	8.00	0.80	8.80	8.33	0.83	9.16
158	2	09/13/84	2132	409	3	5.1	CH	1280.16	1321.54	14.06	0.00	14.06	13.62	0.00	13.62
159	2	09/13/84	2145	410	3	5.0	CH	1280.16	1261.74	22.65	0.78	23.43	22.98	0.79	23.78
160	2	09/13/84	2159	411	3	5.0	CH	1158.24	1184.86	112.24	0.00	112.24	109.72	0.00	109.72
161	2	09/13/84	2210	412	3	5.0	CH	1158.24	1183.09	34.54	0.00	34.54	33.81	0.00	33.81
162	2	09/13/84	2221	413	3	5.0	CH	1158.24	1225.34	29.35	0.00	29.35	27.75	0.00	27.75

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
163	2	09/13/84	2234	414	3	5	CH	1097.28	1383.20	100.25	0.00	100.25	79.53	0.00	79.53
164	2	09/13/84	2246	415	3	5	CH	1249.68	1345.92	82.42	1.60	84.02	76.53	1.49	78.01
165	2	09/13/84	2257	416	3	5	CH	1249.68	1155.69	3.20	0.00	3.20	3.46	0.00	3.46
166	2	09/13/84	2320	417	3	5	CH	1188.72	1344.42	5.05	0.00	5.05	4.46	0.00	4.46
167	2	09/13/84	2334	418	3	5	CH	1188.72	1358.39	5.89	0.84	6.73	5.15	0.74	5.89
168	2	09/13/84	2351	419	3	5	CH	1188.72	1374.13	34.49	0.84	35.33	29.84	0.73	30.56
169	2	09/14/84	8	420	3	5	CH	1158.24	1306.72	23.31	0.86	24.17	20.66	0.77	21.43
170	2	09/14/84	22	421	3	5	CH	1158.24	777.68	15.54	0.86	16.40	23.15	1.29	24.43
171	2	09/14/84	111	425	3	5	CH	1249.68	1407.87	26.41	0.80	27.21	23.44	0.71	24.15
172	2	09/14/84	147	428	3	5	CH	1341.12	1338.35	32.06	0.00	32.06	32.13	0.00	32.13
173	2	09/14/84	216	430	3	5	CH	1188.72	1469.69	10.09	0.00	10.09	8.16	0.00	8.16
174	2	09/14/84	226	431	3	5	CH	1341.12	1467.37	8.20	0.00	8.20	7.50	0.00	7.50
175	2	09/14/84	236	432	3	5	CH	1249.68	1318.24	38.41	0.80	39.21	36.41	0.76	37.17
176	2	09/14/84	247	433	3	5	CH	1402.08	1670.21	14.98	0.00	14.98	12.57	0.00	12.57
177	2	09/14/84	259	434	3	5	CH	1249.68	1351.23	138.44	0.00	138.44	128.03	0.00	128.03
178	2	09/14/84	309	435	3	5	CH	1432.56	1275.24	182.89	0.00	182.89	205.45	0.00	205.45
179	2	09/14/84	335	437	3	5	CH	1402.08	1359.73	113.40	0.00	113.40	116.94	0.00	116.94
180	2	09/15/84	2004	460	3	5	IP	975.36	1078.26	18.45	0.00	18.45	16.69	0.00	16.69
181	2	09/15/84	2024	461	3	5	CH	944.88	1283.83	11.64	0.00	11.64	8.57	0.00	8.57
182	2	09/15/84	2048	462	3	5	CH	1005.84	1181.04	41.76	0.00	41.76	35.56	0.00	35.56
183	2	09/15/84	2147	463	3	5	CH	1219.20	1357.19	90.22	0.82	91.04	81.05	0.74	81.79
184	2	09/15/84	2231	465	3	5	CH	1188.72	1409.74	35.33	0.00	35.33	29.79	0.00	29.79
185	2	09/15/84	2247	466	3	5	CH	1402.08	1337.57	37.09	0.00	37.09	38.88	0.00	38.88
186	2	09/15/84	2300	467	3	5	CH	1158.24	1341.44	38.85	0.00	38.85	33.55	0.00	33.55
187	2	09/15/84	2316	468	3	5	CH	1249.68	1280.55	68.02	0.00	68.02	66.38	0.00	66.38
188	2	09/15/84	2331	501	3	5	CH	1219.20	1277.43	80.38	0.00	80.38	76.72	0.00	76.72
189	2	09/16/84	30	502	3	5	TZ	914.40	1374.00	15.31	1.09	16.40	10.19	0.73	10.92
190	2	09/24/84	1939	601	4	5	CH	944.88	1425.76	138.64	0.00	138.64	91.88	0.00	91.88
191	2	09/24/84	2028	604	4	5	CH	1188.72	1484.85	227.98	0.00	227.98	182.51	0.00	182.51
192	2	09/24/84	2045	605	4	5	CH	1188.72	1512.64	177.50	0.00	177.50	139.49	0.00	139.49
193	2	09/24/84	2100	606	4	5	CH	975.36	1490.56	217.36	0.00	217.36	142.23	0.00	142.23
194	2	09/24/84	2115	607	4	5	CH	1310.64	1414.62	57.22	0.00	57.22	53.02	0.00	53.02
195	2	09/24/84	2138	608	4	5	CH	1645.92	1458.99	20.05	0.00	20.05	22.62	0.00	22.62
196	2	09/24/84	2153	609	4	5	CH	1371.60	1332.00	33.54	0.00	33.54	34.53	0.00	34.53
197	2	09/24/84	2214	610	4	5	CH	1219.20	1318.58	21.33	1.64	22.97	19.72	1.52	21.23
198	2	09/24/84	2235	611	4	5	CH	1127.76	1340.39	22.17	0.00	22.17	18.65	0.00	18.65
199	2	09/24/84	2309	612	4	5	CH	1249.68	1304.00	15.20	0.00	15.20	14.57	0.00	14.57
200	2	09/24/84	2328	613	4	5	CH	1127.76	1364.06	42.56	0.00	42.56	35.19	0.00	35.19
201	2	09/24/84	2345	614	4	5	CH	1341.12	1415.17	44.74	1.49	46.23	42.40	1.41	43.81
202	2	09/25/84	4	615	4	5	CH	1219.20	1394.05	63.98	0.00	63.98	55.95	0.00	55.95
203	2	09/25/84	29	616	4	5	CH	1249.68	1593.82	10.40	0.80	11.20	8.16	0.63	8.78
204	2	09/25/84	47	617	4	5	CH	1127.76	1530.12	56.75	1.77	58.52	41.83	1.31	43.13
205	2	09/25/84	143	620	4	5	CH	1036.32	1342.04	21.23	0.96	22.19	16.39	0.75	17.14
206	2	09/25/84	204	621	4	5	CH	1219.20	1348.78	4.10	0.82	4.92	3.71	0.74	4.45
207	2	09/25/84	256	623	4	5	CH	1158.24	1098.66	54.39	1.73	56.12	57.34	1.82	59.16
208	2	09/25/84	336	625	4	5	CH	1097.28	1311.84	15.49	0.00	15.49	12.96	0.00	12.96
209	2	09/25/84	1920	626	4	5	CH	1158.24	1240.23	12.09	0.00	12.09	11.29	0.00	11.29
210	2	09/25/84	1937	627	4	5	CH	1036.32	993.48	6.75	0.00	6.75	7.05	0.00	7.05
211	2	09/25/84	1952	628	4	5	CH	1219.20	1301.32	24.61	0.00	24.61	23.05	0.00	23.05
212	2	09/25/84	2007	629	4	5	CH	1127.76	1280.41	101.09	0.00	101.09	89.03	0.00	89.03
213	2	09/25/84	2023	630	4	5	CH	1158.24	1258.87	68.21	0.86	69.07	62.75	0.79	63.55
214	2	09/25/84	2041	631	4	5	CH	1097.28	1229.71	23.69	0.91	24.61	21.14	0.81	21.96
215	2	09/25/84	2125	632	4	5	CH	1341.12	1332.07	56.67	0.00	56.67	57.05	0.00	57.05
216	2	09/25/84	2157	634	4	5	CH	1249.68	1242.30	44.01	3.20	47.21	44.27	3.22	47.49

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
217	2	09/25/84	2222	635	4	5.0	CH	1127.76	1214.37	37.24	0.89	38.13	34.59	0.82	35.41
218	2	09/25/84	2237	636	4	5.0	CH	1127.76	1264.38	30.15	0.00	30.15	26.89	0.00	26.89
219	2	09/25/84	2251	637	4	5.0	CH	1402.08	1419.57	91.29	0.00	91.29	90.17	0.00	90.17
220	2	09/25/84	2306	638	4	5.0	CH	1493.52	1397.69	140.61	3.35	143.96	150.25	3.58	153.82
221	2	09/25/84	2325	639	4	5.0	CH	1005.84	1322.57	62.63	0.99	63.63	47.63	0.76	48.39
222	2	09/25/84	2343	640	4	5.0	CH	1371.60	1386.89	56.14	0.00	56.14	55.52	0.00	55.52
223	2	09/26/84	1	641	4	5.0	CH	1097.28	1339.22	91.13	1.82	92.96	74.67	1.49	76.16
224	2	09/26/84	16	642	4	5.0	CH	1066.80	1209.14	34.68	0.00	34.68	30.60	0.00	30.60
225	2	09/26/84	36	643	4	5.0	CH	944.88	1176.67	190.50	7.41	197.91	152.97	5.95	158.92
226	2	09/26/84	54	644	4	5.0	CH	1127.76	1354.49	76.26	5.32	81.58	63.49	4.43	67.92
227	2	09/26/84	147	647	4	5.0	CH	1402.08	1292.65	6.42	1.43	7.85	6.96	1.55	8.51
228	2	09/26/84	209	648	4	5.0	CH	1127.76	1311.16	25.71	2.66	28.37	22.12	2.29	24.41
229	2	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	33.77	1.93	35.70	30.85	1.76	32.61
230	2	09/26/84	304	651	4	5.0	CH	975.36	1143.79	31.78	0.00	31.78	27.10	0.00	27.10
231	2	09/26/84	324	652	4	5.0	CH	1097.28	1148.67	9.11	0.00	9.11	8.71	0.00	8.71
232	2	09/26/84	342	653	4	5.0	CH	1097.28	1000.84	30.99	0.00	30.99	33.97	0.00	33.97
233	2	09/26/84	402	654	4	5.0	CH	1584.96	1210.17	35.96	0.00	35.96	47.10	0.00	47.10
234	2	09/26/84	420	655	4	5.0	CH	1371.60	992.58	10.21	0.73	10.94	14.10	1.01	15.11
235	2	09/26/84	440	656	4	5.0	CH	1066.80	1232.94	98.43	2.81	101.24	85.16	2.43	87.60
236	2	09/26/84	456	657	4	5.0	CH	1097.28	1306.41	41.01	0.00	41.01	34.45	0.00	34.45
237	2	09/26/84	2223	658	4	5.0	CH	1645.92	1282.06	6.08	0.00	6.08	7.80	0.00	7.80
238	2	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	12.19	2.81	15.00	9.14	2.11	11.24
239	2	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	26.92	1.68	28.60	22.74	1.42	24.16
240	2	09/26/84	2308	661	4	5.0	CH	1036.32	1371.35	76.23	1.93	78.16	57.61	1.46	59.07
241	2	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	214.98	0.00	214.98	189.64	0.00	189.64
242	2	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	457.64	0.00	457.64	426.06	0.00	426.06
243	2	09/27/84	2024	552	4	5.0	CH	1645.92	1666.94	26.73	0.00	26.73	26.40	0.00	26.40
244	2	09/27/84	2041	553	4	5.0	CH	1554.48	1503.50	18.01	1.29	19.30	18.62	1.33	19.95
245	2	09/27/84	2055	554	4	5.0	CH	1463.04	1642.20	75.19	0.00	75.19	66.98	0.00	66.98
246	2	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	32.81	0.00	32.81	31.66	0.00	31.66
247	2	09/29/84	2015	603	4	5.0	CH	1066.80	1387.72	181.85	0.00	181.85	139.80	0.00	139.80
248	3	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	1.56	0.00	1.56	1.86	0.00	1.86
249	3	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	2.09	0.00	2.09	2.38	0.00	2.38
250	3	08/17/84	35	39	1	5.2	CH	1584.96	1305.97	0.63	0.00	0.63	0.77	0.00	0.77
251	3	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	0.63	0.00	0.63	0.71	0.00	0.71
252	3	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	0.61	0.00	0.61	0.76	0.00	0.76
253	3	08/17/84	428	49	1	5.5	CH	1371.60	1158.66	0.73	0.00	0.73	0.86	0.00	0.86
254	3	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	1.60	0.00	1.60	1.61	0.00	1.61
255	3	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	0.70	0.00	0.70	0.77	0.00	0.77
256	3	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	1.93	0.00	1.93	1.67	0.00	1.67
257	3	08/18/84	435	70	1	5.5	CH	1188.72	1173.02	1.68	0.00	1.68	1.71	0.00	1.71
258	3	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	0.84	0.00	0.84	0.81	0.00	0.81
259	3	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	0.96	0.00	0.96	0.92	0.00	0.92
260	3	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	1.73	0.00	1.73	1.60	0.00	1.60
261	3	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	0.89	0.00	0.89	0.87	0.00	0.87
262	3	08/29/84	338	133	2	5.0	CH	1554.48	1546.17	0.64	0.00	0.64	0.65	0.00	0.65
263	3	08/29/84	412	135	2	5.0	CH	1554.48	1401.89	0.64	0.00	0.64	0.71	0.00	0.71
264	3	08/29/84	453	137	2	5.0	CH	1524.00	1421.53	0.66	0.00	0.66	0.70	0.00	0.70
265	3	08/30/84	2211	142	2	5.0	CH	1402.08	1495.95	0.71	0.00	0.71	0.67	0.00	0.67
266	3	08/30/84	2301	144	2	5.0	CH	1341.12	1458.84	0.75	0.00	0.75	0.69	0.00	0.69
267	3	08/30/84	2353	148	2	5.0	CH	1554.48	646.71	0.64	0.00	0.64	1.55	0.00	1.55
268	3	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	0.76	0.00	0.76	0.73	0.00	0.73
269	3	08/31/84	34	151	2	5.0	CH	1341.12	1514.69	0.75	0.00	0.75	0.66	0.00	0.66
270	3	08/31/84	112	154	2	5.0	CH	1402.08	1531.59	0.71	0.00	0.71	0.65	0.00	0.65

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USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
271	3	08/31/84	124	155	2	5	CH	1432.56	1467.94	0.70	0	0.70	0.68	0	0.68
272	3	08/31/84	206	157	2	5	CH	1432.56	1493.46	0.70	0	0.70	0.67	0	0.67
273	3	08/31/84	244	158	2	5	CH	1310.64	1449.80	2.29	0	2.29	2.07	0	2.07
274	3	08/31/84	301	159	2	5	CH	1341.12	1426.04	5.22	0	5.22	4.91	0	4.91
275	3	08/31/84	328	161	2	5	CH	1493.52	1497.99	0.67	0	0.67	0.67	0	0.67
276	3	08/31/84	536	169	2	5	CH	1371.60	1536.56	0.73	0	0.73	0.65	0	0.65
277	3	08/31/84	2259	283	2	5	CH	1554.48	1538.17	0.64	0	0.64	0.65	0	0.65
278	3	08/31/84	2357	285	2	5	CH	1524.00	1581.65	1.31	0	1.31	1.26	0	1.26
279	3	09/01/84	10	286	2	5	CH	1432.56	1567.33	1.40	0	1.40	1.28	0	1.28
280	3	09/01/84	23	287	2	5	CH	1493.52	1535.10	2.01	0	2.01	1.95	0	1.95
281	3	09/01/84	38	288	2	5	CH	1371.60	1452.14	3.65	0	3.65	3.44	0	3.44
282	3	09/01/84	51	289	2	5	CH	1463.04	1455.76	3.42	0	3.42	3.43	0	3.43
283	3	09/01/84	121	291	2	5	CH	1432.56	1484.44	1.40	0	1.40	1.35	0	1.35
284	3	09/01/84	134	292	2	5	CH	1463.04	1506.41	1.37	0	1.37	1.33	0	1.33
285	3	09/01/84	238	296	2	5	CH	1341.12	1464.75	0.75	0	0.75	0.68	0	0.68
286	3	09/01/84	252	297	2	5	CH	1371.60	1339.38	2.19	0	2.19	2.24	0	2.24
287	3	09/01/84	305	298	2	5	CH	1310.64	1392.79	1.53	0	1.53	1.44	0	1.44
288	3	09/01/84	318	299	2	5	CH	1432.56	1440.64	1.40	0	1.40	1.39	0	1.39
289	3	09/01/84	332	300	2	5	CH	1341.12	1429.06	1.49	0	1.49	1.40	0	1.40
290	3	09/01/84	345	301	2	5	CH	1463.04	1336.45	3.42	0	3.42	3.74	0	3.74
291	3	09/01/84	410	303	2	5	CH	1341.12	1464.70	2.98	0	2.98	2.73	0	2.73
292	3	09/01/84	423	304	2	5	CH	1341.12	1458.02	3.73	0	3.73	3.43	0	3.43
293	3	09/12/84	2232	251	3	5	CH	1280.16	1119.08	0.78	0	0.78	0.89	0	0.89
294	3	09/12/84	2300	253	3	5	CH	1280.16	1265.97	1.56	0	1.56	1.58	0	1.58
295	3	09/12/84	2312	254	3	5	CH	1280.16	1598.65	0.78	0	0.78	0.63	0	0.63
296	3	09/12/84	2351	257	3	5	CH	1341.12	979.77	0.75	0	0.75	1.02	0	1.02
297	3	09/13/84	101	263	3	5	CH	1341.12	1428.18	0.75	0	0.75	0.70	0	0.70
298	3	09/13/84	346	274	3	5	CH	1554.48	1194.40	3.86	0	3.86	5.02	0	5.02
299	3	09/13/84	420	275	3	5	CH	1158.24	1285.05	0.86	0	0.86	0.78	0	0.78
300	3	09/13/84	446	397	3	5	CH	1158.24	1489.93	1.73	0	1.73	1.34	0	1.34
301	3	09/13/84	551	401	3	5	CH	1127.76	1175.25	1.77	0	1.77	1.70	0	1.70
302	3	09/13/84	2000	403	3	5	CH	1066.80	1169.45	0.94	0	0.94	0.86	0	0.86
303	3	09/13/84	2022	404	3	5	CH	1341.12	1256.01	0.75	0	0.75	0.80	0	0.80
304	3	09/13/84	2036	405	3	5	CH	1249.68	1240.61	1.60	0	1.60	1.61	0	1.61
305	3	09/13/84	2117	408	3	5	CH	1249.68	1200.26	1.60	0	1.60	1.67	0	1.67
306	3	09/13/84	2221	413	3	5	CH	1158.24	1225.34	0.86	0	0.86	0.82	0	0.82
307	3	09/13/84	2234	414	3	5	CH	1097.28	1383.20	0.91	0	0.91	0.72	0	0.72
308	3	09/13/84	2257	416	3	5	CH	1249.68	1155.69	0.80	0	0.80	0.87	0	0.87
309	3	09/13/84	2334	418	3	5	CH	1188.72	1358.39	1.68	0	1.68	1.47	0	1.47
310	3	09/13/84	2351	419	3	5	CH	1188.72	1374.13	0.84	0	0.84	0.73	0	0.73
311	3	09/14/84	8	420	3	5	CH	1158.24	1306.72	0.86	0	0.86	0.77	0	0.77
312	3	09/14/84	22	421	3	5	CH	1158.24	777.68	0.86	0	0.86	1.29	0	1.29
313	3	09/14/84	49	423	3	5	CH	1341.12	1265.83	0.75	0	0.75	0.79	0	0.79
314	3	09/14/84	111	425	3	5	CH	1249.68	1407.87	0.80	0	0.80	0.71	0	0.71
315	3	09/14/84	309	435	3	5	CH	1432.56	1275.24	0.70	0	0.70	0.78	0	0.78
316	3	09/15/84	2004	460	3	5	IP	975.36	1078.26	2.05	0	2.05	1.85	0	1.85
317	3	09/15/84	2048	462	3	5	CH	1005.84	1181.04	0.99	0	0.99	0.85	0	0.85
318	3	09/15/84	2316	468	3	5	CH	1249.68	1280.55	0.80	0	0.80	0.78	0	0.78
319	3	09/24/84	2028	604	4	5	CH	1188.72	1484.85	0.84	0	0.84	0.67	0	0.67
320	3	09/24/84	2115	607	4	5	CH	1310.64	1414.62	1.53	0	1.53	1.41	0	1.41
321	3	09/24/84	2138	608	4	5	CH	1645.92	1458.99	2.43	0	2.43	2.74	0	2.74
322	3	09/24/84	2235	611	4	5	CH	1127.76	1340.39	0.89	0	0.89	0.75	0	0.75
323	3	09/24/84	2309	612	4	5	CH	1249.68	1304.00	0.80	0	0.80	0.77	0	0.77
324	3	09/24/84	2328	613	4	5	CH	1127.76	1364.06	2.66	0	2.66	2.20	0	2.20

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
325	3	09/24/84	2345	614	4	5.0	CH	1341.12	1415.17	1.49	0.00	1.49	1.41	0.00	1.41
326	3	09/25/84	4	615	4	5.0	CH	1219.20	1394.05	1.64	0.00	1.64	1.43	0.00	1.43
327	3	09/25/84	143	620	4	5.0	CH	1036.32	1342.04	1.93	0.00	1.93	1.49	0.00	1.49
328	3	09/25/84	1920	626	4	5.0	CH	1158.24	1240.23	0.86	0.00	0.86	0.81	0.00	0.81
329	3	09/25/84	2222	635	4	5.0	CH	1127.76	1214.37	0.89	0.00	0.89	0.82	0.00	0.82
330	3	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	0.94	0.00	0.94	0.70	0.00	0.70
331	3	09/29/84	2015	603	4	5.0	CH	1066.80	1387.72	0.94	0.00	0.94	0.72	0.00	0.72
332	4	08/16/84	2334	36	1	5.2	CH	1432.56	1248.29	0.70	0.00	0.70	0.80	0.00	0.80
333	4	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	1.03	0.00	1.03	0.86	0.00	0.86
334	4	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0.89	0.00	0.89	0.81	0.00	0.81
335	4	08/30/84	2315	145	2	5.0	CH	1341.12	1443.33	0.75	0.00	0.75	0.69	0.00	0.69
336	4	08/31/84	137	156	2	5.0	CH	1341.12	1423.94	0.75	0.00	0.75	0.70	0.00	0.70
337	4	08/31/84	301	159	2	5.0	CH	1341.12	1426.04	0.75	0.00	0.75	0.70	0.00	0.70
338	4	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	1.53	0.00	1.53	1.33	0.00	1.33
339	4	08/31/84	2357	285	2	5.0	CH	1524.00	1581.65	1.31	0.00	1.31	1.26	0.00	1.26
340	4	09/01/84	252	297	2	5.0	CH	1371.60	1339.38	0.73	0.00	0.73	0.75	0.00	0.75
341	4	09/01/84	305	298	2	5.0	CH	1310.64	1392.79	0.76	0.00	0.76	0.72	0.00	0.72
342	4	09/13/84	306	271	3	5.0	CH	1493.52	1236.79	0.67	0.00	0.67	0.81	0.00	0.81
343	4	09/13/84	551	401	3	5.0	CH	1127.76	1175.25	0.89	0.00	0.89	0.85	0.00	0.85
344	4	09/13/84	2246	415	3	5.0	CH	1249.68	1345.92	0.80	0.00	0.80	0.74	0.00	0.74
345	4	09/13/84	2351	419	3	5.0	CH	1188.72	1374.13	0.84	0.00	0.84	0.73	0.00	0.73
346	4	09/14/84	8	420	3	5.0	CH	1158.24	1306.72	0.86	0.00	0.86	0.77	0.00	0.77
347	4	09/14/84	147	428	3	5.0	CH	1341.12	1338.35	0.75	0.00	0.75	0.75	0.00	0.75
348	4	09/15/84	2147	463	3	5.0	CH	1219.20	1357.19	0.82	0.00	0.82	0.74	0.00	0.74
349	4	09/24/84	2115	607	4	5.0	CH	1310.64	1414.62	0.76	0.00	0.76	0.71	0.00	0.71
350	4	09/24/84	2153	609	4	5.0	CH	1371.60	1332.00	2.19	0.00	2.19	2.25	0.00	2.25
351	4	09/25/84	143	620	4	5.0	CH	1036.32	1342.04	1.93	0.00	1.93	1.49	0.00	1.49
352	4	09/25/84	204	621	4	5.0	CH	1219.20	1348.78	0.82	0.00	0.82	0.74	0.00	0.74
353	4	09/25/84	1952	628	4	5.0	CH	1219.20	1301.32	0.82	0.00	0.82	0.77	0.00	0.77
354	4	09/25/84	2157	634	4	5.0	CH	1249.68	1242.30	0.80	0.00	0.80	0.80	0.00	0.80
355	4	09/25/84	2237	636	4	5.0	CH	1127.76	1264.38	0.89	0.00	0.89	0.79	0.00	0.79
356	4	09/25/84	2306	638	4	5.0	CH	1493.52	1397.69	0.67	0.00	0.67	0.72	0.00	0.72
357	4	09/25/84	2325	639	4	5.0	CH	1005.84	1322.57	0.99	0.00	0.99	0.76	0.00	0.76
358	4	09/26/84	54	644	4	5.0	CH	1127.76	1354.49	0.89	0.00	0.89	0.74	0.00	0.74
359	4	09/26/84	147	647	4	5.0	CH	1402.08	1292.65	0.71	0.00	0.71	0.77	0.00	0.77
360	4	09/26/84	304	651	4	5.0	CH	975.36	1143.79	1.03	0.00	1.03	0.87	0.00	0.87
361	4	09/26/84	342	653	4	5.0	CH	1097.28	1000.84	0.91	0.00	0.91	1.00	0.00	1.00
362	4	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	0.86	0.00	0.86	0.76	0.00	0.76
363	6	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	0.00	0.80	0.80	0.00	0.82	0.82
364	6	08/31/84	301	159	2	5.0	CH	1341.12	1426.04	0.00	1.49	1.49	0.00	1.40	1.40
365	6	09/01/84	149	293	2	5.0	CH	1463.04	1416.40	0.00	0.68	0.68	0.00	0.71	0.71
366	6	09/13/84	2210	412	3	5.0	CH	1158.24	1183.09	0.00	0.86	0.86	0.00	0.85	0.85
367	6	09/25/84	2041	631	4	5.0	CH	1097.28	1229.71	0.00	1.82	1.82	0.00	1.63	1.63
368	6	09/25/84	2306	638	4	5.0	CH	1493.52	1397.69	0.00	0.67	0.67	0.00	0.72	0.72
369	6	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	0.00	0.96	0.96	0.00	0.88	0.88
370	6	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	0.00	2.14	2.14	0.00	2.06	2.06
371	7	09/01/84	121	291	2	5.0	CH	1432.56	1484.44	0.00	0.70	0.70	0.00	0.67	0.67
372	7	09/01/84	252	297	2	5.0	CH	1371.60	1339.38	0.00	0.73	0.73	0.00	0.75	0.75
373	7	09/27/84	2055	554	4	5.0	CH	1463.04	1642.20	0.00	0.68	0.68	0.00	0.61	0.61
374	9	09/26/84	420	655	4	5.0	CH	1371.60	992.58	0.00	0.73	0.73	0.00	1.01	1.01
375	10	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	0.00	1.60	1.60	0.00	1.57	1.57
376	10	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	0.00	0.78	0.78	0.00	0.93	0.93
377	10	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	0.00	4.32	4.32	0.00	4.64	4.64
378	10	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	0.00	3.20	3.20	0.00	3.29	3.29

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
379	10	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	0	1.86	1.86	0	2.27	2.27
380	10	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	0	0.61	0.61	0	0.73	0.73
381	10	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	0	1.22	1.22	0	1.53	1.53
382	10	08/17/84	316	46	1	5.5	CH	1615.44	1339.54	0	0.62	0.62	0	0.75	0.75
383	10	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	0	2.73	2.73	0	2.44	2.44
384	10	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	0	1.60	1.60	0	1.60	1.60
385	10	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	0	0.86	0.86	0	0.79	0.79
386	10	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	0	0.94	0.94	0	0.86	0.86
387	10	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	0	0.80	0.80	0	0.82	0.82
388	10	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	0	0.76	0.76	0	0.88	0.88
389	10	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	0	0.96	0.96	0	0.83	0.83
390	10	08/18/84	305	66	1	5.5	IP	975.36	1030.14	0	1.03	1.03	0	0.97	0.97
391	10	08/18/84	323	67	1	5.5	CH	1005.84	1205.81	0	0.99	0.99	0	0.83	0.83
392	10	08/18/84	2053	73	1	5.5	CH	1158.24	1158.11	0	1.73	1.73	0	1.73	1.73
393	10	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	0	1.03	1.03	0	0.86	0.86
394	10	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	0	0.96	0.96	0	0.92	0.92
395	10	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	0	1.73	1.73	0	1.60	1.60
396	10	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	0	2.73	2.73	0	2.31	2.31
397	10	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	0	7.63	7.63	0	7.74	7.74
398	10	08/19/84	17	83	1	5.5	CH	1249.68	1257.11	0	0.80	0.80	0	0.80	0.80
399	10	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	0	2.66	2.66	0	2.97	2.97
400	10	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	0	5.32	5.32	0	5.25	5.25
401	10	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	0	3.55	3.55	0	3.31	3.31
402	10	08/19/84	136	87	1	5.5	CH	1127.76	1150.29	0	2.66	2.66	0	2.61	2.61
403	10	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	0	2.66	2.66	0	2.45	2.45
404	10	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	0	3.75	3.75	0	3.56	3.56
405	10	08/19/84	301	91	1	5.5	CH	1066.80	998.28	0	1.87	1.87	0	2.00	2.00
406	10	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0	1.77	1.77	0	1.61	1.61
407	10	08/29/84	141	95	2	5.0	CH	1158.24	1371.31	0	0.86	0.86	0	0.73	0.73
408	10	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	0	0.67	0.67	0	0.67	0.67
409	10	08/31/84	2204	281	2	5.0	CH	1432.56	1367.17	0	2.09	2.09	0	2.19	2.19
410	10	08/31/84	2259	283	2	5.0	CH	1554.48	1538.17	0	1.29	1.29	0	1.30	1.30
411	10	09/01/84	51	289	2	5.0	CH	1463.04	1455.76	0	2.73	2.73	0	2.75	2.75
412	10	09/01/84	106	290	2	5.0	CH	1524.00	1559.75	0	1.97	1.97	0	1.92	1.92
413	10	09/01/84	121	291	2	5.0	CH	1432.56	1484.44	0	0.70	0.70	0	0.67	0.67
414	10	09/01/84	134	292	2	5.0	CH	1463.04	1506.41	0	3.42	3.42	0	3.32	3.32
415	10	09/01/84	238	296	2	5.0	CH	1341.12	1464.75	0	0.75	0.75	0	0.68	0.68
416	10	09/01/84	252	297	2	5.0	CH	1371.60	1339.38	0	1.46	1.46	0	1.49	1.49
417	10	09/01/84	318	299	2	5.0	CH	1432.56	1440.64	0	3.49	3.49	0	3.47	3.47
418	10	09/01/84	332	300	2	5.0	CH	1341.12	1429.06	0	1.49	1.49	0	1.40	1.40
419	10	09/01/84	345	301	2	5.0	CH	1463.04	1336.45	0	0.68	0.68	0	0.75	0.75
420	10	09/01/84	410	303	2	5.0	CH	1341.12	1464.70	0	1.49	1.49	0	1.37	1.37
421	10	09/01/84	423	304	2	5.0	CH	1341.12	1458.02	0	3.73	3.73	0	3.43	3.43
422	10	09/01/84	436	305	2	5.0	CH	1341.12	1403.22	0	2.24	2.24	0	2.14	2.14
423	10	09/12/84	2300	253	3	5.0	CH	1280.16	1265.97	0	0.78	0.78	0	0.79	0.79
424	10	09/13/84	158	266	3	5.0	CH	1493.52	1448.49	0	0.67	0.67	0	0.69	0.69
425	10	09/13/84	2102	407	3	5.0	CH	1097.28	1293.02	0	0.91	0.91	0	0.77	0.77
426	10	09/13/84	2145	410	3	5.0	CH	1280.16	1261.74	0	0.78	0.78	0	0.79	0.79
427	10	09/14/84	247	433	3	5.0	CH	1402.08	1670.21	0	0.71	0.71	0	0.60	0.60
428	10	09/15/84	2331	501	3	5.0	CH	1219.20	1277.43	0	0.82	0.82	0	0.78	0.78
429	10	09/24/84	2100	606	4	5.0	CH	975.36	1490.56	0	1.03	1.03	0	0.67	0.67
430	10	09/24/84	2115	607	4	5.0	CH	1310.64	1414.62	0	0.76	0.76	0	0.71	0.71
431	10	09/24/84	2153	609	4	5.0	CH	1371.60	1332.00	0	1.46	1.46	0	1.50	1.50
432	10	09/24/84	2235	611	4	5.0	CH	1127.76	1340.39	0	0.89	0.89	0	0.75	0.75

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
433	10	09/24/84	2309	612	4	5.0	CH	1249.68	1304.00	0	0.80	0.80	0	0.77	0.77
434	10	09/25/84	4	615	4	5.0	CH	1219.20	1394.05	0	1.64	1.64	0	1.43	1.43
435	10	09/25/84	47	617	4	5.0	CH	1127.76	1530.12	0	0.89	0.89	0	0.65	0.65
436	10	09/25/84	143	620	4	5.0	CH	1036.32	1342.04	0	0.96	0.96	0	0.75	0.75
437	10	09/25/84	1952	628	4	5.0	CH	1219.20	1301.32	0	0.82	0.82	0	0.77	0.77
438	10	09/25/84	2041	631	4	5.0	CH	1097.28	1229.71	0	0.91	0.91	0	0.81	0.81
439	10	09/25/84	2343	640	4	5.0	CH	1371.60	1386.89	0	0.73	0.73	0	0.72	0.72
440	10	09/26/84	1	641	4	5.0	CH	1097.28	1339.22	0	0.91	0.91	0	0.75	0.75
441	10	09/26/84	16	642	4	5.0	CH	1066.80	1209.14	0	1.87	1.87	0	1.65	1.65
442	10	09/26/84	54	644	4	5.0	CH	1127.76	1354.49	0	0.89	0.89	0	0.74	0.74
443	10	09/26/84	147	647	4	5.0	CH	1402.08	1292.65	0	0.71	0.71	0	0.77	0.77
444	10	09/26/84	342	653	4	5.0	CH	1097.28	1000.84	0	0.91	0.91	0	1.00	1.00
445	10	09/26/84	402	654	4	5.0	CH	1584.96	1210.17	0	1.26	1.26	0	1.65	1.65
446	10	09/26/84	440	656	4	5.0	CH	1066.80	1232.94	0	1.87	1.87	0	1.62	1.62
447	10	09/26/84	456	657	4	5.0	CH	1097.28	1306.41	0	1.82	1.82	0	1.53	1.53
448	10	09/26/84	2223	658	4	5.0	CH	1645.92	1282.06	0	0.61	0.61	0	0.78	0.78
449	10	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	0	0.94	0.94	0	0.70	0.70
450	10	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0	1.68	1.68	0	1.42	1.42
451	10	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	0	4.32	4.32	0	3.81	3.81
452	10	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	0	2.52	2.52	0	2.35	2.35
453	10	09/27/84	2041	553	4	5.0	CH	1554.48	1503.50	0	0.64	0.64	0	0.67	0.67
454	10	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	0	0.71	0.71	0	0.69	0.69
455	13	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	0	4.80	4.80	0	4.71	4.71
456	13	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	0	14.84	14.84	0	17.69	17.69
457	13	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	0	26.76	26.76	0	28.75	28.75
458	13	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	0	24.81	24.81	0	25.49	25.49
459	13	08/16/84	2334	36	1	5.2	CH	1432.56	1248.29	0	3.49	3.49	0	4.01	4.01
460	13	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	0	5.58	5.58	0	6.36	6.36
461	13	08/17/84	35	39	1	5.2	CH	1584.96	1305.97	0	2.52	2.52	0	3.06	3.06
462	13	08/17/84	51	40	1	5.7	CH	1463.04	1227.16	0	12.99	12.99	0	15.48	15.48
463	13	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	0	12.62	12.62	0	14.27	14.27
464	13	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	0	45.19	45.19	0	55.28	55.28
465	13	08/17/84	201	43	1	5.5	CH	1645.92	1339.06	0	12.15	12.15	0	14.94	14.94
466	13	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	0	18.83	18.83	0	22.77	22.77
467	13	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	0	27.34	27.34	0	34.41	34.41
468	13	08/17/84	316	46	1	5.5	CH	1615.44	1339.54	0	19.81	19.81	0	23.89	23.89
469	13	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	0	10.02	10.02	0	8.96	8.96
470	13	08/17/84	407	48	1	5.5	CH	1371.60	1212.48	0	15.31	15.31	0	17.32	17.32
471	13	08/17/84	428	49	1	5.5	CH	1371.60	1158.66	0	8.02	8.02	0	9.49	9.49
472	13	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	0	16.80	16.80	0	16.88	16.88
473	13	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	0	16.00	16.00	0	16.01	16.01
474	13	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	0	15.54	15.54	0	14.19	14.19
475	13	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	0	25.31	25.31	0	23.10	23.10
476	13	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	0	13.60	13.60	0	13.92	13.92
477	13	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	0	22.13	22.13	0	25.46	25.46
478	13	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	0	12.56	12.56	0	13.84	13.84
479	13	08/18/84	114	60	1	5.5	CH	1097.28	1134.77	0	11.85	11.85	0	11.46	11.46
480	13	08/18/84	132	61	1	5.5	CH	1158.24	1098.80	0	7.77	7.77	0	8.19	8.19
481	13	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	0	12.54	12.54	0	10.82	10.82
482	13	08/18/84	210	63	1	5.5	IP	1158.24	1151.17	0	14.68	14.68	0	14.77	14.77
483	13	08/18/84	229	64	1	5.5	IP	975.36	1070.49	0	7.18	7.18	0	6.54	6.54
484	13	08/18/84	247	65	1	5.5	IP	1036.32	1186.59	0	10.61	10.61	0	9.27	9.27
485	13	08/18/84	305	66	1	5.5	IP	975.36	1030.14	0	9.23	9.23	0	8.74	8.74
486	13	08/18/84	323	67	1	5.5	CH	1005.84	1205.81	0	15.91	15.91	0	13.27	13.27

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
487	13	08/18/84	412	69	1	5.5	CH	1219.20	1223.75	0	13.94	13.94	0	13.89	13.89
488	13	08/18/84	435	70	1	5.5	CH	1188.72	1173.02	0	10.94	10.94	0	11.08	11.08
489	13	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	0	6.73	6.73	0	6.47	6.47
490	13	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	0	11.28	11.28	0	9.46	9.46
491	13	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	0	14.47	14.47	0	13.85	13.85
492	13	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	0	12.09	12.09	0	11.17	11.17
493	13	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	0	10.94	10.94	0	9.23	9.23
494	13	08/18/84	2307	79	1	5.5	CH	1158.24	1159.90	0	15.54	15.54	0	15.52	15.52
495	13	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	0	0.76	0.76	0	0.77	0.77
496	13	08/18/84	2342	81	1	5.5	CH	1371.60	1241.79	0	5.10	5.10	0	5.64	5.64
497	13	08/19/84	17	83	1	5.5	CH	1249.68	1257.11	0	9.60	9.60	0	9.55	9.55
498	13	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	0	18.62	18.62	0	20.82	20.82
499	13	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	0	13.30	13.30	0	13.12	13.12
500	13	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	0	17.73	17.73	0	16.53	16.53
501	13	08/19/84	136	87	1	5.5	CH	1127.76	1150.29	0	12.41	12.41	0	12.17	12.17
502	13	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	0	5.62	5.62	0	5.96	5.96
503	13	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	0	13.30	13.30	0	12.27	12.27
504	13	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	0	17.81	17.81	0	16.92	16.92
505	13	08/19/84	301	91	1	5.5	CH	1066.80	998.28	0	18.75	18.75	0	20.03	20.03
506	13	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0	19.51	19.51	0	17.75	17.75
507	13	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	0	13.60	13.60	0	14.36	14.36
508	13	08/29/84	106	93	2	5.0	CH	1280.16	1338.81	0	1.56	1.56	0	1.49	1.49
509	13	08/29/84	121	94	2	5.0	CH	762.00	1297.23	0	2.62	2.62	0	1.54	1.54
510	13	08/29/84	141	95	2	5.0	CH	1158.24	1371.31	0	6.04	6.04	0	5.10	5.10
511	13	08/29/84	158	96	2	5.0	CH	1524.00	1578.74	0	2.62	2.62	0	2.53	2.53
512	13	08/29/84	255	99	2	5.0	CH	1737.36	1494.88	0	0.58	0.58	0	0.67	0.67
513	13	08/29/84	322	100	2	5.0	CH	1341.12	1538.44	0	4.47	4.47	0	3.90	3.90
514	13	08/29/84	338	133	2	5.0	CH	1554.48	1546.17	0	1.29	1.29	0	1.29	1.29
515	13	08/29/84	352	134	2	5.0	CH	1097.28	1460.94	0	6.38	6.38	0	4.79	4.79
516	13	08/29/84	412	135	2	5.0	CH	1554.48	1401.89	0	4.50	4.50	0	4.99	4.99
517	13	08/29/84	433	136	2	5.0	CH	1280.16	1366.96	0	4.69	4.69	0	4.39	4.39
518	13	08/29/84	453	137	2	5.0	CH	1524.00	1421.53	0	2.62	2.62	0	2.81	2.81
519	13	08/30/84	2129	139	2	5.0	CH	1493.52	1411.24	0	7.37	7.37	0	7.79	7.79
520	13	08/30/84	2144	140	2	5.0	CH	1584.96	1493.06	0	3.15	3.15	0	3.35	3.35
521	13	08/30/84	2158	141	2	5.0	CH	1463.04	1412.39	0	2.05	2.05	0	2.12	2.12
522	13	08/30/84	2211	142	2	5.0	CH	1402.08	1495.95	0	7.13	7.13	0	6.68	6.68
523	13	08/30/84	2301	144	2	5.0	CH	1341.12	1458.84	0	4.47	4.47	0	4.11	4.11
524	13	08/30/84	2315	145	2	5.0	CH	1341.12	1443.33	0	2.98	2.98	0	2.77	2.77
525	13	08/30/84	2328	146	2	5.0	CH	1402.08	1430.09	0	2.14	2.14	0	2.10	2.10
526	13	08/30/84	2341	147	2	5.0	CH	1493.52	1489.20	0	1.34	1.34	0	1.34	1.34
527	13	08/30/84	2353	148	2	5.0	CH	1554.48	646.71	0	0.64	0.64	0	1.55	1.55
528	13	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	0	0.76	0.76	0	0.73	0.73
529	13	08/31/84	18	150	2	5.0	CH	1310.64	1492.32	0	9.16	9.16	0	8.04	8.04
530	13	08/31/84	34	151	2	5.0	CH	1341.12	1514.69	0	1.49	1.49	0	1.32	1.32
531	13	08/31/84	45	152	2	5.0	CH	1463.04	1518.46	0	1.37	1.37	0	1.32	1.32
532	13	08/31/84	112	154	2	5.0	CH	1402.08	1531.59	0	0.71	0.71	0	0.65	0.65
533	13	08/31/84	124	155	2	5.0	CH	1432.56	1467.94	0	0.70	0.70	0	0.68	0.68
534	13	08/31/84	206	157	2	5.0	CH	1432.56	1493.46	0	3.49	3.49	0	3.35	3.35
535	13	08/31/84	244	158	2	5.0	CH	1310.64	1449.80	0	2.29	2.29	0	2.07	2.07
536	13	08/31/84	301	159	2	5.0	CH	1341.12	1426.04	0	4.47	4.47	0	4.21	4.21
537	13	08/31/84	316	160	2	5.0	CH	1402.08	1518.81	0	1.43	1.43	0	1.32	1.32
538	13	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	0	0.67	0.67	0	0.67	0.67
539	13	08/31/84	342	162	2	5.1	CH	1676.40	1496.40	0	0.60	0.60	0	0.67	0.67
540	13	08/31/84	354	163	2	5.0	CH	1463.04	1521.23	0	1.37	1.37	0	1.31	1.31

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541	13	08/31/84	406	164	2	5.0	CH	1432.56	1508.19	0.00	0.70	0.70	0.00	0.66	0.66
542	13	08/31/84	522	168	2	5.0	CH	1341.12	1450.83	0.00	1.49	1.49	0.00	1.38	1.38
543	13	08/31/84	2038	276	2	5.0	CH	1127.76	1322.98	0.00	2.66	2.66	0.00	2.27	2.27
544	13	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	0.00	1.53	1.53	0.00	1.33	1.33
545	13	08/31/84	2113	278	2	5.0	TZ	1463.04	1610.27	0.00	0.68	0.68	0.00	0.62	0.62
546	13	08/31/84	2128	279	2	5.0	TZ	1432.56	1450.65	0.00	5.58	5.58	0.00	5.51	5.51
547	13	08/31/84	2142	280	2	5.0	TZ	1402.08	1377.93	0.00	2.85	2.85	0.00	2.90	2.90
548	13	08/31/84	2245	282	2	5.0	CH	1341.12	1512.78	0.00	1.49	1.49	0.00	1.32	1.32
549	13	08/31/84	2259	283	2	5.0	CH	1554.48	1538.17	0.00	0.64	0.64	0.00	0.65	0.65
550	13	08/31/84	2357	285	2	5.0	CH	1524.00	1581.65	0.00	1.97	1.97	0.00	1.90	1.90
551	13	09/01/84	10	286	2	5.0	CH	1432.56	1567.33	0.00	0.70	0.70	0.00	0.64	0.64
552	13	09/01/84	23	287	2	5.0	CH	1493.52	1535.10	0.00	1.34	1.34	0.00	1.30	1.30
553	13	09/01/84	51	289	2	5.0	CH	1463.04	1455.76	0.00	10.94	10.94	0.00	10.99	10.99
554	13	09/01/84	106	290	2	5.0	CH	1524.00	1559.75	0.00	6.56	6.56	0.00	6.41	6.41
555	13	09/01/84	121	291	2	5.0	CH	1432.56	1484.44	0.00	6.28	6.28	0.00	6.06	6.06
556	13	09/01/84	134	292	2	5.0	CH	1463.04	1506.41	0.00	6.15	6.15	0.00	5.97	5.97
557	13	09/01/84	149	293	2	5.0	CH	1463.04	1416.40	0.00	9.57	9.57	0.00	9.88	9.88
558	13	09/01/84	225	295	2	5.0	CH	1371.60	1224.47	0.00	18.96	18.96	0.00	21.23	21.23
559	13	09/01/84	238	296	2	5.0	CH	1341.12	1464.75	0.00	4.47	4.47	0.00	4.10	4.10
560	13	09/01/84	252	297	2	5.0	CH	1371.60	1339.38	0.00	5.10	5.10	0.00	5.23	5.23
561	13	09/01/84	305	298	2	5.0	CH	1310.64	1392.79	0.00	4.58	4.58	0.00	4.31	4.31
562	13	09/01/84	318	299	2	5.0	CH	1432.56	1440.64	0.00	6.28	6.28	0.00	6.25	6.25
563	13	09/01/84	332	300	2	5.0	CH	1341.12	1429.06	0.00	3.73	3.73	0.00	3.50	3.50
564	13	09/01/84	345	301	2	5.0	CH	1463.04	1336.45	0.00	3.42	3.42	0.00	3.74	3.74
565	13	09/01/84	410	303	2	5.0	CH	1341.12	1464.70	0.00	10.44	10.44	0.00	9.56	9.56
566	13	09/01/84	423	304	2	5.0	CH	1341.12	1458.02	0.00	6.71	6.71	0.00	6.17	6.17
567	13	09/01/84	436	305	2	5.0	CH	1341.12	1403.22	0.00	19.39	19.39	0.00	18.53	18.53
568	13	09/12/84	2141	248	3	5.0	CH	1097.28	1206.87	0.00	1.82	1.82	0.00	1.66	1.66
569	13	09/12/84	2209	249	3	5.0	CH	1310.64	1337.74	0.00	0.76	0.76	0.00	0.75	0.75
570	13	09/12/84	2221	250	3	5.0	CH	1310.64	1438.27	0.00	0.76	0.76	0.00	0.70	0.70
571	13	09/12/84	2232	251	3	5.0	CH	1280.16	1119.08	0.00	0.78	0.78	0.00	0.89	0.89
572	13	09/12/84	2246	252	3	5.0	CH	1280.16	1374.68	0.00	0.78	0.78	0.00	0.73	0.73
573	13	09/12/84	2300	253	3	5.0	CH	1280.16	1265.97	0.00	1.56	1.56	0.00	1.58	1.58
574	13	09/12/84	2323	255	3	5.0	CH	1280.16	1294.39	0.00	0.78	0.78	0.00	0.77	0.77
575	13	09/12/84	2338	256	3	5.0	CH	1310.64	1443.25	0.76	1.53	2.29	0.69	1.39	2.08
576	13	09/13/84	5	258	3	5.0	CH	1249.68	1255.40	0.00	1.60	1.60	0.00	1.59	1.59
577	13	09/13/84	15	259	3	5.0	CH	1188.72	1463.62	0.00	1.68	1.68	0.00	1.37	1.37
578	13	09/13/84	101	263	3	5.0	CH	1341.12	1428.18	0.00	2.98	2.98	0.00	2.80	2.80
579	13	09/13/84	124	265	3	5.0	CH	1402.08	1358.52	0.00	2.14	2.14	0.00	2.21	2.21
580	13	09/13/84	346	274	3	5.0	CH	1554.48	1194.40	0.00	8.36	8.36	0.00	10.88	10.88
581	13	09/13/84	420	275	3	5.0	CH	1158.24	1285.05	0.00	3.45	3.45	0.00	3.11	3.11
582	13	09/13/84	446	397	3	5.0	CH	1158.24	1489.93	0.00	6.04	6.04	0.00	4.70	4.70
583	13	09/13/84	512	398	3	5.0	CH	1402.08	1357.84	0.00	1.43	1.43	0.00	1.47	1.47
584	13	09/13/84	525	399	3	5.0	CH	1249.68	1245.79	0.00	1.60	1.60	0.00	1.61	1.61
585	13	09/13/84	538	400	3	5.0	CH	1310.64	1307.20	0.00	0.76	0.76	0.00	0.76	0.76
586	13	09/13/84	551	401	3	5.0	CH	1127.76	1175.25	0.00	0.89	0.89	0.00	0.85	0.85
587	13	09/13/84	604	402	3	5.0	CH	1097.28	1178.86	0.00	0.91	0.91	0.00	0.85	0.85
588	13	09/13/84	2000	403	3	5.0	CH	1066.80	1169.45	0.00	17.81	17.81	0.00	16.25	16.25
589	13	09/13/84	2022	404	3	5.0	CH	1341.12	1256.01	0.75	16.40	17.15	0.80	17.52	18.31
590	13	09/13/84	2036	405	3	5.0	CH	1249.68	1240.61	0.00	5.60	5.60	0.00	5.64	5.64
591	13	09/13/84	2050	406	3	5.0	CH	1158.24	800.92	0.00	5.18	5.18	0.00	7.49	7.49
592	13	09/13/84	2102	407	3	5.0	CH	1097.28	1293.02	0.00	12.76	12.76	0.00	10.83	10.83
593	13	09/13/84	2117	408	3	5.0	CH	1249.68	1200.26	0.00	12.00	12.00	0.00	12.50	12.50
594	13	09/13/84	2132	409	3	5.1	CH	1280.16	1321.54	0.00	3.12	3.12	0.00	3.03	3.03

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
595	13	09/13/84	2159	411	3	5	CH	1158.24	1184.86	0.00	4.32	4.32	0.00	4.22	4.22
596	13	09/13/84	2210	412	3	5	CH	1158.24	1183.09	0.86	12.09	12.95	0.85	11.83	12.68
597	13	09/13/84	2221	413	3	5	CH	1158.24	1225.34	0.00	2.59	2.59	0.00	2.45	2.45
598	13	09/13/84	2234	414	3	5	CH	1097.28	1383.20	0.00	2.73	2.73	0.00	2.17	2.17
599	13	09/13/84	2257	416	3	5	CH	1249.68	1155.69	0.00	5.60	5.60	0.00	6.06	6.06
600	13	09/13/84	2320	417	3	5	CH	1188.72	1344.42	0.00	3.36	3.36	0.00	2.98	2.98
601	13	09/13/84	2334	418	3	5	CH	1188.72	1358.39	0.84	9.25	10.09	0.74	8.10	8.83
602	13	09/13/84	2351	419	3	5	CH	1188.72	1374.13	0.00	12.62	12.62	0.00	10.92	10.92
603	13	09/14/84	8	420	3	5	CH	1158.24	1306.72	0.00	10.36	10.36	0.00	9.18	9.18
604	13	09/14/84	22	421	3	5	CH	1158.24	777.68	0.00	12.95	12.95	0.00	19.29	19.29
605	13	09/14/84	49	423	3	5	CH	1341.12	1265.83	0.00	8.20	8.20	0.00	8.69	8.69
606	13	09/14/84	134	427	3	5	CH	1188.72	1318.99	0.00	5.89	5.89	0.00	5.31	5.31
607	13	09/14/84	147	428	3	5	CH	1341.12	1338.35	0.00	0.75	0.75	0.00	0.75	0.75
608	13	09/14/84	247	433	3	5	CH	1402.08	1670.21	0.00	0.71	0.71	0.00	0.60	0.60
609	13	09/14/84	335	437	3	5	CH	1402.08	1359.73	0.00	0.71	0.71	0.00	0.74	0.74
610	13	09/15/84	2004	460	3	5	IP	975.36	1078.26	0.00	4.10	4.10	0.00	3.71	3.71
611	13	09/15/84	2024	461	3	5	CH	944.88	1283.83	0.00	2.12	2.12	0.00	1.56	1.56
612	13	09/15/84	2048	462	3	5	CH	1005.84	1181.04	0.00	0.99	0.99	0.00	0.85	0.85
613	13	09/15/84	2147	463	3	5	CH	1219.20	1357.19	0.00	1.64	1.64	0.00	1.47	1.47
614	13	09/15/84	2231	465	3	5	CH	1188.72	1409.74	0.00	4.21	4.21	0.00	3.55	3.55
615	13	09/15/84	2247	466	3	5	CH	1402.08	1337.57	2.14	0.00	2.14	2.24	0.00	2.24
616	13	09/15/84	2316	468	3	5	CH	1249.68	1280.55	0.00	0.80	0.80	0.00	0.78	0.78
617	13	09/24/84	2028	604	4	5	CH	1188.72	1484.85	0.00	2.52	2.52	0.00	2.02	2.02
618	13	09/24/84	2045	605	4	5	CH	1188.72	1512.64	0.00	0.84	0.84	0.00	0.66	0.66
619	13	09/24/84	2100	606	4	5	CH	975.36	1490.56	0.00	3.08	3.08	0.00	2.01	2.01
620	13	09/24/84	2115	607	4	5	CH	1310.64	1414.62	9.16	0.00	9.16	8.48	0.00	8.48
621	13	09/24/84	2138	608	4	5	CH	1645.92	1458.99	0.00	0.61	0.61	0.00	0.69	0.69
622	13	09/24/84	2153	609	4	5	CH	1371.60	1332.00	0.00	5.10	5.10	0.00	5.26	5.26
623	13	09/24/84	2214	610	4	5	CH	1219.20	1318.58	0.00	7.38	7.38	0.00	6.83	6.83
624	13	09/24/84	2235	611	4	5	CH	1127.76	1340.39	0.00	3.55	3.55	0.00	2.98	2.98
625	13	09/24/84	2309	612	4	5	CH	1249.68	1304.00	0.00	6.40	6.40	0.00	6.13	6.13
626	13	09/24/84	2328	613	4	5	CH	1127.76	1364.06	0.00	10.64	10.64	0.00	8.80	8.80
627	13	09/24/84	2345	614	4	5	CH	1341.12	1415.17	0.00	2.98	2.98	0.00	2.83	2.83
628	13	09/25/84	4	615	4	5	CH	1219.20	1394.05	0.82	5.74	6.56	0.72	5.02	5.74
629	13	09/25/84	29	616	4	5	CH	1249.68	1593.82	0.00	4.00	4.00	0.00	3.14	3.14
630	13	09/25/84	47	617	4	5	CH	1127.76	1530.12	0.00	1.77	1.77	0.00	1.31	1.31
631	13	09/25/84	143	620	4	5	CH	1036.32	1342.04	0.00	7.72	7.72	0.00	5.96	5.96
632	13	09/25/84	204	621	4	5	CH	1219.20	1348.78	0.00	5.74	5.74	0.00	5.19	5.19
633	13	09/25/84	256	623	4	5	CH	1158.24	1098.66	0.00	6.91	6.91	0.00	7.28	7.28
634	13	09/25/84	1920	626	4	5	CH	1158.24	1240.23	0.00	2.59	2.59	0.00	2.42	2.42
635	13	09/25/84	1937	627	4	5	CH	1036.32	993.48	0.00	3.86	3.86	0.00	4.03	4.03
636	13	09/25/84	1952	628	4	5	CH	1219.20	1301.32	0.00	1.64	1.64	0.00	1.54	1.54
637	13	09/25/84	2007	629	4	5	CH	1127.76	1280.41	0.00	1.77	1.77	0.00	1.56	1.56
638	13	09/25/84	2023	630	4	5	CH	1158.24	1258.87	0.00	2.59	2.59	0.00	2.38	2.38
639	13	09/25/84	2041	631	4	5	CH	1097.28	1229.71	0.00	5.47	5.47	0.00	4.88	4.88
640	13	09/25/84	2125	632	4	5	CH	1341.12	1332.07	0.00	0.75	0.75	0.00	0.75	0.75
641	13	09/25/84	2157	634	4	5	CH	1249.68	1242.30	0.00	0.80	0.80	0.00	0.80	0.80
642	13	09/25/84	2222	635	4	5	CH	1127.76	1214.37	0.00	0.89	0.89	0.00	0.82	0.82
643	13	09/25/84	2237	636	4	5	CH	1127.76	1264.38	0.00	0.89	0.89	0.00	0.79	0.79
644	13	09/25/84	2306	638	4	5	CH	1493.52	1397.69	0.00	0.67	0.67	0.00	0.72	0.72
645	13	09/25/84	2325	639	4	5	CH	1005.84	1322.57	0.00	3.98	3.98	0.00	3.02	3.02
646	13	09/26/84	16	642	4	5	CH	1066.80	1209.14	0.00	1.87	1.87	0.00	1.65	1.65
647	13	09/26/84	36	643	4	5	CH	944.88	1176.67	0.00	2.12	2.12	0.00	1.70	1.70
648	13	09/26/84	54	644	4	5	CH	1127.76	1354.49	0.89	0.89	1.77	0.74	0.74	1.48

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FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
649	13	09/26/84	147	647	4	5.0	CH	1402.08	1292.65	0.00	1.43	1.43	0.00	1.55	1.55
650	13	09/26/84	209	648	4	5.0	CH	1127.76	1311.16	0.00	2.66	2.66	0.00	2.29	2.29
651	13	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	0.00	0.96	0.96	0.00	0.88	0.88
652	13	09/26/84	304	651	4	5.0	CH	975.36	1143.79	0.00	4.10	4.10	0.00	3.50	3.50
653	13	09/26/84	324	652	4	5.0	CH	1097.28	1148.67	0.00	2.73	2.73	0.00	2.61	2.61
654	13	09/26/84	342	653	4	5.0	CH	1097.28	1000.84	0.00	3.65	3.65	0.00	4.00	4.00
655	13	09/26/84	402	654	4	5.0	CH	1584.96	1210.17	0.00	0.63	0.63	0.00	0.83	0.83
656	13	09/26/84	420	655	4	5.0	CH	1371.60	992.58	0.00	4.37	4.37	0.00	6.04	6.04
657	13	09/26/84	440	656	4	5.0	CH	1066.80	1232.94	0.00	12.19	12.19	0.00	10.54	10.54
658	13	09/26/84	456	657	4	5.0	CH	1097.28	1306.41	0.91	7.29	8.20	0.77	6.12	6.89
659	13	09/26/84	2223	658	4	5.0	CH	1645.92	1282.06	0.00	5.47	5.47	0.00	7.02	7.02
660	13	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	0.00	6.56	6.56	0.00	4.92	4.92
661	13	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0.00	0.84	0.84	0.00	0.71	0.71
662	13	09/26/84	2308	661	4	5.0	CH	1036.32	1371.35	0.00	0.96	0.96	0.00	0.73	0.73
663	13	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	0.00	2.59	2.59	0.00	2.28	2.28
664	13	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	0.00	10.09	10.09	0.00	9.40	9.40
665	13	09/27/84	2041	553	4	5.0	CH	1554.48	1503.50	0.00	1.29	1.29	0.00	1.33	1.33
666	13	09/27/84	2055	554	4	5.0	CH	1463.04	1642.20	0.00	1.37	1.37	0.00	1.22	1.22
667	13	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	0.00	2.14	2.14	0.00	2.06	2.06
668	14	08/18/84	2053	73	1	5.5	CH	1158.24	1158.11	0.86	0.00	0.86	0.86	0.00	0.86
669	14	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	0.86	0.00	0.86	0.80	0.00	0.80
670	14	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	1.77	0.00	1.77	1.75	0.00	1.75
671	19	09/01/84	23	287	2	5.0	CH	1493.52	1535.10	0.67	0.00	0.67	0.65	0.00	0.65
672	19	09/01/84	38	288	2	5.0	CH	1371.60	1452.14	0.73	0.00	0.73	0.69	0.00	0.69
673	19	09/01/84	51	289	2	5.0	CH	1463.04	1455.76	0.68	0.00	0.68	0.69	0.00	0.69
674	19	09/13/84	2117	408	3	5.0	CH	1249.68	1200.26	0.00	0.80	0.80	0.00	0.83	0.83
675	19	09/13/84	2145	410	3	5.0	CH	1280.16	1261.74	0.00	0.78	0.78	0.00	0.79	0.79
676	19	09/15/84	2247	466	3	5.0	CH	1402.08	1337.57	0.00	1.43	1.43	0.00	1.50	1.50
677	19	09/26/84	440	656	4	5.0	CH	1066.80	1232.94	0.00	0.94	0.94	0.00	0.81	0.81
678	19	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0.00	0.84	0.84	0.00	0.71	0.71
679	22	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	0.76	0.00	0.76	0.77	0.00	0.77
680	22	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	0.76	0.00	0.76	0.73	0.00	0.73
681	22	08/31/84	2357	285	2	5.0	CH	1524.00	1581.65	0.66	0.00	0.66	0.63	0.00	0.63
682	22	09/01/84	10	286	2	5.0	CH	1432.56	1567.33	0.70	0.00	0.70	0.64	0.00	0.64
683	22	09/01/84	238	296	2	5.0	CH	1341.12	1464.75	0.75	0.00	0.75	0.68	0.00	0.68
684	22	09/01/84	318	299	2	5.0	CH	1432.56	1440.64	0.70	0.00	0.70	0.69	0.00	0.69
685	22	09/12/84	2338	256	3	5.0	CH	1310.64	1443.25	0.76	0.00	0.76	0.69	0.00	0.69
686	22	09/13/84	101	263	3	5.0	CH	1341.12	1428.18	0.75	0.00	0.75	0.70	0.00	0.70
687	22	09/13/84	446	397	3	5.0	CH	1158.24	1489.93	0.86	0.00	0.86	0.67	0.00	0.67
688	22	09/14/84	309	435	3	5.0	CH	1432.56	1275.24	0.70	0.00	0.70	0.78	0.00	0.78
689	22	09/15/84	2147	463	3	5.0	CH	1219.20	1357.19	0.82	0.00	0.82	0.74	0.00	0.74
690	22	09/24/84	2028	604	4	5.0	CH	1188.72	1484.85	0.84	0.00	0.84	0.67	0.00	0.67
691	22	09/25/84	204	621	4	5.0	CH	1219.20	1348.78	0.82	0.00	0.82	0.74	0.00	0.74
692	22	09/26/84	1	641	4	5.0	CH	1097.28	1339.22	0.00	0.91	0.91	0.00	0.75	0.75
693	22	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	0.94	0.00	0.94	0.70	0.00	0.70
694	22	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0.84	0.00	0.84	0.71	0.00	0.71
695	30	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	32.01	0.00	32.01	31.37	0.00	31.37
696	30	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	34.37	1.56	35.93	40.96	1.86	42.82
697	30	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	46.62	1.73	48.35	50.08	1.85	51.93
698	30	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	33.61	1.60	35.21	34.53	1.64	36.18
699	30	08/16/84	2334	36	1	5.2	CH	1432.56	1248.29	9.07	0.70	9.77	10.41	0.80	11.22
700	30	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	8.38	0.00	8.38	9.54	0.00	9.54
701	30	08/17/84	35	39	1	5.2	CH	1584.96	1305.97	2.52	0.00	2.52	3.06	0.00	3.06
702	30	08/17/84	51	40	1	5.7	CH	1463.04	1227.16	9.57	0.00	9.57	11.41	0.00	11.41

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
703	30	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	7.57	0.63	8.20	8.56	0.71	9.27
704	30	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	9.90	1.24	11.14	12.12	1.51	13.63
705	30	08/17/84	201	43	1	5.5	CH	1645.92	1339.06	21.87	1.22	23.09	26.88	1.49	28.38
706	30	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	23.09	1.82	24.91	27.91	2.20	30.11
707	30	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	21.26	1.82	23.09	26.77	2.29	29.06
708	30	08/17/84	316	46	1	5.5	CH	1615.44	1339.54	23.52	1.86	25.38	28.37	2.24	30.61
709	30	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	8.20	4.56	12.76	7.33	4.07	11.40
710	30	08/17/84	407	48	1	5.5	CH	1371.60	1212.48	20.41	0.73	21.14	23.09	0.82	23.92
711	30	08/17/84	428	49	1	5.5	CH	1371.60	1158.66	18.23	0.73	18.96	21.58	0.86	22.44
712	30	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	27.21	0.00	27.21	27.33	0.00	27.33
713	30	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	22.41	0.80	23.21	22.41	0.80	23.21
714	30	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	45.76	0.86	46.62	41.80	0.79	42.58
715	30	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	34.68	0.00	34.68	31.66	0.00	31.66
716	30	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	19.20	0.80	20.01	19.65	0.82	20.47
717	30	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	22.89	0.00	22.89	26.33	0.00	26.33
718	30	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	18.85	0.00	18.85	20.77	0.00	20.77
719	30	08/18/84	114	60	1	5.5	CH	1097.28	1134.77	5.47	0.00	5.47	5.29	0.00	5.29
720	30	08/18/84	132	61	1	5.5	CH	1158.24	1098.80	31.08	0.86	31.95	32.76	0.91	33.67
721	30	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	34.74	0.00	34.74	29.97	0.00	29.97
722	30	08/18/84	210	63	1	5.5	IP	1158.24	1151.17	37.99	0.86	38.85	38.22	0.87	39.09
723	30	08/18/84	229	64	1	5.5	IP	975.36	1070.49	34.86	2.05	36.91	31.76	1.87	33.63
724	30	08/18/84	247	65	1	5.5	IP	1036.32	1186.59	39.56	0.00	39.56	34.55	0.00	34.55
725	30	08/18/84	305	66	1	5.5	IP	975.36	1030.14	19.48	0.00	19.48	18.44	0.00	18.44
726	30	08/18/84	323	67	1	5.5	CH	1005.84	1205.81	11.93	0.00	11.93	9.95	0.00	9.95
727	30	08/18/84	412	69	1	5.5	CH	1219.20	1223.75	11.48	0.00	11.48	11.44	0.00	11.44
728	30	08/18/84	435	70	1	5.5	CH	1188.72	1173.02	9.25	0.00	9.25	9.38	0.00	9.38
729	30	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	17.67	0.00	17.67	16.99	0.00	16.99
730	30	08/18/84	2053	73	1	5.5	CH	1158.24	1158.11	33.67	0.86	34.54	33.68	0.86	34.54
731	30	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	21.53	0.00	21.53	18.06	0.00	18.06
732	30	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	24.12	0.00	24.12	23.09	0.00	23.09
733	30	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	12.95	0.00	12.95	11.97	0.00	11.97
734	30	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	30.07	0.91	30.99	25.38	0.77	26.15
735	30	08/18/84	2307	79	1	5.5	CH	1158.24	1159.90	32.81	0.86	33.67	32.76	0.86	33.62
736	30	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	22.13	0.00	22.13	22.46	0.00	22.46
737	30	08/18/84	2342	81	1	5.5	CH	1371.60	1241.79	23.33	0.73	24.06	25.77	0.81	26.57
738	30	08/19/84	17	83	1	5.5	CH	1249.68	1257.11	12.80	0.00	12.80	12.73	0.00	12.73
739	30	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	36.36	0.89	37.24	40.66	0.99	41.65
740	30	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	31.03	1.77	32.81	30.62	1.75	32.37
741	30	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	23.94	0.00	23.94	22.31	0.00	22.31
742	30	08/19/84	136	87	1	5.5	CH	1127.76	1150.29	15.07	0.89	15.96	14.78	0.87	15.65
743	30	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	21.56	0.00	21.56	22.85	0.00	22.85
744	30	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	10.64	0.89	11.53	9.82	0.82	10.64
745	30	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	34.68	0.00	34.68	32.95	0.00	32.95
746	30	08/19/84	301	91	1	5.5	CH	1066.80	998.28	16.87	2.81	19.69	18.03	3.01	21.04
747	30	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	23.05	0.89	23.94	20.98	0.81	21.79
748	30	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	15.20	0.00	15.20	16.05	0.00	16.05
749	30	08/29/84	106	93	2	5.0	CH	1280.16	1338.81	0.78	0.00	0.78	0.75	0.00	0.75
750	30	08/29/84	121	94	2	5.0	CH	762.00	1297.23	1.31	0.00	1.31	0.77	0.00	0.77
751	30	08/29/84	141	95	2	5.0	CH	1158.24	1371.31	0.86	0.00	0.86	0.73	0.00	0.73
752	30	08/29/84	158	96	2	5.0	CH	1524.00	1578.74	2.62	0.00	2.62	2.53	0.00	2.53
753	30	08/29/84	221	97	2	5.0	CH	1432.56	1565.21	0.70	0.00	0.70	0.64	0.00	0.64
754	30	08/29/84	239	98	2	5.0	CH	1584.96	1413.68	3.79	0.00	3.79	4.24	0.00	4.24
755	30	08/29/84	338	133	2	5.0	CH	1554.48	1546.17	1.93	0.00	1.93	1.94	0.00	1.94
756	30	08/29/84	352	134	2	5.0	CH	1097.28	1460.94	5.47	0.00	5.47	4.11	0.00	4.11

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757	30	08/29/84	412	135	2	5.0	CH	1554.48	1401.89	11.58	0.00	11.58	12.84	0.00	12.84
758	30	08/29/84	433	136	2	5.0	CH	1280.16	1366.96	4.69	0.78	5.47	4.39	0.73	5.12
759	30	08/29/84	453	137	2	5.0	CH	1524.00	1421.53	4.59	0.00	4.59	4.92	0.00	4.92
760	30	08/30/84	2129	139	2	5.0	CH	1493.52	1411.24	9.37	0.00	9.37	9.92	0.00	9.92
761	30	08/30/84	2144	140	2	5.0	CH	1584.96	1493.06	5.68	0.00	5.68	6.03	0.00	6.03
762	30	08/30/84	2158	141	2	5.0	CH	1463.04	1412.39	8.20	0.00	8.20	8.50	0.00	8.50
763	30	08/30/84	2211	142	2	5.0	CH	1402.08	1495.95	2.14	0.00	2.14	2.01	0.00	2.01
764	30	08/30/84	2235	143	2	5.0	CH	1584.96	1472.73	0.63	0.00	0.63	0.68	0.00	0.68
765	30	08/30/84	2301	144	2	5.0	CH	1341.12	1458.84	4.47	0.00	4.47	4.11	0.00	4.11
766	30	08/30/84	2315	145	2	5.0	CH	1341.12	1443.33	3.73	0.00	3.73	3.46	0.00	3.46
767	30	08/30/84	2341	147	2	5.0	CH	1493.52	1489.20	2.01	0.00	2.01	2.01	0.00	2.01
768	30	08/30/84	2353	148	2	5.0	CH	1554.48	646.71	0.64	0.00	0.64	1.55	0.00	1.55
769	30	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	3.05	0.76	3.81	2.91	0.73	3.63
770	30	08/31/84	18	150	2	5.0	CH	1310.64	1492.32	23.65	0.00	23.65	20.77	0.00	20.77
771	30	08/31/84	34	151	2	5.0	CH	1341.12	1514.69	0.75	0.00	0.75	0.66	0.00	0.66
772	30	08/31/84	45	152	2	5.0	CH	1463.04	1518.46	2.05	0.00	2.05	1.98	0.00	1.98
773	30	08/31/84	59	153	2	5.0	CH	1432.56	1477.31	1.40	0.00	1.40	1.35	0.00	1.35
774	30	08/31/84	112	154	2	5.0	CH	1402.08	1531.59	7.85	0.00	7.85	7.18	0.00	7.18
775	30	08/31/84	124	155	2	5.0	CH	1432.56	1467.94	2.79	0.00	2.79	2.72	0.00	2.72
776	30	08/31/84	137	156	2	5.0	CH	1341.12	1423.94	23.12	0.00	23.12	21.77	0.00	21.77
777	30	08/31/84	206	157	2	5.0	CH	1432.56	1493.46	11.87	0.00	11.87	11.38	0.00	11.38
778	30	08/31/84	244	158	2	5.0	CH	1310.64	1449.80	2.29	0.00	2.29	2.07	0.00	2.07
779	30	08/31/84	301	159	2	5.0	CH	1341.12	1426.04	13.42	0.00	13.42	12.62	0.00	12.62
780	30	08/31/84	316	160	2	5.0	CH	1402.08	1518.81	0.71	0.00	0.71	0.66	0.00	0.66
781	30	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	8.70	0.00	8.70	8.68	0.00	8.68
782	30	08/31/84	342	162	2	5.1	CH	1676.40	1496.40	1.19	0.00	1.19	1.34	0.00	1.34
783	30	08/31/84	354	163	2	5.0	CH	1463.04	1521.23	0.68	0.00	0.68	0.66	0.00	0.66
784	30	08/31/84	406	164	2	5.0	CH	1432.56	1508.19	5.58	0.00	5.58	5.30	0.00	5.30
785	30	08/31/84	449	166	2	5.0	CH	1554.48	1527.47	12.87	0.00	12.87	13.09	0.00	13.09
786	30	08/31/84	522	168	2	5.0	CH	1341.12	1450.83	0.75	0.00	0.75	0.69	0.00	0.69
787	30	08/31/84	536	169	2	5.0	CH	1371.60	1536.56	3.65	1.46	5.10	3.25	1.30	4.56
788	30	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	3.81	0.76	4.58	3.34	0.67	4.00
789	30	08/31/84	2113	278	2	5.0	TZ	1463.04	1610.27	0.68	0.00	0.68	0.62	0.00	0.62
790	30	08/31/84	2128	279	2	5.0	TZ	1432.56	1450.65	5.58	0.00	5.58	5.51	0.00	5.51
791	30	08/31/84	2142	280	2	5.0	TZ	1402.08	1377.93	4.28	0.00	4.28	4.35	0.00	4.35
792	30	08/31/84	2245	282	2	5.0	CH	1341.12	1512.78	5.22	0.00	5.22	4.63	0.00	4.63
793	30	08/31/84	2259	283	2	5.0	CH	1554.48	1538.17	6.43	0.00	6.43	6.50	0.00	6.50
794	30	08/31/84	2357	285	2	5.0	CH	1524.00	1581.65	5.91	0.00	5.91	5.69	0.00	5.69
795	30	09/01/84	10	286	2	5.0	CH	1432.56	1567.33	5.58	0.00	5.58	5.10	0.00	5.10
796	30	09/01/84	23	287	2	5.0	CH	1493.52	1535.10	17.41	0.00	17.41	16.94	0.00	16.94
797	30	09/01/84	38	288	2	5.0	CH	1371.60	1452.14	8.75	0.00	8.75	8.26	0.00	8.26
798	30	09/01/84	51	289	2	5.0	CH	1463.04	1455.76	63.57	0.00	63.57	63.88	0.00	63.88
799	30	09/01/84	106	290	2	5.0	CH	1524.00	1559.75	44.62	0.00	44.62	43.60	0.00	43.60
800	30	09/01/84	121	291	2	5.0	CH	1432.56	1484.44	54.45	0.00	54.45	52.54	0.00	52.54
801	30	09/01/84	134	292	2	5.0	CH	1463.04	1506.41	40.33	0.00	40.33	39.17	0.00	39.17
802	30	09/01/84	149	293	2	5.0	CH	1463.04	1416.40	33.49	0.00	33.49	34.59	0.00	34.59
803	30	09/01/84	225	295	2	5.0	CH	1371.60	1224.47	45.93	0.00	45.93	51.45	0.00	51.45
804	30	09/01/84	238	296	2	5.0	CH	1341.12	1464.75	20.13	0.00	20.13	18.43	0.00	18.43
805	30	09/01/84	252	297	2	5.0	CH	1371.60	1339.38	30.62	0.00	30.62	31.36	0.00	31.36
806	30	09/01/84	305	298	2	5.0	CH	1310.64	1392.79	39.68	0.00	39.68	37.34	0.00	37.34
807	30	09/01/84	318	299	2	5.0	CH	1432.56	1440.64	26.53	0.00	26.53	26.38	0.00	26.38
808	30	09/01/84	332	300	2	5.0	CH	1341.12	1429.06	35.79	0.00	35.79	33.59	0.00	33.59
809	30	09/01/84	345	301	2	5.0	CH	1463.04	1336.45	23.92	0.00	23.92	26.19	0.00	26.19
810	30	09/01/84	410	303	2	5.0	CH	1341.12	1464.70	12.68	0.00	12.68	11.61	0.00	11.61

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811	30	09/01/84	423	304	2	5.0	CH	1341.12	1458.02	29.83	0	29.83	27.43	0	27.43
812	30	09/01/84	436	305	2	5.0	CH	1341.12	1403.22	26.84	0	26.84	25.66	0	25.66
813	30	09/12/84	2209	249	3	5.0	CH	1310.64	1337.74	6.10	0	6.10	5.98	0	5.98
814	30	09/12/84	2232	251	3	5.0	CH	1280.16	1119.08	0.78	0	0.78	0.89	0	0.89
815	30	09/12/84	2246	252	3	5.0	CH	1280.16	1374.68	2.34	0	2.34	2.18	0	2.18
816	30	09/12/84	2300	253	3	5.0	CH	1280.16	1265.97	0.78	0	0.78	0.79	0	0.79
817	30	09/12/84	2338	256	3	5.0	CH	1310.64	1443.25	4.58	0	4.58	4.16	0	4.16
818	30	09/12/84	2351	257	3	5.0	CH	1341.12	979.77	0.75	0	0.75	1.02	0	1.02
819	30	09/13/84	5	258	3	5.0	CH	1249.68	1255.40	4.00	0	4.00	3.98	0	3.98
820	30	09/13/84	15	259	3	5.0	CH	1188.72	1463.62	2.52	0	2.52	2.05	0	2.05
821	30	09/13/84	26	260	3	5.0	CH	1280.16	1229.16	0.78	0	0.78	0.81	0	0.81
822	30	09/13/84	38	261	3	5.0	CH	1341.12	1417.96	2.24	0	2.24	2.12	0	2.12
823	30	09/13/84	49	262	3	5.0	CH	1341.12	1595.44	0.75	0	0.75	0.63	0	0.63
824	30	09/13/84	101	263	3	5.0	CH	1341.12	1428.18	2.24	0	2.24	2.10	0	2.10
825	30	09/13/84	113	264	3	5.0	CH	1280.16	1428.32	1.56	0	1.56	1.40	0	1.40
826	30	09/13/84	124	265	3	5.0	CH	1402.08	1358.52	2.85	0	2.85	2.94	0	2.94
827	30	09/13/84	306	271	3	5.0	CH	1493.52	1236.79	1.34	0	1.34	1.62	0	1.62
828	30	09/13/84	346	274	3	5.0	CH	1554.48	1194.40	16.73	0	16.73	21.77	0	21.77
829	30	09/13/84	420	275	3	5.0	CH	1158.24	1285.05	2.59	0	2.59	2.33	0	2.33
830	30	09/13/84	446	397	3	5.0	CH	1158.24	1489.93	14.68	0	14.68	11.41	0	11.41
831	30	09/13/84	512	398	3	5.0	CH	1402.08	1357.84	2.85	0	2.85	2.95	0	2.95
832	30	09/13/84	525	399	3	5.0	CH	1249.68	1245.79	1.60	0	1.60	1.61	0	1.61
833	30	09/13/84	538	400	3	5.0	CH	1310.64	1307.20	1.53	0	1.53	1.53	0	1.53
834	30	09/13/84	551	401	3	5.0	CH	1127.76	1175.25	0.89	0	0.89	0.85	0	0.85
835	30	09/13/84	604	402	3	5.0	CH	1097.28	1178.86	0.91	0	0.91	0.85	0	0.85
836	30	09/13/84	2000	403	3	5.0	CH	1066.80	1169.45	26.25	0	26.25	23.94	0	23.94
837	30	09/13/84	2022	404	3	5.0	CH	1341.12	1256.01	13.42	0	13.42	14.33	0	14.33
838	30	09/13/84	2036	405	3	5.0	CH	1249.68	1240.61	17.60	0	17.60	17.73	0	17.73
839	30	09/13/84	2050	406	3	5.0	CH	1158.24	800.92	21.58	0	21.58	31.21	0	31.21
840	30	09/13/84	2102	407	3	5.0	CH	1097.28	1293.02	30.99	0	30.99	26.29	0	26.29
841	30	09/13/84	2117	408	3	5.0	CH	1249.68	1200.26	12.80	0	12.80	13.33	0	13.33
842	30	09/13/84	2132	409	3	5.1	CH	1280.16	1321.54	21.09	0	21.09	20.43	0	20.43
843	30	09/13/84	2145	410	3	5.0	CH	1280.16	1261.74	3.12	0	3.12	3.17	0	3.17
844	30	09/13/84	2159	411	3	5.0	CH	1158.24	1184.86	5.18	0	5.18	5.06	0	5.06
845	30	09/13/84	2210	412	3	5.0	CH	1158.24	1183.09	10.36	0	10.36	10.14	0	10.14
846	30	09/13/84	2221	413	3	5.0	CH	1158.24	1225.34	6.91	0	6.91	6.53	0	6.53
847	30	09/13/84	2234	414	3	5.0	CH	1097.28	1383.20	1.82	0	1.82	1.45	0	1.45
848	30	09/13/84	2257	416	3	5.0	CH	1249.68	1155.69	15.20	0	15.20	16.44	0	16.44
849	30	09/13/84	2320	417	3	5.0	CH	1188.72	1344.42	20.19	0	20.19	17.85	0	17.85
850	30	09/13/84	2334	418	3	5.0	CH	1188.72	1358.39	25.24	0	25.24	22.08	0	22.08
851	30	09/13/84	2351	419	3	5.0	CH	1188.72	1374.13	11.78	0	11.78	10.19	0	10.19
852	30	09/14/84	8	420	3	5.0	CH	1158.24	1306.72	17.27	0	17.27	15.31	0	15.31
853	30	09/14/84	22	421	3	5.0	CH	1158.24	777.68	13.81	0	13.81	20.57	0	20.57
854	30	09/14/84	49	423	3	5.0	CH	1341.12	1265.83	11.93	0	11.93	12.64	0	12.64
855	30	09/14/84	147	428	3	5.0	CH	1341.12	1338.35	2.24	0	2.24	2.24	0	2.24
856	30	09/14/84	247	433	3	5.0	CH	1402.08	1670.21	1.43	0	1.43	1.20	0	1.20
857	30	09/14/84	309	435	3	5.0	CH	1432.56	1275.24	0.70	0	0.70	0.78	0	0.78
858	30	09/14/84	335	437	3	5.0	CH	1402.08	1359.73	0.71	0	0.71	0.74	0	0.74
859	30	09/15/84	2004	460	3	5.0	IP	975.36	1078.26	8.20	0	8.20	7.42	0	7.42
860	30	09/15/84	2024	461	3	5.0	CH	944.88	1283.83	4.23	0	4.23	3.12	0	3.12
861	30	09/15/84	2048	462	3	5.0	CH	1005.84	1181.04	2.98	0	2.98	2.54	0	2.54
862	30	09/15/84	2147	463	3	5.0	CH	1219.20	1357.19	3.28	0	3.28	2.95	0	2.95
863	30	09/15/84	2231	465	3	5.0	CH	1188.72	1409.74	5.05	0	5.05	4.26	0	4.26
864	30	09/15/84	2247	466	3	5.0	CH	1402.08	1337.57	1.43	0	1.43	1.50	0	1.50

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
865	30	09/15/84	2316	468	3	5	CH	1249.68	1280.55	3.20	0.00	3.20	3.12	0.00	3.12
866	30	09/15/84	2331	501	3	5	CH	1219.20	1277.43	4.92	0.00	4.92	4.70	0.00	4.70
867	30	09/16/84	30	502	3	5	TZ	914.40	1374.00	4.37	0.00	4.37	2.91	0.00	2.91
868	30	09/24/84	1939	601	4	5	CH	944.88	1425.76	2.12	0.00	2.12	1.40	0.00	1.40
869	30	09/24/84	2028	604	4	5	CH	1188.72	1484.85	7.57	0.00	7.57	6.06	0.00	6.06
870	30	09/24/84	2045	605	4	5	CH	1188.72	1512.64	4.21	0.00	4.21	3.31	0.00	3.31
871	30	09/24/84	2100	606	4	5	CH	975.36	1490.56	5.13	0.00	5.13	3.35	0.00	3.35
872	30	09/24/84	2115	607	4	5	CH	1310.64	1414.62	24.42	0.00	24.42	22.62	0.00	22.62
873	30	09/24/84	2138	608	4	5	CH	1645.92	1458.99	7.29	0.00	7.29	8.22	0.00	8.22
874	30	09/24/84	2153	609	4	5	CH	1371.60	1332.00	24.79	0.00	24.79	25.53	0.00	25.53
875	30	09/24/84	2214	610	4	5	CH	1219.20	1318.58	38.55	0.00	38.55	35.64	0.00	35.64
876	30	09/24/84	2235	611	4	5	CH	1127.76	1340.39	31.03	0.89	31.92	26.11	0.75	26.86
877	30	09/24/84	2309	612	4	5	CH	1249.68	1304.00	39.21	0.00	39.21	37.58	0.00	37.58
878	30	09/24/84	2328	613	4	5	CH	1127.76	1364.06	24.83	0.00	24.83	20.53	0.00	20.53
879	30	09/24/84	2345	614	4	5	CH	1341.12	1415.17	29.83	0.00	29.83	28.27	0.00	28.27
880	30	09/25/84	4	615	4	5	CH	1219.20	1394.05	32.81	0.82	33.63	28.69	0.72	29.41
881	30	09/25/84	29	616	4	5	CH	1249.68	1593.82	34.41	0.00	34.41	26.98	0.00	26.98
882	30	09/25/84	47	617	4	5	CH	1127.76	1530.12	31.92	0.00	31.92	23.53	0.00	23.53
883	30	09/25/84	143	620	4	5	CH	1036.32	1342.04	22.19	0.00	22.19	17.14	0.00	17.14
884	30	09/25/84	204	621	4	5	CH	1219.20	1348.78	29.53	0.00	29.53	26.69	0.00	26.69
885	30	09/25/84	256	623	4	5	CH	1158.24	1098.66	18.99	0.00	18.99	20.02	0.00	20.02
886	30	09/25/84	336	625	4	5	CH	1097.28	1311.84	15.49	0.00	15.49	12.96	0.00	12.96
887	30	09/25/84	1920	626	4	5	CH	1158.24	1240.23	9.50	0.00	9.50	8.87	0.00	8.87
888	30	09/25/84	1937	627	4	5	CH	1036.32	993.48	6.75	0.00	6.75	7.05	0.00	7.05
889	30	09/25/84	1952	628	4	5	CH	1219.20	1301.32	17.22	1.64	18.86	16.14	1.54	17.67
890	30	09/25/84	2007	629	4	5	CH	1127.76	1280.41	17.73	0.00	17.73	15.62	0.00	15.62
891	30	09/25/84	2023	630	4	5	CH	1158.24	1258.87	20.72	0.00	20.72	19.06	0.00	19.06
892	30	09/25/84	2041	631	4	5	CH	1097.28	1229.71	19.14	0.00	19.14	17.08	0.00	17.08
893	30	09/25/84	2125	632	4	5	CH	1341.12	1332.07	4.47	0.00	4.47	4.50	0.00	4.50
894	30	09/25/84	2157	634	4	5	CH	1249.68	1242.30	10.40	0.80	11.20	10.46	0.80	11.27
895	30	09/25/84	2222	635	4	5	CH	1127.76	1214.37	7.98	0.89	8.87	7.41	0.82	8.23
896	30	09/25/84	2237	636	4	5	CH	1127.76	1264.38	0.89	0.00	0.89	0.79	0.00	0.79
897	30	09/25/84	2251	637	4	5	CH	1402.08	1419.57	0.71	0.00	0.71	0.70	0.00	0.70
898	30	09/25/84	2306	638	4	5	CH	1493.52	1397.69	0.67	0.00	0.67	0.72	0.00	0.72
899	30	09/25/84	2325	639	4	5	CH	1005.84	1322.57	11.93	0.00	11.93	9.07	0.00	9.07
900	30	09/25/84	2343	640	4	5	CH	1371.60	1386.89	15.31	0.00	15.31	15.14	0.00	15.14
901	30	09/26/84	1	641	4	5	CH	1097.28	1339.22	3.65	0.00	3.65	2.99	0.00	2.99
902	30	09/26/84	16	642	4	5	CH	1066.80	1209.14	22.50	0.00	22.50	19.85	0.00	19.85
903	30	09/26/84	36	643	4	5	CH	944.88	1176.67	29.63	0.00	29.63	23.80	0.00	23.80
904	30	09/26/84	54	644	4	5	CH	1127.76	1354.49	8.87	0.00	8.87	7.38	0.00	7.38
905	30	09/26/84	147	647	4	5	CH	1402.08	1292.65	9.99	0.71	10.70	10.83	0.77	11.60
906	30	09/26/84	209	648	4	5	CH	1127.76	1311.16	14.19	0.00	14.19	12.20	0.00	12.20
907	30	09/26/84	248	650	4	5	CH	1036.32	1134.57	19.30	0.00	19.30	17.63	0.00	17.63
908	30	09/26/84	304	651	4	5	CH	975.36	1143.79	19.48	0.00	19.48	16.61	0.00	16.61
909	30	09/26/84	324	652	4	5	CH	1097.28	1148.67	28.25	0.00	28.25	26.99	0.00	26.99
910	30	09/26/84	342	653	4	5	CH	1097.28	1000.84	26.43	0.00	26.43	28.98	0.00	28.98
911	30	09/26/84	402	654	4	5	CH	1584.96	1210.17	14.51	0.63	15.14	19.01	0.83	19.83
912	30	09/26/84	420	655	4	5	CH	1371.60	992.58	16.77	0.00	16.77	23.17	0.00	23.17
913	30	09/26/84	440	656	4	5	CH	1066.80	1232.94	20.62	0.00	20.62	17.84	0.00	17.84
914	30	09/26/84	456	657	4	5	CH	1097.28	1306.41	31.90	0.00	31.90	26.79	0.00	26.79
915	30	09/26/84	2223	658	4	5	CH	1645.92	1282.06	3.04	0.00	3.04	3.90	0.00	3.90
916	30	09/26/84	2240	659	4	5	CH	1066.80	1422.94	2.81	0.00	2.81	2.11	0.00	2.11
917	30	09/26/84	2253	660	4	5	CH	1188.72	1407.46	1.68	0.00	1.68	1.42	0.00	1.42
918	30	09/26/84	2308	661	4	5	CH	1036.32	1371.35	8.68	0.00	8.68	6.56	0.00	6.56

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FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
919	30	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	44.03	0.86	44.90	38.84	0.76	39.60
920	30	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	42.90	0.00	42.90	39.94	0.00	39.94
921	30	09/27/84	2024	552	4	5.0	CH	1645.92	1666.94	4.25	0.00	4.25	4.20	0.00	4.20
922	30	09/27/84	2041	553	4	5.0	CH	1554.48	1503.50	5.79	0.00	5.79	5.99	0.00	5.99
923	30	09/27/84	2055	554	4	5.0	CH	1463.04	1642.20	19.82	0.00	19.82	17.66	0.00	17.66
924	30	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	23.54	0.00	23.54	22.71	0.00	22.71
925	30	09/29/84	2015	603	4	5.0	CH	1066.80	1387.72	2.81	0.00	2.81	2.16	0.00	2.16
926	32	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	0.80	0.00	0.80	0.82	0.00	0.82
927	32	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	4.95	0.00	4.95	6.06	0.00	6.06
928	32	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	1.22	0.00	1.22	1.47	0.00	1.47
929	32	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	6.08	0.00	6.08	7.65	0.00	7.65
930	32	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	0.91	0.00	0.91	0.81	0.00	0.81
931	32	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	0.80	0.00	0.80	0.80	0.00	0.80
932	32	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	0.94	0.00	0.94	0.86	0.00	0.86
933	32	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	0.70	0.00	0.70	0.77	0.00	0.77
934	32	08/18/84	412	69	1	5.5	CH	1219.20	1223.75	0.82	0.00	0.82	0.82	0.00	0.82
935	32	08/18/84	2307	79	1	5.5	CH	1158.24	1159.90	0.86	0.00	0.86	0.86	0.00	0.86
936	32	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	0.89	0.00	0.89	0.99	0.00	0.99
937	32	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	0.89	0.00	0.89	0.83	0.00	0.83
938	32	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	0.94	0.00	0.94	0.99	0.00	0.99
939	32	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	0.94	0.00	0.94	0.89	0.00	0.89
940	32	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0.89	0.00	0.89	0.81	0.00	0.81
941	32	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	0.80	0.00	0.80	0.84	0.00	0.84
942	32	09/13/84	420	275	3	5.0	CH	1158.24	1285.05	0.86	0.00	0.86	0.78	0.00	0.78
943	34	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	0.00	2.40	2.40	0.00	2.35	2.35
944	34	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	0.00	3.91	3.91	0.00	4.65	4.65
945	34	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	0.00	0.86	0.86	0.00	0.93	0.93
946	34	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	0.00	3.20	3.20	0.00	3.29	3.29
947	34	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	0.00	0.70	0.70	0.00	0.79	0.79
948	34	08/17/84	51	40	1	5.7	CH	1463.04	1227.16	0.00	1.37	1.37	0.00	1.63	1.63
949	34	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	0.00	2.52	2.52	0.00	2.85	2.85
950	34	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	0.00	4.95	4.95	0.00	6.06	6.06
951	34	08/17/84	201	43	1	5.5	CH	1645.92	1339.06	0.00	2.43	2.43	0.00	2.99	2.99
952	34	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	0.00	0.61	0.61	0.00	0.73	0.73
953	34	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	0.00	1.82	1.82	0.00	2.29	2.29
954	34	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	0.00	2.73	2.73	0.00	2.44	2.44
955	34	08/17/84	407	48	1	5.5	CH	1371.60	1212.48	0.00	1.46	1.46	0.00	1.65	1.65
956	34	08/17/84	428	49	1	5.5	CH	1371.60	1158.66	0.00	1.46	1.46	0.00	1.73	1.73
957	34	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	0.00	0.80	0.80	0.00	0.80	0.80
958	34	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	0.00	3.20	3.20	0.00	3.20	3.20
959	34	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	0.00	3.45	3.45	0.00	3.15	3.15
960	34	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	0.00	3.75	3.75	0.00	3.42	3.42
961	34	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	0.00	0.80	0.80	0.00	0.82	0.82
962	34	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	0.00	1.53	1.53	0.00	1.76	1.76
963	34	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	0.00	1.40	1.40	0.00	1.54	1.54
964	34	08/18/84	210	63	1	5.5	IP	1158.24	1151.17	0.00	2.59	2.59	0.00	2.61	2.61
965	34	08/18/84	229	64	1	5.5	IP	975.36	1070.49	0.00	3.08	3.08	0.00	2.80	2.80
966	34	08/18/84	323	67	1	5.5	CH	1005.84	1205.81	0.00	1.99	1.99	0.00	1.66	1.66
967	34	08/18/84	412	69	1	5.5	CH	1219.20	1223.75	0.00	1.64	1.64	0.00	1.63	1.63
968	34	08/18/84	435	70	1	5.5	CH	1188.72	1173.02	0.00	1.68	1.68	0.00	1.71	1.71
969	34	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	0.00	1.68	1.68	0.00	1.62	1.62
970	34	08/18/84	2053	73	1	5.5	CH	1158.24	1158.11	0.00	3.45	3.45	0.00	3.45	3.45
971	34	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	0.00	3.08	3.08	0.00	2.58	2.58
972	34	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	0.00	0.96	0.96	0.00	0.92	0.92

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
973	34	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	0	3.45	3.45	0	3.19	3.19
974	34	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	0	1.82	1.82	0	1.54	1.54
975	34	08/18/84	2342	81	1	5.5	CH	1371.60	1241.79	0	1.46	1.46	0	1.61	1.61
976	34	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	0	3.55	3.55	0	3.97	3.97
977	34	08/19/84	136	87	1	5.5	CH	1127.76	1150.29	0	1.77	1.77	0	1.74	1.74
978	34	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	0	0.94	0.94	0	0.99	0.99
979	34	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	0	1.77	1.77	0	1.64	1.64
980	34	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	0	2.81	2.81	0	2.67	2.67
981	34	08/19/84	301	91	1	5.5	CH	1066.80	998.28	0	1.87	1.87	0	2.00	2.00
982	34	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0	2.66	2.66	0	2.42	2.42
983	34	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	0	0.80	0.80	0	0.84	0.84
984	34	08/29/84	221	97	2	5.0	CH	1432.56	1565.21	0	0.70	0.70	0	0.64	0.64
985	34	08/29/84	239	98	2	5.0	CH	1584.96	1413.68	0	0.63	0.63	0	0.71	0.71
986	34	08/30/84	2129	139	2	5.0	CH	1493.52	1411.24	0	1.34	1.34	0	1.42	1.42
987	34	08/30/84	2144	140	2	5.0	CH	1584.96	1493.06	0	1.89	1.89	0	2.01	2.01
988	34	08/30/84	2158	141	2	5.0	CH	1463.04	1412.39	0	2.73	2.73	0	2.83	2.83
989	34	08/30/84	2211	142	2	5.0	CH	1402.08	1495.95	0	0.71	0.71	0	0.67	0.67
990	34	08/30/84	2235	143	2	5.0	CH	1584.96	1472.73	0	1.26	1.26	0	1.36	1.36
991	34	08/30/84	2315	145	2	5.0	CH	1341.12	1443.33	0	1.49	1.49	0	1.39	1.39
992	34	08/30/84	2328	146	2	5.0	CH	1402.08	1430.09	0	0.71	0.71	0	0.70	0.70
993	34	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	0	0.76	0.76	0	0.73	0.73
994	34	08/31/84	18	150	2	5.0	CH	1310.64	1492.32	0	1.53	1.53	0	1.34	1.34
995	34	08/31/84	45	152	2	5.0	CH	1463.04	1518.46	0	0.68	0.68	0	0.66	0.66
996	34	08/31/84	112	154	2	5.0	CH	1402.08	1531.59	0	0.71	0.71	0	0.65	0.65
997	34	08/31/84	124	155	2	5.0	CH	1432.56	1467.94	0	0.70	0.70	0	0.68	0.68
998	34	08/31/84	137	156	2	5.0	CH	1341.12	1423.94	0	1.49	1.49	0	1.40	1.40
999	34	08/31/84	206	157	2	5.0	CH	1432.56	1493.46	0	2.79	2.79	0	2.68	2.68
1000	34	08/31/84	244	158	2	5.0	CH	1310.64	1449.80	0	1.53	1.53	0	1.38	1.38
1001	34	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	0	0.67	0.67	0	0.67	0.67
1002	34	08/31/84	449	166	2	5.0	CH	1554.48	1527.47	0	50.18	50.18	0	51.06	51.06
1003	34	08/31/84	510	167	2	5.0	CH	1310.64	1401.55	0	3.81	3.81	0	3.57	3.57
1004	34	08/31/84	522	168	2	5.0	CH	1341.12	1450.83	0	1.49	1.49	0	1.38	1.38
1005	34	08/31/84	536	169	2	5.0	CH	1371.60	1536.56	0	5.10	5.10	0	4.56	4.56
1006	34	08/31/84	2038	276	2	5.0	CH	1127.76	1322.98	0	1.77	1.77	0	1.51	1.51
1007	34	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	0	1.53	1.53	0	1.33	1.33
1008	34	08/31/84	2113	278	2	5.0	TZ	1463.04	1610.27	0	1.37	1.37	0	1.24	1.24
1009	34	08/31/84	2128	279	2	5.0	TZ	1432.56	1450.65	0	4.19	4.19	0	4.14	4.14
1010	34	08/31/84	2142	280	2	5.0	TZ	1402.08	1377.93	0	3.57	3.57	0	3.63	3.63
1011	34	08/31/84	2204	281	2	5.0	CH	1432.56	1367.17	0	9.77	9.77	0	10.24	10.24
1012	34	09/01/84	10	286	2	5.0	CH	1432.56	1567.33	0	0.70	0.70	0	0.64	0.64
1013	34	09/01/84	121	291	2	5.0	CH	1432.56	1484.44	0	3.49	3.49	0	3.37	3.37
1014	34	09/01/84	134	292	2	5.0	CH	1463.04	1506.41	0	3.42	3.42	0	3.32	3.32
1015	34	09/01/84	149	293	2	5.0	CH	1463.04	1416.40	0	2.05	2.05	0	2.12	2.12
1016	34	09/01/84	225	295	2	5.0	CH	1371.60	1224.47	0	0.73	0.73	0	0.82	0.82
1017	34	09/01/84	305	298	2	5.0	CH	1310.64	1392.79	0	1.53	1.53	0	1.44	1.44
1018	34	09/01/84	318	299	2	5.0	CH	1432.56	1440.64	0	1.40	1.40	0	1.39	1.39
1019	34	09/01/84	332	300	2	5.0	CH	1341.12	1429.06	0	5.22	5.22	0	4.90	4.90
1020	34	09/01/84	345	301	2	5.0	CH	1463.04	1336.45	0	2.73	2.73	0	2.99	2.99
1021	34	09/01/84	410	303	2	5.0	CH	1341.12	1464.70	0	6.71	6.71	0	6.14	6.14
1022	34	09/01/84	423	304	2	5.0	CH	1341.12	1458.02	0	2.98	2.98	0	2.74	2.74
1023	34	09/01/84	436	305	2	5.0	CH	1341.12	1403.22	0	2.98	2.98	0	2.85	2.85
1024	34	09/12/84	2128	247	3	5.0	CH	1219.20	1205.78	0	2.46	2.46	0	2.49	2.49
1025	34	09/12/84	2221	250	3	5.0	CH	1310.64	1438.27	0	0.76	0.76	0	0.70	0.70
1026	34	09/12/84	2323	255	3	5.0	CH	1280.16	1294.39	0	0.78	0.78	0	0.77	0.77

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1027	34	09/13/84	5	258	3	5.0	CH	1249.68	1255.40	0	0.80	0.80	0	0.80	0.80
1028	34	09/13/84	38	261	3	5.0	CH	1341.12	1417.96	0	0.75	0.75	0	0.71	0.71
1029	34	09/13/84	49	262	3	5.0	CH	1341.12	1595.44	0	0.75	0.75	0	0.63	0.63
1030	34	09/13/84	113	264	3	5.0	CH	1280.16	1428.32	0	0.78	0.78	0	0.70	0.70
1031	34	09/13/84	158	266	3	5.0	CH	1493.52	1448.49	0	0.67	0.67	0	0.69	0.69
1032	34	09/13/84	446	397	3	5.0	CH	1158.24	1489.93	0	2.59	2.59	0	2.01	2.01
1033	34	09/13/84	551	401	3	5.0	CH	1127.76	1175.25	0	0.89	0.89	0	0.85	0.85
1034	34	09/13/84	2000	403	3	5.0	CH	1066.80	1169.45	0	13.12	13.12	0	11.97	11.97
1035	34	09/13/84	2117	408	3	5.0	CH	1249.68	1200.26	0	1.60	1.60	0	1.67	1.67
1036	34	09/13/84	2132	409	3	5.1	CH	1280.16	1321.54	0	1.56	1.56	0	1.51	1.51
1037	34	09/13/84	2221	413	3	5.0	CH	1158.24	1225.34	0	3.45	3.45	0	3.26	3.26
1038	34	09/13/84	2320	417	3	5.0	CH	1188.72	1344.42	0	3.36	3.36	0	2.98	2.98
1039	34	09/14/84	8	420	3	5.0	CH	1158.24	1306.72	0	4.32	4.32	0	3.83	3.83
1040	34	09/14/84	49	423	3	5.0	CH	1341.12	1265.83	0	5.22	5.22	0	5.53	5.53
1041	34	09/15/84	2004	460	3	5.0	IP	975.36	1078.26	0	1.03	1.03	0	0.93	0.93
1042	34	09/15/84	2147	463	3	5.0	CH	1219.20	1357.19	0	1.64	1.64	0	1.47	1.47
1043	34	09/15/84	2231	465	3	5.0	CH	1188.72	1409.74	0	0.84	0.84	0	0.71	0.71
1044	34	09/15/84	2247	466	3	5.0	CH	1402.08	1337.57	0	0.71	0.71	0	0.75	0.75
1045	34	09/15/84	2300	467	3	5.0	CH	1158.24	1341.44	0	0.86	0.86	0	0.75	0.75
1046	34	09/24/84	2115	607	4	5.0	CH	1310.64	1414.62	0	2.29	2.29	0	2.12	2.12
1047	34	09/24/84	2138	608	4	5.0	CH	1645.92	1458.99	0	0.61	0.61	0	0.69	0.69
1048	34	09/24/84	2153	609	4	5.0	CH	1371.60	1332.00	0	0.73	0.73	0	0.75	0.75
1049	34	09/24/84	2214	610	4	5.0	CH	1219.20	1318.58	0	3.28	3.28	0	3.03	3.03
1050	34	09/24/84	2235	611	4	5.0	CH	1127.76	1340.39	0	2.66	2.66	0	2.24	2.24
1051	34	09/24/84	2309	612	4	5.0	CH	1249.68	1304.00	0	1.60	1.60	0	1.53	1.53
1052	34	09/24/84	2328	613	4	5.0	CH	1127.76	1364.06	0	2.66	2.66	0	2.20	2.20
1053	34	09/24/84	2345	614	4	5.0	CH	1341.12	1415.17	0	1.49	1.49	0	1.41	1.41
1054	34	09/25/84	4	615	4	5.0	CH	1219.20	1394.05	0	0.82	0.82	0	0.72	0.72
1055	34	09/25/84	47	617	4	5.0	CH	1127.76	1530.12	0	3.55	3.55	0	2.61	2.61
1056	34	09/25/84	204	621	4	5.0	CH	1219.20	1348.78	0	3.28	3.28	0	2.97	2.97
1057	34	09/25/84	256	623	4	5.0	CH	1158.24	1098.66	0	0.86	0.86	0	0.91	0.91
1058	34	09/25/84	1920	626	4	5.0	CH	1158.24	1240.23	0	1.73	1.73	0	1.61	1.61
1059	34	09/25/84	1937	627	4	5.0	CH	1036.32	993.48	0	7.72	7.72	0	8.05	8.05
1060	34	09/25/84	1952	628	4	5.0	CH	1219.20	1301.32	0	0.82	0.82	0	0.77	0.77
1061	34	09/25/84	2041	631	4	5.0	CH	1097.28	1229.71	0	0.91	0.91	0	0.81	0.81
1062	34	09/25/84	2125	632	4	5.0	CH	1341.12	1332.07	0	1.49	1.49	0	1.50	1.50
1063	34	09/25/84	2222	635	4	5.0	CH	1127.76	1214.37	0	1.77	1.77	0	1.65	1.65
1064	34	09/25/84	2306	638	4	5.0	CH	1493.52	1397.69	0	1.34	1.34	0	1.43	1.43
1065	34	09/25/84	2325	639	4	5.0	CH	1005.84	1322.57	0	1.99	1.99	0	1.51	1.51
1066	34	09/25/84	2343	640	4	5.0	CH	1371.60	1386.89	0	0.73	0.73	0	0.72	0.72
1067	34	09/26/84	1	641	4	5.0	CH	1097.28	1339.22	0	7.29	7.29	0	5.97	5.97
1068	34	09/26/84	16	642	4	5.0	CH	1066.80	1209.14	0	7.50	7.50	0	6.62	6.62
1069	34	09/26/84	36	643	4	5.0	CH	944.88	1176.67	0	3.18	3.18	0	2.55	2.55
1070	34	09/26/84	54	644	4	5.0	CH	1127.76	1354.49	0	0.89	0.89	0	0.74	0.74
1071	34	09/26/84	209	648	4	5.0	CH	1127.76	1311.16	0	15.07	15.07	0	12.97	12.97
1072	34	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	0	1.93	1.93	0	1.76	1.76
1073	34	09/26/84	304	651	4	5.0	CH	975.36	1143.79	0	7.18	7.18	0	6.12	6.12
1074	34	09/26/84	324	652	4	5.0	CH	1097.28	1148.67	0	1.82	1.82	0	1.74	1.74
1075	34	09/26/84	342	653	4	5.0	CH	1097.28	1000.84	0	10.94	10.94	0	11.99	11.99
1076	34	09/26/84	402	654	4	5.0	CH	1584.96	1210.17	0	1.26	1.26	0	1.65	1.65
1077	34	09/26/84	420	655	4	5.0	CH	1371.60	992.58	0	2.19	2.19	0	3.02	3.02
1078	34	09/26/84	440	656	4	5.0	CH	1066.80	1232.94	0	4.69	4.69	0	4.06	4.06
1079	34	09/26/84	456	657	4	5.0	CH	1097.28	1306.41	0	1.82	1.82	0	1.53	1.53
1080	34	09/26/84	2223	658	4	5.0	CH	1645.92	1282.06	0	4.86	4.86	0	6.24	6.24

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1081	34	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0.00	1.68	1.68	0.00	1.42	1.42
1082	34	09/26/84	2308	661	4	5.0	CH	1036.32	1371.35	0.00	4.82	4.82	0.00	3.65	3.65
1083	34	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	0.00	4.32	4.32	0.00	3.81	3.81
1084	34	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	0.00	2.52	2.52	0.00	2.35	2.35
1085	34	09/27/84	2024	552	4	5.0	CH	1645.92	1666.94	0.00	1.22	1.22	0.00	1.20	1.20
1086	34	09/27/84	2041	553	4	5.0	CH	1554.48	1503.50	0.00	1.29	1.29	0.00	1.33	1.33
1087	34	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	0.00	1.43	1.43	0.00	1.38	1.38
1088	35	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	0.80	23.21	24.01	0.78	22.74	23.53
1089	35	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	0.00	28.90	28.90	0.00	34.44	34.44
1090	35	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	0.86	25.90	26.76	0.93	27.82	28.75
1091	35	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	0.00	12.00	12.00	0.00	12.33	12.33
1092	35	08/16/84	2334	36	1	5.2	CH	1432.56	1248.29	0.70	13.96	14.66	0.80	16.02	16.82
1093	35	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	0.70	27.22	27.92	0.79	30.99	31.79
1094	35	08/17/84	17	38	1	5.2	CH	2834.64	1362.54	0.00	4.59	4.59	0.00	9.54	9.54
1095	35	08/17/84	35	39	1	5.2	CH	1584.96	1305.97	0.00	1.26	1.26	0.00	1.53	1.53
1096	35	08/17/84	51	40	1	5.7	CH	1463.04	1227.16	0.00	34.18	34.18	0.00	40.74	40.74
1097	35	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	1.26	21.45	22.71	1.43	24.25	25.68
1098	35	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	0.00	19.81	19.81	0.00	24.23	24.23
1099	35	08/17/84	201	43	1	5.5	CH	1645.92	1339.06	0.61	23.09	23.69	0.75	28.38	29.12
1100	35	08/17/84	226	44	1	5.5	CH	1645.92	1361.47	0.61	16.40	17.01	0.73	19.83	20.57
1101	35	08/17/84	248	45	1	5.5	CH	1645.92	1307.61	0.00	19.44	19.44	0.00	24.47	24.47
1102	35	08/17/84	316	46	1	5.5	CH	1615.44	1339.54	0.00	7.43	7.43	0.00	8.96	8.96
1103	35	08/17/84	334	47	1	5.5	CH	1097.28	1228.28	0.91	34.63	35.54	0.81	30.94	31.75
1104	35	08/17/84	407	48	1	5.5	CH	1371.60	1212.48	0.00	19.69	19.69	0.00	22.27	22.27
1105	35	08/17/84	428	49	1	5.5	CH	1371.60	1158.66	0.00	14.58	14.58	0.00	17.26	17.26
1106	35	08/17/84	447	50	1	5.5	CH	1249.68	1244.18	0.80	20.01	20.81	0.80	20.09	20.90
1107	35	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	1.60	25.61	27.21	1.60	25.61	27.21
1108	35	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	0.00	61.30	61.30	0.00	55.99	55.99
1109	35	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	0.00	36.56	36.56	0.00	33.37	33.37
1110	35	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	0.00	35.21	35.21	0.00	36.02	36.02
1111	35	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	1.53	35.86	37.39	1.76	41.26	43.01
1112	35	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	0.70	30.02	30.71	0.77	33.07	33.84
1113	35	08/18/84	114	60	1	5.5	CH	1097.28	1134.77	0.00	13.67	13.67	0.00	13.22	13.22
1114	35	08/18/84	132	61	1	5.5	CH	1158.24	1098.80	0.86	31.08	31.95	0.91	32.76	33.67
1115	35	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	0.96	26.05	27.02	0.83	22.48	23.31
1116	35	08/18/84	210	63	1	5.5	IP	1158.24	1151.17	0.00	13.81	13.81	0.00	13.90	13.90
1117	35	08/18/84	229	64	1	5.5	IP	975.36	1070.49	0.00	23.58	23.58	0.00	21.49	21.49
1118	35	08/18/84	247	65	1	5.5	IP	1036.32	1186.59	0.96	27.02	27.98	0.84	23.60	24.44
1119	35	08/18/84	305	66	1	5.5	IP	975.36	1030.14	1.03	16.40	17.43	0.97	15.53	16.50
1120	35	08/18/84	323	67	1	5.5	CH	1005.84	1205.81	0.99	87.49	88.48	0.83	72.98	73.81
1121	35	08/18/84	412	69	1	5.5	CH	1219.20	1223.75	0.82	6.56	7.38	0.82	6.54	7.35
1122	35	08/18/84	435	70	1	5.5	CH	1188.72	1173.02	0.00	34.49	34.49	0.00	34.95	34.95
1123	35	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	0.00	13.46	13.46	0.00	12.94	12.94
1124	35	08/18/84	2053	73	1	5.5	CH	1158.24	1158.11	0.00	34.54	34.54	0.00	34.54	34.54
1125	35	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	1.03	9.23	10.25	0.86	7.74	8.60
1126	35	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	0.96	18.33	19.30	0.92	17.55	18.47
1127	35	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	0.00	17.27	17.27	0.00	15.96	15.96
1128	35	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	1.82	10.94	12.76	1.54	9.23	10.77
1129	35	08/18/84	2307	79	1	5.5	CH	1158.24	1159.90	0.00	13.81	13.81	0.00	13.79	13.79
1130	35	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	0.00	12.97	12.97	0.00	13.16	13.16
1131	35	08/18/84	2342	81	1	5.5	CH	1371.60	1241.79	1.46	13.85	15.31	1.61	15.30	16.91
1132	35	08/19/84	17	83	1	5.5	CH	1249.68	1257.11	0.80	16.00	16.80	0.80	15.91	16.71
1133	35	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	0.00	34.58	34.58	0.00	38.67	38.67
1134	35	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	0.00	31.03	31.03	0.00	30.62	30.62

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1135	35	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	0.00	28.37	28.37	0.00	26.44	26.44
1136	35	08/19/84	136	87	1	5.5	CH	1127.76	1150.29	0.89	28.37	29.26	0.87	27.82	28.69
1137	35	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	0.94	12.19	13.12	0.99	12.92	13.91
1138	35	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	0.00	11.53	11.53	0.00	10.64	10.64
1139	35	08/19/84	235	90	1	5.5	CH	1066.80	1122.81	0.00	41.24	41.24	0.00	39.19	39.19
1140	35	08/19/84	301	91	1	5.5	CH	1066.80	998.28	0.00	26.25	26.25	0.00	28.05	28.05
1141	35	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0.00	39.90	39.90	0.00	36.32	36.32
1142	35	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	0.80	14.40	15.20	0.84	15.21	16.05
1143	35	08/29/84	106	93	2	5.0	CH	1280.16	1338.81	0.00	3.12	3.12	0.00	2.99	2.99
1144	35	08/29/84	121	94	2	5.0	CH	762.00	1297.23	0.00	10.50	10.50	0.00	6.17	6.17
1145	35	08/29/84	141	95	2	5.0	CH	1158.24	1371.31	0.00	4.32	4.32	0.00	3.65	3.65
1146	35	08/29/84	158	96	2	5.0	CH	1524.00	1578.74	0.00	4.59	4.59	0.00	4.43	4.43
1147	35	08/29/84	221	97	2	5.0	CH	1432.56	1565.21	0.00	3.49	3.49	0.00	3.19	3.19
1148	35	08/29/84	239	98	2	5.0	CH	1584.96	1413.68	0.00	1.89	1.89	0.00	2.12	2.12
1149	35	08/29/84	255	99	2	5.0	CH	1737.36	1494.88	0.00	0.58	0.58	0.00	0.67	0.67
1150	35	08/29/84	322	100	2	5.0	CH	1341.12	1538.44	0.75	5.22	5.97	0.65	4.55	5.20
1151	35	08/29/84	338	133	2	5.0	CH	1554.48	1546.17	1.29	9.01	10.29	1.29	9.05	10.35
1152	35	08/29/84	352	134	2	5.0	CH	1097.28	1460.94	0.00	24.61	24.61	0.00	18.48	18.48
1153	35	08/29/84	412	135	2	5.0	CH	1554.48	1401.89	7.08	70.76	77.84	7.85	78.47	86.31
1154	35	08/29/84	433	136	2	5.0	CH	1280.16	1366.96	2.34	76.55	78.90	2.19	71.69	73.89
1155	35	08/29/84	453	137	2	5.0	CH	1524.00	1421.53	1.97	9.19	11.15	2.11	9.85	11.96
1156	35	08/30/84	2129	139	2	5.0	CH	1493.52	1411.24	0.00	6.70	6.70	0.00	7.09	7.09
1157	35	08/30/84	2144	140	2	5.0	CH	1584.96	1493.06	0.00	5.68	5.68	0.00	6.03	6.03
1158	35	08/30/84	2158	141	2	5.0	CH	1463.04	1412.39	0.00	7.52	7.52	0.00	7.79	7.79
1159	35	08/30/84	2211	142	2	5.0	CH	1402.08	1495.95	0.71	5.71	6.42	0.67	5.35	6.02
1160	35	08/30/84	2235	143	2	5.0	CH	1584.96	1472.73	0.00	3.15	3.15	0.00	3.40	3.40
1161	35	08/30/84	2301	144	2	5.0	CH	1341.12	1458.84	0.75	40.26	41.01	0.69	37.02	37.70
1162	35	08/30/84	2315	145	2	5.0	CH	1341.12	1443.33	2.98	29.83	32.81	2.77	27.71	30.49
1163	35	08/30/84	2328	146	2	5.0	CH	1402.08	1430.09	0.71	10.70	11.41	0.70	10.49	11.19
1164	35	08/30/84	2341	147	2	5.0	CH	1493.52	1489.20	0.00	4.02	4.02	0.00	4.03	4.03
1165	35	08/30/84	2353	148	2	5.0	CH	1554.48	646.71	0.64	1.93	2.57	1.55	4.64	6.19
1166	35	08/31/84	4	149	2	5.0	CH	1310.64	1375.88	0.00	6.87	6.87	0.00	6.54	6.54
1167	35	08/31/84	18	150	2	5.0	CH	1310.64	1492.32	3.81	22.89	26.70	3.35	20.10	23.45
1168	35	08/31/84	34	151	2	5.0	CH	1341.12	1514.69	0.00	4.47	4.47	0.00	3.96	3.96
1169	35	08/31/84	45	152	2	5.0	CH	1463.04	1518.46	0.00	5.47	5.47	0.00	5.27	5.27
1170	35	08/31/84	112	154	2	5.0	CH	1402.08	1531.59	0.71	2.85	3.57	0.65	2.61	3.26
1171	35	08/31/84	124	155	2	5.0	CH	1432.56	1467.94	2.09	5.58	7.68	2.04	5.45	7.49
1172	35	08/31/84	137	156	2	5.0	CH	1341.12	1423.94	2.24	43.25	45.48	2.11	40.73	42.84
1173	35	08/31/84	206	157	2	5.0	CH	1432.56	1493.46	3.49	56.54	60.03	3.35	54.24	57.58
1174	35	08/31/84	244	158	2	5.0	CH	1310.64	1449.80	1.53	29.76	31.28	1.38	26.90	28.28
1175	35	08/31/84	301	159	2	5.0	CH	1341.12	1426.04	2.98	34.30	37.28	2.80	32.26	35.06
1176	35	08/31/84	316	160	2	5.0	CH	1402.08	1518.81	0.00	3.57	3.57	0.00	3.29	3.29
1177	35	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	0.67	24.10	24.77	0.67	24.03	24.70
1178	35	08/31/84	342	162	2	5.1	CH	1676.40	1496.40	0.00	4.18	4.18	0.00	4.68	4.68
1179	35	08/31/84	354	163	2	5.0	CH	1463.04	1521.23	0.00	7.52	7.52	0.00	7.23	7.23
1180	35	08/31/84	406	164	2	5.0	CH	1432.56	1508.19	0.00	7.68	7.68	0.00	7.29	7.29
1181	35	08/31/84	449	166	2	5.0	CH	1554.48	1527.47	0.64	72.69	73.34	0.65	73.98	74.63
1182	35	08/31/84	510	167	2	5.0	CH	1310.64	1401.55	0.00	12.21	12.21	0.00	11.42	11.42
1183	35	08/31/84	522	168	2	5.0	CH	1341.12	1450.83	0.00	4.47	4.47	0.00	4.14	4.14
1184	35	08/31/84	536	169	2	5.0	CH	1371.60	1536.56	0.73	5.83	6.56	0.65	5.21	5.86
1185	35	08/31/84	2038	276	2	5.0	CH	1127.76	1322.98	0.00	7.98	7.98	0.00	6.80	6.80
1186	35	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	0.00	10.68	10.68	0.00	9.34	9.34
1187	35	08/31/84	2113	278	2	5.0	TZ	1463.04	1610.27	0.00	8.20	8.20	0.00	7.45	7.45
1188	35	08/31/84	2128	279	2	5.0	TZ	1432.56	1450.65	0.00	18.15	18.15	0.00	17.92	17.92

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1189	35	08/31/84	2142	280	2	5	TZ	1402.08	1377.93	0.00	7.85	7.85	0.00	7.98	7.98
1190	35	08/31/84	2204	281	2	5	CH	1432.56	1367.17	0.00	241.53	241.53	0.00	253.08	253.08
1191	35	08/31/84	2245	282	2	5	CH	1341.12	1512.78	0.75	21.62	22.37	0.66	19.17	19.83
1192	35	08/31/84	2259	283	2	5	CH	1554.48	1538.17	0.64	10.29	10.94	0.65	10.40	11.05
1193	35	08/31/84	2357	285	2	5	CH	1524.00	1581.65	0.00	1.31	1.31	0.00	1.26	1.26
1194	35	09/01/84	10	286	2	5	CH	1432.56	1567.33	1.40	3.49	4.89	1.28	3.19	4.47
1195	35	09/01/84	23	287	2	5	CH	1493.52	1535.10	2.01	3.35	5.36	1.95	3.26	5.21
1196	35	09/01/84	38	288	2	5	CH	1371.60	1452.14	0.73	2.92	3.65	0.69	2.75	3.44
1197	35	09/01/84	51	289	2	5	CH	1463.04	1455.76	2.73	39.64	42.38	2.75	39.84	42.59
1198	35	09/01/84	106	290	2	5	CH	1524.00	1559.75	1.31	26.25	27.56	1.28	25.65	26.93
1199	35	09/01/84	121	291	2	5	CH	1432.56	1484.44	6.28	39.09	45.37	6.06	37.72	43.79
1200	35	09/01/84	134	292	2	5	CH	1463.04	1506.41	3.42	22.56	25.97	3.32	21.91	25.23
1201	35	09/01/84	149	293	2	5	CH	1463.04	1416.40	4.10	25.29	29.39	4.24	26.12	30.36
1202	35	09/01/84	225	295	2	5	CH	1371.60	1224.47	5.10	14.58	19.69	5.72	16.33	22.05
1203	35	09/01/84	238	296	2	5	CH	1341.12	1464.75	2.24	10.44	12.68	2.05	9.56	11.61
1204	35	09/01/84	252	297	2	5	CH	1371.60	1339.38	2.19	14.58	16.77	2.24	14.93	17.17
1205	35	09/01/84	305	298	2	5	CH	1310.64	1392.79	2.29	25.94	28.23	2.15	24.41	26.57
1206	35	09/01/84	318	299	2	5	CH	1432.56	1440.64	2.09	24.43	26.53	2.08	24.29	26.38
1207	35	09/01/84	332	300	2	5	CH	1341.12	1429.06	5.22	19.39	24.61	4.90	18.19	23.09
1208	35	09/01/84	345	301	2	5	CH	1463.04	1336.45	1.37	13.67	15.04	1.50	14.96	16.46
1209	35	09/01/84	410	303	2	5	CH	1341.12	1464.70	4.47	28.33	32.81	4.10	25.94	30.04
1210	35	09/01/84	423	304	2	5	CH	1341.12	1458.02	2.24	16.40	18.64	2.06	15.09	17.15
1211	35	09/01/84	436	305	2	5	CH	1341.12	1403.22	3.73	21.62	25.35	3.56	20.67	24.23
1212	35	09/12/84	2128	247	3	5	CH	1219.20	1205.78	0.00	1.64	1.64	0.00	1.66	1.66
1213	35	09/12/84	2141	248	3	5	CH	1097.28	1206.87	0.00	2.73	2.73	0.00	2.49	2.49
1214	35	09/12/84	2209	249	3	5	CH	1310.64	1337.74	0.76	3.05	3.81	0.75	2.99	3.74
1215	35	09/12/84	2221	250	3	5	CH	1310.64	1438.27	0.00	1.53	1.53	0.00	1.39	1.39
1216	35	09/12/84	2232	251	3	5	CH	1280.16	1119.08	0.78	0.78	1.56	0.89	0.89	1.79
1217	35	09/12/84	2246	252	3	5	CH	1280.16	1374.68	0.00	1.56	1.56	0.00	1.45	1.45
1218	35	09/12/84	2300	253	3	5	CH	1280.16	1265.97	0.00	1.56	1.56	0.00	1.58	1.58
1219	35	09/12/84	2312	254	3	5	CH	1280.16	1598.65	0.00	1.56	1.56	0.00	1.25	1.25
1220	35	09/12/84	2338	256	3	5	CH	1310.64	1443.25	0.00	1.53	1.53	0.00	1.39	1.39
1221	35	09/12/84	2351	257	3	5	CH	1341.12	979.77	0.00	0.75	0.75	0.00	1.02	1.02
1222	35	09/13/84	5	258	3	5	CH	1249.68	1255.40	0.00	2.40	2.40	0.00	2.39	2.39
1223	35	09/13/84	15	259	3	5	CH	1188.72	1463.62	0.00	0.84	0.84	0.00	0.68	0.68
1224	35	09/13/84	26	260	3	5	CH	1280.16	1229.16	0.00	1.56	1.56	0.00	1.63	1.63
1225	35	09/13/84	38	261	3	5	CH	1341.12	1417.96	0.75	3.73	4.47	0.71	3.53	4.23
1226	35	09/13/84	49	262	3	5	CH	1341.12	1595.44	0.00	2.24	2.24	0.00	1.88	1.88
1227	35	09/13/84	101	263	3	5	CH	1341.12	1428.18	0.00	3.73	3.73	0.00	3.50	3.50
1228	35	09/13/84	113	264	3	5	CH	1280.16	1428.32	0.00	3.91	3.91	0.00	3.50	3.50
1229	35	09/13/84	124	265	3	5	CH	1402.08	1358.52	0.71	5.71	6.42	0.74	5.89	6.62
1230	35	09/13/84	158	266	3	5	CH	1493.52	1448.49	0.00	6.03	6.03	0.00	6.21	6.21
1231	35	09/13/84	306	271	3	5	CH	1493.52	1236.79	0.00	2.01	2.01	0.00	2.43	2.43
1232	35	09/13/84	346	274	3	5	CH	1554.48	1194.40	5.15	10.29	15.44	6.70	13.40	20.09
1233	35	09/13/84	420	275	3	5	CH	1158.24	1285.05	1.73	9.50	11.22	1.56	8.56	10.12
1234	35	09/13/84	446	397	3	5	CH	1158.24	1489.93	1.73	47.49	49.21	1.34	36.91	38.26
1235	35	09/13/84	512	398	3	5	CH	1402.08	1357.84	0.00	9.99	9.99	0.00	10.31	10.31
1236	35	09/13/84	525	399	3	5	CH	1249.68	1245.79	0.00	3.20	3.20	0.00	3.21	3.21
1237	35	09/13/84	2000	403	3	5	CH	1066.80	1169.45	14.06	51.56	65.62	12.83	47.03	59.86
1238	35	09/13/84	2022	404	3	5	CH	1341.12	1256.01	10.44	23.86	34.30	11.15	25.48	36.62
1239	35	09/13/84	2036	405	3	5	CH	1249.68	1240.61	1.60	22.41	24.01	1.61	22.57	24.18
1240	35	09/13/84	2050	406	3	5	CH	1158.24	800.92	8.63	12.09	20.72	12.49	17.48	29.97
1241	35	09/13/84	2102	407	3	5	CH	1097.28	1293.02	0.91	30.07	30.99	0.77	25.52	26.29
1242	35	09/13/84	2117	408	3	5	CH	1249.68	1200.26	4.00	57.61	61.62	4.17	59.99	64.15

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1243	35	09/13/84	2132	409	3	5.1	CH	1280.16	1321.54	2.34	50.77	53.12	2.27	49.19	51.46
1244	35	09/13/84	2145	410	3	5.0	CH	1280.16	1261.74	0.00	11.72	11.72	0.00	11.89	11.89
1245	35	09/13/84	2159	411	3	5.0	CH	1158.24	1184.86	0.00	6.04	6.04	0.00	5.91	5.91
1246	35	09/13/84	2210	412	3	5.0	CH	1158.24	1183.09	0.00	51.80	51.80	0.00	50.71	50.71
1247	35	09/13/84	2221	413	3	5.0	CH	1158.24	1225.34	3.45	25.90	29.35	3.26	24.48	27.75
1248	35	09/13/84	2234	414	3	5.0	CH	1097.28	1383.20	0.00	21.87	21.87	0.00	17.35	17.35
1249	35	09/13/84	2246	415	3	5.0	CH	1249.68	1345.92	0.00	13.60	13.60	0.00	12.63	12.63
1250	35	09/13/84	2257	416	3	5.0	CH	1249.68	1155.69	0.80	29.61	30.41	0.87	32.02	32.88
1251	35	09/13/84	2320	417	3	5.0	CH	1188.72	1344.42	2.52	14.30	16.82	2.23	12.64	14.88
1252	35	09/13/84	2334	418	3	5.0	CH	1188.72	1358.39	2.52	18.51	21.03	2.21	16.20	18.40
1253	35	09/13/84	2351	419	3	5.0	CH	1188.72	1374.13	10.09	42.90	53.00	8.73	37.11	45.85
1254	35	09/14/84	8	420	3	5.0	CH	1158.24	1306.72	14.68	31.08	45.76	13.01	27.55	40.56
1255	35	09/14/84	22	421	3	5.0	CH	1158.24	777.68	6.91	43.17	50.08	10.29	64.29	74.58
1256	35	09/14/84	49	423	3	5.0	CH	1341.12	1265.83	2.98	8.95	11.93	3.16	9.48	12.64
1257	35	09/14/84	111	425	3	5.0	CH	1249.68	1407.87	0.00	0.80	0.80	0.00	0.71	0.71
1258	35	09/14/84	134	427	3	5.0	CH	1188.72	1318.99	0.00	19.35	19.35	0.00	17.44	17.44
1259	35	09/14/84	147	428	3	5.0	CH	1341.12	1338.35	2.24	6.71	8.95	2.24	6.72	8.97
1260	35	09/14/84	236	432	3	5.0	CH	1249.68	1318.24	0.00	0.80	0.80	0.00	0.76	0.76
1261	35	09/14/84	247	433	3	5.0	CH	1402.08	1670.21	0.00	2.85	2.85	0.00	2.39	2.39
1262	35	09/14/84	309	435	3	5.0	CH	1432.56	1275.24	0.00	4.89	4.89	0.00	5.49	5.49
1263	35	09/14/84	335	437	3	5.0	CH	1402.08	1359.73	0.00	2.14	2.14	0.00	2.21	2.21
1264	35	09/15/84	2004	460	3	5.0	IP	975.36	1078.26	0.00	54.34	54.34	0.00	49.15	49.15
1265	35	09/15/84	2024	461	3	5.0	CH	944.88	1283.83	0.00	2.12	2.12	0.00	1.56	1.56
1266	35	09/15/84	2048	462	3	5.0	CH	1005.84	1181.04	0.00	6.96	6.96	0.00	5.93	5.93
1267	35	09/15/84	2147	463	3	5.0	CH	1219.20	1357.19	2.46	6.56	9.02	2.21	5.89	8.10
1268	35	09/15/84	2231	465	3	5.0	CH	1188.72	1409.74	0.00	17.67	17.67	0.00	14.90	14.90
1269	35	09/15/84	2247	466	3	5.0	CH	1402.08	1337.57	2.85	7.13	9.99	2.99	7.48	10.47
1270	35	09/15/84	2300	467	3	5.0	CH	1158.24	1341.44	0.00	0.86	0.86	0.00	0.75	0.75
1271	35	09/15/84	2316	468	3	5.0	CH	1249.68	1280.55	0.80	6.40	7.20	0.78	6.25	7.03
1272	35	09/15/84	2331	501	3	5.0	CH	1219.20	1277.43	4.92	7.38	12.30	4.70	7.05	11.74
1273	35	09/16/84	30	502	3	5.0	TZ	914.40	1374.00	0.00	4.37	4.37	0.00	2.91	2.91
1274	35	09/24/84	2028	604	4	5.0	CH	1188.72	1484.85	0.84	5.89	6.73	0.67	4.71	5.39
1275	35	09/24/84	2045	605	4	5.0	CH	1188.72	1512.64	1.68	1.68	3.36	1.32	1.32	2.64
1276	35	09/24/84	2100	606	4	5.0	CH	975.36	1490.56	0.00	4.10	4.10	0.00	2.68	2.68
1277	35	09/24/84	2115	607	4	5.0	CH	1310.64	1414.62	13.73	22.13	35.86	12.72	20.50	33.22
1278	35	09/24/84	2138	608	4	5.0	CH	1645.92	1458.99	0.61	4.25	4.86	0.69	4.80	5.48
1279	35	09/24/84	2153	609	4	5.0	CH	1371.60	1332.00	13.85	18.23	32.08	14.26	18.77	33.03
1280	35	09/24/84	2214	610	4	5.0	CH	1219.20	1318.58	9.84	31.17	41.01	9.10	28.82	37.92
1281	35	09/24/84	2235	611	4	5.0	CH	1127.76	1340.39	7.98	23.94	31.92	6.71	20.14	26.86
1282	35	09/24/84	2309	612	4	5.0	CH	1249.68	1304.00	11.20	24.81	36.01	10.74	23.77	34.51
1283	35	09/24/84	2328	613	4	5.0	CH	1127.76	1364.06	7.98	14.19	22.17	6.60	11.73	18.33
1284	35	09/24/84	2345	614	4	5.0	CH	1341.12	1415.17	6.71	14.91	21.62	6.36	14.13	20.49
1285	35	09/25/84	4	615	4	5.0	CH	1219.20	1394.05	5.74	18.86	24.61	5.02	16.50	21.52
1286	35	09/25/84	29	616	4	5.0	CH	1249.68	1593.82	4.80	24.01	28.81	3.76	18.82	22.59
1287	35	09/25/84	47	617	4	5.0	CH	1127.76	1530.12	10.64	13.30	23.94	7.84	9.80	17.65
1288	35	09/25/84	143	620	4	5.0	CH	1036.32	1342.04	2.89	21.23	24.12	2.24	16.39	18.63
1289	35	09/25/84	204	621	4	5.0	CH	1219.20	1348.78	12.30	42.65	54.95	11.12	38.55	49.67
1290	35	09/25/84	256	623	4	5.0	CH	1158.24	1098.66	0.86	19.86	20.72	0.91	20.93	21.84
1291	35	09/25/84	1920	626	4	5.0	CH	1158.24	1240.23	0.00	66.48	66.48	0.00	62.09	62.09
1292	35	09/25/84	1937	627	4	5.0	CH	1036.32	993.48	0.00	38.60	38.60	0.00	40.26	40.26
1293	35	09/25/84	1952	628	4	5.0	CH	1219.20	1301.32	0.00	13.12	13.12	0.00	12.30	12.30
1294	35	09/25/84	2007	629	4	5.0	CH	1127.76	1280.41	0.00	54.98	54.98	0.00	48.42	48.42
1295	35	09/25/84	2023	630	4	5.0	CH	1158.24	1258.87	0.00	60.44	60.44	0.00	55.61	55.61
1296	35	09/25/84	2041	631	4	5.0	CH	1097.28	1229.71	0.00	103.89	103.89	0.00	92.71	92.71

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1297	35	09/25/84	2125	632	4	5.0	CH	1341.12	1332.07	0.75	11.18	11.93	0.75	11.26	12.01
1298	35	09/25/84	2157	634	4	5.0	CH	1249.68	1242.30	0.00	29.61	29.61	0.00	29.78	29.78
1299	35	09/25/84	2222	635	4	5.0	CH	1127.76	1214.37	1.77	17.73	19.51	1.65	16.47	18.12
1300	35	09/25/84	2237	636	4	5.0	CH	1127.76	1264.38	0.00	2.66	2.66	0.00	2.37	2.37
1301	35	09/25/84	2251	637	4	5.0	CH	1402.08	1419.57	0.00	4.99	4.99	0.00	4.93	4.93
1302	35	09/25/84	2306	638	4	5.0	CH	1493.52	1397.69	0.00	8.03	8.03	0.00	8.59	8.59
1303	35	09/25/84	2325	639	4	5.0	CH	1005.84	1322.57	0.00	43.74	43.74	0.00	33.27	33.27
1304	35	09/25/84	2343	640	4	5.0	CH	1371.60	1386.89	0.00	32.81	32.81	0.00	32.45	32.45
1305	35	09/26/84	1	641	4	5.0	CH	1097.28	1339.22	0.00	29.16	29.16	0.00	23.89	23.89
1306	35	09/26/84	16	642	4	5.0	CH	1066.80	1209.14	0.00	74.99	74.99	0.00	66.16	66.16
1307	35	09/26/84	36	643	4	5.0	CH	944.88	1176.67	0.00	49.74	49.74	0.00	39.94	39.94
1308	35	09/26/84	54	644	4	5.0	CH	1127.76	1354.49	0.00	57.64	57.64	0.00	47.99	47.99
1309	35	09/26/84	147	647	4	5.0	CH	1402.08	1292.65	0.00	141.93	141.93	0.00	153.95	153.95
1310	35	09/26/84	209	648	4	5.0	CH	1127.76	1311.16	0.00	76.26	76.26	0.00	65.59	65.59
1311	35	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	0.00	53.07	53.07	0.00	48.48	48.48
1312	35	09/26/84	304	651	4	5.0	CH	975.36	1143.79	0.00	81.00	81.00	0.00	69.07	69.07
1313	35	09/26/84	324	652	4	5.0	CH	1097.28	1148.67	0.00	61.97	61.97	0.00	59.20	59.20
1314	35	09/26/84	342	653	4	5.0	CH	1097.28	1000.84	0.00	68.35	68.35	0.00	74.94	74.94
1315	35	09/26/84	402	654	4	5.0	CH	1584.96	1210.17	0.00	67.51	67.51	0.00	88.42	88.42
1316	35	09/26/84	420	655	4	5.0	CH	1371.60	992.58	0.00	87.49	87.49	0.00	120.90	120.90
1317	35	09/26/84	440	656	4	5.0	CH	1066.80	1232.94	0.00	55.31	55.31	0.00	47.85	47.85
1318	35	09/26/84	456	657	4	5.0	CH	1097.28	1306.41	0.00	60.15	60.15	0.00	50.52	50.52
1319	35	09/26/84	2223	658	4	5.0	CH	1645.92	1282.06	0.00	69.26	69.26	0.00	88.92	88.92
1320	35	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	0.00	6.56	6.56	0.00	4.92	4.92
1321	35	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0.00	4.21	4.21	0.00	3.55	3.55
1322	35	09/26/84	2308	661	4	5.0	CH	1036.32	1371.35	0.00	69.48	69.48	0.00	52.50	52.50
1323	35	09/26/84	2324	662	4	5.0	CH	1158.24	1313.01	0.00	87.20	87.20	0.00	76.92	76.92
1324	35	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	0.00	15.98	15.98	0.00	14.88	14.88
1325	35	09/27/84	2024	552	4	5.0	CH	1645.92	1666.94	0.00	27.34	27.34	0.00	27.00	27.00
1326	35	09/27/84	2041	553	4	5.0	CH	1554.48	1503.50	0.00	66.26	66.26	0.00	68.51	68.51
1327	35	09/27/84	2055	554	4	5.0	CH	1463.04	1642.20	0.00	23.92	23.92	0.00	21.31	21.31
1328	35	09/27/84	2111	555	4	5.0	CH	1402.08	1452.86	1.43	34.95	36.37	1.38	33.73	35.10
1329	35	09/29/84	2015	603	4	5.0	CH	1066.80	1387.72	0.00	3.75	3.75	0.00	2.88	2.88
1330	36	08/31/84	59	153	2	5.0	CH	1432.56	1477.31	0.00	0.70	0.70	0.00	0.68	0.68
1331	42	09/13/84	2320	417	3	5.0	CH	1188.72	1344.42	0.00	0.84	0.84	0.00	0.74	0.74
1332	42	09/14/84	22	421	3	5.0	CH	1158.24	777.68	0.00	0.86	0.86	0.00	1.29	1.29
1333	42	09/26/84	36	643	4	5.0	CH	944.88	1176.67	0.00	1.06	1.06	0.00	0.85	0.85
1334	45	08/16/84	2149	31	1	5.2	CH	1249.68	1275.21	2.40	0.00	2.40	2.35	0.00	2.35
1335	45	08/16/84	2214	32	1	5.2	CH	1280.16	1074.20	5.47	0.00	5.47	6.52	0.00	6.52
1336	45	08/16/84	2251	34	1	5.0	CH	1158.24	1078.37	6.04	0.00	6.04	6.49	0.00	6.49
1337	45	08/16/84	2312	35	1	5.2	CH	1249.68	1216.21	11.20	0.00	11.20	11.51	0.00	11.51
1338	45	08/16/84	2334	36	1	5.2	CH	1432.56	1248.29	1.40	0.00	1.40	1.60	0.00	1.60
1339	45	08/16/84	2352	37	1	5.2	CH	1432.56	1258.37	2.09	0.00	2.09	2.38	0.00	2.38
1340	45	08/17/84	112	41	1	5.8	CH	1584.96	1401.80	4.42	0.00	4.42	4.99	0.00	4.99
1341	45	08/17/84	135	42	1	5.5	CH	1615.44	1320.52	1.86	0.00	1.86	2.27	0.00	2.27
1342	45	08/17/84	201	43	1	5.5	CH	1645.92	1339.06	2.43	0.00	2.43	2.99	0.00	2.99
1343	45	08/17/84	316	46	1	5.5	CH	1615.44	1339.54	0.62	0.00	0.62	0.75	0.00	0.75
1344	45	08/17/84	407	48	1	5.5	CH	1371.60	1212.48	0.73	0.00	0.73	0.82	0.00	0.82
1345	45	08/17/84	2131	51	1	5.5	CH	1249.68	1249.45	2.40	0.00	2.40	2.40	0.00	2.40
1346	45	08/17/84	2210	53	1	5.5	CH	1158.24	1268.06	1.73	0.00	1.73	1.58	0.00	1.58
1347	45	08/17/84	2229	54	1	5.5	CH	1066.80	1168.81	7.50	0.00	7.50	6.84	0.00	6.84
1348	45	08/17/84	2312	55	1	5.5	CH	1249.68	1221.42	5.60	0.00	5.60	5.73	0.00	5.73
1349	45	08/18/84	15	57	1	5.5	CH	1310.64	1139.21	5.34	0.00	5.34	6.14	0.00	6.14
1350	45	08/18/84	38	58	1	5.5	CH	1432.56	1300.12	4.19	0.00	4.19	4.61	0.00	4.61

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OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1351	45	08/18/84	114	60	1	5.5	CH	1097.28	1134.77	4.56	0	4.56	4.41	0	4.41
1352	45	08/18/84	132	61	1	5.5	CH	1158.24	1098.80	6.91	0	6.91	7.28	0	7.28
1353	45	08/18/84	152	62	1	5.5	IP	1036.32	1201.08	4.82	0	4.82	4.16	0	4.16
1354	45	08/18/84	210	63	1	5.5	IP	1158.24	1151.17	0.86	0	0.86	0.87	0	0.87
1355	45	08/18/84	229	64	1	5.5	IP	975.36	1070.49	4.10	0	4.10	3.74	0	3.74
1356	45	08/18/84	305	66	1	5.5	IP	975.36	1030.14	1.03	0	1.03	0.97	0	0.97
1357	45	08/18/84	454	71	1	5.0	IP	1188.72	1236.01	0.84	0	0.84	0.81	0	0.81
1358	45	08/18/84	2113	74	1	5.5	CH	975.36	1162.64	2.05	0	2.05	1.72	0	1.72
1359	45	08/18/84	2133	75	1	5.5	CH	1036.32	1082.70	1.93	0	1.93	1.85	0	1.85
1360	45	08/18/84	2150	76	1	5.5	CH	1158.24	1253.31	2.59	0	2.59	2.39	0	2.39
1361	45	08/18/84	2207	77	1	5.5	CH	1097.28	1300.28	1.82	0	1.82	1.54	0	1.54
1362	45	08/18/84	2307	79	1	5.5	CH	1158.24	1159.90	2.59	0	2.59	2.59	0	2.59
1363	45	08/18/84	2325	80	1	5.5	CH	1310.64	1291.45	1.53	0	1.53	1.55	0	1.55
1364	45	08/18/84	2342	81	1	5.5	CH	1371.60	1241.79	1.46	0	1.46	1.61	0	1.61
1365	45	08/19/84	17	83	1	5.5	CH	1249.68	1257.11	2.40	0	2.40	2.39	0	2.39
1366	45	08/19/84	33	84	1	5.5	CH	1127.76	1008.48	1.77	0	1.77	1.98	0	1.98
1367	45	08/19/84	53	85	1	5.5	CH	1127.76	1142.99	3.55	0	3.55	3.50	0	3.50
1368	45	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	5.32	0	5.32	4.96	0	4.96
1369	45	08/19/84	136	87	1	5.5	CH	1127.76	1150.29	3.55	0	3.55	3.48	0	3.48
1370	45	08/19/84	156	88	1	5.5	CH	1066.80	1006.35	4.69	0	4.69	4.97	0	4.97
1371	45	08/19/84	216	89	1	5.5	CH	1127.76	1222.35	9.75	0	9.75	9.00	0	9.00
1372	45	08/19/84	301	91	1	5.5	CH	1066.80	998.28	0.94	0	0.94	1.00	0	1.00
1373	45	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	1.77	0	1.77	1.61	0	1.61
1374	45	08/19/84	2400	82	1	5.5	CH	1249.68	1183.58	1.60	0	1.60	1.69	0	1.69
1375	45	08/29/84	141	95	2	5.0	CH	1158.24	1371.31	0.86	0	0.86	0.73	0	0.73
1376	45	08/29/84	158	96	2	5.0	CH	1524.00	1578.74	0.66	0	0.66	0.63	0	0.63
1377	45	08/29/84	352	134	2	5.0	CH	1097.28	1460.94	0.91	0	0.91	0.68	0	0.68
1378	45	08/29/84	433	136	2	5.0	CH	1280.16	1366.96	0.78	0	0.78	0.73	0	0.73
1379	45	08/30/84	2129	139	2	5.0	CH	1493.52	1411.24	0.67	0	0.67	0.71	0	0.71
1380	45	08/30/84	2144	140	2	5.0	CH	1584.96	1493.06	1.26	0	1.26	1.34	0	1.34
1381	45	08/31/84	45	152	2	5.0	CH	1463.04	1518.46	0.68	0	0.68	0.66	0	0.66
1382	45	08/31/84	328	161	2	5.0	CH	1493.52	1497.99	0.67	0	0.67	0.67	0	0.67
1383	45	08/31/84	2059	277	2	5.0	TZ	1310.64	1498.47	0.76	0	0.76	0.67	0	0.67
1384	45	09/01/84	10	286	2	5.0	CH	1432.56	1567.33	0.70	0	0.70	0.64	0	0.64
1385	45	09/01/84	149	293	2	5.0	CH	1463.04	1416.40	0.68	0	0.68	0.71	0	0.71
1386	45	09/01/84	238	296	2	5.0	CH	1341.12	1464.75	0.75	0	0.75	0.68	0	0.68
1387	45	09/01/84	305	298	2	5.0	CH	1310.64	1392.79	0.76	0	0.76	0.72	0	0.72
1388	45	09/01/84	436	305	2	5.0	CH	1341.12	1403.22	0.75	0	0.75	0.71	0	0.71
1389	45	09/13/84	346	274	3	5.0	CH	1554.48	1194.40	0.64	0	0.64	0.84	0	0.84
1390	45	09/15/84	2147	463	3	5.0	CH	1219.20	1357.19	0.82	0	0.82	0.74	0	0.74
1391	45	09/25/84	143	620	4	5.0	CH	1036.32	1342.04	0.96	0	0.96	0.75	0	0.75
1392	45	09/25/84	336	625	4	5.0	CH	1097.28	1311.84	1.82	0	1.82	1.52	0	1.52
1393	45	09/25/84	2343	640	4	5.0	CH	1371.60	1386.89	0.73	0	0.73	0.72	0	0.72
1394	45	09/26/84	16	642	4	5.0	CH	1066.80	1209.14	1.87	0	1.87	1.65	0	1.65
1395	45	09/26/84	36	643	4	5.0	CH	944.88	1176.67	1.06	0	1.06	0.85	0	0.85
1396	45	09/26/84	54	644	4	5.0	CH	1127.76	1354.49	1.77	0	1.77	1.48	0	1.48
1397	45	09/26/84	147	647	4	5.0	CH	1402.08	1292.65	1.43	0	1.43	1.55	0	1.55
1398	45	09/26/84	209	648	4	5.0	CH	1127.76	1311.16	2.66	0	2.66	2.29	0	2.29
1399	45	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	1.93	0	1.93	1.76	0	1.76
1400	45	09/26/84	304	651	4	5.0	CH	975.36	1143.79	3.08	0	3.08	2.62	0	2.62
1401	45	09/26/84	402	654	4	5.0	CH	1584.96	1210.17	0.63	0	0.63	0.83	0	0.83
1402	45	09/26/84	420	655	4	5.0	CH	1371.60	992.58	0.73	0	0.73	1.01	0	1.01
1403	45	09/26/84	2223	658	4	5.0	CH	1645.92	1282.06	1.82	0	1.82	2.34	0	2.34
1404	45	09/26/84	2253	660	4	5.0	CH	1188.72	1407.46	0.84	0	0.84	0.71	0	0.71

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CODE 01)
FISH CATCH AND DENSITY DATA FOR THE 3 METER BEAM TRAWL,
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	WEEK	DURATION	REGION	TOW_AREA	VOLUME	AD_YOY	AD_YR_OL	AD_TOTAL	VD_YOY	VD_YR_OL	VD_TOTAL
1405	45	09/26/84	2308	661	4	5.0	CH	1036.32	1371.35	0.96	0.00	0.96	0.73	0.00	0.73
1406	45	09/26/84	2340	663	4	5.0	CH	1188.72	1276.83	2.52	0.00	2.52	2.35	0.00	2.35
1407	49	09/26/84	36	643	4	5.0	CH	944.88	1176.67	1.06	0.00	1.06	0.85	0.00	0.85
1408	73	09/24/84	2115	607	4	5.0	CH	1310.64	1414.62	0.00	0.76	0.76	0.00	0.71	0.71
1409	106	08/19/84	115	86	1	5.5	CH	1127.76	1210.19	0.00	0.89	0.89	0.00	0.83	0.83
1410	106	08/19/84	321	92	1	5.5	CH	1127.76	1239.09	0.00	1.77	1.77	0.00	1.61	1.61
1411	106	08/31/84	536	169	2	5.0	CH	1371.60	1536.56	0.00	0.73	0.73	0.00	0.65	0.65
1412	106	09/24/84	2345	614	4	5.0	CH	1341.12	1415.17	0.00	0.75	0.75	0.00	0.71	0.71
1413	106	09/25/84	1937	627	4	5.0	CH	1036.32	993.48	0.00	0.96	0.96	0.00	1.01	1.01
1414	106	09/26/84	248	650	4	5.0	CH	1036.32	1134.57	0.00	0.96	0.96	0.00	0.88	0.88
1415	110	09/26/84	2240	659	4	5.0	CH	1066.80	1422.94	0.94	0.00	0.94	0.70	0.00	0.70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1	30	08/16/84	2149	31	38	CH	41
2	30	08/16/84	2149	31	38	CH	46
3	30	08/16/84	2149	31	38	CH	48
4	30	08/16/84	2149	31	38	CH	50
5	30	08/16/84	2149	31	38	CH	51
6	30	08/16/84	2149	31	38	CH	52
7	30	08/16/84	2149	31	38	CH	53
8	30	08/16/84	2149	31	38	CH	53
9	30	08/16/84	2149	31	38	CH	53
10	30	08/16/84	2149	31	38	CH	56
11	30	08/16/84	2149	31	38	CH	56
12	30	08/16/84	2149	31	38	CH	57
13	30	08/16/84	2149	31	38	CH	57
14	30	08/16/84	2149	31	38	CH	58
15	30	08/16/84	2149	31	38	CH	60
16	30	08/16/84	2149	31	38	CH	60
17	30	08/16/84	2149	31	38	CH	60
18	30	08/16/84	2149	31	38	CH	60
19	30	08/16/84	2149	31	38	CH	62
20	30	08/16/84	2149	31	38	CH	62
21	30	08/16/84	2149	31	38	CH	62
22	30	08/16/84	2149	31	38	CH	63
23	30	08/16/84	2149	31	38	CH	63
24	30	08/16/84	2149	31	38	CH	64
25	30	08/16/84	2149	31	38	CH	64
26	30	08/16/84	2149	31	38	CH	64
27	30	08/16/84	2149	31	38	CH	64
28	30	08/16/84	2149	31	38	CH	64
29	30	08/16/84	2149	31	38	CH	65
30	30	08/16/84	2149	31	38	CH	65
31	30	08/16/84	2149	31	38	CH	65
32	30	08/16/84	2149	31	38	CH	66
33	30	08/16/84	2149	31	38	CH	67
34	30	08/16/84	2149	31	38	CH	67
35	30	08/16/84	2149	31	38	CH	67
36	30	08/16/84	2149	31	38	CH	70
37	30	08/16/84	2149	31	38	CH	71
38	30	08/16/84	2149	31	38	CH	71
39	30	08/16/84	2149	31	38	CH	72
40	30	08/16/84	2149	31	38	CH	78
41	30	08/16/84	2214	32	38	CH	34
42	30	08/16/84	2214	32	38	CH	38
43	30	08/16/84	2214	32	38	CH	39
44	30	08/16/84	2214	32	38	CH	44
45	30	08/16/84	2214	32	38	CH	45
46	30	08/16/84	2214	32	38	CH	50
47	30	08/16/84	2214	32	38	CH	54
48	30	08/16/84	2214	32	38	CH	55
49	30	08/16/84	2214	32	38	CH	55
50	30	08/16/84	2214	32	38	CH	57
51	30	08/16/84	2214	32	38	CH	57
52	30	08/16/84	2214	32	38	CH	58
53	30	08/16/84	2214	32	38	CH	59

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
54	30	08/16/84	2214	32	38	CH	59
55	30	08/16/84	2214	32	38	CH	59
56	30	08/16/84	2214	32	38	CH	59
57	30	08/16/84	2214	32	38	CH	60
58	30	08/16/84	2214	32	38	CH	60
59	30	08/16/84	2214	32	38	CH	60
60	30	08/16/84	2214	32	38	CH	61
61	30	08/16/84	2214	32	38	CH	61
62	30	08/16/84	2214	32	38	CH	63
63	30	08/16/84	2214	32	38	CH	64
64	30	08/16/84	2214	32	38	CH	65
65	30	08/16/84	2214	32	38	CH	65
66	30	08/16/84	2214	32	38	CH	65
67	30	08/16/84	2214	32	38	CH	66
68	30	08/16/84	2214	32	38	CH	66
69	30	08/16/84	2214	32	38	CH	67
70	30	08/16/84	2214	32	38	CH	67
71	30	08/16/84	2214	32	38	CH	68
72	30	08/16/84	2214	32	38	CH	68
73	30	08/16/84	2214	32	38	CH	68
74	30	08/16/84	2214	32	38	CH	69
75	30	08/16/84	2214	32	38	CH	69
76	30	08/16/84	2214	32	38	CH	70
77	30	08/16/84	2214	32	38	CH	71
78	30	08/16/84	2214	32	38	CH	71
79	30	08/16/84	2214	32	38	CH	71
80	30	08/16/84	2214	32	38	CH	72
81	30	08/16/84	2214	32	38	CH	73
82	30	08/16/84	2214	32	38	CH	73
83	30	08/16/84	2214	32	38	CH	74
84	30	08/16/84	2214	32	38	CH	81
85	30	08/16/84	2251	34	38	CH	34
86	30	08/16/84	2251	34	38	CH	38
87	30	08/16/84	2251	34	38	CH	46
88	30	08/16/84	2251	34	38	CH	48
89	30	08/16/84	2251	34	38	CH	49
90	30	08/16/84	2251	34	38	CH	50
91	30	08/16/84	2251	34	38	CH	50
92	30	08/16/84	2251	34	38	CH	50
93	30	08/16/84	2251	34	38	CH	51
94	30	08/16/84	2251	34	38	CH	52
95	30	08/16/84	2251	34	38	CH	53
96	30	08/16/84	2251	34	38	CH	53
97	30	08/16/84	2251	34	38	CH	53
98	30	08/16/84	2251	34	38	CH	54
99	30	08/16/84	2251	34	38	CH	55
100	30	08/16/84	2251	34	38	CH	55
101	30	08/16/84	2251	34	38	CH	55
102	30	08/16/84	2251	34	38	CH	55
103	30	08/16/84	2251	34	38	CH	56
104	30	08/16/84	2251	34	38	CH	58
105	30	08/16/84	2251	34	38	CH	58
106	30	08/16/84	2251	34	38	CH	59

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
107	30	08/16/84	2251	34	38	CH	59
108	30	08/16/84	2251	34	38	CH	60
109	30	08/16/84	2251	34	38	CH	60
110	30	08/16/84	2251	34	38	CH	60
111	30	08/16/84	2251	34	38	CH	61
112	30	08/16/84	2251	34	38	CH	61
113	30	08/16/84	2251	34	38	CH	62
114	30	08/16/84	2251	34	38	CH	62
115	30	08/16/84	2251	34	38	CH	63
116	30	08/16/84	2251	34	38	CH	63
117	30	08/16/84	2251	34	38	CH	63
118	30	08/16/84	2251	34	38	CH	64
119	30	08/16/84	2251	34	38	CH	64
120	30	08/16/84	2251	34	38	CH	65
121	30	08/16/84	2251	34	38	CH	66
122	30	08/16/84	2251	34	38	CH	66
123	30	08/16/84	2251	34	38	CH	66
124	30	08/16/84	2251	34	38	CH	66
125	30	08/16/84	2251	34	38	CH	66
126	30	08/16/84	2251	34	38	CH	67
127	30	08/16/84	2251	34	38	CH	67
128	30	08/16/84	2251	34	38	CH	67
129	30	08/16/84	2251	34	38	CH	67
130	30	08/16/84	2251	34	38	CH	68
131	30	08/16/84	2251	34	38	CH	69
132	30	08/16/84	2251	34	38	CH	69
133	30	08/16/84	2251	34	38	CH	71
134	30	08/16/84	2251	34	38	CH	72
135	30	08/16/84	2251	34	38	CH	72
136	30	08/16/84	2251	34	38	CH	73
137	30	08/16/84	2251	34	38	CH	74
138	30	08/16/84	2251	34	38	CH	81
139	30	08/16/84	2312	35	38	CH	40
140	30	08/16/84	2312	35	38	CH	42
141	30	08/16/84	2312	35	38	CH	46
142	30	08/16/84	2312	35	38	CH	48
143	30	08/16/84	2312	35	38	CH	51
144	30	08/16/84	2312	35	38	CH	52
145	30	08/16/84	2312	35	38	CH	52
146	30	08/16/84	2312	35	38	CH	53
147	30	08/16/84	2312	35	38	CH	54
148	30	08/16/84	2312	35	38	CH	55
149	30	08/16/84	2312	35	38	CH	56
150	30	08/16/84	2312	35	38	CH	56
151	30	08/16/84	2312	35	38	CH	56
152	30	08/16/84	2312	35	38	CH	56
153	30	08/16/84	2312	35	38	CH	57
154	30	08/16/84	2312	35	38	CH	57
155	30	08/16/84	2312	35	38	CH	57
156	30	08/16/84	2312	35	38	CH	58
157	30	08/16/84	2312	35	38	CH	61
158	30	08/16/84	2312	35	38	CH	61
159	30	08/16/84	2312	35	38	CH	63

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
160	30	08/16/84	2312	35	38	CH	63
161	30	08/16/84	2312	35	38	CH	63
162	30	08/16/84	2312	35	38	CH	63
163	30	08/16/84	2312	35	38	CH	64
164	30	08/16/84	2312	35	38	CH	65
165	30	08/16/84	2312	35	38	CH	65
166	30	08/16/84	2312	35	38	CH	67
167	30	08/16/84	2312	35	38	CH	67
168	30	08/16/84	2312	35	38	CH	67
169	30	08/16/84	2312	35	38	CH	67
170	30	08/16/84	2312	35	38	CH	68
171	30	08/16/84	2312	35	38	CH	68
172	30	08/16/84	2312	35	38	CH	68
173	30	08/16/84	2312	35	38	CH	72
174	30	08/16/84	2312	35	38	CH	73
175	30	08/16/84	2312	35	38	CH	73
176	30	08/16/84	2312	35	38	CH	74
177	30	08/16/84	2312	35	38	CH	76
178	30	08/16/84	2312	35	38	CH	78
179	30	08/16/84	2312	35	38	CH	86
180	30	08/16/84	2312	35	38	CH	105
181	30	08/16/84	2334	36	38	CH	45
182	30	08/16/84	2334	36	38	CH	52
183	30	08/16/84	2334	36	38	CH	55
184	30	08/16/84	2334	36	38	CH	59
185	30	08/16/84	2334	36	38	CH	61
186	30	08/16/84	2334	36	38	CH	61
187	30	08/16/84	2334	36	38	CH	63
188	30	08/16/84	2334	36	38	CH	64
189	30	08/16/84	2334	36	38	CH	65
190	30	08/16/84	2334	36	38	CH	69
191	30	08/16/84	2334	36	38	CH	70
192	30	08/16/84	2334	36	38	CH	71
193	30	08/16/84	2334	36	38	CH	80
194	30	08/16/84	2352	37	38	CH	42
195	30	08/16/84	2352	37	38	CH	50
196	30	08/16/84	2352	37	38	CH	58
197	30	08/16/84	2352	37	38	CH	60
198	30	08/16/84	2352	37	38	CH	60
199	30	08/16/84	2352	37	38	CH	62
200	30	08/16/84	2352	37	38	CH	63
201	30	08/16/84	2352	37	38	CH	65
202	30	08/16/84	2352	37	38	CH	68
203	30	08/16/84	2352	37	38	CH	69
204	30	08/16/84	2352	37	38	CH	72
205	30	08/16/84	2352	37	38	CH	76
206	30	08/17/84	35	39	37	CH	51
207	30	08/17/84	35	39	37	CH	52
208	30	08/17/84	35	39	37	CH	55
209	30	08/17/84	35	39	37	CH	73
210	30	08/17/84	51	40	38	CH	50
211	30	08/17/84	51	40	38	CH	57
212	30	08/17/84	51	40	38	CH	60

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
213	30	08/17/84	51	40	38	CH	61
214	30	08/17/84	51	40	38	CH	63
215	30	08/17/84	51	40	38	CH	63
216	30	08/17/84	51	40	38	CH	63
217	30	08/17/84	51	40	38	CH	65
218	30	08/17/84	51	40	38	CH	67
219	30	08/17/84	51	40	38	CH	71
220	30	08/17/84	51	40	38	CH	71
221	30	08/17/84	51	40	38	CH	73
222	30	08/17/84	51	40	38	CH	75
223	30	08/17/84	51	40	38	CH	109
224	30	08/17/84	112	41	38	CH	50
225	30	08/17/84	112	41	38	CH	52
226	30	08/17/84	112	41	38	CH	57
227	30	08/17/84	112	41	38	CH	59
228	30	08/17/84	112	41	38	CH	63
229	30	08/17/84	112	41	38	CH	66
230	30	08/17/84	112	41	38	CH	66
231	30	08/17/84	112	41	38	CH	67
232	30	08/17/84	112	41	38	CH	68
233	30	08/17/84	112	41	38	CH	70
234	30	08/17/84	112	41	38	CH	71
235	30	08/17/84	112	41	38	CH	72
236	30	08/17/84	135	42	38	CH	47
237	30	08/17/84	135	42	38	CH	48
238	30	08/17/84	135	42	38	CH	50
239	30	08/17/84	135	42	38	CH	51
240	30	08/17/84	135	42	38	CH	51
241	30	08/17/84	135	42	38	CH	52
242	30	08/17/84	135	42	38	CH	56
243	30	08/17/84	135	42	38	CH	63
244	30	08/17/84	135	42	38	CH	64
245	30	08/17/84	135	42	38	CH	66
246	30	08/17/84	135	42	38	CH	67
247	30	08/17/84	135	42	38	CH	69
248	30	08/17/84	135	42	38	CH	70
249	30	08/17/84	135	42	38	CH	70
250	30	08/17/84	135	42	38	CH	74
251	30	08/17/84	135	42	38	CH	74
252	30	08/17/84	201	43	38	CH	37
253	30	08/17/84	201	43	38	CH	44
254	30	08/17/84	201	43	38	CH	47
255	30	08/17/84	201	43	38	CH	47
256	30	08/17/84	201	43	38	CH	49
257	30	08/17/84	201	43	38	CH	49
258	30	08/17/84	201	43	38	CH	51
259	30	08/17/84	201	43	38	CH	53
260	30	08/17/84	201	43	38	CH	53
261	30	08/17/84	201	43	38	CH	55
262	30	08/17/84	201	43	38	CH	56
263	30	08/17/84	201	43	38	CH	56
264	30	08/17/84	201	43	38	CH	58
265	30	08/17/84	201	43	38	CH	58

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
266	30	08/17/84	201	43	38	CH	59
267	30	08/17/84	201	43	38	CH	59
268	30	08/17/84	201	43	38	CH	61
269	30	08/17/84	201	43	38	CH	61
270	30	08/17/84	201	43	38	CH	62
271	30	08/17/84	201	43	38	CH	62
272	30	08/17/84	201	43	38	CH	63
273	30	08/17/84	201	43	38	CH	65
274	30	08/17/84	201	43	38	CH	65
275	30	08/17/84	201	43	38	CH	66
276	30	08/17/84	201	43	38	CH	66
277	30	08/17/84	201	43	38	CH	67
278	30	08/17/84	201	43	38	CH	67
279	30	08/17/84	201	43	38	CH	67
280	30	08/17/84	201	43	38	CH	67
281	30	08/17/84	201	43	38	CH	68
282	30	08/17/84	201	43	38	CH	69
283	30	08/17/84	201	43	38	CH	69
284	30	08/17/84	201	43	38	CH	70
285	30	08/17/84	201	43	38	CH	70
286	30	08/17/84	201	43	38	CH	72
287	30	08/17/84	201	43	38	CH	76
288	30	08/17/84	226	44	38	CH	44
289	30	08/17/84	226	44	38	CH	51
290	30	08/17/84	226	44	38	CH	51
291	30	08/17/84	226	44	38	CH	53
292	30	08/17/84	226	44	38	CH	54
293	30	08/17/84	226	44	38	CH	54
294	30	08/17/84	226	44	38	CH	55
295	30	08/17/84	226	44	38	CH	55
296	30	08/17/84	226	44	38	CH	56
297	30	08/17/84	226	44	38	CH	56
298	30	08/17/84	226	44	38	CH	56
299	30	08/17/84	226	44	38	CH	58
300	30	08/17/84	226	44	38	CH	58
301	30	08/17/84	226	44	38	CH	58
302	30	08/17/84	226	44	38	CH	59
303	30	08/17/84	226	44	38	CH	60
304	30	08/17/84	226	44	38	CH	60
305	30	08/17/84	226	44	38	CH	61
306	30	08/17/84	226	44	38	CH	61
307	30	08/17/84	226	44	38	CH	62
308	30	08/17/84	226	44	38	CH	62
309	30	08/17/84	226	44	38	CH	63
310	30	08/17/84	226	44	38	CH	64
311	30	08/17/84	226	44	38	CH	64
312	30	08/17/84	226	44	38	CH	64
313	30	08/17/84	226	44	38	CH	64
314	30	08/17/84	226	44	38	CH	64
315	30	08/17/84	226	44	38	CH	64
316	30	08/17/84	226	44	38	CH	66
317	30	08/17/84	226	44	38	CH	66
318	30	08/17/84	226	44	38	CH	68

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
319	30	08/17/84	226	44	38	CH	69
320	30	08/17/84	226	44	38	CH	71
321	30	08/17/84	226	44	38	CH	73
322	30	08/17/84	226	44	38	CH	77
323	30	08/17/84	226	44	38	CH	77
324	30	08/17/84	226	44	38	CH	79
325	30	08/17/84	226	44	38	CH	79
326	30	08/17/84	248	45	38	CH	40
327	30	08/17/84	248	45	38	CH	44
328	30	08/17/84	248	45	38	CH	50
329	30	08/17/84	248	45	38	CH	52
330	30	08/17/84	248	45	38	CH	52
331	30	08/17/84	248	45	38	CH	54
332	30	08/17/84	248	45	38	CH	55
333	30	08/17/84	248	45	38	CH	56
334	30	08/17/84	248	45	38	CH	56
335	30	08/17/84	248	45	38	CH	56
336	30	08/17/84	248	45	38	CH	57
337	30	08/17/84	248	45	38	CH	57
338	30	08/17/84	248	45	38	CH	58
339	30	08/17/84	248	45	38	CH	60
340	30	08/17/84	248	45	38	CH	61
341	30	08/17/84	248	45	38	CH	61
342	30	08/17/84	248	45	38	CH	61
343	30	08/17/84	248	45	38	CH	63
344	30	08/17/84	248	45	38	CH	64
345	30	08/17/84	248	45	38	CH	65
346	30	08/17/84	248	45	38	CH	66
347	30	08/17/84	248	45	38	CH	66
348	30	08/17/84	248	45	38	CH	68
349	30	08/17/84	248	45	38	CH	68
350	30	08/17/84	248	45	38	CH	68
351	30	08/17/84	248	45	38	CH	69
352	30	08/17/84	248	45	38	CH	70
353	30	08/17/84	248	45	38	CH	71
354	30	08/17/84	248	45	38	CH	71
355	30	08/17/84	248	45	38	CH	73
356	30	08/17/84	248	45	38	CH	73
357	30	08/17/84	248	45	38	CH	77
358	30	08/17/84	248	45	38	CH	77
359	30	08/17/84	248	45	38	CH	79
360	30	08/17/84	248	45	38	CH	80
361	30	08/17/84	316	46	38	CH	47
362	30	08/17/84	316	46	38	CH	50
363	30	08/17/84	316	46	38	CH	51
364	30	08/17/84	316	46	38	CH	54
365	30	08/17/84	316	46	38	CH	55
366	30	08/17/84	316	46	38	CH	57
367	30	08/17/84	316	46	38	CH	59
368	30	08/17/84	316	46	38	CH	60
369	30	08/17/84	316	46	38	CH	60
370	30	08/17/84	316	46	38	CH	61
371	30	08/17/84	316	46	38	CH	61

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
372	30	08/17/84	316	46	38	CH	61
373	30	08/17/84	316	46	38	CH	62
374	30	08/17/84	316	46	38	CH	62
375	30	08/17/84	316	46	38	CH	63
376	30	08/17/84	316	46	38	CH	64
377	30	08/17/84	316	46	38	CH	65
378	30	08/17/84	316	46	38	CH	65
379	30	08/17/84	316	46	38	CH	65
380	30	08/17/84	316	46	38	CH	65
381	30	08/17/84	316	46	38	CH	66
382	30	08/17/84	316	46	38	CH	66
383	30	08/17/84	316	46	38	CH	66
384	30	08/17/84	316	46	38	CH	67
385	30	08/17/84	316	46	38	CH	67
386	30	08/17/84	316	46	38	CH	68
387	30	08/17/84	316	46	38	CH	69
388	30	08/17/84	316	46	38	CH	69
389	30	08/17/84	316	46	38	CH	69
390	30	08/17/84	316	46	38	CH	69
391	30	08/17/84	316	46	38	CH	70
392	30	08/17/84	316	46	38	CH	71
393	30	08/17/84	316	46	38	CH	74
394	30	08/17/84	316	46	38	CH	74
395	30	08/17/84	316	46	38	CH	75
396	30	08/17/84	316	46	38	CH	75
397	30	08/17/84	316	46	38	CH	78
398	30	08/17/84	316	46	38	CH	107
399	30	08/17/84	334	47	38	CH	52
400	30	08/17/84	334	47	38	CH	54
401	30	08/17/84	334	47	38	CH	59
402	30	08/17/84	334	47	38	CH	60
403	30	08/17/84	334	47	38	CH	61
404	30	08/17/84	334	47	38	CH	63
405	30	08/17/84	334	47	38	CH	63
406	30	08/17/84	334	47	38	CH	65
407	30	08/17/84	334	47	38	CH	66
408	30	08/17/84	407	48	38	CH	44
409	30	08/17/84	407	48	38	CH	45
410	30	08/17/84	407	48	38	CH	48
411	30	08/17/84	407	48	38	CH	50
412	30	08/17/84	407	48	38	CH	51
413	30	08/17/84	407	48	38	CH	55
414	30	08/17/84	407	48	38	CH	57
415	30	08/17/84	407	48	38	CH	58
416	30	08/17/84	407	48	38	CH	59
417	30	08/17/84	407	48	38	CH	60
418	30	08/17/84	407	48	38	CH	60
419	30	08/17/84	407	48	38	CH	60
420	30	08/17/84	407	48	38	CH	60
421	30	08/17/84	407	48	38	CH	60
422	30	08/17/84	407	48	38	CH	60
423	30	08/17/84	407	48	38	CH	62
424	30	08/17/84	407	48	38	CH	64

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
425	30	08/17/84	407	48	38	CH	65
426	30	08/17/84	407	48	38	CH	66
427	30	08/17/84	407	48	38	CH	66
428	30	08/17/84	407	48	38	CH	66
429	30	08/17/84	407	48	38	CH	68
430	30	08/17/84	407	48	38	CH	69
431	30	08/17/84	407	48	38	CH	71
432	30	08/17/84	407	48	38	CH	72
433	30	08/17/84	407	48	38	CH	72
434	30	08/17/84	407	48	38	CH	75
435	30	08/17/84	407	48	38	CH	78
436	30	08/17/84	428	49	38	CH	36
437	30	08/17/84	428	49	38	CH	43
438	30	08/17/84	428	49	38	CH	49
439	30	08/17/84	428	49	38	CH	51
440	30	08/17/84	428	49	38	CH	52
441	30	08/17/84	428	49	38	CH	53
442	30	08/17/84	428	49	38	CH	56
443	30	08/17/84	428	49	38	CH	56
444	30	08/17/84	428	49	38	CH	57
445	30	08/17/84	428	49	38	CH	58
446	30	08/17/84	428	49	38	CH	59
447	30	08/17/84	428	49	38	CH	59
448	30	08/17/84	428	49	38	CH	60
449	30	08/17/84	428	49	38	CH	60
450	30	08/17/84	428	49	38	CH	61
451	30	08/17/84	428	49	38	CH	62
452	30	08/17/84	428	49	38	CH	62
453	30	08/17/84	428	49	38	CH	62
454	30	08/17/84	428	49	38	CH	66
455	30	08/17/84	428	49	38	CH	66
456	30	08/17/84	428	49	38	CH	67
457	30	08/17/84	428	49	38	CH	69
458	30	08/17/84	428	49	38	CH	69
459	30	08/17/84	428	49	38	CH	71
460	30	08/17/84	428	49	38	CH	72
461	30	08/17/84	447	50	38	CH	37
462	30	08/17/84	447	50	38	CH	42
463	30	08/17/84	447	50	38	CH	45
464	30	08/17/84	447	50	38	CH	45
465	30	08/17/84	447	50	38	CH	46
466	30	08/17/84	447	50	38	CH	50
467	30	08/17/84	447	50	38	CH	50
468	30	08/17/84	447	50	38	CH	52
469	30	08/17/84	447	50	38	CH	54
470	30	08/17/84	447	50	38	CH	54
471	30	08/17/84	447	50	38	CH	55
472	30	08/17/84	447	50	38	CH	57
473	30	08/17/84	447	50	38	CH	57
474	30	08/17/84	447	50	38	CH	57
475	30	08/17/84	447	50	38	CH	57
476	30	08/17/84	447	50	38	CH	57
477	30	08/17/84	447	50	38	CH	60

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
478	30	08/17/84	447	50	38	CH	60
479	30	08/17/84	447	50	38	CH	60
480	30	08/17/84	447	50	38	CH	60
481	30	08/17/84	447	50	38	CH	61
482	30	08/17/84	447	50	38	CH	61
483	30	08/17/84	447	50	38	CH	62
484	30	08/17/84	447	50	38	CH	62
485	30	08/17/84	447	50	38	CH	63
486	30	08/17/84	447	50	38	CH	63
487	30	08/17/84	447	50	38	CH	65
488	30	08/17/84	447	50	38	CH	68
489	30	08/17/84	447	50	38	CH	68
490	30	08/17/84	447	50	38	CH	71
491	30	08/17/84	447	50	38	CH	71
492	30	08/17/84	447	50	38	CH	74
493	30	08/17/84	447	50	38	CH	75
494	30	08/17/84	447	50	38	CH	76
495	30	08/17/84	2131	51	38	CH	45
496	30	08/17/84	2131	51	38	CH	49
497	30	08/17/84	2131	51	38	CH	50
498	30	08/17/84	2131	51	38	CH	53
499	30	08/17/84	2131	51	38	CH	54
500	30	08/17/84	2131	51	38	CH	55
501	30	08/17/84	2131	51	38	CH	55
502	30	08/17/84	2131	51	38	CH	55
503	30	08/17/84	2131	51	38	CH	56
504	30	08/17/84	2131	51	38	CH	60
505	30	08/17/84	2131	51	38	CH	60
506	30	08/17/84	2131	51	38	CH	61
507	30	08/17/84	2131	51	38	CH	62
508	30	08/17/84	2131	51	38	CH	63
509	30	08/17/84	2131	51	38	CH	63
510	30	08/17/84	2131	51	38	CH	64
511	30	08/17/84	2131	51	38	CH	64
512	30	08/17/84	2131	51	38	CH	64
513	30	08/17/84	2131	51	38	CH	65
514	30	08/17/84	2131	51	38	CH	65
515	30	08/17/84	2131	51	38	CH	66
516	30	08/17/84	2131	51	38	CH	67
517	30	08/17/84	2131	51	38	CH	68
518	30	08/17/84	2131	51	38	CH	69
519	30	08/17/84	2131	51	38	CH	71
520	30	08/17/84	2131	51	38	CH	73
521	30	08/17/84	2131	51	38	CH	80
522	30	08/17/84	2131	51	38	CH	109
523	30	08/17/84	2210	53	38	CH	42
524	30	08/17/84	2210	53	38	CH	46
525	30	08/17/84	2210	53	38	CH	46
526	30	08/17/84	2210	53	38	CH	48
527	30	08/17/84	2210	53	38	CH	48
528	30	08/17/84	2210	53	38	CH	51
529	30	08/17/84	2210	53	38	CH	51
530	30	08/17/84	2210	53	38	CH	51

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
531	30	08/17/84	2210	53	38	CH	53
532	30	08/17/84	2210	53	38	CH	54
533	30	08/17/84	2210	53	38	CH	54
534	30	08/17/84	2210	53	38	CH	56
535	30	08/17/84	2210	53	38	CH	59
536	30	08/17/84	2210	53	38	CH	60
537	30	08/17/84	2210	53	38	CH	60
538	30	08/17/84	2210	53	38	CH	60
539	30	08/17/84	2210	53	38	CH	61
540	30	08/17/84	2210	53	38	CH	62
541	30	08/17/84	2210	53	38	CH	62
542	30	08/17/84	2210	53	38	CH	63
543	30	08/17/84	2210	53	38	CH	63
544	30	08/17/84	2210	53	38	CH	64
545	30	08/17/84	2210	53	38	CH	64
546	30	08/17/84	2210	53	38	CH	64
547	30	08/17/84	2210	53	38	CH	64
548	30	08/17/84	2210	53	38	CH	65
549	30	08/17/84	2210	53	38	CH	65
550	30	08/17/84	2210	53	38	CH	65
551	30	08/17/84	2210	53	38	CH	66
552	30	08/17/84	2210	53	38	CH	66
553	30	08/17/84	2210	53	38	CH	66
554	30	08/17/84	2210	53	38	CH	67
555	30	08/17/84	2210	53	38	CH	69
556	30	08/17/84	2210	53	38	CH	70
557	30	08/17/84	2210	53	38	CH	70
558	30	08/17/84	2210	53	38	CH	70
559	30	08/17/84	2210	53	38	CH	71
560	30	08/17/84	2210	53	38	CH	71
561	30	08/17/84	2210	53	38	CH	72
562	30	08/17/84	2210	53	38	CH	72
563	30	08/17/84	2210	53	38	CH	72
564	30	08/17/84	2210	53	38	CH	72
565	30	08/17/84	2210	53	38	CH	73
566	30	08/17/84	2210	53	38	CH	73
567	30	08/17/84	2210	53	38	CH	73
568	30	08/17/84	2210	53	38	CH	74
569	30	08/17/84	2210	53	38	CH	74
570	30	08/17/84	2210	53	38	CH	75
571	30	08/17/84	2210	53	38	CH	76
572	30	08/17/84	2210	53	38	CH	76
573	30	08/17/84	2210	53	38	CH	77
574	30	08/17/84	2210	53	38	CH	80
575	30	08/17/84	2210	53	38	CH	81
576	30	08/17/84	2229	54	38	CH	40
577	30	08/17/84	2229	54	38	CH	45
578	30	08/17/84	2229	54	38	CH	47
579	30	08/17/84	2229	54	38	CH	52
580	30	08/17/84	2229	54	38	CH	53
581	30	08/17/84	2229	54	38	CH	53
582	30	08/17/84	2229	54	38	CH	54
583	30	08/17/84	2229	54	38	CH	54

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
584	30	08/17/84	2229	54	38	CH	55
585	30	08/17/84	2229	54	38	CH	56
586	30	08/17/84	2229	54	38	CH	56
587	30	08/17/84	2229	54	38	CH	58
588	30	08/17/84	2229	54	38	CH	59
589	30	08/17/84	2229	54	38	CH	59
590	30	08/17/84	2229	54	38	CH	60
591	30	08/17/84	2229	54	38	CH	61
592	30	08/17/84	2229	54	38	CH	61
593	30	08/17/84	2229	54	38	CH	63
594	30	08/17/84	2229	54	38	CH	64
595	30	08/17/84	2229	54	38	CH	65
596	30	08/17/84	2229	54	38	CH	65
597	30	08/17/84	2229	54	38	CH	65
598	30	08/17/84	2229	54	38	CH	66
599	30	08/17/84	2229	54	38	CH	66
600	30	08/17/84	2229	54	38	CH	67
601	30	08/17/84	2229	54	38	CH	67
602	30	08/17/84	2229	54	38	CH	68
603	30	08/17/84	2229	54	38	CH	68
604	30	08/17/84	2229	54	38	CH	68
605	30	08/17/84	2229	54	38	CH	69
606	30	08/17/84	2229	54	38	CH	70
607	30	08/17/84	2229	54	38	CH	70
608	30	08/17/84	2229	54	38	CH	71
609	30	08/17/84	2229	54	38	CH	72
610	30	08/17/84	2229	54	38	CH	72
611	30	08/17/84	2229	54	38	CH	77
612	30	08/17/84	2229	54	38	CH	77
613	30	08/17/84	2312	55	38	CH	42
614	30	08/17/84	2312	55	38	CH	49
615	30	08/17/84	2312	55	38	CH	51
616	30	08/17/84	2312	55	38	CH	53
617	30	08/17/84	2312	55	38	CH	56
618	30	08/17/84	2312	55	38	CH	56
619	30	08/17/84	2312	55	38	CH	59
620	30	08/17/84	2312	55	38	CH	60
621	30	08/17/84	2312	55	38	CH	62
622	30	08/17/84	2312	55	38	CH	64
623	30	08/17/84	2312	55	38	CH	65
624	30	08/17/84	2312	55	38	CH	65
625	30	08/17/84	2312	55	38	CH	65
626	30	08/17/84	2312	55	38	CH	66
627	30	08/17/84	2312	55	38	CH	67
628	30	08/17/84	2312	55	38	CH	68
629	30	08/17/84	2312	55	38	CH	68
630	30	08/17/84	2312	55	38	CH	68
631	30	08/17/84	2312	55	38	CH	69
632	30	08/17/84	2312	55	38	CH	69
633	30	08/17/84	2312	55	38	CH	70
634	30	08/17/84	2312	55	38	CH	71
635	30	08/17/84	2312	55	38	CH	74
636	30	08/17/84	2312	55	38	CH	76

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
637	30	08/18/84	15	57	38	CH	45
638	30	08/18/84	15	57	38	CH	51
639	30	08/18/84	15	57	38	CH	54
640	30	08/18/84	15	57	38	CH	55
641	30	08/18/84	15	57	38	CH	56
642	30	08/18/84	15	57	38	CH	57
643	30	08/18/84	15	57	38	CH	59
644	30	08/18/84	15	57	38	CH	60
645	30	08/18/84	15	57	38	CH	61
646	30	08/18/84	15	57	38	CH	62
647	30	08/18/84	15	57	38	CH	63
648	30	08/18/84	15	57	38	CH	63
649	30	08/18/84	15	57	38	CH	65
650	30	08/18/84	15	57	38	CH	65
651	30	08/18/84	15	57	38	CH	65
652	30	08/18/84	15	57	38	CH	66
653	30	08/18/84	15	57	38	CH	66
654	30	08/18/84	15	57	38	CH	67
655	30	08/18/84	15	57	38	CH	67
656	30	08/18/84	15	57	38	CH	68
657	30	08/18/84	15	57	38	CH	68
658	30	08/18/84	15	57	38	CH	68
659	30	08/18/84	15	57	38	CH	68
660	30	08/18/84	15	57	38	CH	69
661	30	08/18/84	15	57	38	CH	69
662	30	08/18/84	15	57	38	CH	70
663	30	08/18/84	15	57	38	CH	71
664	30	08/18/84	15	57	38	CH	72
665	30	08/18/84	15	57	38	CH	74
666	30	08/18/84	15	57	38	CH	78
667	30	08/18/84	38	58	38	CH	40
668	30	08/18/84	38	58	38	CH	57
669	30	08/18/84	38	58	38	CH	57
670	30	08/18/84	38	58	38	CH	58
671	30	08/18/84	38	58	38	CH	58
672	30	08/18/84	38	58	38	CH	61
673	30	08/18/84	38	58	38	CH	61
674	30	08/18/84	38	58	38	CH	61
675	30	08/18/84	38	58	38	CH	62
676	30	08/18/84	38	58	38	CH	62
677	30	08/18/84	38	58	38	CH	65
678	30	08/18/84	38	58	38	CH	65
679	30	08/18/84	38	58	38	CH	66
680	30	08/18/84	38	58	38	CH	67
681	30	08/18/84	38	58	38	CH	67
682	30	08/18/84	38	58	38	CH	68
683	30	08/18/84	38	58	38	CH	71
684	30	08/18/84	38	58	38	CH	72
685	30	08/18/84	38	58	38	CH	72
686	30	08/18/84	38	58	38	CH	73
687	30	08/18/84	38	58	38	CH	75
688	30	08/18/84	38	58	38	CH	76
689	30	08/18/84	38	58	38	CH	76

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
690	30	08/18/84	38	58	38	CH	76
691	30	08/18/84	38	58	38	CH	76
692	30	08/18/84	38	58	38	CH	77
693	30	08/18/84	38	58	38	CH	84
694	30	08/18/84	114	60	38	CH	64
695	30	08/18/84	114	60	38	CH	65
696	30	08/18/84	114	60	38	CH	67
697	30	08/18/84	114	60	38	CH	68
698	30	08/18/84	114	60	38	CH	70
699	30	08/18/84	114	60	38	CH	71
700	30	08/18/84	132	61	38	CH	44
701	30	08/18/84	132	61	38	CH	44
702	30	08/18/84	132	61	38	CH	50
703	30	08/18/84	132	61	38	CH	50
704	30	08/18/84	132	61	38	CH	51
705	30	08/18/84	132	61	38	CH	51
706	30	08/18/84	132	61	38	CH	53
707	30	08/18/84	132	61	38	CH	54
708	30	08/18/84	132	61	38	CH	54
709	30	08/18/84	132	61	38	CH	57
710	30	08/18/84	132	61	38	CH	59
711	30	08/18/84	132	61	38	CH	59
712	30	08/18/84	132	61	38	CH	59
713	30	08/18/84	132	61	38	CH	61
714	30	08/18/84	132	61	38	CH	61
715	30	08/18/84	132	61	38	CH	62
716	30	08/18/84	132	61	38	CH	63
717	30	08/18/84	132	61	38	CH	65
718	30	08/18/84	132	61	38	CH	66
719	30	08/18/84	132	61	38	CH	67
720	30	08/18/84	132	61	38	CH	67
721	30	08/18/84	132	61	38	CH	67
722	30	08/18/84	132	61	38	CH	67
723	30	08/18/84	132	61	38	CH	68
724	30	08/18/84	132	61	38	CH	69
725	30	08/18/84	132	61	38	CH	69
726	30	08/18/84	132	61	38	CH	70
727	30	08/18/84	132	61	38	CH	71
728	30	08/18/84	132	61	38	CH	71
729	30	08/18/84	132	61	38	CH	72
730	30	08/18/84	132	61	38	CH	72
731	30	08/18/84	132	61	38	CH	74
732	30	08/18/84	132	61	38	CH	74
733	30	08/18/84	132	61	38	CH	76
734	30	08/18/84	132	61	38	CH	76
735	30	08/18/84	132	61	38	CH	78
736	30	08/18/84	152	62	39	IP	40
737	30	08/18/84	152	62	39	IP	46
738	30	08/18/84	152	62	39	IP	48
739	30	08/18/84	152	62	39	IP	49
740	30	08/18/84	152	62	39	IP	50
741	30	08/18/84	152	62	39	IP	53
742	30	08/18/84	152	62	39	IP	59

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
743	30	08/18/84	152	62	39	IP	59
744	30	08/18/84	152	62	39	IP	60
745	30	08/18/84	152	62	39	IP	60
746	30	08/18/84	152	62	39	IP	60
747	30	08/18/84	152	62	39	IP	60
748	30	08/18/84	152	62	39	IP	61
749	30	08/18/84	152	62	39	IP	61
750	30	08/18/84	152	62	39	IP	61
751	30	08/18/84	152	62	39	IP	61
752	30	08/18/84	152	62	39	IP	63
753	30	08/18/84	152	62	39	IP	63
754	30	08/18/84	152	62	39	IP	63
755	30	08/18/84	152	62	39	IP	65
756	30	08/18/84	152	62	39	IP	65
757	30	08/18/84	152	62	39	IP	65
758	30	08/18/84	152	62	39	IP	66
759	30	08/18/84	152	62	39	IP	66
760	30	08/18/84	152	62	39	IP	67
761	30	08/18/84	152	62	39	IP	67
762	30	08/18/84	152	62	39	IP	68
763	30	08/18/84	152	62	39	IP	68
764	30	08/18/84	152	62	39	IP	69
765	30	08/18/84	152	62	39	IP	69
766	30	08/18/84	152	62	39	IP	69
767	30	08/18/84	152	62	39	IP	72
768	30	08/18/84	152	62	39	IP	72
769	30	08/18/84	152	62	39	IP	74
770	30	08/18/84	152	62	39	IP	74
771	30	08/18/84	152	62	39	IP	74
772	30	08/18/84	210	63	39	IP	45
773	30	08/18/84	210	63	39	IP	47
774	30	08/18/84	210	63	39	IP	49
775	30	08/18/84	210	63	39	IP	51
776	30	08/18/84	210	63	39	IP	51
777	30	08/18/84	210	63	39	IP	52
778	30	08/18/84	210	63	39	IP	53
779	30	08/18/84	210	63	39	IP	54
780	30	08/18/84	210	63	39	IP	54
781	30	08/18/84	210	63	39	IP	56
782	30	08/18/84	210	63	39	IP	57
783	30	08/18/84	210	63	39	IP	57
784	30	08/18/84	210	63	39	IP	57
785	30	08/18/84	210	63	39	IP	58
786	30	08/18/84	210	63	39	IP	58
787	30	08/18/84	210	63	39	IP	58
788	30	08/18/84	210	63	39	IP	59
789	30	08/18/84	210	63	39	IP	61
790	30	08/18/84	210	63	39	IP	61
791	30	08/18/84	210	63	39	IP	62
792	30	08/18/84	210	63	39	IP	62
793	30	08/18/84	210	63	39	IP	62
794	30	08/18/84	210	63	39	IP	62
795	30	08/18/84	210	63	39	IP	62

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
796	30	08/18/84	210	63	39	IP	62
797	30	08/18/84	210	63	39	IP	63
798	30	08/18/84	210	63	39	IP	63
799	30	08/18/84	210	63	39	IP	64
800	30	08/18/84	210	63	39	IP	65
801	30	08/18/84	210	63	39	IP	65
802	30	08/18/84	210	63	39	IP	65
803	30	08/18/84	210	63	39	IP	65
804	30	08/18/84	210	63	39	IP	65
805	30	08/18/84	210	63	39	IP	67
806	30	08/18/84	210	63	39	IP	67
807	30	08/18/84	210	63	39	IP	67
808	30	08/18/84	210	63	39	IP	68
809	30	08/18/84	210	63	39	IP	69
810	30	08/18/84	210	63	39	IP	69
811	30	08/18/84	210	63	39	IP	69
812	30	08/18/84	210	63	39	IP	73
813	30	08/18/84	210	63	39	IP	75
814	30	08/18/84	210	63	39	IP	75
815	30	08/18/84	210	63	39	IP	76
816	30	08/18/84	229	64	39	IP	47
817	30	08/18/84	229	64	39	IP	49
818	30	08/18/84	229	64	39	IP	51
819	30	08/18/84	229	64	39	IP	51
820	30	08/18/84	229	64	39	IP	52
821	30	08/18/84	229	64	39	IP	53
822	30	08/18/84	229	64	39	IP	53
823	30	08/18/84	229	64	39	IP	56
824	30	08/18/84	229	64	39	IP	57
825	30	08/18/84	229	64	39	IP	57
826	30	08/18/84	229	64	39	IP	59
827	30	08/18/84	229	64	39	IP	59
828	30	08/18/84	229	64	39	IP	60
829	30	08/18/84	229	64	39	IP	62
830	30	08/18/84	229	64	39	IP	62
831	30	08/18/84	229	64	39	IP	64
832	30	08/18/84	229	64	39	IP	64
833	30	08/18/84	229	64	39	IP	64
834	30	08/18/84	229	64	39	IP	65
835	30	08/18/84	229	64	39	IP	65
836	30	08/18/84	229	64	39	IP	65
837	30	08/18/84	229	64	39	IP	65
838	30	08/18/84	229	64	39	IP	66
839	30	08/18/84	229	64	39	IP	67
840	30	08/18/84	229	64	39	IP	68
841	30	08/18/84	229	64	39	IP	68
842	30	08/18/84	229	64	39	IP	68
843	30	08/18/84	229	64	39	IP	69
844	30	08/18/84	229	64	39	IP	69
845	30	08/18/84	229	64	39	IP	70
846	30	08/18/84	229	64	39	IP	72
847	30	08/18/84	229	64	39	IP	72
848	30	08/18/84	229	64	39	IP	73

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
849	30	08/18/84	229	64	39	IP	73
850	30	08/18/84	247	65	39	IP	41
851	30	08/18/84	247	65	39	IP	46
852	30	08/18/84	247	65	39	IP	47
853	30	08/18/84	247	65	39	IP	51
854	30	08/18/84	247	65	39	IP	52
855	30	08/18/84	247	65	39	IP	52
856	30	08/18/84	247	65	39	IP	54
857	30	08/18/84	247	65	39	IP	56
858	30	08/18/84	247	65	39	IP	56
859	30	08/18/84	247	65	39	IP	57
860	30	08/18/84	247	65	39	IP	58
861	30	08/18/84	247	65	39	IP	60
862	30	08/18/84	247	65	39	IP	61
863	30	08/18/84	247	65	39	IP	61
864	30	08/18/84	247	65	39	IP	62
865	30	08/18/84	247	65	39	IP	62
866	30	08/18/84	247	65	39	IP	63
867	30	08/18/84	247	65	39	IP	63
868	30	08/18/84	247	65	39	IP	63
869	30	08/18/84	247	65	39	IP	63
870	30	08/18/84	247	65	39	IP	63
871	30	08/18/84	247	65	39	IP	64
872	30	08/18/84	247	65	39	IP	64
873	30	08/18/84	247	65	39	IP	64
874	30	08/18/84	247	65	39	IP	65
875	30	08/18/84	247	65	39	IP	65
876	30	08/18/84	247	65	39	IP	66
877	30	08/18/84	247	65	39	IP	66
878	30	08/18/84	247	65	39	IP	67
879	30	08/18/84	247	65	39	IP	68
880	30	08/18/84	247	65	39	IP	68
881	30	08/18/84	247	65	39	IP	68
882	30	08/18/84	247	65	39	IP	69
883	30	08/18/84	247	65	39	IP	69
884	30	08/18/84	247	65	39	IP	70
885	30	08/18/84	247	65	39	IP	70
886	30	08/18/84	247	65	39	IP	71
887	30	08/18/84	247	65	39	IP	72
888	30	08/18/84	247	65	39	IP	72
889	30	08/18/84	247	65	39	IP	72
890	30	08/18/84	247	65	39	IP	75
891	30	08/18/84	305	66	39	IP	44
892	30	08/18/84	305	66	39	IP	50
893	30	08/18/84	305	66	39	IP	51
894	30	08/18/84	305	66	39	IP	52
895	30	08/18/84	305	66	39	IP	57
896	30	08/18/84	305	66	39	IP	59
897	30	08/18/84	305	66	39	IP	59
898	30	08/18/84	305	66	39	IP	59
899	30	08/18/84	305	66	39	IP	61
900	30	08/18/84	305	66	39	IP	62
901	30	08/18/84	305	66	39	IP	63

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
902	30	08/18/84	305	66	39	IP	64
903	30	08/18/84	305	66	39	IP	66
904	30	08/18/84	305	66	39	IP	66
905	30	08/18/84	305	66	39	IP	67
906	30	08/18/84	305	66	39	IP	67
907	30	08/18/84	305	66	39	IP	67
908	30	08/18/84	305	66	39	IP	67
909	30	08/18/84	305	66	39	IP	67
910	30	08/18/84	323	67	38	CH	56
911	30	08/18/84	323	67	38	CH	57
912	30	08/18/84	323	67	38	CH	59
913	30	08/18/84	323	67	38	CH	59
914	30	08/18/84	323	67	38	CH	60
915	30	08/18/84	323	67	38	CH	64
916	30	08/18/84	323	67	38	CH	65
917	30	08/18/84	323	67	38	CH	66
918	30	08/18/84	323	67	38	CH	66
919	30	08/18/84	323	67	38	CH	66
920	30	08/18/84	323	67	38	CH	71
921	30	08/18/84	323	67	38	CH	73
922	30	08/18/84	412	69	38	CH	44
923	30	08/18/84	412	69	38	CH	48
924	30	08/18/84	412	69	38	CH	51
925	30	08/18/84	412	69	38	CH	52
926	30	08/18/84	412	69	38	CH	55
927	30	08/18/84	412	69	38	CH	60
928	30	08/18/84	412	69	38	CH	61
929	30	08/18/84	412	69	38	CH	61
930	30	08/18/84	412	69	38	CH	61
931	30	08/18/84	412	69	38	CH	64
932	30	08/18/84	412	69	38	CH	65
933	30	08/18/84	412	69	38	CH	66
934	30	08/18/84	412	69	38	CH	74
935	30	08/18/84	412	69	38	CH	77
936	30	08/18/84	435	70	38	CH	46
937	30	08/18/84	435	70	38	CH	50
938	30	08/18/84	435	70	38	CH	52
939	30	08/18/84	435	70	38	CH	57
940	30	08/18/84	435	70	38	CH	57
941	30	08/18/84	435	70	38	CH	63
942	30	08/18/84	435	70	38	CH	66
943	30	08/18/84	435	70	38	CH	69
944	30	08/18/84	435	70	38	CH	71
945	30	08/18/84	435	70	38	CH	71
946	30	08/18/84	435	70	38	CH	76
947	30	08/18/84	454	71	39	IP	42
948	30	08/18/84	454	71	39	IP	50
949	30	08/18/84	454	71	39	IP	50
950	30	08/18/84	454	71	39	IP	53
951	30	08/18/84	454	71	39	IP	56
952	30	08/18/84	454	71	39	IP	57
953	30	08/18/84	454	71	39	IP	58
954	30	08/18/84	454	71	39	IP	58

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
955	30	08/18/84	454	71	39	IP	59
956	30	08/18/84	454	71	39	IP	60
957	30	08/18/84	454	71	39	IP	60
958	30	08/18/84	454	71	39	IP	60
959	30	08/18/84	454	71	39	IP	61
960	30	08/18/84	454	71	39	IP	62
961	30	08/18/84	454	71	39	IP	63
962	30	08/18/84	454	71	39	IP	68
963	30	08/18/84	454	71	39	IP	70
964	30	08/18/84	454	71	39	IP	71
965	30	08/18/84	454	71	39	IP	72
966	30	08/18/84	454	71	39	IP	75
967	30	08/18/84	454	71	39	IP	76
968	30	08/18/84	2053	73	38	CH	44
969	30	08/18/84	2053	73	38	CH	47
970	30	08/18/84	2053	73	38	CH	49
971	30	08/18/84	2053	73	38	CH	49
972	30	08/18/84	2053	73	38	CH	50
973	30	08/18/84	2053	73	38	CH	51
974	30	08/18/84	2053	73	38	CH	54
975	30	08/18/84	2053	73	38	CH	56
976	30	08/18/84	2053	73	38	CH	58
977	30	08/18/84	2053	73	38	CH	58
978	30	08/18/84	2053	73	38	CH	58
979	30	08/18/84	2053	73	38	CH	59
980	30	08/18/84	2053	73	38	CH	60
981	30	08/18/84	2053	73	38	CH	60
982	30	08/18/84	2053	73	38	CH	61
983	30	08/18/84	2053	73	38	CH	61
984	30	08/18/84	2053	73	38	CH	63
985	30	08/18/84	2053	73	38	CH	64
986	30	08/18/84	2053	73	38	CH	66
987	30	08/18/84	2053	73	38	CH	66
988	30	08/18/84	2053	73	38	CH	67
989	30	08/18/84	2053	73	38	CH	67
990	30	08/18/84	2053	73	38	CH	67
991	30	08/18/84	2053	73	38	CH	67
992	30	08/18/84	2053	73	38	CH	68
993	30	08/18/84	2053	73	38	CH	68
994	30	08/18/84	2053	73	38	CH	68
995	30	08/18/84	2053	73	38	CH	69
996	30	08/18/84	2053	73	38	CH	69
997	30	08/18/84	2053	73	38	CH	70
998	30	08/18/84	2053	73	38	CH	71
999	30	08/18/84	2053	73	38	CH	72
1000	30	08/18/84	2053	73	38	CH	73
1001	30	08/18/84	2053	73	38	CH	74
1002	30	08/18/84	2053	73	38	CH	75
1003	30	08/18/84	2053	73	38	CH	75
1004	30	08/18/84	2053	73	38	CH	76
1005	30	08/18/84	2053	73	38	CH	78
1006	30	08/18/84	2053	73	38	CH	78
1007	30	08/18/84	2113	74	38	CH	37

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1008	30	08/18/84	2113	74	38	CH	45
1009	30	08/18/84	2113	74	38	CH	47
1010	30	08/18/84	2113	74	38	CH	53
1011	30	08/18/84	2113	74	38	CH	57
1012	30	08/18/84	2113	74	38	CH	58
1013	30	08/18/84	2113	74	38	CH	59
1014	30	08/18/84	2113	74	38	CH	59
1015	30	08/18/84	2113	74	38	CH	61
1016	30	08/18/84	2113	74	38	CH	61
1017	30	08/18/84	2113	74	38	CH	64
1018	30	08/18/84	2113	74	38	CH	65
1019	30	08/18/84	2113	74	38	CH	66
1020	30	08/18/84	2113	74	38	CH	66
1021	30	08/18/84	2113	74	38	CH	66
1022	30	08/18/84	2113	74	38	CH	72
1023	30	08/18/84	2113	74	38	CH	72
1024	30	08/18/84	2113	74	38	CH	73
1025	30	08/18/84	2113	74	38	CH	73
1026	30	08/18/84	2113	74	38	CH	74
1027	30	08/18/84	2113	74	38	CH	78
1028	30	08/18/84	2133	75	38	CH	48
1029	30	08/18/84	2133	75	38	CH	51
1030	30	08/18/84	2133	75	38	CH	55
1031	30	08/18/84	2133	75	38	CH	59
1032	30	08/18/84	2133	75	38	CH	59
1033	30	08/18/84	2133	75	38	CH	60
1034	30	08/18/84	2133	75	38	CH	60
1035	30	08/18/84	2133	75	38	CH	61
1036	30	08/18/84	2133	75	38	CH	61
1037	30	08/18/84	2133	75	38	CH	62
1038	30	08/18/84	2133	75	38	CH	62
1039	30	08/18/84	2133	75	38	CH	64
1040	30	08/18/84	2133	75	38	CH	64
1041	30	08/18/84	2133	75	38	CH	66
1042	30	08/18/84	2133	75	38	CH	66
1043	30	08/18/84	2133	75	38	CH	66
1044	30	08/18/84	2133	75	38	CH	67
1045	30	08/18/84	2133	75	38	CH	67
1046	30	08/18/84	2133	75	38	CH	68
1047	30	08/18/84	2133	75	38	CH	69
1048	30	08/18/84	2133	75	38	CH	70
1049	30	08/18/84	2133	75	38	CH	71
1050	30	08/18/84	2133	75	38	CH	72
1051	30	08/18/84	2133	75	38	CH	74
1052	30	08/18/84	2133	75	38	CH	81
1053	30	08/18/84	2150	76	38	CH	54
1054	30	08/18/84	2150	76	38	CH	59
1055	30	08/18/84	2150	76	38	CH	61
1056	30	08/18/84	2150	76	38	CH	62
1057	30	08/18/84	2150	76	38	CH	62
1058	30	08/18/84	2150	76	38	CH	63
1059	30	08/18/84	2150	76	38	CH	66
1060	30	08/18/84	2150	76	38	CH	67

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1061	30	08/18/84	2150	76	38	CH	67
1062	30	08/18/84	2150	76	38	CH	71
1063	30	08/18/84	2150	76	38	CH	73
1064	30	08/18/84	2150	76	38	CH	75
1065	30	08/18/84	2150	76	38	CH	75
1066	30	08/18/84	2150	76	38	CH	78
1067	30	08/18/84	2150	76	38	CH	79
1068	30	08/18/84	2207	77	38	CH	39
1069	30	08/18/84	2207	77	38	CH	51
1070	30	08/18/84	2207	77	38	CH	53
1071	30	08/18/84	2207	77	38	CH	53
1072	30	08/18/84	2207	77	38	CH	55
1073	30	08/18/84	2207	77	38	CH	57
1074	30	08/18/84	2207	77	38	CH	57
1075	30	08/18/84	2207	77	38	CH	58
1076	30	08/18/84	2207	77	38	CH	60
1077	30	08/18/84	2207	77	38	CH	61
1078	30	08/18/84	2207	77	38	CH	61
1079	30	08/18/84	2207	77	38	CH	62
1080	30	08/18/84	2207	77	38	CH	62
1081	30	08/18/84	2207	77	38	CH	62
1082	30	08/18/84	2207	77	38	CH	63
1083	30	08/18/84	2207	77	38	CH	63
1084	30	08/18/84	2207	77	38	CH	63
1085	30	08/18/84	2207	77	38	CH	65
1086	30	08/18/84	2207	77	38	CH	65
1087	30	08/18/84	2207	77	38	CH	65
1088	30	08/18/84	2207	77	38	CH	68
1089	30	08/18/84	2207	77	38	CH	70
1090	30	08/18/84	2207	77	38	CH	71
1091	30	08/18/84	2207	77	38	CH	71
1092	30	08/18/84	2207	77	38	CH	72
1093	30	08/18/84	2207	77	38	CH	73
1094	30	08/18/84	2207	77	38	CH	74
1095	30	08/18/84	2207	77	38	CH	76
1096	30	08/18/84	2207	77	38	CH	81
1097	30	08/18/84	2207	77	38	CH	86
1098	30	08/18/84	2207	77	38	CH	99
1099	30	08/18/84	2207	77	38	CH	108
1100	30	08/18/84	2207	77	38	CH	110
1101	30	08/18/84	2307	79	38	CH	47
1102	30	08/18/84	2307	79	38	CH	51
1103	30	08/18/84	2307	79	38	CH	52
1104	30	08/18/84	2307	79	38	CH	55
1105	30	08/18/84	2307	79	38	CH	56
1106	30	08/18/84	2307	79	38	CH	56
1107	30	08/18/84	2307	79	38	CH	56
1108	30	08/18/84	2307	79	38	CH	57
1109	30	08/18/84	2307	79	38	CH	58
1110	30	08/18/84	2307	79	38	CH	59
1111	30	08/18/84	2307	79	38	CH	61
1112	30	08/18/84	2307	79	38	CH	62
1113	30	08/18/84	2307	79	38	CH	62

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1114	30	08/18/84	2307	79	38	CH	62
1115	30	08/18/84	2307	79	38	CH	62
1116	30	08/18/84	2307	79	38	CH	63
1117	30	08/18/84	2307	79	38	CH	63
1118	30	08/18/84	2307	79	38	CH	64
1119	30	08/18/84	2307	79	38	CH	65
1120	30	08/18/84	2307	79	38	CH	67
1121	30	08/18/84	2307	79	38	CH	67
1122	30	08/18/84	2307	79	38	CH	68
1123	30	08/18/84	2307	79	38	CH	68
1124	30	08/18/84	2307	79	38	CH	69
1125	30	08/18/84	2307	79	38	CH	69
1126	30	08/18/84	2307	79	38	CH	70
1127	30	08/18/84	2307	79	38	CH	70
1128	30	08/18/84	2307	79	38	CH	71
1129	30	08/18/84	2307	79	38	CH	71
1130	30	08/18/84	2307	79	38	CH	71
1131	30	08/18/84	2307	79	38	CH	73
1132	30	08/18/84	2307	79	38	CH	73
1133	30	08/18/84	2307	79	38	CH	75
1134	30	08/18/84	2307	79	38	CH	75
1135	30	08/18/84	2307	79	38	CH	76
1136	30	08/18/84	2307	79	38	CH	77
1137	30	08/18/84	2307	79	38	CH	82
1138	30	08/18/84	2307	79	38	CH	83
1139	30	08/18/84	2325	80	38	CH	47
1140	30	08/18/84	2325	80	38	CH	48
1141	30	08/18/84	2325	80	38	CH	50
1142	30	08/18/84	2325	80	38	CH	53
1143	30	08/18/84	2325	80	38	CH	53
1144	30	08/18/84	2325	80	38	CH	55
1145	30	08/18/84	2325	80	38	CH	55
1146	30	08/18/84	2325	80	38	CH	56
1147	30	08/18/84	2325	80	38	CH	60
1148	30	08/18/84	2325	80	38	CH	61
1149	30	08/18/84	2325	80	38	CH	61
1150	30	08/18/84	2325	80	38	CH	63
1151	30	08/18/84	2325	80	38	CH	63
1152	30	08/18/84	2325	80	38	CH	65
1153	30	08/18/84	2325	80	38	CH	65
1154	30	08/18/84	2325	80	38	CH	66
1155	30	08/18/84	2325	80	38	CH	66
1156	30	08/18/84	2325	80	38	CH	66
1157	30	08/18/84	2325	80	38	CH	67
1158	30	08/18/84	2325	80	38	CH	67
1159	30	08/18/84	2325	80	38	CH	68
1160	30	08/18/84	2325	80	38	CH	69
1161	30	08/18/84	2325	80	38	CH	70
1162	30	08/18/84	2325	80	38	CH	70
1163	30	08/18/84	2325	80	38	CH	70
1164	30	08/18/84	2325	80	38	CH	71
1165	30	08/18/84	2325	80	38	CH	74
1166	30	08/18/84	2325	80	38	CH	76

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1167	30	08/18/84	2325	80	38	CH	83
1168	30	08/18/84	2342	81	38	CH	38
1169	30	08/18/84	2342	81	38	CH	42
1170	30	08/18/84	2342	81	38	CH	43
1171	30	08/18/84	2342	81	38	CH	44
1172	30	08/18/84	2342	81	38	CH	48
1173	30	08/18/84	2342	81	38	CH	49
1174	30	08/18/84	2342	81	38	CH	50
1175	30	08/18/84	2342	81	38	CH	57
1176	30	08/18/84	2342	81	38	CH	58
1177	30	08/18/84	2342	81	38	CH	58
1178	30	08/18/84	2342	81	38	CH	59
1179	30	08/18/84	2342	81	38	CH	59
1180	30	08/18/84	2342	81	38	CH	60
1181	30	08/18/84	2342	81	38	CH	60
1182	30	08/18/84	2342	81	38	CH	62
1183	30	08/18/84	2342	81	38	CH	62
1184	30	08/18/84	2342	81	38	CH	63
1185	30	08/18/84	2342	81	38	CH	63
1186	30	08/18/84	2342	81	38	CH	63
1187	30	08/18/84	2342	81	38	CH	64
1188	30	08/18/84	2342	81	38	CH	65
1189	30	08/18/84	2342	81	38	CH	65
1190	30	08/18/84	2342	81	38	CH	65
1191	30	08/18/84	2342	81	38	CH	66
1192	30	08/18/84	2342	81	38	CH	67
1193	30	08/18/84	2342	81	38	CH	69
1194	30	08/18/84	2342	81	38	CH	70
1195	30	08/18/84	2342	81	38	CH	71
1196	30	08/18/84	2342	81	38	CH	73
1197	30	08/18/84	2342	81	38	CH	76
1198	30	08/18/84	2342	81	38	CH	77
1199	30	08/18/84	2342	81	38	CH	79
1200	30	08/19/84	17	83	38	CH	42
1201	30	08/19/84	17	83	38	CH	51
1202	30	08/19/84	17	83	38	CH	52
1203	30	08/19/84	17	83	38	CH	52
1204	30	08/19/84	17	83	38	CH	53
1205	30	08/19/84	17	83	38	CH	53
1206	30	08/19/84	17	83	38	CH	58
1207	30	08/19/84	17	83	38	CH	60
1208	30	08/19/84	17	83	38	CH	62
1209	30	08/19/84	17	83	38	CH	62
1210	30	08/19/84	17	83	38	CH	64
1211	30	08/19/84	17	83	38	CH	67
1212	30	08/19/84	17	83	38	CH	67
1213	30	08/19/84	17	83	38	CH	68
1214	30	08/19/84	17	83	38	CH	69
1215	30	08/19/84	17	83	38	CH	73
1216	30	08/19/84	33	84	38	CH	51
1217	30	08/19/84	33	84	38	CH	51
1218	30	08/19/84	33	84	38	CH	55
1219	30	08/19/84	33	84	38	CH	56

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1220	30	08/19/84	33	84	38	CH	56
1221	30	08/19/84	33	84	38	CH	56
1222	30	08/19/84	33	84	38	CH	57
1223	30	08/19/84	33	84	38	CH	58
1224	30	08/19/84	33	84	38	CH	58
1225	30	08/19/84	33	84	38	CH	58
1226	30	08/19/84	33	84	38	CH	59
1227	30	08/19/84	33	84	38	CH	59
1228	30	08/19/84	33	84	38	CH	60
1229	30	08/19/84	33	84	38	CH	61
1230	30	08/19/84	33	84	38	CH	61
1231	30	08/19/84	33	84	38	CH	63
1232	30	08/19/84	33	84	38	CH	63
1233	30	08/19/84	33	84	38	CH	63
1234	30	08/19/84	33	84	38	CH	64
1235	30	08/19/84	33	84	38	CH	65
1236	30	08/19/84	33	84	38	CH	66
1237	30	08/19/84	33	84	38	CH	66
1238	30	08/19/84	33	84	38	CH	66
1239	30	08/19/84	33	84	38	CH	67
1240	30	08/19/84	33	84	38	CH	68
1241	30	08/19/84	33	84	38	CH	69
1242	30	08/19/84	33	84	38	CH	69
1243	30	08/19/84	33	84	38	CH	69
1244	30	08/19/84	33	84	38	CH	69
1245	30	08/19/84	33	84	38	CH	69
1246	30	08/19/84	33	84	38	CH	70
1247	30	08/19/84	33	84	38	CH	70
1248	30	08/19/84	33	84	38	CH	71
1249	30	08/19/84	33	84	38	CH	72
1250	30	08/19/84	33	84	38	CH	74
1251	30	08/19/84	33	84	38	CH	75
1252	30	08/19/84	33	84	38	CH	75
1253	30	08/19/84	33	84	38	CH	76
1254	30	08/19/84	33	84	38	CH	78
1255	30	08/19/84	33	84	38	CH	79
1256	30	08/19/84	33	84	38	CH	82
1257	30	08/19/84	53	85	38	CH	42
1258	30	08/19/84	53	85	38	CH	45
1259	30	08/19/84	53	85	38	CH	48
1260	30	08/19/84	53	85	38	CH	51
1261	30	08/19/84	53	85	38	CH	52
1262	30	08/19/84	53	85	38	CH	52
1263	30	08/19/84	53	85	38	CH	52
1264	30	08/19/84	53	85	38	CH	58
1265	30	08/19/84	53	85	38	CH	58
1266	30	08/19/84	53	85	38	CH	59
1267	30	08/19/84	53	85	38	CH	61
1268	30	08/19/84	53	85	38	CH	63
1269	30	08/19/84	53	85	38	CH	63
1270	30	08/19/84	53	85	38	CH	65
1271	30	08/19/84	53	85	38	CH	66
1272	30	08/19/84	53	85	38	CH	67

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1273	30	08/19/84	53	85	38	CH	68
1274	30	08/19/84	53	85	38	CH	68
1275	30	08/19/84	53	85	38	CH	69
1276	30	08/19/84	53	85	38	CH	69
1277	30	08/19/84	53	85	38	CH	70
1278	30	08/19/84	53	85	38	CH	70
1279	30	08/19/84	53	85	38	CH	70
1280	30	08/19/84	53	85	38	CH	71
1281	30	08/19/84	53	85	38	CH	71
1282	30	08/19/84	53	85	38	CH	71
1283	30	08/19/84	53	85	38	CH	72
1284	30	08/19/84	53	85	38	CH	72
1285	30	08/19/84	53	85	38	CH	73
1286	30	08/19/84	53	85	38	CH	74
1287	30	08/19/84	53	85	38	CH	74
1288	30	08/19/84	53	85	38	CH	74
1289	30	08/19/84	53	85	38	CH	79
1290	30	08/19/84	53	85	38	CH	82
1291	30	08/19/84	53	85	38	CH	84
1292	30	08/19/84	115	86	38	CH	40
1293	30	08/19/84	115	86	38	CH	46
1294	30	08/19/84	115	86	38	CH	55
1295	30	08/19/84	115	86	38	CH	56
1296	30	08/19/84	115	86	38	CH	59
1297	30	08/19/84	115	86	38	CH	60
1298	30	08/19/84	115	86	38	CH	60
1299	30	08/19/84	115	86	38	CH	62
1300	30	08/19/84	115	86	38	CH	62
1301	30	08/19/84	115	86	38	CH	62
1302	30	08/19/84	115	86	38	CH	62
1303	30	08/19/84	115	86	38	CH	64
1304	30	08/19/84	115	86	38	CH	65
1305	30	08/19/84	115	86	38	CH	66
1306	30	08/19/84	115	86	38	CH	68
1307	30	08/19/84	115	86	38	CH	69
1308	30	08/19/84	115	86	38	CH	71
1309	30	08/19/84	115	86	38	CH	71
1310	30	08/19/84	115	86	38	CH	71
1311	30	08/19/84	115	86	38	CH	72
1312	30	08/19/84	115	86	38	CH	72
1313	30	08/19/84	115	86	38	CH	72
1314	30	08/19/84	115	86	38	CH	74
1315	30	08/19/84	115	86	38	CH	74
1316	30	08/19/84	115	86	38	CH	78
1317	30	08/19/84	115	86	38	CH	78
1318	30	08/19/84	115	86	38	CH	80
1319	30	08/19/84	136	87	38	CH	51
1320	30	08/19/84	136	87	38	CH	53
1321	30	08/19/84	136	87	38	CH	55
1322	30	08/19/84	136	87	38	CH	56
1323	30	08/19/84	136	87	38	CH	57
1324	30	08/19/84	136	87	38	CH	59
1325	30	08/19/84	136	87	38	CH	64

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1326	30	08/19/84	136	87	38	CH	64
1327	30	08/19/84	136	87	38	CH	66
1328	30	08/19/84	136	87	38	CH	66
1329	30	08/19/84	136	87	38	CH	68
1330	30	08/19/84	136	87	38	CH	70
1331	30	08/19/84	136	87	38	CH	71
1332	30	08/19/84	136	87	38	CH	72
1333	30	08/19/84	136	87	38	CH	72
1334	30	08/19/84	136	87	38	CH	73
1335	30	08/19/84	136	87	38	CH	74
1336	30	08/19/84	156	88	38	CH	50
1337	30	08/19/84	156	88	38	CH	52
1338	30	08/19/84	156	88	38	CH	53
1339	30	08/19/84	156	88	38	CH	54
1340	30	08/19/84	156	88	38	CH	55
1341	30	08/19/84	156	88	38	CH	57
1342	30	08/19/84	156	88	38	CH	58
1343	30	08/19/84	156	88	38	CH	60
1344	30	08/19/84	156	88	38	CH	60
1345	30	08/19/84	156	88	38	CH	60
1346	30	08/19/84	156	88	38	CH	62
1347	30	08/19/84	156	88	38	CH	63
1348	30	08/19/84	156	88	38	CH	64
1349	30	08/19/84	156	88	38	CH	65
1350	30	08/19/84	156	88	38	CH	65
1351	30	08/19/84	156	88	38	CH	65
1352	30	08/19/84	156	88	38	CH	67
1353	30	08/19/84	156	88	38	CH	68
1354	30	08/19/84	156	88	38	CH	69
1355	30	08/19/84	156	88	38	CH	71
1356	30	08/19/84	156	88	38	CH	71
1357	30	08/19/84	156	88	38	CH	72
1358	30	08/19/84	156	88	38	CH	73
1359	30	08/19/84	216	89	38	CH	44
1360	30	08/19/84	216	89	38	CH	46
1361	30	08/19/84	216	89	38	CH	55
1362	30	08/19/84	216	89	38	CH	55
1363	30	08/19/84	216	89	38	CH	64
1364	30	08/19/84	216	89	38	CH	65
1365	30	08/19/84	216	89	38	CH	67
1366	30	08/19/84	216	89	38	CH	70
1367	30	08/19/84	216	89	38	CH	74
1368	30	08/19/84	216	89	38	CH	74
1369	30	08/19/84	216	89	38	CH	74
1370	30	08/19/84	216	89	38	CH	77
1371	30	08/19/84	235	90	38	CH	46
1372	30	08/19/84	235	90	38	CH	49
1373	30	08/19/84	235	90	38	CH	50
1374	30	08/19/84	235	90	38	CH	50
1375	30	08/19/84	235	90	38	CH	52
1376	30	08/19/84	235	90	38	CH	52
1377	30	08/19/84	235	90	38	CH	54
1378	30	08/19/84	235	90	38	CH	55

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1379	30	08/19/84	235	90	38	CH	56
1380	30	08/19/84	235	90	38	CH	56
1381	30	08/19/84	235	90	38	CH	56
1382	30	08/19/84	235	90	38	CH	56
1383	30	08/19/84	235	90	38	CH	57
1384	30	08/19/84	235	90	38	CH	57
1385	30	08/19/84	235	90	38	CH	58
1386	30	08/19/84	235	90	38	CH	58
1387	30	08/19/84	235	90	38	CH	58
1388	30	08/19/84	235	90	38	CH	60
1389	30	08/19/84	235	90	38	CH	61
1390	30	08/19/84	235	90	38	CH	62
1391	30	08/19/84	235	90	38	CH	62
1392	30	08/19/84	235	90	38	CH	63
1393	30	08/19/84	235	90	38	CH	64
1394	30	08/19/84	235	90	38	CH	64
1395	30	08/19/84	235	90	38	CH	66
1396	30	08/19/84	235	90	38	CH	66
1397	30	08/19/84	235	90	38	CH	67
1398	30	08/19/84	235	90	38	CH	67
1399	30	08/19/84	235	90	38	CH	68
1400	30	08/19/84	235	90	38	CH	68
1401	30	08/19/84	235	90	38	CH	68
1402	30	08/19/84	235	90	38	CH	69
1403	30	08/19/84	235	90	38	CH	74
1404	30	08/19/84	235	90	38	CH	74
1405	30	08/19/84	235	90	38	CH	74
1406	30	08/19/84	235	90	38	CH	76
1407	30	08/19/84	235	90	38	CH	85
1408	30	08/19/84	301	91	38	CH	34
1409	30	08/19/84	301	91	38	CH	52
1410	30	08/19/84	301	91	38	CH	53
1411	30	08/19/84	301	91	38	CH	57
1412	30	08/19/84	301	91	38	CH	58
1413	30	08/19/84	301	91	38	CH	59
1414	30	08/19/84	301	91	38	CH	60
1415	30	08/19/84	301	91	38	CH	60
1416	30	08/19/84	301	91	38	CH	61
1417	30	08/19/84	301	91	38	CH	65
1418	30	08/19/84	301	91	38	CH	65
1419	30	08/19/84	301	91	38	CH	66
1420	30	08/19/84	301	91	38	CH	67
1421	30	08/19/84	301	91	38	CH	70
1422	30	08/19/84	301	91	38	CH	70
1423	30	08/19/84	301	91	38	CH	71
1424	30	08/19/84	301	91	38	CH	72
1425	30	08/19/84	301	91	38	CH	72
1426	30	08/19/84	321	92	38	CH	47
1427	30	08/19/84	321	92	38	CH	50
1428	30	08/19/84	321	92	38	CH	51
1429	30	08/19/84	321	92	38	CH	52
1430	30	08/19/84	321	92	38	CH	54
1431	30	08/19/84	321	92	38	CH	55

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1432	30	08/19/84	321	92	38	CH	55
1433	30	08/19/84	321	92	38	CH	57
1434	30	08/19/84	321	92	38	CH	57
1435	30	08/19/84	321	92	38	CH	57
1436	30	08/19/84	321	92	38	CH	57
1437	30	08/19/84	321	92	38	CH	58
1438	30	08/19/84	321	92	38	CH	61
1439	30	08/19/84	321	92	38	CH	64
1440	30	08/19/84	321	92	38	CH	65
1441	30	08/19/84	321	92	38	CH	65
1442	30	08/19/84	321	92	38	CH	67
1443	30	08/19/84	321	92	38	CH	68
1444	30	08/19/84	321	92	38	CH	69
1445	30	08/19/84	321	92	38	CH	71
1446	30	08/19/84	321	92	38	CH	71
1447	30	08/19/84	321	92	38	CH	75
1448	30	08/19/84	321	92	38	CH	77
1449	30	08/19/84	321	92	38	CH	78
1450	30	08/19/84	321	92	38	CH	79
1451	30	08/19/84	321	92	38	CH	81
1452	30	08/19/84	2400	82	38	CH	44
1453	30	08/19/84	2400	82	38	CH	48
1454	30	08/19/84	2400	82	38	CH	55
1455	30	08/19/84	2400	82	38	CH	55
1456	30	08/19/84	2400	82	38	CH	57
1457	30	08/19/84	2400	82	38	CH	61
1458	30	08/19/84	2400	82	38	CH	61
1459	30	08/19/84	2400	82	38	CH	63
1460	30	08/19/84	2400	82	38	CH	63
1461	30	08/19/84	2400	82	38	CH	66
1462	30	08/19/84	2400	82	38	CH	68
1463	30	08/19/84	2400	82	38	CH	69
1464	30	08/19/84	2400	82	38	CH	69
1465	30	08/19/84	2400	82	38	CH	69
1466	30	08/19/84	2400	82	38	CH	73
1467	30	08/19/84	2400	82	38	CH	75
1468	30	08/19/84	2400	82	38	CH	77
1469	30	08/19/84	2400	82	38	CH	78
1470	30	08/19/84	2400	82	38	CH	83
1471	30	08/29/84	106	93	38	CH	41
1472	30	08/29/84	121	94	38	CH	56
1473	30	08/29/84	141	95	38	CH	79
1474	30	08/29/84	158	96	38	CH	65
1475	30	08/29/84	158	96	38	CH	76
1476	30	08/29/84	158	96	38	CH	76
1477	30	08/29/84	158	96	38	CH	78
1478	30	08/29/84	221	97	38	CH	72
1479	30	08/29/84	239	98	38	CH	62
1480	30	08/29/84	239	98	38	CH	62
1481	30	08/29/84	239	98	38	CH	65
1482	30	08/29/84	239	98	38	CH	69
1483	30	08/29/84	239	98	38	CH	78
1484	30	08/29/84	239	98	38	CH	82

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1485	30	08/29/84	338	133	35	CH	59
1486	30	08/29/84	338	133	35	CH	71
1487	30	08/29/84	338	133	35	CH	73
1488	30	08/29/84	352	134	35	CH	54
1489	30	08/29/84	352	134	35	CH	67
1490	30	08/29/84	352	134	35	CH	74
1491	30	08/29/84	352	134	35	CH	74
1492	30	08/29/84	352	134	35	CH	74
1493	30	08/29/84	352	134	35	CH	76
1494	30	08/29/84	412	135	35	CH	57
1495	30	08/29/84	412	135	35	CH	60
1496	30	08/29/84	412	135	35	CH	60
1497	30	08/29/84	412	135	35	CH	61
1498	30	08/29/84	412	135	35	CH	63
1499	30	08/29/84	412	135	35	CH	66
1500	30	08/29/84	412	135	35	CH	67
1501	30	08/29/84	412	135	35	CH	68
1502	30	08/29/84	412	135	35	CH	69
1503	30	08/29/84	412	135	35	CH	69
1504	30	08/29/84	412	135	35	CH	70
1505	30	08/29/84	412	135	35	CH	71
1506	30	08/29/84	412	135	35	CH	71
1507	30	08/29/84	412	135	35	CH	75
1508	30	08/29/84	412	135	35	CH	75
1509	30	08/29/84	412	135	35	CH	78
1510	30	08/29/84	412	135	35	CH	80
1511	30	08/29/84	412	135	35	CH	87
1512	30	08/29/84	433	136	35	CH	49
1513	30	08/29/84	433	136	35	CH	65
1514	30	08/29/84	433	136	35	CH	65
1515	30	08/29/84	433	136	35	CH	67
1516	30	08/29/84	433	136	35	CH	69
1517	30	08/29/84	433	136	35	CH	79
1518	30	08/29/84	453	137	35	CH	63
1519	30	08/29/84	453	137	35	CH	67
1520	30	08/29/84	453	137	35	CH	74
1521	30	08/29/84	453	137	35	CH	74
1522	30	08/29/84	453	137	35	CH	74
1523	30	08/29/84	453	137	35	CH	75
1524	30	08/29/84	453	137	35	CH	75
1525	30	08/30/84	2129	139	38	CH	49
1526	30	08/30/84	2129	139	38	CH	50
1527	30	08/30/84	2129	139	38	CH	53
1528	30	08/30/84	2129	139	38	CH	55
1529	30	08/30/84	2129	139	38	CH	63
1530	30	08/30/84	2129	139	38	CH	67
1531	30	08/30/84	2129	139	38	CH	72
1532	30	08/30/84	2129	139	38	CH	74
1533	30	08/30/84	2129	139	38	CH	75
1534	30	08/30/84	2129	139	38	CH	80
1535	30	08/30/84	2129	139	38	CH	82
1536	30	08/30/84	2129	139	38	CH	82
1537	30	08/30/84	2129	139	38	CH	82

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1538	30	08/30/84	2129	139	38	CH	84
1539	30	08/30/84	2144	140	38	CH	46
1540	30	08/30/84	2144	140	38	CH	51
1541	30	08/30/84	2144	140	38	CH	58
1542	30	08/30/84	2144	140	38	CH	59
1543	30	08/30/84	2144	140	38	CH	63
1544	30	08/30/84	2144	140	38	CH	66
1545	30	08/30/84	2144	140	38	CH	68
1546	30	08/30/84	2144	140	38	CH	73
1547	30	08/30/84	2144	140	38	CH	76
1548	30	08/30/84	2158	141	38	CH	52
1549	30	08/30/84	2158	141	38	CH	56
1550	30	08/30/84	2158	141	38	CH	59
1551	30	08/30/84	2158	141	38	CH	62
1552	30	08/30/84	2158	141	38	CH	65
1553	30	08/30/84	2158	141	38	CH	66
1554	30	08/30/84	2158	141	38	CH	66
1555	30	08/30/84	2158	141	38	CH	70
1556	30	08/30/84	2158	141	38	CH	73
1557	30	08/30/84	2158	141	38	CH	75
1558	30	08/30/84	2158	141	38	CH	79
1559	30	08/30/84	2158	141	38	CH	89
1560	30	08/30/84	2211	142	38	CH	69
1561	30	08/30/84	2211	142	38	CH	75
1562	30	08/30/84	2211	142	38	CH	80
1563	30	08/30/84	2235	143	37	CH	51
1564	30	08/30/84	2301	144	36	CH	61
1565	30	08/30/84	2301	144	36	CH	64
1566	30	08/30/84	2301	144	36	CH	69
1567	30	08/30/84	2301	144	36	CH	71
1568	30	08/30/84	2301	144	36	CH	73
1569	30	08/30/84	2301	144	36	CH	86
1570	30	08/30/84	2315	145	36	CH	67
1571	30	08/30/84	2315	145	36	CH	72
1572	30	08/30/84	2315	145	36	CH	73
1573	30	08/30/84	2315	145	36	CH	73
1574	30	08/30/84	2315	145	36	CH	75
1575	30	08/30/84	2341	147	35	CH	65
1576	30	08/30/84	2341	147	35	CH	70
1577	30	08/30/84	2341	147	35	CH	76
1578	30	08/30/84	2353	148	35	CH	59
1579	30	08/31/84	4	149	35	CH	63
1580	30	08/31/84	4	149	35	CH	64
1581	30	08/31/84	4	149	35	CH	64
1582	30	08/31/84	4	149	35	CH	68
1583	30	08/31/84	18	150	35	CH	47
1584	30	08/31/84	18	150	35	CH	48
1585	30	08/31/84	18	150	35	CH	51
1586	30	08/31/84	18	150	35	CH	52
1587	30	08/31/84	18	150	35	CH	52
1588	30	08/31/84	18	150	35	CH	53
1589	30	08/31/84	18	150	35	CH	53
1590	30	08/31/84	18	150	35	CH	54

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1591	30	08/31/84	18	150	35	CH	55
1592	30	08/31/84	18	150	35	CH	57
1593	30	08/31/84	18	150	35	CH	58
1594	30	08/31/84	18	150	35	CH	59
1595	30	08/31/84	18	150	35	CH	59
1596	30	08/31/84	18	150	35	CH	60
1597	30	08/31/84	18	150	35	CH	60
1598	30	08/31/84	18	150	35	CH	61
1599	30	08/31/84	18	150	35	CH	62
1600	30	08/31/84	18	150	35	CH	62
1601	30	08/31/84	18	150	35	CH	64
1602	30	08/31/84	18	150	35	CH	65
1603	30	08/31/84	18	150	35	CH	65
1604	30	08/31/84	18	150	35	CH	66
1605	30	08/31/84	18	150	35	CH	67
1606	30	08/31/84	18	150	35	CH	67
1607	30	08/31/84	18	150	35	CH	69
1608	30	08/31/84	18	150	35	CH	70
1609	30	08/31/84	18	150	35	CH	70
1610	30	08/31/84	18	150	35	CH	75
1611	30	08/31/84	18	150	35	CH	76
1612	30	08/31/84	18	150	35	CH	78
1613	30	08/31/84	18	150	35	CH	82
1614	30	08/31/84	34	151	36	CH	76
1615	30	08/31/84	45	152	36	CH	70
1616	30	08/31/84	45	152	36	CH	75
1617	30	08/31/84	45	152	36	CH	84
1618	30	08/31/84	59	153	35	CH	59
1619	30	08/31/84	59	153	35	CH	61
1620	30	08/31/84	112	154	35	CH	54
1621	30	08/31/84	112	154	35	CH	55
1622	30	08/31/84	112	154	35	CH	56
1623	30	08/31/84	112	154	35	CH	57
1624	30	08/31/84	112	154	35	CH	58
1625	30	08/31/84	112	154	35	CH	61
1626	30	08/31/84	112	154	35	CH	62
1627	30	08/31/84	112	154	35	CH	65
1628	30	08/31/84	112	154	35	CH	67
1629	30	08/31/84	112	154	35	CH	73
1630	30	08/31/84	112	154	35	CH	75
1631	30	08/31/84	124	155	35	CH	61
1632	30	08/31/84	124	155	35	CH	63
1633	30	08/31/84	124	155	35	CH	68
1634	30	08/31/84	124	155	35	CH	73
1635	30	08/31/84	137	156	35	CH	45
1636	30	08/31/84	137	156	35	CH	51
1637	30	08/31/84	137	156	35	CH	56
1638	30	08/31/84	137	156	35	CH	59
1639	30	08/31/84	137	156	35	CH	60
1640	30	08/31/84	137	156	35	CH	60
1641	30	08/31/84	137	156	35	CH	61
1642	30	08/31/84	137	156	35	CH	61
1643	30	08/31/84	137	156	35	CH	61

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1644	30	08/31/84	137	156	35	CH	62
1645	30	08/31/84	137	156	35	CH	63
1646	30	08/31/84	137	156	35	CH	65
1647	30	08/31/84	137	156	35	CH	65
1648	30	08/31/84	137	156	35	CH	66
1649	30	08/31/84	137	156	35	CH	66
1650	30	08/31/84	137	156	35	CH	67
1651	30	08/31/84	137	156	35	CH	67
1652	30	08/31/84	137	156	35	CH	69
1653	30	08/31/84	137	156	35	CH	70
1654	30	08/31/84	137	156	35	CH	71
1655	30	08/31/84	137	156	35	CH	72
1656	30	08/31/84	137	156	35	CH	73
1657	30	08/31/84	137	156	35	CH	73
1658	30	08/31/84	137	156	35	CH	76
1659	30	08/31/84	137	156	35	CH	76
1660	30	08/31/84	137	156	35	CH	78
1661	30	08/31/84	137	156	35	CH	78
1662	30	08/31/84	137	156	35	CH	80
1663	30	08/31/84	137	156	35	CH	80
1664	30	08/31/84	137	156	35	CH	81
1665	30	08/31/84	137	156	35	CH	82
1666	30	08/31/84	206	157	36	CH	56
1667	30	08/31/84	206	157	36	CH	59
1668	30	08/31/84	206	157	36	CH	59
1669	30	08/31/84	206	157	36	CH	61
1670	30	08/31/84	206	157	36	CH	63
1671	30	08/31/84	206	157	36	CH	66
1672	30	08/31/84	206	157	36	CH	66
1673	30	08/31/84	206	157	36	CH	68
1674	30	08/31/84	206	157	36	CH	69
1675	30	08/31/84	206	157	36	CH	70
1676	30	08/31/84	206	157	36	CH	70
1677	30	08/31/84	206	157	36	CH	71
1678	30	08/31/84	206	157	36	CH	72
1679	30	08/31/84	206	157	36	CH	74
1680	30	08/31/84	206	157	36	CH	76
1681	30	08/31/84	206	157	36	CH	80
1682	30	08/31/84	206	157	36	CH	85
1683	30	08/31/84	244	158	36	CH	57
1684	30	08/31/84	244	158	36	CH	62
1685	30	08/31/84	244	158	36	CH	79
1686	30	08/31/84	301	159	36	CH	55
1687	30	08/31/84	301	159	36	CH	57
1688	30	08/31/84	301	159	36	CH	60
1689	30	08/31/84	301	159	36	CH	62
1690	30	08/31/84	301	159	36	CH	65
1691	30	08/31/84	301	159	36	CH	69
1692	30	08/31/84	301	159	36	CH	70
1693	30	08/31/84	301	159	36	CH	71
1694	30	08/31/84	301	159	36	CH	72
1695	30	08/31/84	301	159	36	CH	72
1696	30	08/31/84	301	159	36	CH	75

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1697	30	08/31/84	301	159	36	CH	76
1698	30	08/31/84	301	159	36	CH	77
1699	30	08/31/84	301	159	36	CH	78
1700	30	08/31/84	301	159	36	CH	78
1701	30	08/31/84	301	159	36	CH	78
1702	30	08/31/84	301	159	36	CH	79
1703	30	08/31/84	301	159	36	CH	82
1704	30	08/31/84	316	160	36	CH	75
1705	30	08/31/84	328	161	36	CH	49
1706	30	08/31/84	328	161	36	CH	56
1707	30	08/31/84	328	161	36	CH	56
1708	30	08/31/84	328	161	36	CH	61
1709	30	08/31/84	328	161	36	CH	62
1710	30	08/31/84	328	161	36	CH	63
1711	30	08/31/84	328	161	36	CH	63
1712	30	08/31/84	328	161	36	CH	66
1713	30	08/31/84	328	161	36	CH	67
1714	30	08/31/84	328	161	36	CH	70
1715	30	08/31/84	328	161	36	CH	73
1716	30	08/31/84	328	161	36	CH	79
1717	30	08/31/84	342	162	35	CH	66
1718	30	08/31/84	342	162	35	CH	69
1719	30	08/31/84	354	163	35	CH	63
1720	30	08/31/84	406	164	35	CH	55
1721	30	08/31/84	406	164	35	CH	56
1722	30	08/31/84	406	164	35	CH	62
1723	30	08/31/84	406	164	35	CH	65
1724	30	08/31/84	406	164	35	CH	69
1725	30	08/31/84	406	164	35	CH	72
1726	30	08/31/84	406	164	35	CH	74
1727	30	08/31/84	406	164	35	CH	83
1728	30	08/31/84	449	166	38	CH	50
1729	30	08/31/84	449	166	38	CH	57
1730	30	08/31/84	449	166	38	CH	58
1731	30	08/31/84	449	166	38	CH	60
1732	30	08/31/84	449	166	38	CH	60
1733	30	08/31/84	449	166	38	CH	65
1734	30	08/31/84	449	166	38	CH	65
1735	30	08/31/84	449	166	38	CH	66
1736	30	08/31/84	449	166	38	CH	67
1737	30	08/31/84	449	166	38	CH	67
1738	30	08/31/84	449	166	38	CH	69
1739	30	08/31/84	449	166	38	CH	70
1740	30	08/31/84	449	166	38	CH	74
1741	30	08/31/84	449	166	38	CH	74
1742	30	08/31/84	449	166	38	CH	81
1743	30	08/31/84	449	166	38	CH	81
1744	30	08/31/84	449	166	38	CH	85
1745	30	08/31/84	449	166	38	CH	85
1746	30	08/31/84	449	166	38	CH	86
1747	30	08/31/84	449	166	38	CH	100
1748	30	08/31/84	522	168	38	CH	83
1749	30	08/31/84	536	169	38	CH	72

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1750	30	08/31/84	536	169	38	CH	73
1751	30	08/31/84	536	169	38	CH	77
1752	30	08/31/84	536	169	38	CH	78
1753	30	08/31/84	536	169	38	CH	79
1754	30	08/31/84	2059	277	33	TZ	58
1755	30	08/31/84	2059	277	33	TZ	65
1756	30	08/31/84	2059	277	33	TZ	67
1757	30	08/31/84	2059	277	33	TZ	68
1758	30	08/31/84	2059	277	33	TZ	69
1759	30	08/31/84	2113	278	33	TZ	70
1760	30	08/31/84	2128	279	32	TZ	63
1761	30	08/31/84	2128	279	32	TZ	67
1762	30	08/31/84	2128	279	32	TZ	69
1763	30	08/31/84	2128	279	32	TZ	70
1764	30	08/31/84	2128	279	32	TZ	70
1765	30	08/31/84	2128	279	32	TZ	81
1766	30	08/31/84	2128	279	32	TZ	81
1767	30	08/31/84	2128	279	32	TZ	82
1768	30	08/31/84	2142	280	32	TZ	54
1769	30	08/31/84	2142	280	32	TZ	58
1770	30	08/31/84	2142	280	32	TZ	70
1771	30	08/31/84	2142	280	32	TZ	73
1772	30	08/31/84	2142	280	32	TZ	74
1773	30	08/31/84	2142	280	32	TZ	80
1774	30	08/31/84	2245	282	35	CH	56
1775	30	08/31/84	2245	282	35	CH	59
1776	30	08/31/84	2245	282	35	CH	67
1777	30	08/31/84	2245	282	35	CH	67
1778	30	08/31/84	2245	282	35	CH	68
1779	30	08/31/84	2245	282	35	CH	84
1780	30	08/31/84	2245	282	35	CH	90
1781	30	08/31/84	2259	283	35	CH	52
1782	30	08/31/84	2259	283	35	CH	53
1783	30	08/31/84	2259	283	35	CH	56
1784	30	08/31/84	2259	283	35	CH	57
1785	30	08/31/84	2259	283	35	CH	57
1786	30	08/31/84	2259	283	35	CH	59
1787	30	08/31/84	2259	283	35	CH	61
1788	30	08/31/84	2259	283	35	CH	68
1789	30	08/31/84	2259	283	35	CH	71
1790	30	08/31/84	2259	283	35	CH	88
1791	30	08/31/84	2357	285	35	CH	55
1792	30	08/31/84	2357	285	35	CH	56
1793	30	08/31/84	2357	285	35	CH	57
1794	30	08/31/84	2357	285	35	CH	65
1795	30	08/31/84	2357	285	35	CH	65
1796	30	08/31/84	2357	285	35	CH	78
1797	30	08/31/84	2357	285	35	CH	79
1798	30	08/31/84	2357	285	35	CH	81
1799	30	08/31/84	2357	285	35	CH	82
1800	30	09/01/84	10	286	35	CH	56
1801	30	09/01/84	10	286	35	CH	59
1802	30	09/01/84	10	286	35	CH	60

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1803	30	09/01/84	10	286	35	CH	70
1804	30	09/01/84	10	286	35	CH	71
1805	30	09/01/84	10	286	35	CH	72
1806	30	09/01/84	10	286	35	CH	74
1807	30	09/01/84	10	286	35	CH	84
1808	30	09/01/84	23	287	35	CH	56
1809	30	09/01/84	23	287	35	CH	62
1810	30	09/01/84	23	287	35	CH	63
1811	30	09/01/84	23	287	35	CH	63
1812	30	09/01/84	23	287	35	CH	63
1813	30	09/01/84	23	287	35	CH	65
1814	30	09/01/84	23	287	35	CH	66
1815	30	09/01/84	23	287	35	CH	67
1816	30	09/01/84	23	287	35	CH	67
1817	30	09/01/84	23	287	35	CH	68
1818	30	09/01/84	23	287	35	CH	70
1819	30	09/01/84	23	287	35	CH	70
1820	30	09/01/84	23	287	35	CH	71
1821	30	09/01/84	23	287	35	CH	72
1822	30	09/01/84	23	287	35	CH	73
1823	30	09/01/84	23	287	35	CH	73
1824	30	09/01/84	23	287	35	CH	74
1825	30	09/01/84	23	287	35	CH	74
1826	30	09/01/84	23	287	35	CH	76
1827	30	09/01/84	23	287	35	CH	76
1828	30	09/01/84	23	287	35	CH	78
1829	30	09/01/84	23	287	35	CH	79
1830	30	09/01/84	23	287	35	CH	81
1831	30	09/01/84	23	287	35	CH	84
1832	30	09/01/84	23	287	35	CH	86
1833	30	09/01/84	23	287	35	CH	87
1834	30	09/01/84	38	288	35	CH	43
1835	30	09/01/84	38	288	35	CH	57
1836	30	09/01/84	38	288	35	CH	58
1837	30	09/01/84	38	288	35	CH	58
1838	30	09/01/84	38	288	35	CH	62
1839	30	09/01/84	38	288	35	CH	68
1840	30	09/01/84	38	288	35	CH	72
1841	30	09/01/84	38	288	35	CH	73
1842	30	09/01/84	38	288	35	CH	74
1843	30	09/01/84	38	288	35	CH	76
1844	30	09/01/84	38	288	35	CH	77
1845	30	09/01/84	38	288	35	CH	80
1846	30	09/01/84	51	289	35	CH	46
1847	30	09/01/84	51	289	35	CH	49
1848	30	09/01/84	51	289	35	CH	51
1849	30	09/01/84	51	289	35	CH	51
1850	30	09/01/84	51	289	35	CH	53
1851	30	09/01/84	51	289	35	CH	53
1852	30	09/01/84	51	289	35	CH	55
1853	30	09/01/84	51	289	35	CH	56
1854	30	09/01/84	51	289	35	CH	57
1855	30	09/01/84	51	289	35	CH	57

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1856	30	09/01/84	51	289	35	CH	58
1857	30	09/01/84	51	289	35	CH	58
1858	30	09/01/84	51	289	35	CH	59
1859	30	09/01/84	51	289	35	CH	59
1860	30	09/01/84	51	289	35	CH	59
1861	30	09/01/84	51	289	35	CH	59
1862	30	09/01/84	51	289	35	CH	59
1863	30	09/01/84	51	289	35	CH	59
1864	30	09/01/84	51	289	35	CH	59
1865	30	09/01/84	51	289	35	CH	60
1866	30	09/01/84	51	289	35	CH	60
1867	30	09/01/84	51	289	35	CH	61
1868	30	09/01/84	51	289	35	CH	61
1869	30	09/01/84	51	289	35	CH	62
1870	30	09/01/84	51	289	35	CH	62
1871	30	09/01/84	51	289	35	CH	63
1872	30	09/01/84	51	289	35	CH	63
1873	30	09/01/84	51	289	35	CH	64
1874	30	09/01/84	51	289	35	CH	64
1875	30	09/01/84	51	289	35	CH	64
1876	30	09/01/84	51	289	35	CH	64
1877	30	09/01/84	51	289	35	CH	65
1878	30	09/01/84	51	289	35	CH	65
1879	30	09/01/84	51	289	35	CH	65
1880	30	09/01/84	51	289	35	CH	66
1881	30	09/01/84	51	289	35	CH	66
1882	30	09/01/84	51	289	35	CH	66
1883	30	09/01/84	51	289	35	CH	67
1884	30	09/01/84	51	289	35	CH	67
1885	30	09/01/84	51	289	35	CH	67
1886	30	09/01/84	51	289	35	CH	69
1887	30	09/01/84	51	289	35	CH	69
1888	30	09/01/84	51	289	35	CH	69
1889	30	09/01/84	51	289	35	CH	70
1890	30	09/01/84	51	289	35	CH	70
1891	30	09/01/84	51	289	35	CH	70
1892	30	09/01/84	51	289	35	CH	70
1893	30	09/01/84	51	289	35	CH	70
1894	30	09/01/84	51	289	35	CH	70
1895	30	09/01/84	51	289	35	CH	70
1896	30	09/01/84	51	289	35	CH	71
1897	30	09/01/84	51	289	35	CH	71
1898	30	09/01/84	51	289	35	CH	71
1899	30	09/01/84	51	289	35	CH	71
1900	30	09/01/84	51	289	35	CH	71
1901	30	09/01/84	51	289	35	CH	71
1902	30	09/01/84	51	289	35	CH	71
1903	30	09/01/84	51	289	35	CH	72
1904	30	09/01/84	51	289	35	CH	72
1905	30	09/01/84	51	289	35	CH	72
1906	30	09/01/84	51	289	35	CH	72
1907	30	09/01/84	51	289	35	CH	73
1908	30	09/01/84	51	289	35	CH	73

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1909	30	09/01/84	51	289	35	CH	73
1910	30	09/01/84	51	289	35	CH	73
1911	30	09/01/84	51	289	35	CH	74
1912	30	09/01/84	51	289	35	CH	74
1913	30	09/01/84	51	289	35	CH	75
1914	30	09/01/84	51	289	35	CH	76
1915	30	09/01/84	51	289	35	CH	76
1916	30	09/01/84	51	289	35	CH	76
1917	30	09/01/84	51	289	35	CH	76
1918	30	09/01/84	51	289	35	CH	76
1919	30	09/01/84	51	289	35	CH	77
1920	30	09/01/84	51	289	35	CH	77
1921	30	09/01/84	51	289	35	CH	77
1922	30	09/01/84	51	289	35	CH	77
1923	30	09/01/84	51	289	35	CH	77
1924	30	09/01/84	51	289	35	CH	78
1925	30	09/01/84	51	289	35	CH	78
1926	30	09/01/84	51	289	35	CH	78
1927	30	09/01/84	51	289	35	CH	80
1928	30	09/01/84	51	289	35	CH	80
1929	30	09/01/84	51	289	35	CH	80
1930	30	09/01/84	51	289	35	CH	81
1931	30	09/01/84	51	289	35	CH	81
1932	30	09/01/84	51	289	35	CH	81
1933	30	09/01/84	51	289	35	CH	81
1934	30	09/01/84	51	289	35	CH	82
1935	30	09/01/84	51	289	35	CH	84
1936	30	09/01/84	51	289	35	CH	84
1937	30	09/01/84	51	289	35	CH	85
1938	30	09/01/84	51	289	35	CH	85
1939	30	09/01/84	106	290	35	CH	55
1940	30	09/01/84	106	290	35	CH	56
1941	30	09/01/84	106	290	35	CH	56
1942	30	09/01/84	106	290	35	CH	56
1943	30	09/01/84	106	290	35	CH	57
1944	30	09/01/84	106	290	35	CH	59
1945	30	09/01/84	106	290	35	CH	60
1946	30	09/01/84	106	290	35	CH	60
1947	30	09/01/84	106	290	35	CH	60
1948	30	09/01/84	106	290	35	CH	60
1949	30	09/01/84	106	290	35	CH	61
1950	30	09/01/84	106	290	35	CH	62
1951	30	09/01/84	106	290	35	CH	62
1952	30	09/01/84	106	290	35	CH	62
1953	30	09/01/84	106	290	35	CH	63
1954	30	09/01/84	106	290	35	CH	63
1955	30	09/01/84	106	290	35	CH	63
1956	30	09/01/84	106	290	35	CH	64
1957	30	09/01/84	106	290	35	CH	64
1958	30	09/01/84	106	290	35	CH	64
1959	30	09/01/84	106	290	35	CH	65
1960	30	09/01/84	106	290	35	CH	65
1961	30	09/01/84	106	290	35	CH	65

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
1962	30	09/01/84	106	290	35	CH	65
1963	30	09/01/84	106	290	35	CH	65
1964	30	09/01/84	106	290	35	CH	65
1965	30	09/01/84	106	290	35	CH	66
1966	30	09/01/84	106	290	35	CH	67
1967	30	09/01/84	106	290	35	CH	67
1968	30	09/01/84	106	290	35	CH	67
1969	30	09/01/84	106	290	35	CH	68
1970	30	09/01/84	106	290	35	CH	69
1971	30	09/01/84	106	290	35	CH	69
1972	30	09/01/84	106	290	35	CH	70
1973	30	09/01/84	106	290	35	CH	70
1974	30	09/01/84	106	290	35	CH	70
1975	30	09/01/84	106	290	35	CH	71
1976	30	09/01/84	106	290	35	CH	71
1977	30	09/01/84	106	290	35	CH	72
1978	30	09/01/84	106	290	35	CH	72
1979	30	09/01/84	106	290	35	CH	73
1980	30	09/01/84	106	290	35	CH	73
1981	30	09/01/84	106	290	35	CH	73
1982	30	09/01/84	106	290	35	CH	74
1983	30	09/01/84	106	290	35	CH	74
1984	30	09/01/84	106	290	35	CH	75
1985	30	09/01/84	106	290	35	CH	76
1986	30	09/01/84	106	290	35	CH	76
1987	30	09/01/84	106	290	35	CH	76
1988	30	09/01/84	106	290	35	CH	76
1989	30	09/01/84	106	290	35	CH	76
1990	30	09/01/84	106	290	35	CH	76
1991	30	09/01/84	106	290	35	CH	77
1992	30	09/01/84	106	290	35	CH	77
1993	30	09/01/84	106	290	35	CH	78
1994	30	09/01/84	106	290	35	CH	78
1995	30	09/01/84	106	290	35	CH	78
1996	30	09/01/84	106	290	35	CH	78
1997	30	09/01/84	106	290	35	CH	79
1998	30	09/01/84	106	290	35	CH	79
1999	30	09/01/84	106	290	35	CH	81
2000	30	09/01/84	106	290	35	CH	81
2001	30	09/01/84	106	290	35	CH	82
2002	30	09/01/84	106	290	35	CH	83
2003	30	09/01/84	106	290	35	CH	83
2004	30	09/01/84	106	290	35	CH	84
2005	30	09/01/84	106	290	35	CH	86
2006	30	09/01/84	106	290	35	CH	91
2007	30	09/01/84	121	291	35	CH	49
2008	30	09/01/84	121	291	35	CH	50
2009	30	09/01/84	121	291	35	CH	52
2010	30	09/01/84	121	291	35	CH	53
2011	30	09/01/84	121	291	35	CH	54
2012	30	09/01/84	121	291	35	CH	54
2013	30	09/01/84	121	291	35	CH	55
2014	30	09/01/84	121	291	35	CH	56

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2015	30	09/01/84	121	291	35	CH	56
2016	30	09/01/84	121	291	35	CH	57
2017	30	09/01/84	121	291	35	CH	57
2018	30	09/01/84	121	291	35	CH	57
2019	30	09/01/84	121	291	35	CH	57
2020	30	09/01/84	121	291	35	CH	58
2021	30	09/01/84	121	291	35	CH	58
2022	30	09/01/84	121	291	35	CH	59
2023	30	09/01/84	121	291	35	CH	60
2024	30	09/01/84	121	291	35	CH	60
2025	30	09/01/84	121	291	35	CH	60
2026	30	09/01/84	121	291	35	CH	60
2027	30	09/01/84	121	291	35	CH	61
2028	30	09/01/84	121	291	35	CH	61
2029	30	09/01/84	121	291	35	CH	61
2030	30	09/01/84	121	291	35	CH	62
2031	30	09/01/84	121	291	35	CH	63
2032	30	09/01/84	121	291	35	CH	63
2033	30	09/01/84	121	291	35	CH	65
2034	30	09/01/84	121	291	35	CH	66
2035	30	09/01/84	121	291	35	CH	66
2036	30	09/01/84	121	291	35	CH	66
2037	30	09/01/84	121	291	35	CH	66
2038	30	09/01/84	121	291	35	CH	66
2039	30	09/01/84	121	291	35	CH	67
2040	30	09/01/84	121	291	35	CH	67
2041	30	09/01/84	121	291	35	CH	67
2042	30	09/01/84	121	291	35	CH	68
2043	30	09/01/84	121	291	35	CH	68
2044	30	09/01/84	121	291	35	CH	69
2045	30	09/01/84	121	291	35	CH	69
2046	30	09/01/84	121	291	35	CH	69
2047	30	09/01/84	121	291	35	CH	70
2048	30	09/01/84	121	291	35	CH	70
2049	30	09/01/84	121	291	35	CH	70
2050	30	09/01/84	121	291	35	CH	72
2051	30	09/01/84	121	291	35	CH	72
2052	30	09/01/84	121	291	35	CH	73
2053	30	09/01/84	121	291	35	CH	73
2054	30	09/01/84	121	291	35	CH	75
2055	30	09/01/84	121	291	35	CH	75
2056	30	09/01/84	121	291	35	CH	75
2057	30	09/01/84	121	291	35	CH	75
2058	30	09/01/84	121	291	35	CH	75
2059	30	09/01/84	121	291	35	CH	75
2060	30	09/01/84	121	291	35	CH	75
2061	30	09/01/84	121	291	35	CH	76
2062	30	09/01/84	121	291	35	CH	76
2063	30	09/01/84	121	291	35	CH	77
2064	30	09/01/84	121	291	35	CH	77
2065	30	09/01/84	121	291	35	CH	78
2066	30	09/01/84	121	291	35	CH	78
2067	30	09/01/84	121	291	35	CH	78

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2068	30	09/01/84	121	291	35	CH	78
2069	30	09/01/84	121	291	35	CH	78
2070	30	09/01/84	121	291	35	CH	79
2071	30	09/01/84	121	291	35	CH	79
2072	30	09/01/84	121	291	35	CH	80
2073	30	09/01/84	121	291	35	CH	80
2074	30	09/01/84	121	291	35	CH	82
2075	30	09/01/84	121	291	35	CH	83
2076	30	09/01/84	121	291	35	CH	83
2077	30	09/01/84	121	291	35	CH	84
2078	30	09/01/84	121	291	35	CH	84
2079	30	09/01/84	121	291	35	CH	84
2080	30	09/01/84	121	291	35	CH	84
2081	30	09/01/84	121	291	35	CH	85
2082	30	09/01/84	121	291	35	CH	85
2083	30	09/01/84	121	291	35	CH	87
2084	30	09/01/84	121	291	35	CH	87
2085	30	09/01/84	134	292	35	CH	49
2086	30	09/01/84	134	292	35	CH	53
2087	30	09/01/84	134	292	35	CH	54
2088	30	09/01/84	134	292	35	CH	55
2089	30	09/01/84	134	292	35	CH	56
2090	30	09/01/84	134	292	35	CH	57
2091	30	09/01/84	134	292	35	CH	58
2092	30	09/01/84	134	292	35	CH	59
2093	30	09/01/84	134	292	35	CH	59
2094	30	09/01/84	134	292	35	CH	60
2095	30	09/01/84	134	292	35	CH	61
2096	30	09/01/84	134	292	35	CH	61
2097	30	09/01/84	134	292	35	CH	61
2098	30	09/01/84	134	292	35	CH	62
2099	30	09/01/84	134	292	35	CH	62
2100	30	09/01/84	134	292	35	CH	64
2101	30	09/01/84	134	292	35	CH	64
2102	30	09/01/84	134	292	35	CH	67
2103	30	09/01/84	134	292	35	CH	67
2104	30	09/01/84	134	292	35	CH	68
2105	30	09/01/84	134	292	35	CH	68
2106	30	09/01/84	134	292	35	CH	68
2107	30	09/01/84	134	292	35	CH	69
2108	30	09/01/84	134	292	35	CH	69
2109	30	09/01/84	134	292	35	CH	70
2110	30	09/01/84	134	292	35	CH	70
2111	30	09/01/84	134	292	35	CH	70
2112	30	09/01/84	134	292	35	CH	70
2113	30	09/01/84	134	292	35	CH	71
2114	30	09/01/84	134	292	35	CH	71
2115	30	09/01/84	134	292	35	CH	71
2116	30	09/01/84	134	292	35	CH	71
2117	30	09/01/84	134	292	35	CH	71
2118	30	09/01/84	134	292	35	CH	72
2119	30	09/01/84	134	292	35	CH	72
2120	30	09/01/84	134	292	35	CH	72

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2121	30	09/01/84	134	292	35	CH	73
2122	30	09/01/84	134	292	35	CH	73
2123	30	09/01/84	134	292	35	CH	74
2124	30	09/01/84	134	292	35	CH	75
2125	30	09/01/84	134	292	35	CH	75
2126	30	09/01/84	134	292	35	CH	75
2127	30	09/01/84	134	292	35	CH	75
2128	30	09/01/84	134	292	35	CH	76
2129	30	09/01/84	134	292	35	CH	77
2130	30	09/01/84	134	292	35	CH	77
2131	30	09/01/84	134	292	35	CH	78
2132	30	09/01/84	134	292	35	CH	79
2133	30	09/01/84	134	292	35	CH	80
2134	30	09/01/84	134	292	35	CH	80
2135	30	09/01/84	134	292	35	CH	80
2136	30	09/01/84	134	292	35	CH	81
2137	30	09/01/84	134	292	35	CH	83
2138	30	09/01/84	134	292	35	CH	84
2139	30	09/01/84	134	292	35	CH	84
2140	30	09/01/84	134	292	35	CH	84
2141	30	09/01/84	134	292	35	CH	87
2142	30	09/01/84	134	292	35	CH	87
2143	30	09/01/84	134	292	35	CH	94
2144	30	09/01/84	149	293	35	CH	48
2145	30	09/01/84	149	293	35	CH	52
2146	30	09/01/84	149	293	35	CH	53
2147	30	09/01/84	149	293	35	CH	57
2148	30	09/01/84	149	293	35	CH	57
2149	30	09/01/84	149	293	35	CH	59
2150	30	09/01/84	149	293	35	CH	60
2151	30	09/01/84	149	293	35	CH	61
2152	30	09/01/84	149	293	35	CH	62
2153	30	09/01/84	149	293	35	CH	62
2154	30	09/01/84	149	293	35	CH	63
2155	30	09/01/84	149	293	35	CH	63
2156	30	09/01/84	149	293	35	CH	64
2157	30	09/01/84	149	293	35	CH	64
2158	30	09/01/84	149	293	35	CH	65
2159	30	09/01/84	149	293	35	CH	65
2160	30	09/01/84	149	293	35	CH	65
2161	30	09/01/84	149	293	35	CH	65
2162	30	09/01/84	149	293	35	CH	66
2163	30	09/01/84	149	293	35	CH	67
2164	30	09/01/84	149	293	35	CH	67
2165	30	09/01/84	149	293	35	CH	67
2166	30	09/01/84	149	293	35	CH	68
2167	30	09/01/84	149	293	35	CH	68
2168	30	09/01/84	149	293	35	CH	69
2169	30	09/01/84	149	293	35	CH	70
2170	30	09/01/84	149	293	35	CH	70
2171	30	09/01/84	149	293	35	CH	71
2172	30	09/01/84	149	293	35	CH	71
2173	30	09/01/84	149	293	35	CH	71

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2174	30	09/01/84	149	293	35	CH	72
2175	30	09/01/84	149	293	35	CH	72
2176	30	09/01/84	149	293	35	CH	72
2177	30	09/01/84	149	293	35	CH	73
2178	30	09/01/84	149	293	35	CH	74
2179	30	09/01/84	149	293	35	CH	74
2180	30	09/01/84	149	293	35	CH	75
2181	30	09/01/84	149	293	35	CH	75
2182	30	09/01/84	149	293	35	CH	77
2183	30	09/01/84	149	293	35	CH	80
2184	30	09/01/84	149	293	35	CH	81
2185	30	09/01/84	149	293	35	CH	81
2186	30	09/01/84	149	293	35	CH	82
2187	30	09/01/84	149	293	35	CH	82
2188	30	09/01/84	149	293	35	CH	83
2189	30	09/01/84	149	293	35	CH	84
2190	30	09/01/84	149	293	35	CH	84
2191	30	09/01/84	149	293	35	CH	85
2192	30	09/01/84	149	293	35	CH	92
2193	30	09/01/84	225	295	35	CH	51
2194	30	09/01/84	225	295	35	CH	53
2195	30	09/01/84	225	295	35	CH	54
2196	30	09/01/84	225	295	35	CH	54
2197	30	09/01/84	225	295	35	CH	55
2198	30	09/01/84	225	295	35	CH	55
2199	30	09/01/84	225	295	35	CH	57
2200	30	09/01/84	225	295	35	CH	57
2201	30	09/01/84	225	295	35	CH	58
2202	30	09/01/84	225	295	35	CH	58
2203	30	09/01/84	225	295	35	CH	58
2204	30	09/01/84	225	295	35	CH	59
2205	30	09/01/84	225	295	35	CH	60
2206	30	09/01/84	225	295	35	CH	60
2207	30	09/01/84	225	295	35	CH	61
2208	30	09/01/84	225	295	35	CH	61
2209	30	09/01/84	225	295	35	CH	61
2210	30	09/01/84	225	295	35	CH	62
2211	30	09/01/84	225	295	35	CH	62
2212	30	09/01/84	225	295	35	CH	62
2213	30	09/01/84	225	295	35	CH	63
2214	30	09/01/84	225	295	35	CH	63
2215	30	09/01/84	225	295	35	CH	63
2216	30	09/01/84	225	295	35	CH	63
2217	30	09/01/84	225	295	35	CH	63
2218	30	09/01/84	225	295	35	CH	63
2219	30	09/01/84	225	295	35	CH	63
2220	30	09/01/84	225	295	35	CH	66
2221	30	09/01/84	225	295	35	CH	67
2222	30	09/01/84	225	295	35	CH	67
2223	30	09/01/84	225	295	35	CH	68
2224	30	09/01/84	225	295	35	CH	70
2225	30	09/01/84	225	295	35	CH	70
2226	30	09/01/84	225	295	35	CH	70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2227	30	09/01/84	225	295	35	CH	70
2228	30	09/01/84	225	295	35	CH	70
2229	30	09/01/84	225	295	35	CH	70
2230	30	09/01/84	225	295	35	CH	71
2231	30	09/01/84	225	295	35	CH	71
2232	30	09/01/84	225	295	35	CH	72
2233	30	09/01/84	225	295	35	CH	73
2234	30	09/01/84	225	295	35	CH	73
2235	30	09/01/84	225	295	35	CH	74
2236	30	09/01/84	225	295	35	CH	75
2237	30	09/01/84	225	295	35	CH	75
2238	30	09/01/84	225	295	35	CH	75
2239	30	09/01/84	225	295	35	CH	75
2240	30	09/01/84	225	295	35	CH	76
2241	30	09/01/84	225	295	35	CH	76
2242	30	09/01/84	225	295	35	CH	76
2243	30	09/01/84	225	295	35	CH	78
2244	30	09/01/84	225	295	35	CH	78
2245	30	09/01/84	225	295	35	CH	79
2246	30	09/01/84	225	295	35	CH	80
2247	30	09/01/84	225	295	35	CH	80
2248	30	09/01/84	225	295	35	CH	81
2249	30	09/01/84	225	295	35	CH	81
2250	30	09/01/84	225	295	35	CH	81
2251	30	09/01/84	225	295	35	CH	83
2252	30	09/01/84	225	295	35	CH	84
2253	30	09/01/84	225	295	35	CH	85
2254	30	09/01/84	225	295	35	CH	85
2255	30	09/01/84	225	295	35	CH	90
2256	30	09/01/84	238	296	35	CH	53
2257	30	09/01/84	238	296	35	CH	55
2258	30	09/01/84	238	296	35	CH	55
2259	30	09/01/84	238	296	35	CH	56
2260	30	09/01/84	238	296	35	CH	56
2261	30	09/01/84	238	296	35	CH	58
2262	30	09/01/84	238	296	35	CH	62
2263	30	09/01/84	238	296	35	CH	62
2264	30	09/01/84	238	296	35	CH	63
2265	30	09/01/84	238	296	35	CH	64
2266	30	09/01/84	238	296	35	CH	65
2267	30	09/01/84	238	296	35	CH	66
2268	30	09/01/84	238	296	35	CH	69
2269	30	09/01/84	238	296	35	CH	70
2270	30	09/01/84	238	296	35	CH	71
2271	30	09/01/84	238	296	35	CH	72
2272	30	09/01/84	238	296	35	CH	72
2273	30	09/01/84	238	296	35	CH	73
2274	30	09/01/84	238	296	35	CH	73
2275	30	09/01/84	238	296	35	CH	73
2276	30	09/01/84	238	296	35	CH	73
2277	30	09/01/84	238	296	35	CH	75
2278	30	09/01/84	238	296	35	CH	75
2279	30	09/01/84	238	296	35	CH	77

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2280	30	09/01/84	238	296	35	CH	81
2281	30	09/01/84	238	296	35	CH	88
2282	30	09/01/84	238	296	35	CH	88
2283	30	09/01/84	252	297	35	CH	43
2284	30	09/01/84	252	297	35	CH	53
2285	30	09/01/84	252	297	35	CH	53
2286	30	09/01/84	252	297	35	CH	57
2287	30	09/01/84	252	297	35	CH	57
2288	30	09/01/84	252	297	35	CH	59
2289	30	09/01/84	252	297	35	CH	59
2290	30	09/01/84	252	297	35	CH	59
2291	30	09/01/84	252	297	35	CH	60
2292	30	09/01/84	252	297	35	CH	61
2293	30	09/01/84	252	297	35	CH	64
2294	30	09/01/84	252	297	35	CH	64
2295	30	09/01/84	252	297	35	CH	64
2296	30	09/01/84	252	297	35	CH	65
2297	30	09/01/84	252	297	35	CH	65
2298	30	09/01/84	252	297	35	CH	65
2299	30	09/01/84	252	297	35	CH	66
2300	30	09/01/84	252	297	35	CH	67
2301	30	09/01/84	252	297	35	CH	67
2302	30	09/01/84	252	297	35	CH	67
2303	30	09/01/84	252	297	35	CH	69
2304	30	09/01/84	252	297	35	CH	71
2305	30	09/01/84	252	297	35	CH	72
2306	30	09/01/84	252	297	35	CH	72
2307	30	09/01/84	252	297	35	CH	73
2308	30	09/01/84	252	297	35	CH	73
2309	30	09/01/84	252	297	35	CH	73
2310	30	09/01/84	252	297	35	CH	74
2311	30	09/01/84	252	297	35	CH	74
2312	30	09/01/84	252	297	35	CH	76
2313	30	09/01/84	252	297	35	CH	76
2314	30	09/01/84	252	297	35	CH	77
2315	30	09/01/84	252	297	35	CH	77
2316	30	09/01/84	252	297	35	CH	77
2317	30	09/01/84	252	297	35	CH	77
2318	30	09/01/84	252	297	35	CH	79
2319	30	09/01/84	252	297	35	CH	81
2320	30	09/01/84	252	297	35	CH	81
2321	30	09/01/84	252	297	35	CH	85
2322	30	09/01/84	252	297	35	CH	86
2323	30	09/01/84	252	297	35	CH	91
2324	30	09/01/84	252	297	35	CH	95
2325	30	09/01/84	305	298	35	CH	50
2326	30	09/01/84	305	298	35	CH	51
2327	30	09/01/84	305	298	35	CH	53
2328	30	09/01/84	305	298	35	CH	54
2329	30	09/01/84	305	298	35	CH	55
2330	30	09/01/84	305	298	35	CH	55
2331	30	09/01/84	305	298	35	CH	55
2332	30	09/01/84	305	298	35	CH	56

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2333	30	09/01/84	305	298	35	CH	56
2334	30	09/01/84	305	298	35	CH	56
2335	30	09/01/84	305	298	35	CH	57
2336	30	09/01/84	305	298	35	CH	59
2337	30	09/01/84	305	298	35	CH	61
2338	30	09/01/84	305	298	35	CH	62
2339	30	09/01/84	305	298	35	CH	63
2340	30	09/01/84	305	298	35	CH	63
2341	30	09/01/84	305	298	35	CH	64
2342	30	09/01/84	305	298	35	CH	64
2343	30	09/01/84	305	298	35	CH	64
2344	30	09/01/84	305	298	35	CH	65
2345	30	09/01/84	305	298	35	CH	65
2346	30	09/01/84	305	298	35	CH	66
2347	30	09/01/84	305	298	35	CH	66
2348	30	09/01/84	305	298	35	CH	66
2349	30	09/01/84	305	298	35	CH	66
2350	30	09/01/84	305	298	35	CH	67
2351	30	09/01/84	305	298	35	CH	67
2352	30	09/01/84	305	298	35	CH	70
2353	30	09/01/84	305	298	35	CH	70
2354	30	09/01/84	305	298	35	CH	71
2355	30	09/01/84	305	298	35	CH	72
2356	30	09/01/84	305	298	35	CH	73
2357	30	09/01/84	305	298	35	CH	73
2358	30	09/01/84	305	298	35	CH	73
2359	30	09/01/84	305	298	35	CH	73
2360	30	09/01/84	305	298	35	CH	74
2361	30	09/01/84	305	298	35	CH	74
2362	30	09/01/84	305	298	35	CH	75
2363	30	09/01/84	305	298	35	CH	75
2364	30	09/01/84	305	298	35	CH	76
2365	30	09/01/84	305	298	35	CH	76
2366	30	09/01/84	305	298	35	CH	76
2367	30	09/01/84	305	298	35	CH	77
2368	30	09/01/84	305	298	35	CH	79
2369	30	09/01/84	305	298	35	CH	80
2370	30	09/01/84	305	298	35	CH	80
2371	30	09/01/84	305	298	35	CH	82
2372	30	09/01/84	305	298	35	CH	82
2373	30	09/01/84	305	298	35	CH	82
2374	30	09/01/84	305	298	35	CH	83
2375	30	09/01/84	305	298	35	CH	86
2376	30	09/01/84	305	298	35	CH	86
2377	30	09/01/84	318	299	35	CH	53
2378	30	09/01/84	318	299	35	CH	55
2379	30	09/01/84	318	299	35	CH	56
2380	30	09/01/84	318	299	35	CH	57
2381	30	09/01/84	318	299	35	CH	61
2382	30	09/01/84	318	299	35	CH	62
2383	30	09/01/84	318	299	35	CH	62
2384	30	09/01/84	318	299	35	CH	62
2385	30	09/01/84	318	299	35	CH	64

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2386	30	09/01/84	318	299	35	CH	65
2387	30	09/01/84	318	299	35	CH	66
2388	30	09/01/84	318	299	35	CH	66
2389	30	09/01/84	318	299	35	CH	67
2390	30	09/01/84	318	299	35	CH	67
2391	30	09/01/84	318	299	35	CH	67
2392	30	09/01/84	318	299	35	CH	67
2393	30	09/01/84	318	299	35	CH	68
2394	30	09/01/84	318	299	35	CH	69
2395	30	09/01/84	318	299	35	CH	71
2396	30	09/01/84	318	299	35	CH	71
2397	30	09/01/84	318	299	35	CH	72
2398	30	09/01/84	318	299	35	CH	73
2399	30	09/01/84	318	299	35	CH	74
2400	30	09/01/84	318	299	35	CH	75
2401	30	09/01/84	318	299	35	CH	75
2402	30	09/01/84	318	299	35	CH	76
2403	30	09/01/84	318	299	35	CH	77
2404	30	09/01/84	318	299	35	CH	77
2405	30	09/01/84	318	299	35	CH	78
2406	30	09/01/84	318	299	35	CH	78
2407	30	09/01/84	318	299	35	CH	78
2408	30	09/01/84	318	299	35	CH	79
2409	30	09/01/84	318	299	35	CH	79
2410	30	09/01/84	318	299	35	CH	80
2411	30	09/01/84	318	299	35	CH	81
2412	30	09/01/84	318	299	35	CH	85
2413	30	09/01/84	318	299	35	CH	86
2414	30	09/01/84	318	299	35	CH	86
2415	30	09/01/84	332	300	35	CH	51
2416	30	09/01/84	332	300	35	CH	55
2417	30	09/01/84	332	300	35	CH	55
2418	30	09/01/84	332	300	35	CH	55
2419	30	09/01/84	332	300	35	CH	56
2420	30	09/01/84	332	300	35	CH	57
2421	30	09/01/84	332	300	35	CH	58
2422	30	09/01/84	332	300	35	CH	59
2423	30	09/01/84	332	300	35	CH	60
2424	30	09/01/84	332	300	35	CH	60
2425	30	09/01/84	332	300	35	CH	60
2426	30	09/01/84	332	300	35	CH	63
2427	30	09/01/84	332	300	35	CH	64
2428	30	09/01/84	332	300	35	CH	64
2429	30	09/01/84	332	300	35	CH	64
2430	30	09/01/84	332	300	35	CH	65
2431	30	09/01/84	332	300	35	CH	65
2432	30	09/01/84	332	300	35	CH	65
2433	30	09/01/84	332	300	35	CH	65
2434	30	09/01/84	332	300	35	CH	67
2435	30	09/01/84	332	300	35	CH	67
2436	30	09/01/84	332	300	35	CH	67
2437	30	09/01/84	332	300	35	CH	67
2438	30	09/01/84	332	300	35	CH	68

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2439	30	09/01/84	332	300	35	CH	68
2440	30	09/01/84	332	300	35	CH	68
2441	30	09/01/84	332	300	35	CH	69
2442	30	09/01/84	332	300	35	CH	69
2443	30	09/01/84	332	300	35	CH	70
2444	30	09/01/84	332	300	35	CH	71
2445	30	09/01/84	332	300	35	CH	71
2446	30	09/01/84	332	300	35	CH	72
2447	30	09/01/84	332	300	35	CH	72
2448	30	09/01/84	332	300	35	CH	72
2449	30	09/01/84	332	300	35	CH	73
2450	30	09/01/84	332	300	35	CH	73
2451	30	09/01/84	332	300	35	CH	75
2452	30	09/01/84	332	300	35	CH	75
2453	30	09/01/84	332	300	35	CH	77
2454	30	09/01/84	332	300	35	CH	77
2455	30	09/01/84	332	300	35	CH	78
2456	30	09/01/84	332	300	35	CH	79
2457	30	09/01/84	332	300	35	CH	79
2458	30	09/01/84	332	300	35	CH	80
2459	30	09/01/84	332	300	35	CH	84
2460	30	09/01/84	332	300	35	CH	85
2461	30	09/01/84	332	300	35	CH	87
2462	30	09/01/84	332	300	35	CH	104
2463	30	09/01/84	345	301	35	CH	51
2464	30	09/01/84	345	301	35	CH	52
2465	30	09/01/84	345	301	35	CH	53
2466	30	09/01/84	345	301	35	CH	55
2467	30	09/01/84	345	301	35	CH	58
2468	30	09/01/84	345	301	35	CH	62
2469	30	09/01/84	345	301	35	CH	62
2470	30	09/01/84	345	301	35	CH	62
2471	30	09/01/84	345	301	35	CH	63
2472	30	09/01/84	345	301	35	CH	63
2473	30	09/01/84	345	301	35	CH	63
2474	30	09/01/84	345	301	35	CH	64
2475	30	09/01/84	345	301	35	CH	65
2476	30	09/01/84	345	301	35	CH	66
2477	30	09/01/84	345	301	35	CH	67
2478	30	09/01/84	345	301	35	CH	68
2479	30	09/01/84	345	301	35	CH	69
2480	30	09/01/84	345	301	35	CH	72
2481	30	09/01/84	345	301	35	CH	73
2482	30	09/01/84	345	301	35	CH	73
2483	30	09/01/84	345	301	35	CH	74
2484	30	09/01/84	345	301	35	CH	74
2485	30	09/01/84	345	301	35	CH	75
2486	30	09/01/84	345	301	35	CH	75
2487	30	09/01/84	345	301	35	CH	75
2488	30	09/01/84	345	301	35	CH	75
2489	30	09/01/84	345	301	35	CH	76
2490	30	09/01/84	345	301	35	CH	77
2491	30	09/01/84	345	301	35	CH	77

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2492	30	09/01/84	345	301	35	CH	78
2493	30	09/01/84	345	301	35	CH	78
2494	30	09/01/84	345	301	35	CH	80
2495	30	09/01/84	345	301	35	CH	82
2496	30	09/01/84	345	301	35	CH	83
2497	30	09/01/84	345	301	35	CH	87
2498	30	09/01/84	410	303	35	CH	52
2499	30	09/01/84	410	303	35	CH	56
2500	30	09/01/84	410	303	35	CH	57
2501	30	09/01/84	410	303	35	CH	58
2502	30	09/01/84	410	303	35	CH	65
2503	30	09/01/84	410	303	35	CH	66
2504	30	09/01/84	410	303	35	CH	67
2505	30	09/01/84	410	303	35	CH	68
2506	30	09/01/84	410	303	35	CH	68
2507	30	09/01/84	410	303	35	CH	70
2508	30	09/01/84	410	303	35	CH	73
2509	30	09/01/84	410	303	35	CH	75
2510	30	09/01/84	410	303	35	CH	75
2511	30	09/01/84	410	303	35	CH	76
2512	30	09/01/84	410	303	35	CH	86
2513	30	09/01/84	410	303	35	CH	88
2514	30	09/01/84	410	303	35	CH	88
2515	30	09/01/84	423	304	35	CH	52
2516	30	09/01/84	423	304	35	CH	55
2517	30	09/01/84	423	304	35	CH	57
2518	30	09/01/84	423	304	35	CH	57
2519	30	09/01/84	423	304	35	CH	59
2520	30	09/01/84	423	304	35	CH	60
2521	30	09/01/84	423	304	35	CH	62
2522	30	09/01/84	423	304	35	CH	63
2523	30	09/01/84	423	304	35	CH	64
2524	30	09/01/84	423	304	35	CH	64
2525	30	09/01/84	423	304	35	CH	65
2526	30	09/01/84	423	304	35	CH	66
2527	30	09/01/84	423	304	35	CH	66
2528	30	09/01/84	423	304	35	CH	66
2529	30	09/01/84	423	304	35	CH	67
2530	30	09/01/84	423	304	35	CH	67
2531	30	09/01/84	423	304	35	CH	69
2532	30	09/01/84	423	304	35	CH	69
2533	30	09/01/84	423	304	35	CH	70
2534	30	09/01/84	423	304	35	CH	71
2535	30	09/01/84	423	304	35	CH	73
2536	30	09/01/84	423	304	35	CH	73
2537	30	09/01/84	423	304	35	CH	74
2538	30	09/01/84	423	304	35	CH	75
2539	30	09/01/84	423	304	35	CH	76
2540	30	09/01/84	423	304	35	CH	76
2541	30	09/01/84	423	304	35	CH	78
2542	30	09/01/84	423	304	35	CH	78
2543	30	09/01/84	423	304	35	CH	78
2544	30	09/01/84	423	304	35	CH	79

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2545	30	09/01/84	423	304	35	CH	79
2546	30	09/01/84	423	304	35	CH	79
2547	30	09/01/84	423	304	35	CH	79
2548	30	09/01/84	423	304	35	CH	80
2549	30	09/01/84	423	304	35	CH	81
2550	30	09/01/84	423	304	35	CH	82
2551	30	09/01/84	423	304	35	CH	83
2552	30	09/01/84	423	304	35	CH	84
2553	30	09/01/84	423	304	35	CH	85
2554	30	09/01/84	423	304	35	CH	91
2555	30	09/01/84	436	305	35	CH	51
2556	30	09/01/84	436	305	35	CH	59
2557	30	09/01/84	436	305	35	CH	62
2558	30	09/01/84	436	305	35	CH	62
2559	30	09/01/84	436	305	35	CH	63
2560	30	09/01/84	436	305	35	CH	65
2561	30	09/01/84	436	305	35	CH	65
2562	30	09/01/84	436	305	35	CH	66
2563	30	09/01/84	436	305	35	CH	66
2564	30	09/01/84	436	305	35	CH	66
2565	30	09/01/84	436	305	35	CH	66
2566	30	09/01/84	436	305	35	CH	66
2567	30	09/01/84	436	305	35	CH	67
2568	30	09/01/84	436	305	35	CH	67
2569	30	09/01/84	436	305	35	CH	67
2570	30	09/01/84	436	305	35	CH	68
2571	30	09/01/84	436	305	35	CH	68
2572	30	09/01/84	436	305	35	CH	69
2573	30	09/01/84	436	305	35	CH	70
2574	30	09/01/84	436	305	35	CH	70
2575	30	09/01/84	436	305	35	CH	70
2576	30	09/01/84	436	305	35	CH	71
2577	30	09/01/84	436	305	35	CH	71
2578	30	09/01/84	436	305	35	CH	71
2579	30	09/01/84	436	305	35	CH	71
2580	30	09/01/84	436	305	35	CH	72
2581	30	09/01/84	436	305	35	CH	73
2582	30	09/01/84	436	305	35	CH	73
2583	30	09/01/84	436	305	35	CH	74
2584	30	09/01/84	436	305	35	CH	80
2585	30	09/01/84	436	305	35	CH	80
2586	30	09/01/84	436	305	35	CH	81
2587	30	09/01/84	436	305	35	CH	81
2588	30	09/01/84	436	305	35	CH	83
2589	30	09/01/84	436	305	35	CH	88
2590	30	09/01/84	436	305	35	CH	91
2591	30	09/12/84	2209	249	36	CH	65
2592	30	09/12/84	2209	249	36	CH	66
2593	30	09/12/84	2209	249	36	CH	71
2594	30	09/12/84	2209	249	36	CH	76
2595	30	09/12/84	2209	249	36	CH	79
2596	30	09/12/84	2209	249	36	CH	85
2597	30	09/12/84	2209	249	36	CH	86

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2598	30	09/12/84	2209	249	36	CH	91
2599	30	09/12/84	2232	251	35	CH	61
2600	30	09/12/84	2246	252	35	CH	75
2601	30	09/12/84	2246	252	35	CH	81
2602	30	09/12/84	2246	252	35	CH	81
2603	30	09/12/84	2300	253	35	CH	85
2604	30	09/12/84	2338	256	36	CH	76
2605	30	09/12/84	2338	256	36	CH	80
2606	30	09/12/84	2338	256	36	CH	82
2607	30	09/12/84	2338	256	36	CH	86
2608	30	09/12/84	2338	256	36	CH	89
2609	30	09/12/84	2338	256	36	CH	92
2610	30	09/12/84	2351	257	36	CH	76
2611	30	09/13/84	5	258	36	CH	75
2612	30	09/13/84	5	258	36	CH	79
2613	30	09/13/84	5	258	36	CH	91
2614	30	09/13/84	5	258	36	CH	94
2615	30	09/13/84	5	258	36	CH	104
2616	30	09/13/84	15	259	36	CH	67
2617	30	09/13/84	15	259	36	CH	73
2618	30	09/13/84	15	259	36	CH	85
2619	30	09/13/84	26	260	36	CH	85
2620	30	09/13/84	38	261	35	CH	64
2621	30	09/13/84	38	261	35	CH	72
2622	30	09/13/84	38	261	35	CH	76
2623	30	09/13/84	49	262	36	CH	76
2624	30	09/13/84	101	263	37	CH	77
2625	30	09/13/84	101	263	37	CH	78
2626	30	09/13/84	101	263	37	CH	102
2627	30	09/13/84	113	264	37	CH	90
2628	30	09/13/84	113	264	37	CH	98
2629	30	09/13/84	124	265	37	CH	49
2630	30	09/13/84	124	265	37	CH	60
2631	30	09/13/84	124	265	37	CH	89
2632	30	09/13/84	124	265	37	CH	91
2633	30	09/13/84	306	271	37	CH	77
2634	30	09/13/84	306	271	37	CH	87
2635	30	09/13/84	346	274	35	CH	65
2636	30	09/13/84	346	274	35	CH	66
2637	30	09/13/84	346	274	35	CH	67
2638	30	09/13/84	346	274	35	CH	67
2639	30	09/13/84	346	274	35	CH	67
2640	30	09/13/84	346	274	35	CH	68
2641	30	09/13/84	346	274	35	CH	68
2642	30	09/13/84	346	274	35	CH	69
2643	30	09/13/84	346	274	35	CH	71
2644	30	09/13/84	346	274	35	CH	72
2645	30	09/13/84	346	274	35	CH	73
2646	30	09/13/84	346	274	35	CH	73
2647	30	09/13/84	346	274	35	CH	73
2648	30	09/13/84	346	274	35	CH	75
2649	30	09/13/84	346	274	35	CH	75
2650	30	09/13/84	346	274	35	CH	76

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2651	30	09/13/84	346	274	35	CH	76
2652	30	09/13/84	346	274	35	CH	76
2653	30	09/13/84	346	274	35	CH	78
2654	30	09/13/84	346	274	35	CH	80
2655	30	09/13/84	346	274	35	CH	82
2656	30	09/13/84	346	274	35	CH	84
2657	30	09/13/84	346	274	35	CH	85
2658	30	09/13/84	346	274	35	CH	85
2659	30	09/13/84	346	274	35	CH	92
2660	30	09/13/84	346	274	35	CH	95
2661	30	09/13/84	420	275	35	CH	81
2662	30	09/13/84	420	275	35	CH	85
2663	30	09/13/84	420	275	35	CH	86
2664	30	09/13/84	446	397	35	CH	51
2665	30	09/13/84	446	397	35	CH	70
2666	30	09/13/84	446	397	35	CH	70
2667	30	09/13/84	446	397	35	CH	71
2668	30	09/13/84	446	397	35	CH	72
2669	30	09/13/84	446	397	35	CH	74
2670	30	09/13/84	446	397	35	CH	75
2671	30	09/13/84	446	397	35	CH	76
2672	30	09/13/84	446	397	35	CH	78
2673	30	09/13/84	446	397	35	CH	80
2674	30	09/13/84	446	397	35	CH	82
2675	30	09/13/84	446	397	35	CH	83
2676	30	09/13/84	446	397	35	CH	83
2677	30	09/13/84	446	397	35	CH	87
2678	30	09/13/84	446	397	35	CH	87
2679	30	09/13/84	446	397	35	CH	93
2680	30	09/13/84	446	397	35	CH	95
2681	30	09/13/84	512	398	36	CH	57
2682	30	09/13/84	512	398	36	CH	73
2683	30	09/13/84	512	398	36	CH	79
2684	30	09/13/84	512	398	36	CH	93
2685	30	09/13/84	525	399	36	CH	77
2686	30	09/13/84	525	399	36	CH	85
2687	30	09/13/84	538	400	37	CH	79
2688	30	09/13/84	538	400	37	CH	82
2689	30	09/13/84	551	401	37	CH	82
2690	30	09/13/84	604	402	38	CH	57
2691	30	09/13/84	2000	403	35	CH	65
2692	30	09/13/84	2000	403	35	CH	65
2693	30	09/13/84	2000	403	35	CH	66
2694	30	09/13/84	2000	403	35	CH	69
2695	30	09/13/84	2000	403	35	CH	71
2696	30	09/13/84	2000	403	35	CH	71
2697	30	09/13/84	2000	403	35	CH	72
2698	30	09/13/84	2000	403	35	CH	75
2699	30	09/13/84	2000	403	35	CH	75
2700	30	09/13/84	2000	403	35	CH	76
2701	30	09/13/84	2000	403	35	CH	77
2702	30	09/13/84	2000	403	35	CH	78
2703	30	09/13/84	2000	403	35	CH	79

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2704	30	09/13/84	2000	403	35	CH	79
2705	30	09/13/84	2000	403	35	CH	82
2706	30	09/13/84	2000	403	35	CH	84
2707	30	09/13/84	2000	403	35	CH	84
2708	30	09/13/84	2000	403	35	CH	84
2709	30	09/13/84	2000	403	35	CH	85
2710	30	09/13/84	2000	403	35	CH	88
2711	30	09/13/84	2000	403	35	CH	90
2712	30	09/13/84	2000	403	35	CH	90
2713	30	09/13/84	2000	403	35	CH	91
2714	30	09/13/84	2000	403	35	CH	92
2715	30	09/13/84	2000	403	35	CH	93
2716	30	09/13/84	2000	403	35	CH	95
2717	30	09/13/84	2000	403	35	CH	98
2718	30	09/13/84	2000	403	35	CH	99
2719	30	09/13/84	2022	404	35	CH	64
2720	30	09/13/84	2022	404	35	CH	65
2721	30	09/13/84	2022	404	35	CH	68
2722	30	09/13/84	2022	404	35	CH	68
2723	30	09/13/84	2022	404	35	CH	69
2724	30	09/13/84	2022	404	35	CH	72
2725	30	09/13/84	2022	404	35	CH	73
2726	30	09/13/84	2022	404	35	CH	74
2727	30	09/13/84	2022	404	35	CH	74
2728	30	09/13/84	2022	404	35	CH	79
2729	30	09/13/84	2022	404	35	CH	79
2730	30	09/13/84	2022	404	35	CH	82
2731	30	09/13/84	2022	404	35	CH	84
2732	30	09/13/84	2022	404	35	CH	85
2733	30	09/13/84	2022	404	35	CH	85
2734	30	09/13/84	2022	404	35	CH	86
2735	30	09/13/84	2022	404	35	CH	87
2736	30	09/13/84	2022	404	35	CH	92
2737	30	09/13/84	2036	405	35	CH	62
2738	30	09/13/84	2036	405	35	CH	62
2739	30	09/13/84	2036	405	35	CH	63
2740	30	09/13/84	2036	405	35	CH	65
2741	30	09/13/84	2036	405	35	CH	67
2742	30	09/13/84	2036	405	35	CH	67
2743	30	09/13/84	2036	405	35	CH	67
2744	30	09/13/84	2036	405	35	CH	69
2745	30	09/13/84	2036	405	35	CH	69
2746	30	09/13/84	2036	405	35	CH	70
2747	30	09/13/84	2036	405	35	CH	71
2748	30	09/13/84	2036	405	35	CH	72
2749	30	09/13/84	2036	405	35	CH	72
2750	30	09/13/84	2036	405	35	CH	72
2751	30	09/13/84	2036	405	35	CH	73
2752	30	09/13/84	2036	405	35	CH	76
2753	30	09/13/84	2036	405	35	CH	77
2754	30	09/13/84	2036	405	35	CH	78
2755	30	09/13/84	2036	405	35	CH	83
2756	30	09/13/84	2036	405	35	CH	87

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2757	30	09/13/84	2036	405	35	CH	91
2758	30	09/13/84	2036	405	35	CH	96
2759	30	09/13/84	2050	406	35	CH	63
2760	30	09/13/84	2050	406	35	CH	63
2761	30	09/13/84	2050	406	35	CH	64
2762	30	09/13/84	2050	406	35	CH	64
2763	30	09/13/84	2050	406	35	CH	65
2764	30	09/13/84	2050	406	35	CH	65
2765	30	09/13/84	2050	406	35	CH	67
2766	30	09/13/84	2050	406	35	CH	67
2767	30	09/13/84	2050	406	35	CH	72
2768	30	09/13/84	2050	406	35	CH	72
2769	30	09/13/84	2050	406	35	CH	72
2770	30	09/13/84	2050	406	35	CH	72
2771	30	09/13/84	2050	406	35	CH	73
2772	30	09/13/84	2050	406	35	CH	75
2773	30	09/13/84	2050	406	35	CH	76
2774	30	09/13/84	2050	406	35	CH	76
2775	30	09/13/84	2050	406	35	CH	81
2776	30	09/13/84	2050	406	35	CH	82
2777	30	09/13/84	2050	406	35	CH	83
2778	30	09/13/84	2050	406	35	CH	83
2779	30	09/13/84	2050	406	35	CH	85
2780	30	09/13/84	2050	406	35	CH	87
2781	30	09/13/84	2050	406	35	CH	87
2782	30	09/13/84	2050	406	35	CH	89
2783	30	09/13/84	2050	406	35	CH	90
2784	30	09/13/84	2102	407	35	CH	56
2785	30	09/13/84	2102	407	35	CH	61
2786	30	09/13/84	2102	407	35	CH	64
2787	30	09/13/84	2102	407	35	CH	64
2788	30	09/13/84	2102	407	35	CH	68
2789	30	09/13/84	2102	407	35	CH	68
2790	30	09/13/84	2102	407	35	CH	68
2791	30	09/13/84	2102	407	35	CH	69
2792	30	09/13/84	2102	407	35	CH	69
2793	30	09/13/84	2102	407	35	CH	70
2794	30	09/13/84	2102	407	35	CH	70
2795	30	09/13/84	2102	407	35	CH	71
2796	30	09/13/84	2102	407	35	CH	71
2797	30	09/13/84	2102	407	35	CH	72
2798	30	09/13/84	2102	407	35	CH	72
2799	30	09/13/84	2102	407	35	CH	73
2800	30	09/13/84	2102	407	35	CH	73
2801	30	09/13/84	2102	407	35	CH	73
2802	30	09/13/84	2102	407	35	CH	73
2803	30	09/13/84	2102	407	35	CH	74
2804	30	09/13/84	2102	407	35	CH	75
2805	30	09/13/84	2102	407	35	CH	75
2806	30	09/13/84	2102	407	35	CH	76
2807	30	09/13/84	2102	407	35	CH	76
2808	30	09/13/84	2102	407	35	CH	76
2809	30	09/13/84	2102	407	35	CH	77

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2810	30	09/13/84	2102	407	35	CH	79
2811	30	09/13/84	2102	407	35	CH	79
2812	30	09/13/84	2102	407	35	CH	80
2813	30	09/13/84	2102	407	35	CH	84
2814	30	09/13/84	2102	407	35	CH	85
2815	30	09/13/84	2102	407	35	CH	86
2816	30	09/13/84	2102	407	35	CH	87
2817	30	09/13/84	2102	407	35	CH	88
2818	30	09/13/84	2117	408	35	CH	65
2819	30	09/13/84	2117	408	35	CH	68
2820	30	09/13/84	2117	408	35	CH	70
2821	30	09/13/84	2117	408	35	CH	70
2822	30	09/13/84	2117	408	35	CH	71
2823	30	09/13/84	2117	408	35	CH	73
2824	30	09/13/84	2117	408	35	CH	74
2825	30	09/13/84	2117	408	35	CH	75
2826	30	09/13/84	2117	408	35	CH	75
2827	30	09/13/84	2117	408	35	CH	76
2828	30	09/13/84	2117	408	35	CH	78
2829	30	09/13/84	2117	408	35	CH	78
2830	30	09/13/84	2117	408	35	CH	79
2831	30	09/13/84	2117	408	35	CH	81
2832	30	09/13/84	2117	408	35	CH	82
2833	30	09/13/84	2117	408	35	CH	88
2834	30	09/13/84	2132	409	36	CH	65
2835	30	09/13/84	2132	409	36	CH	69
2836	30	09/13/84	2132	409	36	CH	69
2837	30	09/13/84	2132	409	36	CH	70
2838	30	09/13/84	2132	409	36	CH	70
2839	30	09/13/84	2132	409	36	CH	72
2840	30	09/13/84	2132	409	36	CH	72
2841	30	09/13/84	2132	409	36	CH	72
2842	30	09/13/84	2132	409	36	CH	72
2843	30	09/13/84	2132	409	36	CH	73
2844	30	09/13/84	2132	409	36	CH	76
2845	30	09/13/84	2132	409	36	CH	76
2846	30	09/13/84	2132	409	36	CH	78
2847	30	09/13/84	2132	409	36	CH	78
2848	30	09/13/84	2132	409	36	CH	79
2849	30	09/13/84	2132	409	36	CH	80
2850	30	09/13/84	2132	409	36	CH	81
2851	30	09/13/84	2132	409	36	CH	81
2852	30	09/13/84	2132	409	36	CH	81
2853	30	09/13/84	2132	409	36	CH	81
2854	30	09/13/84	2132	409	36	CH	83
2855	30	09/13/84	2132	409	36	CH	84
2856	30	09/13/84	2132	409	36	CH	85
2857	30	09/13/84	2132	409	36	CH	89
2858	30	09/13/84	2132	409	36	CH	90
2859	30	09/13/84	2132	409	36	CH	92
2860	30	09/13/84	2132	409	36	CH	94
2861	30	09/13/84	2145	410	37	CH	69
2862	30	09/13/84	2145	410	37	CH	70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2863	30	09/13/84	2145	410	37	CH	78
2864	30	09/13/84	2145	410	37	CH	87
2865	30	09/13/84	2159	411	37	CH	72
2866	30	09/13/84	2159	411	37	CH	75
2867	30	09/13/84	2159	411	37	CH	75
2868	30	09/13/84	2159	411	37	CH	78
2869	30	09/13/84	2159	411	37	CH	79
2870	30	09/13/84	2159	411	37	CH	80
2871	30	09/13/84	2210	412	36	CH	65
2872	30	09/13/84	2210	412	36	CH	73
2873	30	09/13/84	2210	412	36	CH	74
2874	30	09/13/84	2210	412	36	CH	77
2875	30	09/13/84	2210	412	36	CH	82
2876	30	09/13/84	2210	412	36	CH	83
2877	30	09/13/84	2210	412	36	CH	84
2878	30	09/13/84	2210	412	36	CH	86
2879	30	09/13/84	2210	412	36	CH	88
2880	30	09/13/84	2210	412	36	CH	92
2881	30	09/13/84	2210	412	36	CH	92
2882	30	09/13/84	2210	412	36	CH	94
2883	30	09/13/84	2221	413	36	CH	66
2884	30	09/13/84	2221	413	36	CH	66
2885	30	09/13/84	2221	413	36	CH	71
2886	30	09/13/84	2221	413	36	CH	71
2887	30	09/13/84	2221	413	36	CH	76
2888	30	09/13/84	2221	413	36	CH	82
2889	30	09/13/84	2221	413	36	CH	87
2890	30	09/13/84	2221	413	36	CH	91
2891	30	09/13/84	2234	414	35	CH	71
2892	30	09/13/84	2234	414	35	CH	73
2893	30	09/13/84	2257	416	35	CH	58
2894	30	09/13/84	2257	416	35	CH	63
2895	30	09/13/84	2257	416	35	CH	63
2896	30	09/13/84	2257	416	35	CH	70
2897	30	09/13/84	2257	416	35	CH	71
2898	30	09/13/84	2257	416	35	CH	73
2899	30	09/13/84	2257	416	35	CH	73
2900	30	09/13/84	2257	416	35	CH	73
2901	30	09/13/84	2257	416	35	CH	74
2902	30	09/13/84	2257	416	35	CH	74
2903	30	09/13/84	2257	416	35	CH	75
2904	30	09/13/84	2257	416	35	CH	76
2905	30	09/13/84	2257	416	35	CH	78
2906	30	09/13/84	2257	416	35	CH	79
2907	30	09/13/84	2257	416	35	CH	80
2908	30	09/13/84	2257	416	35	CH	82
2909	30	09/13/84	2257	416	35	CH	82
2910	30	09/13/84	2257	416	35	CH	86
2911	30	09/13/84	2257	416	35	CH	86
2912	30	09/13/84	2320	417	35	CH	58
2913	30	09/13/84	2320	417	35	CH	60
2914	30	09/13/84	2320	417	35	CH	64
2915	30	09/13/84	2320	417	35	CH	66

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2916	30	09/13/84	2320	417	35	CH	67
2917	30	09/13/84	2320	417	35	CH	68
2918	30	09/13/84	2320	417	35	CH	68
2919	30	09/13/84	2320	417	35	CH	70
2920	30	09/13/84	2320	417	35	CH	70
2921	30	09/13/84	2320	417	35	CH	70
2922	30	09/13/84	2320	417	35	CH	71
2923	30	09/13/84	2320	417	35	CH	73
2924	30	09/13/84	2320	417	35	CH	73
2925	30	09/13/84	2320	417	35	CH	73
2926	30	09/13/84	2320	417	35	CH	75
2927	30	09/13/84	2320	417	35	CH	80
2928	30	09/13/84	2320	417	35	CH	81
2929	30	09/13/84	2320	417	35	CH	82
2930	30	09/13/84	2320	417	35	CH	87
2931	30	09/13/84	2320	417	35	CH	88
2932	30	09/13/84	2320	417	35	CH	92
2933	30	09/13/84	2320	417	35	CH	95
2934	30	09/13/84	2320	417	35	CH	101
2935	30	09/13/84	2320	417	35	CH	107
2936	30	09/13/84	2334	418	35	CH	55
2937	30	09/13/84	2334	418	35	CH	60
2938	30	09/13/84	2334	418	35	CH	61
2939	30	09/13/84	2334	418	35	CH	62
2940	30	09/13/84	2334	418	35	CH	66
2941	30	09/13/84	2334	418	35	CH	66
2942	30	09/13/84	2334	418	35	CH	66
2943	30	09/13/84	2334	418	35	CH	66
2944	30	09/13/84	2334	418	35	CH	66
2945	30	09/13/84	2334	418	35	CH	67
2946	30	09/13/84	2334	418	35	CH	68
2947	30	09/13/84	2334	418	35	CH	68
2948	30	09/13/84	2334	418	35	CH	69
2949	30	09/13/84	2334	418	35	CH	71
2950	30	09/13/84	2334	418	35	CH	73
2951	30	09/13/84	2334	418	35	CH	75
2952	30	09/13/84	2334	418	35	CH	76
2953	30	09/13/84	2334	418	35	CH	76
2954	30	09/13/84	2334	418	35	CH	78
2955	30	09/13/84	2334	418	35	CH	78
2956	30	09/13/84	2334	418	35	CH	79
2957	30	09/13/84	2334	418	35	CH	81
2958	30	09/13/84	2334	418	35	CH	81
2959	30	09/13/84	2334	418	35	CH	83
2960	30	09/13/84	2334	418	35	CH	83
2961	30	09/13/84	2334	418	35	CH	83
2962	30	09/13/84	2334	418	35	CH	83
2963	30	09/13/84	2334	418	35	CH	90
2964	30	09/13/84	2334	418	35	CH	90
2965	30	09/13/84	2334	418	35	CH	99
2966	30	09/13/84	2351	419	35	CH	69
2967	30	09/13/84	2351	419	35	CH	69
2968	30	09/13/84	2351	419	35	CH	71

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
2969	30	09/13/84	2351	419	35	CH	72
2970	30	09/13/84	2351	419	35	CH	77
2971	30	09/13/84	2351	419	35	CH	78
2972	30	09/13/84	2351	419	35	CH	80
2973	30	09/13/84	2351	419	35	CH	85
2974	30	09/13/84	2351	419	35	CH	85
2975	30	09/13/84	2351	419	35	CH	85
2976	30	09/13/84	2351	419	35	CH	85
2977	30	09/13/84	2351	419	35	CH	90
2978	30	09/13/84	2351	419	35	CH	94
2979	30	09/13/84	2351	419	35	CH	99
2980	30	09/14/84	8	420	35	CH	58
2981	30	09/14/84	8	420	35	CH	65
2982	30	09/14/84	8	420	35	CH	69
2983	30	09/14/84	8	420	35	CH	71
2984	30	09/14/84	8	420	35	CH	72
2985	30	09/14/84	8	420	35	CH	73
2986	30	09/14/84	8	420	35	CH	73
2987	30	09/14/84	8	420	35	CH	76
2988	30	09/14/84	8	420	35	CH	76
2989	30	09/14/84	8	420	35	CH	76
2990	30	09/14/84	8	420	35	CH	77
2991	30	09/14/84	8	420	35	CH	78
2992	30	09/14/84	8	420	35	CH	79
2993	30	09/14/84	8	420	35	CH	79
2994	30	09/14/84	8	420	35	CH	80
2995	30	09/14/84	8	420	35	CH	80
2996	30	09/14/84	8	420	35	CH	86
2997	30	09/14/84	8	420	35	CH	87
2998	30	09/14/84	8	420	35	CH	90
2999	30	09/14/84	8	420	35	CH	92
3000	30	09/14/84	22	421	35	CH	66
3001	30	09/14/84	22	421	35	CH	69
3002	30	09/14/84	22	421	35	CH	71
3003	30	09/14/84	22	421	35	CH	73
3004	30	09/14/84	22	421	35	CH	74
3005	30	09/14/84	22	421	35	CH	74
3006	30	09/14/84	22	421	35	CH	75
3007	30	09/14/84	22	421	35	CH	79
3008	30	09/14/84	22	421	35	CH	79
3009	30	09/14/84	22	421	35	CH	79
3010	30	09/14/84	22	421	35	CH	80
3011	30	09/14/84	22	421	35	CH	80
3012	30	09/14/84	22	421	35	CH	81
3013	30	09/14/84	22	421	35	CH	81
3014	30	09/14/84	22	421	35	CH	82
3015	30	09/14/84	22	421	35	CH	82
3016	30	09/14/84	49	423	35	CH	69
3017	30	09/14/84	49	423	35	CH	71
3018	30	09/14/84	49	423	35	CH	74
3019	30	09/14/84	49	423	35	CH	74
3020	30	09/14/84	49	423	35	CH	74
3021	30	09/14/84	49	423	35	CH	76

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3022	30	09/14/84	49	423	35	CH	76
3023	30	09/14/84	49	423	35	CH	78
3024	30	09/14/84	49	423	35	CH	78
3025	30	09/14/84	49	423	35	CH	81
3026	30	09/14/84	49	423	35	CH	82
3027	30	09/14/84	49	423	35	CH	85
3028	30	09/14/84	49	423	35	CH	86
3029	30	09/14/84	49	423	35	CH	87
3030	30	09/14/84	49	423	35	CH	93
3031	30	09/14/84	49	423	35	CH	93
3032	30	09/14/84	147	428	35	CH	79
3033	30	09/14/84	147	428	35	CH	87
3034	30	09/14/84	147	428	35	CH	93
3035	30	09/14/84	247	433	36	CH	75
3036	30	09/14/84	247	433	36	CH	80
3037	30	09/14/84	309	435	36	CH	85
3038	30	09/14/84	335	437	35	CH	85
3039	30	09/15/84	2004	460	39	IP	60
3040	30	09/15/84	2004	460	39	IP	60
3041	30	09/15/84	2004	460	39	IP	75
3042	30	09/15/84	2004	460	39	IP	78
3043	30	09/15/84	2004	460	39	IP	79
3044	30	09/15/84	2004	460	39	IP	85
3045	30	09/15/84	2004	460	39	IP	87
3046	30	09/15/84	2004	460	39	IP	91
3047	30	09/15/84	2024	461	38	CH	60
3048	30	09/15/84	2024	461	38	CH	67
3049	30	09/15/84	2024	461	38	CH	83
3050	30	09/15/84	2024	461	38	CH	97
3051	30	09/15/84	2048	462	37	CH	68
3052	30	09/15/84	2048	462	37	CH	86
3053	30	09/15/84	2048	462	37	CH	90
3054	30	09/15/84	2147	463	36	CH	79
3055	30	09/15/84	2147	463	36	CH	83
3056	30	09/15/84	2147	463	36	CH	86
3057	30	09/15/84	2147	463	36	CH	92
3058	30	09/15/84	2231	465	36	CH	70
3059	30	09/15/84	2231	465	36	CH	73
3060	30	09/15/84	2231	465	36	CH	74
3061	30	09/15/84	2231	465	36	CH	75
3062	30	09/15/84	2231	465	36	CH	87
3063	30	09/15/84	2231	465	36	CH	90
3064	30	09/15/84	2247	466	36	CH	79
3065	30	09/15/84	2247	466	36	CH	84
3066	30	09/15/84	2316	468	35	CH	71
3067	30	09/15/84	2316	468	35	CH	81
3068	30	09/15/84	2316	468	35	CH	93
3069	30	09/15/84	2316	468	35	CH	107
3070	30	09/15/84	2331	501	35	CH	68
3071	30	09/15/84	2331	501	35	CH	79
3072	30	09/15/84	2331	501	35	CH	82
3073	30	09/15/84	2331	501	35	CH	82
3074	30	09/15/84	2331	501	35	CH	88

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3075	30	09/15/84	2331	501	35	CH	88
3076	30	09/16/84	30	502	30	TZ	81
3077	30	09/16/84	30	502	30	TZ	89
3078	30	09/16/84	30	502	30	TZ	93
3079	30	09/16/84	30	502	30	TZ	96
3080	30	09/24/84	1939	601	35	CH	69
3081	30	09/24/84	1939	601	35	CH	90
3082	30	09/24/84	2028	604	35	CH	75
3083	30	09/24/84	2028	604	35	CH	76
3084	30	09/24/84	2028	604	35	CH	77
3085	30	09/24/84	2028	604	35	CH	79
3086	30	09/24/84	2028	604	35	CH	82
3087	30	09/24/84	2028	604	35	CH	83
3088	30	09/24/84	2028	604	35	CH	84
3089	30	09/24/84	2028	604	35	CH	84
3090	30	09/24/84	2028	604	35	CH	91
3091	30	09/24/84	2045	605	35	CH	71
3092	30	09/24/84	2045	605	35	CH	74
3093	30	09/24/84	2045	605	35	CH	80
3094	30	09/24/84	2045	605	35	CH	96
3095	30	09/24/84	2045	605	35	CH	98
3096	30	09/24/84	2100	606	35	CH	71
3097	30	09/24/84	2100	606	35	CH	80
3098	30	09/24/84	2100	606	35	CH	92
3099	30	09/24/84	2100	606	35	CH	105
3100	30	09/24/84	2100	606	35	CH	110
3101	30	09/24/84	2115	607	35	CH	67
3102	30	09/24/84	2115	607	35	CH	68
3103	30	09/24/84	2115	607	35	CH	72
3104	30	09/24/84	2115	607	35	CH	72
3105	30	09/24/84	2115	607	35	CH	73
3106	30	09/24/84	2115	607	35	CH	74
3107	30	09/24/84	2115	607	35	CH	77
3108	30	09/24/84	2115	607	35	CH	78
3109	30	09/24/84	2115	607	35	CH	79
3110	30	09/24/84	2115	607	35	CH	79
3111	30	09/24/84	2115	607	35	CH	82
3112	30	09/24/84	2115	607	35	CH	82
3113	30	09/24/84	2115	607	35	CH	83
3114	30	09/24/84	2115	607	35	CH	84
3115	30	09/24/84	2115	607	35	CH	84
3116	30	09/24/84	2115	607	35	CH	84
3117	30	09/24/84	2115	607	35	CH	84
3118	30	09/24/84	2115	607	35	CH	85
3119	30	09/24/84	2115	607	35	CH	88
3120	30	09/24/84	2115	607	35	CH	88
3121	30	09/24/84	2115	607	35	CH	89
3122	30	09/24/84	2115	607	35	CH	89
3123	30	09/24/84	2115	607	35	CH	90
3124	30	09/24/84	2115	607	35	CH	93
3125	30	09/24/84	2115	607	35	CH	95
3126	30	09/24/84	2115	607	35	CH	96
3127	30	09/24/84	2115	607	35	CH	96

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3128	30	09/24/84	2115	607	35	CH	97
3129	30	09/24/84	2115	607	35	CH	98
3130	30	09/24/84	2115	607	35	CH	99
3131	30	09/24/84	2115	607	35	CH	103
3132	30	09/24/84	2115	607	35	CH	115
3133	30	09/24/84	2138	608	35	CH	74
3134	30	09/24/84	2138	608	35	CH	77
3135	30	09/24/84	2138	608	35	CH	77
3136	30	09/24/84	2138	608	35	CH	79
3137	30	09/24/84	2138	608	35	CH	79
3138	30	09/24/84	2138	608	35	CH	86
3139	30	09/24/84	2138	608	35	CH	86
3140	30	09/24/84	2138	608	35	CH	88
3141	30	09/24/84	2138	608	35	CH	90
3142	30	09/24/84	2138	608	35	CH	91
3143	30	09/24/84	2138	608	35	CH	94
3144	30	09/24/84	2138	608	35	CH	98
3145	30	09/24/84	2153	609	35	CH	72
3146	30	09/24/84	2153	609	35	CH	73
3147	30	09/24/84	2153	609	35	CH	74
3148	30	09/24/84	2153	609	35	CH	74
3149	30	09/24/84	2153	609	35	CH	75
3150	30	09/24/84	2153	609	35	CH	75
3151	30	09/24/84	2153	609	35	CH	76
3152	30	09/24/84	2153	609	35	CH	78
3153	30	09/24/84	2153	609	35	CH	78
3154	30	09/24/84	2153	609	35	CH	78
3155	30	09/24/84	2153	609	35	CH	79
3156	30	09/24/84	2153	609	35	CH	79
3157	30	09/24/84	2153	609	35	CH	80
3158	30	09/24/84	2153	609	35	CH	83
3159	30	09/24/84	2153	609	35	CH	84
3160	30	09/24/84	2153	609	35	CH	84
3161	30	09/24/84	2153	609	35	CH	86
3162	30	09/24/84	2153	609	35	CH	87
3163	30	09/24/84	2153	609	35	CH	87
3164	30	09/24/84	2153	609	35	CH	88
3165	30	09/24/84	2153	609	35	CH	88
3166	30	09/24/84	2153	609	35	CH	89
3167	30	09/24/84	2153	609	35	CH	89
3168	30	09/24/84	2153	609	35	CH	91
3169	30	09/24/84	2153	609	35	CH	92
3170	30	09/24/84	2153	609	35	CH	93
3171	30	09/24/84	2153	609	35	CH	93
3172	30	09/24/84	2153	609	35	CH	94
3173	30	09/24/84	2153	609	35	CH	95
3174	30	09/24/84	2153	609	35	CH	95
3175	30	09/24/84	2153	609	35	CH	98
3176	30	09/24/84	2153	609	35	CH	105
3177	30	09/24/84	2153	609	35	CH	114
3178	30	09/24/84	2153	609	35	CH	115
3179	30	09/24/84	2214	610	35	CH	63
3180	30	09/24/84	2214	610	35	CH	64

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3181	30	09/24/84	2214	610	35	CH	68
3182	30	09/24/84	2214	610	35	CH	68
3183	30	09/24/84	2214	610	35	CH	69
3184	30	09/24/84	2214	610	35	CH	72
3185	30	09/24/84	2214	610	35	CH	74
3186	30	09/24/84	2214	610	35	CH	75
3187	30	09/24/84	2214	610	35	CH	75
3188	30	09/24/84	2214	610	35	CH	76
3189	30	09/24/84	2214	610	35	CH	76
3190	30	09/24/84	2214	610	35	CH	78
3191	30	09/24/84	2214	610	35	CH	78
3192	30	09/24/84	2214	610	35	CH	78
3193	30	09/24/84	2214	610	35	CH	79
3194	30	09/24/84	2214	610	35	CH	79
3195	30	09/24/84	2214	610	35	CH	79
3196	30	09/24/84	2214	610	35	CH	80
3197	30	09/24/84	2214	610	35	CH	84
3198	30	09/24/84	2214	610	35	CH	84
3199	30	09/24/84	2214	610	35	CH	84
3200	30	09/24/84	2214	610	35	CH	85
3201	30	09/24/84	2214	610	35	CH	85
3202	30	09/24/84	2214	610	35	CH	86
3203	30	09/24/84	2214	610	35	CH	86
3204	30	09/24/84	2214	610	35	CH	86
3205	30	09/24/84	2214	610	35	CH	86
3206	30	09/24/84	2214	610	35	CH	87
3207	30	09/24/84	2214	610	35	CH	87
3208	30	09/24/84	2214	610	35	CH	88
3209	30	09/24/84	2214	610	35	CH	88
3210	30	09/24/84	2214	610	35	CH	88
3211	30	09/24/84	2214	610	35	CH	88
3212	30	09/24/84	2214	610	35	CH	88
3213	30	09/24/84	2214	610	35	CH	89
3214	30	09/24/84	2214	610	35	CH	90
3215	30	09/24/84	2214	610	35	CH	92
3216	30	09/24/84	2214	610	35	CH	93
3217	30	09/24/84	2214	610	35	CH	94
3218	30	09/24/84	2214	610	35	CH	96
3219	30	09/24/84	2214	610	35	CH	97
3220	30	09/24/84	2214	610	35	CH	97
3221	30	09/24/84	2214	610	35	CH	98
3222	30	09/24/84	2214	610	35	CH	101
3223	30	09/24/84	2214	610	35	CH	107
3224	30	09/24/84	2214	610	35	CH	108
3225	30	09/24/84	2214	610	35	CH	113
3226	30	09/24/84	2235	611	35	CH	70
3227	30	09/24/84	2235	611	35	CH	72
3228	30	09/24/84	2235	611	35	CH	73
3229	30	09/24/84	2235	611	35	CH	73
3230	30	09/24/84	2235	611	35	CH	73
3231	30	09/24/84	2235	611	35	CH	74
3232	30	09/24/84	2235	611	35	CH	75
3233	30	09/24/84	2235	611	35	CH	77

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3234	30	09/24/84	2235	611	35	CH	78
3235	30	09/24/84	2235	611	35	CH	78
3236	30	09/24/84	2235	611	35	CH	79
3237	30	09/24/84	2235	611	35	CH	80
3238	30	09/24/84	2235	611	35	CH	80
3239	30	09/24/84	2235	611	35	CH	81
3240	30	09/24/84	2235	611	35	CH	84
3241	30	09/24/84	2235	611	35	CH	84
3242	30	09/24/84	2235	611	35	CH	85
3243	30	09/24/84	2235	611	35	CH	85
3244	30	09/24/84	2235	611	35	CH	85
3245	30	09/24/84	2235	611	35	CH	85
3246	30	09/24/84	2235	611	35	CH	86
3247	30	09/24/84	2235	611	35	CH	87
3248	30	09/24/84	2235	611	35	CH	88
3249	30	09/24/84	2235	611	35	CH	88
3250	30	09/24/84	2235	611	35	CH	89
3251	30	09/24/84	2235	611	35	CH	90
3252	30	09/24/84	2235	611	35	CH	90
3253	30	09/24/84	2235	611	35	CH	93
3254	30	09/24/84	2235	611	35	CH	94
3255	30	09/24/84	2235	611	35	CH	94
3256	30	09/24/84	2235	611	35	CH	98
3257	30	09/24/84	2235	611	35	CH	98
3258	30	09/24/84	2235	611	35	CH	105
3259	30	09/24/84	2235	611	35	CH	112
3260	30	09/24/84	2235	611	35	CH	113
3261	30	09/24/84	2309	612	35	CH	67
3262	30	09/24/84	2309	612	35	CH	69
3263	30	09/24/84	2309	612	35	CH	69
3264	30	09/24/84	2309	612	35	CH	71
3265	30	09/24/84	2309	612	35	CH	72
3266	30	09/24/84	2309	612	35	CH	74
3267	30	09/24/84	2309	612	35	CH	75
3268	30	09/24/84	2309	612	35	CH	75
3269	30	09/24/84	2309	612	35	CH	76
3270	30	09/24/84	2309	612	35	CH	76
3271	30	09/24/84	2309	612	35	CH	77
3272	30	09/24/84	2309	612	35	CH	78
3273	30	09/24/84	2309	612	35	CH	78
3274	30	09/24/84	2309	612	35	CH	78
3275	30	09/24/84	2309	612	35	CH	79
3276	30	09/24/84	2309	612	35	CH	79
3277	30	09/24/84	2309	612	35	CH	80
3278	30	09/24/84	2309	612	35	CH	80
3279	30	09/24/84	2309	612	35	CH	81
3280	30	09/24/84	2309	612	35	CH	81
3281	30	09/24/84	2309	612	35	CH	82
3282	30	09/24/84	2309	612	35	CH	83
3283	30	09/24/84	2309	612	35	CH	83
3284	30	09/24/84	2309	612	35	CH	83
3285	30	09/24/84	2309	612	35	CH	84
3286	30	09/24/84	2309	612	35	CH	84

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3287	30	09/24/84	2309	612	35	CH	85
3288	30	09/24/84	2309	612	35	CH	85
3289	30	09/24/84	2309	612	35	CH	86
3290	30	09/24/84	2309	612	35	CH	88
3291	30	09/24/84	2309	612	35	CH	90
3292	30	09/24/84	2309	612	35	CH	90
3293	30	09/24/84	2309	612	35	CH	90
3294	30	09/24/84	2309	612	35	CH	90
3295	30	09/24/84	2309	612	35	CH	92
3296	30	09/24/84	2309	612	35	CH	93
3297	30	09/24/84	2309	612	35	CH	94
3298	30	09/24/84	2309	612	35	CH	95
3299	30	09/24/84	2309	612	35	CH	96
3300	30	09/24/84	2309	612	35	CH	97
3301	30	09/24/84	2309	612	35	CH	98
3302	30	09/24/84	2309	612	35	CH	98
3303	30	09/24/84	2309	612	35	CH	98
3304	30	09/24/84	2309	612	35	CH	101
3305	30	09/24/84	2309	612	35	CH	101
3306	30	09/24/84	2309	612	35	CH	102
3307	30	09/24/84	2309	612	35	CH	104
3308	30	09/24/84	2309	612	35	CH	113
3309	30	09/24/84	2309	612	35	CH	116
3310	30	09/24/84	2328	613	35	CH	70
3311	30	09/24/84	2328	613	35	CH	72
3312	30	09/24/84	2328	613	35	CH	72
3313	30	09/24/84	2328	613	35	CH	74
3314	30	09/24/84	2328	613	35	CH	76
3315	30	09/24/84	2328	613	35	CH	80
3316	30	09/24/84	2328	613	35	CH	81
3317	30	09/24/84	2328	613	35	CH	81
3318	30	09/24/84	2328	613	35	CH	82
3319	30	09/24/84	2328	613	35	CH	82
3320	30	09/24/84	2328	613	35	CH	84
3321	30	09/24/84	2328	613	35	CH	84
3322	30	09/24/84	2328	613	35	CH	86
3323	30	09/24/84	2328	613	35	CH	86
3324	30	09/24/84	2328	613	35	CH	88
3325	30	09/24/84	2328	613	35	CH	89
3326	30	09/24/84	2328	613	35	CH	90
3327	30	09/24/84	2328	613	35	CH	90
3328	30	09/24/84	2328	613	35	CH	90
3329	30	09/24/84	2328	613	35	CH	91
3330	30	09/24/84	2328	613	35	CH	92
3331	30	09/24/84	2328	613	35	CH	93
3332	30	09/24/84	2328	613	35	CH	95
3333	30	09/24/84	2328	613	35	CH	95
3334	30	09/24/84	2328	613	35	CH	98
3335	30	09/24/84	2328	613	35	CH	98
3336	30	09/24/84	2328	613	35	CH	106
3337	30	09/24/84	2328	613	35	CH	109
3338	30	09/24/84	2345	614	35	CH	67
3339	30	09/24/84	2345	614	35	CH	70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3340	30	09/24/84	2345	614	35	CH	73
3341	30	09/24/84	2345	614	35	CH	74
3342	30	09/24/84	2345	614	35	CH	75
3343	30	09/24/84	2345	614	35	CH	76
3344	30	09/24/84	2345	614	35	CH	76
3345	30	09/24/84	2345	614	35	CH	76
3346	30	09/24/84	2345	614	35	CH	77
3347	30	09/24/84	2345	614	35	CH	77
3348	30	09/24/84	2345	614	35	CH	79
3349	30	09/24/84	2345	614	35	CH	80
3350	30	09/24/84	2345	614	35	CH	80
3351	30	09/24/84	2345	614	35	CH	80
3352	30	09/24/84	2345	614	35	CH	81
3353	30	09/24/84	2345	614	35	CH	81
3354	30	09/24/84	2345	614	35	CH	81
3355	30	09/24/84	2345	614	35	CH	82
3356	30	09/24/84	2345	614	35	CH	83
3357	30	09/24/84	2345	614	35	CH	85
3358	30	09/24/84	2345	614	35	CH	86
3359	30	09/24/84	2345	614	35	CH	86
3360	30	09/24/84	2345	614	35	CH	87
3361	30	09/24/84	2345	614	35	CH	87
3362	30	09/24/84	2345	614	35	CH	87
3363	30	09/24/84	2345	614	35	CH	88
3364	30	09/24/84	2345	614	35	CH	88
3365	30	09/24/84	2345	614	35	CH	94
3366	30	09/24/84	2345	614	35	CH	97
3367	30	09/24/84	2345	614	35	CH	97
3368	30	09/24/84	2345	614	35	CH	98
3369	30	09/24/84	2345	614	35	CH	99
3370	30	09/24/84	2345	614	35	CH	99
3371	30	09/24/84	2345	614	35	CH	99
3372	30	09/24/84	2345	614	35	CH	99
3373	30	09/24/84	2345	614	35	CH	100
3374	30	09/24/84	2345	614	35	CH	100
3375	30	09/24/84	2345	614	35	CH	101
3376	30	09/24/84	2345	614	35	CH	108
3377	30	09/24/84	2345	614	35	CH	119
3378	30	09/25/84	4	615	35	CH	63
3379	30	09/25/84	4	615	35	CH	68
3380	30	09/25/84	4	615	35	CH	70
3381	30	09/25/84	4	615	35	CH	70
3382	30	09/25/84	4	615	35	CH	70
3383	30	09/25/84	4	615	35	CH	73
3384	30	09/25/84	4	615	35	CH	73
3385	30	09/25/84	4	615	35	CH	75
3386	30	09/25/84	4	615	35	CH	75
3387	30	09/25/84	4	615	35	CH	76
3388	30	09/25/84	4	615	35	CH	76
3389	30	09/25/84	4	615	35	CH	76
3390	30	09/25/84	4	615	35	CH	77
3391	30	09/25/84	4	615	35	CH	77
3392	30	09/25/84	4	615	35	CH	77

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3393	30	09/25/84	4	615	35	CH	79
3394	30	09/25/84	4	615	35	CH	79
3395	30	09/25/84	4	615	35	CH	80
3396	30	09/25/84	4	615	35	CH	81
3397	30	09/25/84	4	615	35	CH	83
3398	30	09/25/84	4	615	35	CH	83
3399	30	09/25/84	4	615	35	CH	84
3400	30	09/25/84	4	615	35	CH	84
3401	30	09/25/84	4	615	35	CH	85
3402	30	09/25/84	4	615	35	CH	85
3403	30	09/25/84	4	615	35	CH	85
3404	30	09/25/84	4	615	35	CH	85
3405	30	09/25/84	4	615	35	CH	87
3406	30	09/25/84	4	615	35	CH	87
3407	30	09/25/84	4	615	35	CH	88
3408	30	09/25/84	4	615	35	CH	89
3409	30	09/25/84	4	615	35	CH	92
3410	30	09/25/84	4	615	35	CH	93
3411	30	09/25/84	4	615	35	CH	95
3412	30	09/25/84	4	615	35	CH	95
3413	30	09/25/84	4	615	35	CH	98
3414	30	09/25/84	4	615	35	CH	101
3415	30	09/25/84	4	615	35	CH	102
3416	30	09/25/84	4	615	35	CH	103
3417	30	09/25/84	4	615	35	CH	121
3418	30	09/25/84	29	616	35	CH	66
3419	30	09/25/84	29	616	35	CH	71
3420	30	09/25/84	29	616	35	CH	72
3421	30	09/25/84	29	616	35	CH	72
3422	30	09/25/84	29	616	35	CH	72
3423	30	09/25/84	29	616	35	CH	73
3424	30	09/25/84	29	616	35	CH	76
3425	30	09/25/84	29	616	35	CH	77
3426	30	09/25/84	29	616	35	CH	77
3427	30	09/25/84	29	616	35	CH	77
3428	30	09/25/84	29	616	35	CH	77
3429	30	09/25/84	29	616	35	CH	78
3430	30	09/25/84	29	616	35	CH	78
3431	30	09/25/84	29	616	35	CH	78
3432	30	09/25/84	29	616	35	CH	79
3433	30	09/25/84	29	616	35	CH	79
3434	30	09/25/84	29	616	35	CH	79
3435	30	09/25/84	29	616	35	CH	80
3436	30	09/25/84	29	616	35	CH	80
3437	30	09/25/84	29	616	35	CH	81
3438	30	09/25/84	29	616	35	CH	81
3439	30	09/25/84	29	616	35	CH	83
3440	30	09/25/84	29	616	35	CH	83
3441	30	09/25/84	29	616	35	CH	83
3442	30	09/25/84	29	616	35	CH	83
3443	30	09/25/84	29	616	35	CH	84
3444	30	09/25/84	29	616	35	CH	84
3445	30	09/25/84	29	616	35	CH	85

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3446	30	09/25/84	29	616	35	CH	85
3447	30	09/25/84	29	616	35	CH	85
3448	30	09/25/84	29	616	35	CH	86
3449	30	09/25/84	29	616	35	CH	86
3450	30	09/25/84	29	616	35	CH	86
3451	30	09/25/84	29	616	35	CH	86
3452	30	09/25/84	29	616	35	CH	87
3453	30	09/25/84	29	616	35	CH	90
3454	30	09/25/84	29	616	35	CH	90
3455	30	09/25/84	29	616	35	CH	92
3456	30	09/25/84	29	616	35	CH	92
3457	30	09/25/84	29	616	35	CH	94
3458	30	09/25/84	29	616	35	CH	95
3459	30	09/25/84	29	616	35	CH	97
3460	30	09/25/84	29	616	35	CH	98
3461	30	09/25/84	47	617	35	CH	70
3462	30	09/25/84	47	617	35	CH	72
3463	30	09/25/84	47	617	35	CH	72
3464	30	09/25/84	47	617	35	CH	73
3465	30	09/25/84	47	617	35	CH	73
3466	30	09/25/84	47	617	35	CH	74
3467	30	09/25/84	47	617	35	CH	75
3468	30	09/25/84	47	617	35	CH	75
3469	30	09/25/84	47	617	35	CH	75
3470	30	09/25/84	47	617	35	CH	76
3471	30	09/25/84	47	617	35	CH	76
3472	30	09/25/84	47	617	35	CH	77
3473	30	09/25/84	47	617	35	CH	78
3474	30	09/25/84	47	617	35	CH	79
3475	30	09/25/84	47	617	35	CH	79
3476	30	09/25/84	47	617	35	CH	80
3477	30	09/25/84	47	617	35	CH	81
3478	30	09/25/84	47	617	35	CH	81
3479	30	09/25/84	47	617	35	CH	81
3480	30	09/25/84	47	617	35	CH	82
3481	30	09/25/84	47	617	35	CH	82
3482	30	09/25/84	47	617	35	CH	82
3483	30	09/25/84	47	617	35	CH	83
3484	30	09/25/84	47	617	35	CH	83
3485	30	09/25/84	47	617	35	CH	83
3486	30	09/25/84	47	617	35	CH	83
3487	30	09/25/84	47	617	35	CH	84
3488	30	09/25/84	47	617	35	CH	86
3489	30	09/25/84	47	617	35	CH	86
3490	30	09/25/84	47	617	35	CH	88
3491	30	09/25/84	47	617	35	CH	89
3492	30	09/25/84	47	617	35	CH	93
3493	30	09/25/84	47	617	35	CH	97
3494	30	09/25/84	47	617	35	CH	112
3495	30	09/25/84	47	617	35	CH	114
3496	30	09/25/84	47	617	35	CH	114
3497	30	09/25/84	143	620	35	CH	68
3498	30	09/25/84	143	620	35	CH	70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3499	30	09/25/84	143	620	35	CH	73
3500	30	09/25/84	143	620	35	CH	74
3501	30	09/25/84	143	620	35	CH	75
3502	30	09/25/84	143	620	35	CH	75
3503	30	09/25/84	143	620	35	CH	75
3504	30	09/25/84	143	620	35	CH	77
3505	30	09/25/84	143	620	35	CH	77
3506	30	09/25/84	143	620	35	CH	79
3507	30	09/25/84	143	620	35	CH	80
3508	30	09/25/84	143	620	35	CH	82
3509	30	09/25/84	143	620	35	CH	82
3510	30	09/25/84	143	620	35	CH	83
3511	30	09/25/84	143	620	35	CH	83
3512	30	09/25/84	143	620	35	CH	83
3513	30	09/25/84	143	620	35	CH	84
3514	30	09/25/84	143	620	35	CH	86
3515	30	09/25/84	143	620	35	CH	87
3516	30	09/25/84	143	620	35	CH	87
3517	30	09/25/84	143	620	35	CH	90
3518	30	09/25/84	143	620	35	CH	92
3519	30	09/25/84	143	620	35	CH	98
3520	30	09/25/84	204	621	35	CH	70
3521	30	09/25/84	204	621	35	CH	70
3522	30	09/25/84	204	621	35	CH	71
3523	30	09/25/84	204	621	35	CH	72
3524	30	09/25/84	204	621	35	CH	75
3525	30	09/25/84	204	621	35	CH	76
3526	30	09/25/84	204	621	35	CH	76
3527	30	09/25/84	204	621	35	CH	77
3528	30	09/25/84	204	621	35	CH	77
3529	30	09/25/84	204	621	35	CH	78
3530	30	09/25/84	204	621	35	CH	79
3531	30	09/25/84	204	621	35	CH	81
3532	30	09/25/84	204	621	35	CH	82
3533	30	09/25/84	204	621	35	CH	82
3534	30	09/25/84	204	621	35	CH	82
3535	30	09/25/84	204	621	35	CH	82
3536	30	09/25/84	204	621	35	CH	83
3537	30	09/25/84	204	621	35	CH	84
3538	30	09/25/84	204	621	35	CH	85
3539	30	09/25/84	204	621	35	CH	85
3540	30	09/25/84	204	621	35	CH	85
3541	30	09/25/84	204	621	35	CH	86
3542	30	09/25/84	204	621	35	CH	87
3543	30	09/25/84	204	621	35	CH	87
3544	30	09/25/84	204	621	35	CH	87
3545	30	09/25/84	204	621	35	CH	88
3546	30	09/25/84	204	621	35	CH	88
3547	30	09/25/84	204	621	35	CH	88
3548	30	09/25/84	204	621	35	CH	90
3549	30	09/25/84	204	621	35	CH	90
3550	30	09/25/84	204	621	35	CH	91
3551	30	09/25/84	204	621	35	CH	93

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3552	30	09/25/84	204	621	35	CH	93
3553	30	09/25/84	204	621	35	CH	94
3554	30	09/25/84	204	621	35	CH	96
3555	30	09/25/84	204	621	35	CH	101
3556	30	09/25/84	256	623	35	CH	66
3557	30	09/25/84	256	623	35	CH	68
3558	30	09/25/84	256	623	35	CH	69
3559	30	09/25/84	256	623	35	CH	72
3560	30	09/25/84	256	623	35	CH	72
3561	30	09/25/84	256	623	35	CH	74
3562	30	09/25/84	256	623	35	CH	74
3563	30	09/25/84	256	623	35	CH	75
3564	30	09/25/84	256	623	35	CH	76
3565	30	09/25/84	256	623	35	CH	77
3566	30	09/25/84	256	623	35	CH	78
3567	30	09/25/84	256	623	35	CH	82
3568	30	09/25/84	256	623	35	CH	83
3569	30	09/25/84	256	623	35	CH	84
3570	30	09/25/84	256	623	35	CH	86
3571	30	09/25/84	256	623	35	CH	86
3572	30	09/25/84	256	623	35	CH	93
3573	30	09/25/84	256	623	35	CH	94
3574	30	09/25/84	256	623	35	CH	97
3575	30	09/25/84	256	623	35	CH	100
3576	30	09/25/84	256	623	35	CH	101
3577	30	09/25/84	256	623	35	CH	105
3578	30	09/25/84	336	625	36	CH	69
3579	30	09/25/84	336	625	36	CH	76
3580	30	09/25/84	336	625	36	CH	77
3581	30	09/25/84	336	625	36	CH	78
3582	30	09/25/84	336	625	36	CH	80
3583	30	09/25/84	336	625	36	CH	81
3584	30	09/25/84	336	625	36	CH	82
3585	30	09/25/84	336	625	36	CH	83
3586	30	09/25/84	336	625	36	CH	83
3587	30	09/25/84	336	625	36	CH	84
3588	30	09/25/84	336	625	36	CH	84
3589	30	09/25/84	336	625	36	CH	84
3590	30	09/25/84	336	625	36	CH	87
3591	30	09/25/84	336	625	36	CH	90
3592	30	09/25/84	336	625	36	CH	94
3593	30	09/25/84	336	625	36	CH	95
3594	30	09/25/84	336	625	36	CH	95
3595	30	09/25/84	1920	626	38	CH	61
3596	30	09/25/84	1920	626	38	CH	65
3597	30	09/25/84	1920	626	38	CH	79
3598	30	09/25/84	1920	626	38	CH	80
3599	30	09/25/84	1920	626	38	CH	82
3600	30	09/25/84	1920	626	38	CH	83
3601	30	09/25/84	1920	626	38	CH	86
3602	30	09/25/84	1920	626	38	CH	89
3603	30	09/25/84	1920	626	38	CH	91
3604	30	09/25/84	1920	626	38	CH	92

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3605	30	09/25/84	1920	626	38	CH	99
3606	30	09/25/84	1937	627	37	CH	73
3607	30	09/25/84	1937	627	37	CH	76
3608	30	09/25/84	1937	627	37	CH	80
3609	30	09/25/84	1937	627	37	CH	81
3610	30	09/25/84	1937	627	37	CH	101
3611	30	09/25/84	1937	627	37	CH	103
3612	30	09/25/84	1937	627	37	CH	107
3613	30	09/25/84	1952	628	37	CH	62
3614	30	09/25/84	1952	628	37	CH	73
3615	30	09/25/84	1952	628	37	CH	74
3616	30	09/25/84	1952	628	37	CH	75
3617	30	09/25/84	1952	628	37	CH	76
3618	30	09/25/84	1952	628	37	CH	77
3619	30	09/25/84	1952	628	37	CH	79
3620	30	09/25/84	1952	628	37	CH	82
3621	30	09/25/84	1952	628	37	CH	82
3622	30	09/25/84	1952	628	37	CH	83
3623	30	09/25/84	1952	628	37	CH	85
3624	30	09/25/84	1952	628	37	CH	87
3625	30	09/25/84	1952	628	37	CH	88
3626	30	09/25/84	1952	628	37	CH	88
3627	30	09/25/84	1952	628	37	CH	89
3628	30	09/25/84	1952	628	37	CH	89
3629	30	09/25/84	1952	628	37	CH	91
3630	30	09/25/84	1952	628	37	CH	92
3631	30	09/25/84	1952	628	37	CH	94
3632	30	09/25/84	1952	628	37	CH	95
3633	30	09/25/84	1952	628	37	CH	96
3634	30	09/25/84	2007	629	36	CH	69
3635	30	09/25/84	2007	629	36	CH	71
3636	30	09/25/84	2007	629	36	CH	77
3637	30	09/25/84	2007	629	36	CH	78
3638	30	09/25/84	2007	629	36	CH	79
3639	30	09/25/84	2007	629	36	CH	81
3640	30	09/25/84	2007	629	36	CH	82
3641	30	09/25/84	2007	629	36	CH	83
3642	30	09/25/84	2007	629	36	CH	87
3643	30	09/25/84	2007	629	36	CH	89
3644	30	09/25/84	2007	629	36	CH	91
3645	30	09/25/84	2007	629	36	CH	92
3646	30	09/25/84	2007	629	36	CH	93
3647	30	09/25/84	2007	629	36	CH	93
3648	30	09/25/84	2007	629	36	CH	94
3649	30	09/25/84	2007	629	36	CH	95
3650	30	09/25/84	2007	629	36	CH	96
3651	30	09/25/84	2007	629	36	CH	98
3652	30	09/25/84	2007	629	36	CH	102
3653	30	09/25/84	2007	629	36	CH	103
3654	30	09/25/84	2023	630	36	CH	65
3655	30	09/25/84	2023	630	36	CH	74
3656	30	09/25/84	2023	630	36	CH	76
3657	30	09/25/84	2023	630	36	CH	76

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3658	30	09/25/84	2023	630	36	CH	77
3659	30	09/25/84	2023	630	36	CH	78
3660	30	09/25/84	2023	630	36	CH	79
3661	30	09/25/84	2023	630	36	CH	80
3662	30	09/25/84	2023	630	36	CH	81
3663	30	09/25/84	2023	630	36	CH	82
3664	30	09/25/84	2023	630	36	CH	83
3665	30	09/25/84	2023	630	36	CH	83
3666	30	09/25/84	2023	630	36	CH	84
3667	30	09/25/84	2023	630	36	CH	86
3668	30	09/25/84	2023	630	36	CH	86
3669	30	09/25/84	2023	630	36	CH	86
3670	30	09/25/84	2023	630	36	CH	87
3671	30	09/25/84	2023	630	36	CH	87
3672	30	09/25/84	2023	630	36	CH	88
3673	30	09/25/84	2023	630	36	CH	92
3674	30	09/25/84	2023	630	36	CH	94
3675	30	09/25/84	2023	630	36	CH	94
3676	30	09/25/84	2023	630	36	CH	97
3677	30	09/25/84	2023	630	36	CH	112
3678	30	09/25/84	2041	631	36	CH	74
3679	30	09/25/84	2041	631	36	CH	77
3680	30	09/25/84	2041	631	36	CH	79
3681	30	09/25/84	2041	631	36	CH	80
3682	30	09/25/84	2041	631	36	CH	81
3683	30	09/25/84	2041	631	36	CH	82
3684	30	09/25/84	2041	631	36	CH	86
3685	30	09/25/84	2041	631	36	CH	87
3686	30	09/25/84	2041	631	36	CH	88
3687	30	09/25/84	2041	631	36	CH	88
3688	30	09/25/84	2041	631	36	CH	88
3689	30	09/25/84	2041	631	36	CH	89
3690	30	09/25/84	2041	631	36	CH	90
3691	30	09/25/84	2041	631	36	CH	91
3692	30	09/25/84	2041	631	36	CH	92
3693	30	09/25/84	2041	631	36	CH	92
3694	30	09/25/84	2041	631	36	CH	93
3695	30	09/25/84	2041	631	36	CH	95
3696	30	09/25/84	2041	631	36	CH	96
3697	30	09/25/84	2041	631	36	CH	98
3698	30	09/25/84	2041	631	36	CH	100
3699	30	09/25/84	2125	632	35	CH	79
3700	30	09/25/84	2125	632	35	CH	84
3701	30	09/25/84	2125	632	35	CH	86
3702	30	09/25/84	2125	632	35	CH	88
3703	30	09/25/84	2125	632	35	CH	93
3704	30	09/25/84	2125	632	35	CH	98
3705	30	09/25/84	2157	634	35	CH	71
3706	30	09/25/84	2157	634	35	CH	75
3707	30	09/25/84	2157	634	35	CH	81
3708	30	09/25/84	2157	634	35	CH	81
3709	30	09/25/84	2157	634	35	CH	83
3710	30	09/25/84	2157	634	35	CH	84

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3711	30	09/25/84	2157	634	35	CH	86
3712	30	09/25/84	2157	634	35	CH	88
3713	30	09/25/84	2157	634	35	CH	91
3714	30	09/25/84	2157	634	35	CH	92
3715	30	09/25/84	2157	634	35	CH	94
3716	30	09/25/84	2157	634	35	CH	99
3717	30	09/25/84	2157	634	35	CH	99
3718	30	09/25/84	2222	635	35	CH	68
3719	30	09/25/84	2222	635	35	CH	72
3720	30	09/25/84	2222	635	35	CH	76
3721	30	09/25/84	2222	635	35	CH	81
3722	30	09/25/84	2222	635	35	CH	81
3723	30	09/25/84	2222	635	35	CH	86
3724	30	09/25/84	2222	635	35	CH	90
3725	30	09/25/84	2222	635	35	CH	104
3726	30	09/25/84	2222	635	35	CH	115
3727	30	09/25/84	2237	636	35	CH	90
3728	30	09/25/84	2251	637	35	CH	86
3729	30	09/25/84	2306	638	36	CH	85
3730	30	09/25/84	2325	639	36	CH	74
3731	30	09/25/84	2325	639	36	CH	76
3732	30	09/25/84	2325	639	36	CH	77
3733	30	09/25/84	2325	639	36	CH	77
3734	30	09/25/84	2325	639	36	CH	78
3735	30	09/25/84	2325	639	36	CH	79
3736	30	09/25/84	2325	639	36	CH	81
3737	30	09/25/84	2325	639	36	CH	81
3738	30	09/25/84	2325	639	36	CH	81
3739	30	09/25/84	2325	639	36	CH	82
3740	30	09/25/84	2325	639	36	CH	83
3741	30	09/25/84	2325	639	36	CH	98
3742	30	09/25/84	2343	640	37	CH	65
3743	30	09/25/84	2343	640	37	CH	74
3744	30	09/25/84	2343	640	37	CH	75
3745	30	09/25/84	2343	640	37	CH	79
3746	30	09/25/84	2343	640	37	CH	80
3747	30	09/25/84	2343	640	37	CH	82
3748	30	09/25/84	2343	640	37	CH	83
3749	30	09/25/84	2343	640	37	CH	85
3750	30	09/25/84	2343	640	37	CH	85
3751	30	09/25/84	2343	640	37	CH	85
3752	30	09/25/84	2343	640	37	CH	86
3753	30	09/25/84	2343	640	37	CH	91
3754	30	09/25/84	2343	640	37	CH	91
3755	30	09/25/84	2343	640	37	CH	93
3756	30	09/25/84	2343	640	37	CH	94
3757	30	09/25/84	2343	640	37	CH	96
3758	30	09/25/84	2343	640	37	CH	97
3759	30	09/25/84	2343	640	37	CH	98
3760	30	09/25/84	2343	640	37	CH	103
3761	30	09/25/84	2343	640	37	CH	104
3762	30	09/25/84	2343	640	37	CH	108
3763	30	09/26/84	1	641	37	CH	75

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3764	30	09/26/84	1	641	37	CH	90
3765	30	09/26/84	1	641	37	CH	92
3766	30	09/26/84	1	641	37	CH	95
3767	30	09/26/84	16	642	37	CH	67
3768	30	09/26/84	16	642	37	CH	75
3769	30	09/26/84	16	642	37	CH	76
3770	30	09/26/84	16	642	37	CH	77
3771	30	09/26/84	16	642	37	CH	78
3772	30	09/26/84	16	642	37	CH	80
3773	30	09/26/84	16	642	37	CH	80
3774	30	09/26/84	16	642	37	CH	85
3775	30	09/26/84	16	642	37	CH	88
3776	30	09/26/84	16	642	37	CH	88
3777	30	09/26/84	16	642	37	CH	89
3778	30	09/26/84	16	642	37	CH	89
3779	30	09/26/84	16	642	37	CH	89
3780	30	09/26/84	16	642	37	CH	90
3781	30	09/26/84	16	642	37	CH	91
3782	30	09/26/84	16	642	37	CH	92
3783	30	09/26/84	16	642	37	CH	94
3784	30	09/26/84	16	642	37	CH	99
3785	30	09/26/84	16	642	37	CH	100
3786	30	09/26/84	16	642	37	CH	101
3787	30	09/26/84	16	642	37	CH	102
3788	30	09/26/84	16	642	37	CH	104
3789	30	09/26/84	16	642	37	CH	106
3790	30	09/26/84	16	642	37	CH	106
3791	30	09/26/84	36	643	36	CH	66
3792	30	09/26/84	36	643	36	CH	75
3793	30	09/26/84	36	643	36	CH	75
3794	30	09/26/84	36	643	36	CH	77
3795	30	09/26/84	36	643	36	CH	78
3796	30	09/26/84	36	643	36	CH	79
3797	30	09/26/84	36	643	36	CH	79
3798	30	09/26/84	36	643	36	CH	80
3799	30	09/26/84	36	643	36	CH	80
3800	30	09/26/84	36	643	36	CH	82
3801	30	09/26/84	36	643	36	CH	82
3802	30	09/26/84	36	643	36	CH	83
3803	30	09/26/84	36	643	36	CH	83
3804	30	09/26/84	36	643	36	CH	84
3805	30	09/26/84	36	643	36	CH	84
3806	30	09/26/84	36	643	36	CH	86
3807	30	09/26/84	36	643	36	CH	87
3808	30	09/26/84	36	643	36	CH	88
3809	30	09/26/84	36	643	36	CH	88
3810	30	09/26/84	36	643	36	CH	89
3811	30	09/26/84	36	643	36	CH	90
3812	30	09/26/84	36	643	36	CH	91
3813	30	09/26/84	36	643	36	CH	91
3814	30	09/26/84	36	643	36	CH	93
3815	30	09/26/84	36	643	36	CH	94
3816	30	09/26/84	36	643	36	CH	96

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3817	30	09/26/84	36	643	36	CH	102
3818	30	09/26/84	36	643	36	CH	113
3819	30	09/26/84	54	644	36	CH	71
3820	30	09/26/84	54	644	36	CH	76
3821	30	09/26/84	54	644	36	CH	78
3822	30	09/26/84	54	644	36	CH	78
3823	30	09/26/84	54	644	36	CH	84
3824	30	09/26/84	54	644	36	CH	85
3825	30	09/26/84	54	644	36	CH	87
3826	30	09/26/84	54	644	36	CH	90
3827	30	09/26/84	54	644	36	CH	94
3828	30	09/26/84	54	644	36	CH	107
3829	30	09/26/84	147	647	37	CH	72
3830	30	09/26/84	147	647	37	CH	76
3831	30	09/26/84	147	647	37	CH	76
3832	30	09/26/84	147	647	37	CH	79
3833	30	09/26/84	147	647	37	CH	81
3834	30	09/26/84	147	647	37	CH	84
3835	30	09/26/84	147	647	37	CH	85
3836	30	09/26/84	147	647	37	CH	89
3837	30	09/26/84	147	647	37	CH	90
3838	30	09/26/84	147	647	37	CH	93
3839	30	09/26/84	147	647	37	CH	96
3840	30	09/26/84	147	647	37	CH	102
3841	30	09/26/84	147	647	37	CH	102
3842	30	09/26/84	147	647	37	CH	103
3843	30	09/26/84	209	648	37	CH	74
3844	30	09/26/84	209	648	37	CH	77
3845	30	09/26/84	209	648	37	CH	77
3846	30	09/26/84	209	648	37	CH	78
3847	30	09/26/84	209	648	37	CH	78
3848	30	09/26/84	209	648	37	CH	82
3849	30	09/26/84	209	648	37	CH	83
3850	30	09/26/84	209	648	37	CH	84
3851	30	09/26/84	209	648	37	CH	88
3852	30	09/26/84	209	648	37	CH	88
3853	30	09/26/84	209	648	37	CH	88
3854	30	09/26/84	209	648	37	CH	89
3855	30	09/26/84	209	648	37	CH	91
3856	30	09/26/84	209	648	37	CH	93
3857	30	09/26/84	209	648	37	CH	98
3858	30	09/26/84	209	648	37	CH	100
3859	30	09/26/84	248	650	36	CH	74
3860	30	09/26/84	248	650	36	CH	76
3861	30	09/26/84	248	650	36	CH	78
3862	30	09/26/84	248	650	36	CH	78
3863	30	09/26/84	248	650	36	CH	78
3864	30	09/26/84	248	650	36	CH	80
3865	30	09/26/84	248	650	36	CH	80
3866	30	09/26/84	248	650	36	CH	80
3867	30	09/26/84	248	650	36	CH	81
3868	30	09/26/84	248	650	36	CH	83
3869	30	09/26/84	248	650	36	CH	84

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3870	30	09/26/84	248	650	36	CH	84
3871	30	09/26/84	248	650	36	CH	84
3872	30	09/26/84	248	650	36	CH	84
3873	30	09/26/84	248	650	36	CH	87
3874	30	09/26/84	248	650	36	CH	88
3875	30	09/26/84	248	650	36	CH	92
3876	30	09/26/84	248	650	36	CH	92
3877	30	09/26/84	248	650	36	CH	97
3878	30	09/26/84	248	650	36	CH	98
3879	30	09/26/84	304	651	37	CH	74
3880	30	09/26/84	304	651	37	CH	74
3881	30	09/26/84	304	651	37	CH	77
3882	30	09/26/84	304	651	37	CH	77
3883	30	09/26/84	304	651	37	CH	78
3884	30	09/26/84	304	651	37	CH	82
3885	30	09/26/84	304	651	37	CH	82
3886	30	09/26/84	304	651	37	CH	85
3887	30	09/26/84	304	651	37	CH	85
3888	30	09/26/84	304	651	37	CH	85
3889	30	09/26/84	304	651	37	CH	87
3890	30	09/26/84	304	651	37	CH	88
3891	30	09/26/84	304	651	37	CH	89
3892	30	09/26/84	304	651	37	CH	89
3893	30	09/26/84	304	651	37	CH	92
3894	30	09/26/84	304	651	37	CH	92
3895	30	09/26/84	304	651	37	CH	96
3896	30	09/26/84	304	651	37	CH	96
3897	30	09/26/84	304	651	37	CH	100
3898	30	09/26/84	324	652	37	CH	65
3899	30	09/26/84	324	652	37	CH	72
3900	30	09/26/84	324	652	37	CH	76
3901	30	09/26/84	324	652	37	CH	78
3902	30	09/26/84	324	652	37	CH	79
3903	30	09/26/84	324	652	37	CH	79
3904	30	09/26/84	324	652	37	CH	81
3905	30	09/26/84	324	652	37	CH	81
3906	30	09/26/84	324	652	37	CH	82
3907	30	09/26/84	324	652	37	CH	82
3908	30	09/26/84	324	652	37	CH	83
3909	30	09/26/84	324	652	37	CH	83
3910	30	09/26/84	324	652	37	CH	84
3911	30	09/26/84	324	652	37	CH	85
3912	30	09/26/84	324	652	37	CH	86
3913	30	09/26/84	324	652	37	CH	86
3914	30	09/26/84	324	652	37	CH	89
3915	30	09/26/84	324	652	37	CH	89
3916	30	09/26/84	324	652	37	CH	89
3917	30	09/26/84	324	652	37	CH	90
3918	30	09/26/84	324	652	37	CH	91
3919	30	09/26/84	324	652	37	CH	92
3920	30	09/26/84	324	652	37	CH	92
3921	30	09/26/84	324	652	37	CH	92
3922	30	09/26/84	324	652	37	CH	93

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3923	30	09/26/84	324	652	37	CH	94
3924	30	09/26/84	324	652	37	CH	96
3925	30	09/26/84	324	652	37	CH	97
3926	30	09/26/84	324	652	37	CH	97
3927	30	09/26/84	324	652	37	CH	103
3928	30	09/26/84	324	652	37	CH	107
3929	30	09/26/84	342	653	37	CH	63
3930	30	09/26/84	342	653	37	CH	66
3931	30	09/26/84	342	653	37	CH	73
3932	30	09/26/84	342	653	37	CH	74
3933	30	09/26/84	342	653	37	CH	75
3934	30	09/26/84	342	653	37	CH	76
3935	30	09/26/84	342	653	37	CH	77
3936	30	09/26/84	342	653	37	CH	77
3937	30	09/26/84	342	653	37	CH	82
3938	30	09/26/84	342	653	37	CH	86
3939	30	09/26/84	342	653	37	CH	87
3940	30	09/26/84	342	653	37	CH	88
3941	30	09/26/84	342	653	37	CH	89
3942	30	09/26/84	342	653	37	CH	90
3943	30	09/26/84	342	653	37	CH	90
3944	30	09/26/84	342	653	37	CH	91
3945	30	09/26/84	342	653	37	CH	92
3946	30	09/26/84	342	653	37	CH	93
3947	30	09/26/84	342	653	37	CH	93
3948	30	09/26/84	342	653	37	CH	93
3949	30	09/26/84	342	653	37	CH	95
3950	30	09/26/84	342	653	37	CH	96
3951	30	09/26/84	342	653	37	CH	97
3952	30	09/26/84	342	653	37	CH	101
3953	30	09/26/84	342	653	37	CH	102
3954	30	09/26/84	342	653	37	CH	104
3955	30	09/26/84	342	653	37	CH	107
3956	30	09/26/84	342	653	37	CH	107
3957	30	09/26/84	342	653	37	CH	111
3958	30	09/26/84	402	654	37	CH	75
3959	30	09/26/84	402	654	37	CH	75
3960	30	09/26/84	402	654	37	CH	75
3961	30	09/26/84	402	654	37	CH	80
3962	30	09/26/84	402	654	37	CH	81
3963	30	09/26/84	402	654	37	CH	81
3964	30	09/26/84	402	654	37	CH	82
3965	30	09/26/84	402	654	37	CH	82
3966	30	09/26/84	402	654	37	CH	83
3967	30	09/26/84	402	654	37	CH	88
3968	30	09/26/84	402	654	37	CH	89
3969	30	09/26/84	402	654	37	CH	92
3970	30	09/26/84	402	654	37	CH	93
3971	30	09/26/84	402	654	37	CH	94
3972	30	09/26/84	402	654	37	CH	96
3973	30	09/26/84	402	654	37	CH	96
3974	30	09/26/84	402	654	37	CH	98
3975	30	09/26/84	402	654	37	CH	100

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
3976	30	09/26/84	402	654	37	CH	101
3977	30	09/26/84	402	654	37	CH	103
3978	30	09/26/84	402	654	37	CH	103
3979	30	09/26/84	402	654	37	CH	104
3980	30	09/26/84	402	654	37	CH	113
3981	30	09/26/84	420	655	37	CH	70
3982	30	09/26/84	420	655	37	CH	73
3983	30	09/26/84	420	655	37	CH	74
3984	30	09/26/84	420	655	37	CH	75
3985	30	09/26/84	420	655	37	CH	75
3986	30	09/26/84	420	655	37	CH	76
3987	30	09/26/84	420	655	37	CH	76
3988	30	09/26/84	420	655	37	CH	78
3989	30	09/26/84	420	655	37	CH	78
3990	30	09/26/84	420	655	37	CH	78
3991	30	09/26/84	420	655	37	CH	79
3992	30	09/26/84	420	655	37	CH	81
3993	30	09/26/84	420	655	37	CH	83
3994	30	09/26/84	420	655	37	CH	84
3995	30	09/26/84	420	655	37	CH	84
3996	30	09/26/84	420	655	37	CH	86
3997	30	09/26/84	420	655	37	CH	88
3998	30	09/26/84	420	655	37	CH	90
3999	30	09/26/84	420	655	37	CH	90
4000	30	09/26/84	420	655	37	CH	90
4001	30	09/26/84	420	655	37	CH	93
4002	30	09/26/84	420	655	37	CH	93
4003	30	09/26/84	420	655	37	CH	95
4004	30	09/26/84	440	656	36	CH	68
4005	30	09/26/84	440	656	36	CH	70
4006	30	09/26/84	440	656	36	CH	70
4007	30	09/26/84	440	656	36	CH	70
4008	30	09/26/84	440	656	36	CH	73
4009	30	09/26/84	440	656	36	CH	73
4010	30	09/26/84	440	656	36	CH	77
4011	30	09/26/84	440	656	36	CH	80
4012	30	09/26/84	440	656	36	CH	82
4013	30	09/26/84	440	656	36	CH	85
4014	30	09/26/84	440	656	36	CH	86
4015	30	09/26/84	440	656	36	CH	88
4016	30	09/26/84	440	656	36	CH	89
4017	30	09/26/84	440	656	36	CH	91
4018	30	09/26/84	440	656	36	CH	95
4019	30	09/26/84	440	656	36	CH	97
4020	30	09/26/84	440	656	36	CH	97
4021	30	09/26/84	440	656	36	CH	98
4022	30	09/26/84	440	656	36	CH	99
4023	30	09/26/84	440	656	36	CH	100
4024	30	09/26/84	440	656	36	CH	102
4025	30	09/26/84	440	656	36	CH	108
4026	30	09/26/84	456	657	37	CH	66
4027	30	09/26/84	456	657	37	CH	71
4028	30	09/26/84	456	657	37	CH	72

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV MILE	REGION	LENGTH
4029	30	09/26/84	456	657	37	CH	74
4030	30	09/26/84	456	657	37	CH	76
4031	30	09/26/84	456	657	37	CH	78
4032	30	09/26/84	456	657	37	CH	78
4033	30	09/26/84	456	657	37	CH	79
4034	30	09/26/84	456	657	37	CH	80
4035	30	09/26/84	456	657	37	CH	81
4036	30	09/26/84	456	657	37	CH	82
4037	30	09/26/84	456	657	37	CH	83
4038	30	09/26/84	456	657	37	CH	84
4039	30	09/26/84	456	657	37	CH	85
4040	30	09/26/84	456	657	37	CH	85
4041	30	09/26/84	456	657	37	CH	86
4042	30	09/26/84	456	657	37	CH	87
4043	30	09/26/84	456	657	37	CH	88
4044	30	09/26/84	456	657	37	CH	88
4045	30	09/26/84	456	657	37	CH	88
4046	30	09/26/84	456	657	37	CH	89
4047	30	09/26/84	456	657	37	CH	90
4048	30	09/26/84	456	657	37	CH	90
4049	30	09/26/84	456	657	37	CH	91
4050	30	09/26/84	456	657	37	CH	92
4051	30	09/26/84	456	657	37	CH	92
4052	30	09/26/84	456	657	37	CH	92
4053	30	09/26/84	456	657	37	CH	93
4054	30	09/26/84	456	657	37	CH	93
4055	30	09/26/84	456	657	37	CH	95
4056	30	09/26/84	456	657	37	CH	96
4057	30	09/26/84	456	657	37	CH	97
4058	30	09/26/84	456	657	37	CH	102
4059	30	09/26/84	456	657	37	CH	103
4060	30	09/26/84	456	657	37	CH	108
4061	30	09/26/84	2223	658	38	CH	74
4062	30	09/26/84	2223	658	38	CH	85
4063	30	09/26/84	2223	658	38	CH	85
4064	30	09/26/84	2223	658	38	CH	86
4065	30	09/26/84	2223	658	38	CH	87
4066	30	09/26/84	2240	659	38	CH	71
4067	30	09/26/84	2240	659	38	CH	93
4068	30	09/26/84	2240	659	38	CH	114
4069	30	09/26/84	2253	660	38	CH	93
4070	30	09/26/84	2253	660	38	CH	94
4071	30	09/26/84	2308	661	38	CH	60
4072	30	09/26/84	2308	661	38	CH	62
4073	30	09/26/84	2308	661	38	CH	77
4074	30	09/26/84	2308	661	38	CH	81
4075	30	09/26/84	2308	661	38	CH	84
4076	30	09/26/84	2308	661	38	CH	85
4077	30	09/26/84	2308	661	38	CH	92
4078	30	09/26/84	2308	661	38	CH	92
4079	30	09/26/84	2308	661	38	CH	98
4080	30	09/26/84	2324	662	37	CH	66
4081	30	09/26/84	2324	662	37	CH	69

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
4082	30	09/26/84	2324	662	37	CH	70
4083	30	09/26/84	2324	662	37	CH	71
4084	30	09/26/84	2324	662	37	CH	71
4085	30	09/26/84	2324	662	37	CH	72
4086	30	09/26/84	2324	662	37	CH	73
4087	30	09/26/84	2324	662	37	CH	73
4088	30	09/26/84	2324	662	37	CH	74
4089	30	09/26/84	2324	662	37	CH	74
4090	30	09/26/84	2324	662	37	CH	74
4091	30	09/26/84	2324	662	37	CH	76
4092	30	09/26/84	2324	662	37	CH	76
4093	30	09/26/84	2324	662	37	CH	77
4094	30	09/26/84	2324	662	37	CH	79
4095	30	09/26/84	2324	662	37	CH	79
4096	30	09/26/84	2324	662	37	CH	79
4097	30	09/26/84	2324	662	37	CH	79
4098	30	09/26/84	2324	662	37	CH	80
4099	30	09/26/84	2324	662	37	CH	81
4100	30	09/26/84	2324	662	37	CH	81
4101	30	09/26/84	2324	662	37	CH	81
4102	30	09/26/84	2324	662	37	CH	82
4103	30	09/26/84	2324	662	37	CH	82
4104	30	09/26/84	2324	662	37	CH	83
4105	30	09/26/84	2324	662	37	CH	83
4106	30	09/26/84	2324	662	37	CH	83
4107	30	09/26/84	2324	662	37	CH	85
4108	30	09/26/84	2324	662	37	CH	85
4109	30	09/26/84	2324	662	37	CH	85
4110	30	09/26/84	2324	662	37	CH	86
4111	30	09/26/84	2324	662	37	CH	88
4112	30	09/26/84	2324	662	37	CH	89
4113	30	09/26/84	2324	662	37	CH	90
4114	30	09/26/84	2324	662	37	CH	90
4115	30	09/26/84	2324	662	37	CH	91
4116	30	09/26/84	2324	662	37	CH	92
4117	30	09/26/84	2324	662	37	CH	93
4118	30	09/26/84	2324	662	37	CH	93
4119	30	09/26/84	2324	662	37	CH	93
4120	30	09/26/84	2324	662	37	CH	96
4121	30	09/26/84	2324	662	37	CH	98
4122	30	09/26/84	2324	662	37	CH	99
4123	30	09/26/84	2324	662	37	CH	100
4124	30	09/26/84	2324	662	37	CH	101
4125	30	09/26/84	2324	662	37	CH	102
4126	30	09/26/84	2324	662	37	CH	102
4127	30	09/26/84	2324	662	37	CH	103
4128	30	09/26/84	2324	662	37	CH	107
4129	30	09/26/84	2324	662	37	CH	114
4130	30	09/26/84	2324	662	37	CH	115
4131	30	09/26/84	2340	663	37	CH	60
4132	30	09/26/84	2340	663	37	CH	65
4133	30	09/26/84	2340	663	37	CH	70
4134	30	09/26/84	2340	663	37	CH	70

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
4135	30	09/26/84	2340	663	37	CH	72
4136	30	09/26/84	2340	663	37	CH	72
4137	30	09/26/84	2340	663	37	CH	73
4138	30	09/26/84	2340	663	37	CH	73
4139	30	09/26/84	2340	663	37	CH	74
4140	30	09/26/84	2340	663	37	CH	74
4141	30	09/26/84	2340	663	37	CH	74
4142	30	09/26/84	2340	663	37	CH	75
4143	30	09/26/84	2340	663	37	CH	76
4144	30	09/26/84	2340	663	37	CH	76
4145	30	09/26/84	2340	663	37	CH	79
4146	30	09/26/84	2340	663	37	CH	79
4147	30	09/26/84	2340	663	37	CH	81
4148	30	09/26/84	2340	663	37	CH	82
4149	30	09/26/84	2340	663	37	CH	82
4150	30	09/26/84	2340	663	37	CH	82
4151	30	09/26/84	2340	663	37	CH	83
4152	30	09/26/84	2340	663	37	CH	84
4153	30	09/26/84	2340	663	37	CH	84
4154	30	09/26/84	2340	663	37	CH	84
4155	30	09/26/84	2340	663	37	CH	85
4156	30	09/26/84	2340	663	37	CH	85
4157	30	09/26/84	2340	663	37	CH	85
4158	30	09/26/84	2340	663	37	CH	86
4159	30	09/26/84	2340	663	37	CH	87
4160	30	09/26/84	2340	663	37	CH	88
4161	30	09/26/84	2340	663	37	CH	89
4162	30	09/26/84	2340	663	37	CH	89
4163	30	09/26/84	2340	663	37	CH	90
4164	30	09/26/84	2340	663	37	CH	91
4165	30	09/26/84	2340	663	37	CH	91
4166	30	09/26/84	2340	663	37	CH	91
4167	30	09/26/84	2340	663	37	CH	92
4168	30	09/26/84	2340	663	37	CH	92
4169	30	09/26/84	2340	663	37	CH	92
4170	30	09/26/84	2340	663	37	CH	93
4171	30	09/26/84	2340	663	37	CH	93
4172	30	09/26/84	2340	663	37	CH	94
4173	30	09/26/84	2340	663	37	CH	94
4174	30	09/26/84	2340	663	37	CH	94
4175	30	09/26/84	2340	663	37	CH	95
4176	30	09/26/84	2340	663	37	CH	95
4177	30	09/26/84	2340	663	37	CH	95
4178	30	09/26/84	2340	663	37	CH	97
4179	30	09/26/84	2340	663	37	CH	102
4180	30	09/26/84	2340	663	37	CH	108
4181	30	09/26/84	2340	663	37	CH	129
4182	30	09/27/84	2024	552	38	CH	78
4183	30	09/27/84	2024	552	38	CH	82
4184	30	09/27/84	2024	552	38	CH	83
4185	30	09/27/84	2024	552	38	CH	91
4186	30	09/27/84	2024	552	38	CH	99
4187	30	09/27/84	2024	552	38	CH	103

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
4188	30	09/27/84	2024	552	38	CH	113
4189	30	09/27/84	2041	553	37	CH	76
4190	30	09/27/84	2041	553	37	CH	80
4191	30	09/27/84	2041	553	37	CH	89
4192	30	09/27/84	2041	553	37	CH	90
4193	30	09/27/84	2041	553	37	CH	96
4194	30	09/27/84	2041	553	37	CH	100
4195	30	09/27/84	2041	553	37	CH	106
4196	30	09/27/84	2041	553	37	CH	106
4197	30	09/27/84	2041	553	37	CH	108
4198	30	09/27/84	2055	554	36	CH	71
4199	30	09/27/84	2055	554	36	CH	71
4200	30	09/27/84	2055	554	36	CH	73
4201	30	09/27/84	2055	554	36	CH	75
4202	30	09/27/84	2055	554	36	CH	76
4203	30	09/27/84	2055	554	36	CH	78
4204	30	09/27/84	2055	554	36	CH	80
4205	30	09/27/84	2055	554	36	CH	80
4206	30	09/27/84	2055	554	36	CH	82
4207	30	09/27/84	2055	554	36	CH	83
4208	30	09/27/84	2055	554	36	CH	84
4209	30	09/27/84	2055	554	36	CH	85
4210	30	09/27/84	2055	554	36	CH	85
4211	30	09/27/84	2055	554	36	CH	85
4212	30	09/27/84	2055	554	36	CH	86
4213	30	09/27/84	2055	554	36	CH	87
4214	30	09/27/84	2055	554	36	CH	87
4215	30	09/27/84	2055	554	36	CH	88
4216	30	09/27/84	2055	554	36	CH	88
4217	30	09/27/84	2055	554	36	CH	90
4218	30	09/27/84	2055	554	36	CH	91
4219	30	09/27/84	2055	554	36	CH	92
4220	30	09/27/84	2055	554	36	CH	93
4221	30	09/27/84	2055	554	36	CH	94
4222	30	09/27/84	2055	554	36	CH	96
4223	30	09/27/84	2055	554	36	CH	96
4224	30	09/27/84	2055	554	36	CH	98
4225	30	09/27/84	2055	554	36	CH	104
4226	30	09/27/84	2111	555	36	CH	66
4227	30	09/27/84	2111	555	36	CH	73
4228	30	09/27/84	2111	555	36	CH	73
4229	30	09/27/84	2111	555	36	CH	73
4230	30	09/27/84	2111	555	36	CH	76
4231	30	09/27/84	2111	555	36	CH	76
4232	30	09/27/84	2111	555	36	CH	78
4233	30	09/27/84	2111	555	36	CH	80
4234	30	09/27/84	2111	555	36	CH	80
4235	30	09/27/84	2111	555	36	CH	80
4236	30	09/27/84	2111	555	36	CH	82
4237	30	09/27/84	2111	555	36	CH	83
4238	30	09/27/84	2111	555	36	CH	84
4239	30	09/27/84	2111	555	36	CH	85
4240	30	09/27/84	2111	555	36	CH	86

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
STRIPED BASS (TAXON=30) LENGTH DATA
FOR 3 METER BEAM TRAWL (GEAR=18),
USE CODE 1 SAMPLES.

OBS	TAXON	DATE	TIME	SAMPLE	RIV_MILE	REGION	LENGTH
4241	30	09/27/84	2111	555	36	CH	86
4242	30	09/27/84	2111	555	36	CH	86
4243	30	09/27/84	2111	555	36	CH	86
4244	30	09/27/84	2111	555	36	CH	89
4245	30	09/27/84	2111	555	36	CH	89
4246	30	09/27/84	2111	555	36	CH	89
4247	30	09/27/84	2111	555	36	CH	89
4248	30	09/27/84	2111	555	36	CH	90
4249	30	09/27/84	2111	555	36	CH	90
4250	30	09/27/84	2111	555	36	CH	90
4251	30	09/27/84	2111	555	36	CH	92
4252	30	09/27/84	2111	555	36	CH	92
4253	30	09/27/84	2111	555	36	CH	93
4254	30	09/27/84	2111	555	36	CH	93
4255	30	09/27/84	2111	555	36	CH	96
4256	30	09/27/84	2111	555	36	CH	97
4257	30	09/27/84	2111	555	36	CH	97
4258	30	09/27/84	2111	555	36	CH	127
4259	30	09/29/84	2015	603	35	CH	64
4260	30	09/29/84	2015	603	35	CH	73
4261	30	09/29/84	2015	603	35	CH	89

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
1	08/16/84	2149	31	18	1	17	10	1	CH	38	6	1	1.5	5.2	1249.68	1275.21
2	08/16/84	2149	1	64	1	9	10	1	CH	38	6	1	1.5	5.0	370.00	507.29
3	08/16/84	2214	32	18	1	17	10	1	CH	38	6	1	1.5	5.2	1280.16	1074.20
4	08/16/84	2214	2	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	485.79
5	08/16/84	2238	33	18	5	17	10	1	CH	38	6	1	.	.	.	.
6	08/16/84	2238	3	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	424.39
7	08/16/84	2251	34	18	1	17	10	1	CH	38	6	1	1.5	5.0	1158.24	1078.37
8	08/16/84	2251	4	64	1	9	10	1	CH	38	6	1	1.5	5.0	430.00	405.70
9	08/16/84	2312	35	18	1	17	10	1	CH	38	6	1	1.5	5.2	1249.68	1216.21
10	08/16/84	2312	5	64	1	9	10	1	CH	38	6	1	1.5	5.0	410.00	477.60
11	08/16/84	2334	36	18	1	17	10	1	CH	38	6	1	1.5	5.2	1432.56	1248.29
12	08/16/84	2334	6	64	1	9	10	1	CH	38	6	1	1.5	5.0	460.00	415.77
13	08/16/84	2352	37	18	1	17	10	1	CH	38	6	1	1.5	5.2	1432.56	1258.37
14	08/16/84	2352	7	64	1	9	10	1	CH	38	6	1	1.5	5.0	510.00	466.06
15	08/17/84	17	38	18	1	17	10	1	CH	37	6	1	1.5	5.2	2834.64	1362.54
16	08/17/84	17	8	64	1	9	10	1	CH	37	6	1	1.5	5.0	500.00	495.16
17	08/17/84	35	39	18	1	17	10	1	CH	37	6	1	1.5	5.2	1584.96	1305.97
18	08/17/84	35	9	64	1	9	10	1	CH	37	6	1	1.5	5.0	540.00	482.45
19	08/17/84	51	40	18	1	17	12	1	CH	38	6	1	1.5	5.7	1463.04	1227.16
20	08/17/84	51	10	64	1	9	12	1	CH	38	6	1	1.5	5.0	520.00	464.52
21	08/17/84	112	41	18	1	17	13	1	CH	38	6	1	1.5	5.8	1584.96	1401.80
22	08/17/84	112	11	64	1	9	12	1	CH	38	6	1	1.5	5.0	530.00	489.40
23	08/17/84	135	42	18	1	17	14	1	CH	38	6	1	1.5	5.5	1615.44	1320.52
24	08/17/84	135	12	64	1	9	13	1	CH	38	6	1	1.5	5.0	510.00	491.98
25	08/17/84	201	43	18	1	17	14	2	CH	38	6	1	1.5	5.5	1645.92	1339.06
26	08/17/84	201	13	64	1	9	13	2	CH	38	6	1	1.5	5.0	590.00	490.95
27	08/17/84	226	44	18	1	17	14	2	CH	38	6	1	1.5	5.5	1645.92	1361.47
28	08/17/84	226	14	64	1	9	13	2	CH	38	6	1	1.5	5.0	540.00	477.15
29	08/17/84	248	45	18	1	17	14	2	CH	38	6	1	1.5	5.5	1645.92	1307.61
30	08/17/84	248	15	64	1	9	14	2	CH	38	6	1	1.5	5.0	550.00	451.34
31	08/17/84	316	46	18	1	17	14	2	CH	38	6	1	1.5	5.5	1615.44	1339.54
32	08/17/84	316	16	64	1	9	14	2	CH	38	6	1	1.5	5.0	590.00	442.98
33	08/17/84	334	47	18	1	17	12	2	CH	38	6	2	1.5	5.5	1097.28	1228.28
34	08/17/84	334	17	64	1	9	12	2	CH	38	6	2	1.5	5.0	540.00	480.14
35	08/17/84	407	48	18	1	17	14	2	CH	38	6	1	1.5	5.5	1371.60	1212.48
36	08/17/84	407	18	64	1	9	13	2	CH	38	6	1	1.5	5.0	410.00	447.20
37	08/17/84	428	49	18	1	17	12	2	CH	38	6	1	1.5	5.5	1371.60	1158.66
38	08/17/84	428	19	64	1	9	12	2	CH	38	6	1	1.5	5.0	450.00	481.34
39	08/17/84	447	50	18	1	17	12	1	CH	38	6	1	1.5	5.5	1249.68	1244.18
40	08/17/84	447	20	64	1	9	12	1	CH	38	6	1	1.5	5.0	500.00	488.15
41	08/17/84	2131	51	18	1	17	12	1	CH	38	6	1	1.5	5.5	1249.68	1249.45
42	08/17/84	2131	21	64	1	9	10	1	CH	38	6	1	1.5	5.0	400.00	443.29
43	08/17/84	2151	52	18	2	17	12	1	CH	38	6	1	1.5	5.5	.	1256.21
44	08/17/84	2151	22	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	486.42
45	08/17/84	2210	53	18	1	17	12	1	CH	38	6	1	1.5	5.5	1158.24	1268.06
46	08/17/84	2210	23	64	1	9	10	1	CH	38	6	1	1.5	5.0	460.00	497.19
47	08/17/84	2229	54	18	1	17	12	2	CH	38	6	1	1.5	5.5	1066.80	1168.81
48	08/17/84	2229	24	64	1	9	10	2	CH	38	6	1	1.5	5.0	410.00	441.64
49	08/17/84	2312	55	18	1	17	12	2	CH	38	6	1	1.5	5.5	1249.68	1221.42
50	08/17/84	2312	25	64	1	9	10	2	CH	38	6	1	1.5	5.0	400.00	436.29
51	08/17/84	2330	56	18	5	.	.	.	CH	38	6	.	.	.	.	.
52	08/17/84	2330	26	64	1	9	11	1	CH	38	6	1	1.5	5.0	370.00	439.67
53	08/18/84	15	57	18	1	17	12	1	CH	38	6	1	1.5	5.5	1310.64	1139.21
54	08/18/84	15	27	64	1	9	10	1	CH	38	6	1	1.5	5.0	440.00	455.92

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
55	08/18/84	38	58	18	1	17	12	1	CH	38	6	1	1.5	5.5	1432.56	1300.12
56	08/18/84	38	28	64	1	9	11	1	CH	38	6	1	1.5	5.0	500.00	544.59
57	08/18/84	57	59	18	2	17	12	1	CH	38	6	2	1.5	5.5	.	27.22
58	08/18/84	57	29	64	1	9	10	1	CH	38	6	2	1.5	5.0	420.00	441.93
59	08/18/84	114	60	18	1	17	12	1	CH	38	6	2	1.5	5.5	1097.28	1134.77
60	08/18/84	114	30	64	1	9	10	1	CH	38	6	2	1.5	5.0	410.00	441.64
61	08/18/84	132	61	18	1	17	12	1	CH	38	6	2	1.5	5.5	1158.24	1098.80
62	08/18/84	132	101	64	1	9	10	1	CH	38	6	2	1.5	5.0	400.00	504.47
63	08/18/84	152	62	18	1	17	12	1	IP	39	6	2	1.5	5.5	1036.32	1201.08
64	08/18/84	152	102	64	1	9	10	1	IP	39	6	2	1.5	5.0	390.00	453.49
65	08/18/84	210	63	18	1	17	10	1	IP	39	6	2	1.5	5.5	1158.24	1151.17
66	08/18/84	210	103	64	1	9	10	1	IP	39	6	2	1.5	5.0	410.00	463.13
67	08/18/84	229	64	18	1	17	10	1	IP	39	6	2	1.5	5.5	975.36	1070.49
68	08/18/84	229	104	64	1	9	10	1	IP	39	6	2	1.5	5.0	370.00	447.20
69	08/18/84	247	65	18	1	17	10	1	IP	39	6	2	1.5	5.5	1036.32	1186.59
70	08/18/84	247	105	64	1	9	10	1	IP	39	6	2	1.5	5.0	350.00	434.67
71	08/18/84	305	66	18	1	17	10	1	IP	39	6	2	1.5	5.5	975.36	1030.14
72	08/18/84	305	106	64	1	9	10	1	IP	39	6	2	1.5	5.0	390.00	410.33
73	08/18/84	323	67	18	1	17	10	1	CH	38	6	2	1.5	5.5	1005.84	1205.81
74	08/18/84	323	107	64	1	9	10	1	CH	38	6	2	1.5	5.0	400.00	505.10
75	08/18/84	345	68	18	2	17	10	1	IP	39	6	2	1.5	5.5	.	853.60
76	08/18/84	345	108	64	1	9	10	1	IP	39	6	2	1.5	5.0	390.00	456.22
77	08/18/84	412	69	18	1	17	12	1	CH	38	6	2	1.5	5.5	1219.20	1223.75
78	08/18/84	412	109	64	5	9	10	1	CH	38	6	2	1.5	5.0	.	.
79	08/18/84	435	70	18	1	17	12	2	CH	38	6	2	1.5	5.5	1188.72	1173.02
80	08/18/84	435	110	64	1	9	10	2	CH	38	6	2	1.5	5.0	410.00	470.91
81	08/18/84	454	71	18	1	17	12	2	IP	39	6	2	1.5	5.0	1188.72	1236.01
82	08/18/84	454	111	64	1	9	10	2	IP	39	6	2	1.5	5.0	410.00	464.84
83	08/18/84	512	72	18	2	17	12	2	CH	38	6	1	1.5	5.5	.	1183.70
84	08/18/84	512	112	64	1	9	10	2	CH	38	6	1	1.5	5.0	420.00	438.89
85	08/18/84	2053	73	18	1	17	12	1	CH	38	6	1	1.5	5.5	1158.24	1158.11
86	08/18/84	2053	113	64	1	9	10	1	CH	38	6	1	1.5	5.0	350.00	443.26
87	08/18/84	2113	74	18	1	17	12	1	CH	38	6	1	1.5	5.5	975.36	1162.64
88	08/18/84	2113	114	64	1	9	10	1	CH	38	6	1	1.5	5.0	350.00	428.57
89	08/18/84	2133	75	18	1	17	12	1	CH	38	6	1	1.5	5.5	1036.32	1082.70
90	08/18/84	2133	115	64	1	9	10	1	CH	38	6	1	1.5	5.0	330.00	414.39
91	08/18/84	2150	76	18	1	17	10	1	CH	38	6	1	1.5	5.5	1158.24	1253.31
92	08/18/84	2150	116	64	1	9	10	1	CH	38	6	1	1.5	5.0	380.00	426.16
93	08/18/84	2207	77	18	1	17	12	1	CH	38	6	1	1.5	5.5	1097.28	1300.28
94	08/18/84	2207	117	64	1	9	10	1	CH	38	6	1	1.5	5.0	360.00	458.43
95	08/18/84	2225	78	18	5	17	12	1	CH	38	6	1	1.5	.	.	.
96	08/18/84	2225	118	64	1	9	10	1	CH	38	6	1	1.5	5.0	320.00	429.43
97	08/18/84	2307	79	18	1	17	11	1	CH	38	6	1	1.5	5.5	1158.24	1159.90
98	08/18/84	2307	119	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	415.23
99	08/18/84	2325	80	18	1	17	10	1	CH	38	6	2	1.5	5.5	1310.64	1291.45
100	08/18/84	2325	120	64	1	9	10	1	CH	38	6	2	1.5	5.0	430.00	425.03
101	08/18/84	2342	81	18	1	17	10	1	CH	38	6	2	1.5	5.5	1371.60	1241.79
102	08/18/84	2342	121	64	1	9	10	1	CH	38	6	2	1.5	5.0	410.00	433.30
103	08/19/84	17	83	18	1	17	10	1	CH	38	6	2	1.5	5.5	1249.68	1257.11
104	08/19/84	17	123	64	1	9	10	1	CH	38	6	2	1.5	5.0	420.00	455.27
105	08/19/84	33	84	18	1	17	12	1	CH	38	6	2	1.5	5.5	1127.76	1008.48
106	08/19/84	33	124	64	1	9	10	1	CH	38	6	2	1.5	5.0	380.00	373.63
107	08/19/84	53	85	18	1	17	12	1	CH	38	6	2	1.5	5.5	1127.76	1142.99
108	08/19/84	53	125	64	1	9	10	1	CH	38	6	2	1.5	5.0	460.00	448.91

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
109	08/19/84	115	86	18	1	17	13	1	CH	38	6	2	1.5	5.5	1127.76	1210.19
110	08/19/84	115	126	64	1	9	10	1	CH	38	6	2	1.5	5.0	370.00	443.09
111	08/19/84	136	87	18	1	17	12	1	CH	38	6	2	1.5	5.5	1127.76	1150.29
112	08/19/84	136	127	64	1	9	10	1	CH	38	6	2	1.5	5.0	440.00	420.84
113	08/19/84	156	88	18	1	17	12	1	CH	38	6	2	1.5	5.5	1066.80	1006.35
114	08/19/84	156	128	64	1	9	10	1	CH	38	6	2	1.5	5.0	320.00	416.74
115	08/19/84	216	89	18	1	17	14	1	CH	38	6	2	1.5	5.5	1127.76	1222.35
116	08/19/84	216	129	64	1	9	10	1	CH	38	6	2	1.5	5.0	440.00	514.32
117	08/19/84	235	90	18	1	17	14	1	CH	38	6	2	1.5	5.5	1066.80	1122.81
118	08/19/84	235	130	64	1	9	10	1	CH	38	6	2	1.5	5.0	400.00	424.26
119	08/19/84	301	91	18	1	17	14	1	CH	38	6	2	1.5	5.5	1066.80	998.28
120	08/19/84	301	131	64	1	9	10	1	CH	38	6	2	1.5	5.0	370.00	424.55
121	08/19/84	321	92	18	1	17	14	1	CH	38	6	2	1.5	5.5	1127.76	1239.09
122	08/19/84	321	132	64	1	9	10	1	CH	38	6	2	1.5	5.0	390.00	437.66
123	08/19/84	2400	82	18	1	17	10	1	CH	38	6	2	1.5	5.5	1249.68	1183.58
124	08/19/84	2400	122	64	1	9	10	1	CH	38	6	2	1.5	5.0	460.00	456.68
125	08/29/84	106	93	18	1	9	12	2	CH	38	6	2	1.5	5.0	1280.16	1338.81
126	08/29/84	106	170	64	1	17	12	2	CH	38	6	2	1.5	5.0	380.00	403.36
127	08/29/84	121	94	18	1	9	12	2	CH	38	6	2	1.5	5.0	762.00	1297.23
128	08/29/84	121	171	64	5	17	12	2	CH	38	6	2	1.5	5.0	.	.
129	08/29/84	141	95	18	1	9	12	2	CH	38	6	2	1.5	5.0	1158.24	1371.31
130	08/29/84	141	172	64	1	17	12	2	CH	38	6	2	1.5	5.0	410.00	473.07
131	08/29/84	158	96	18	1	9	12	2	CH	38	6	1	1.5	5.0	1524.00	1578.74
132	08/29/84	158	173	64	1	17	12	2	CH	38	6	1	1.5	5.0	510.00	488.52
133	08/29/84	221	97	18	1	9	12	2	CH	38	6	2	1.5	5.0	1432.56	1565.21
134	08/29/84	221	174	64	1	17	12	2	CH	38	6	2	1.5	5.0	460.00	524.30
135	08/29/84	239	98	18	1	9	12	2	CH	38	6	2	1.5	5.0	1584.96	1413.68
136	08/29/84	239	175	64	1	17	12	2	CH	38	6	2	1.5	5.0	430.00	457.18
137	08/29/84	255	99	18	1	9	11	2	CH	37	6	2	1.5	5.0	1737.36	1494.88
138	08/29/84	255	176	64	1	17	12	2	CH	37	6	2	1.5	5.0	450.00	448.26
139	08/29/84	322	100	18	1	9	10	2	CH	35	6	1	1.5	5.0	1341.12	1538.44
140	08/29/84	322	177	64	1	17	10	2	CH	35	6	1	1.5	5.0	430.00	494.42
141	08/29/84	338	133	18	1	9	10	2	CH	35	6	1	1.5	5.0	1554.48	1546.17
142	08/29/84	338	178	64	1	17	9	2	CH	35	6	1	1.5	5.0	470.00	479.01
143	08/29/84	352	134	18	1	9	9	2	CH	35	6	1	1.5	5.0	1097.28	1460.94
144	08/29/84	352	179	64	1	17	9	2	CH	35	6	1	1.5	5.0	440.00	504.84
145	08/29/84	412	135	18	1	9	9	2	CH	35	6	1	1.5	5.0	1554.48	1401.89
146	08/29/84	412	180	64	1	17	9	2	CH	35	6	1	1.5	5.0	450.00	547.45
147	08/29/84	433	136	18	1	9	8	2	CH	35	6	1	1.5	5.0	1280.16	1366.96
148	08/29/84	433	181	64	1	17	8	2	CH	35	6	1	1.5	5.0	450.00	511.78
149	08/29/84	453	137	18	1	9	6	2	CH	35	6	1	1.5	5.0	1524.00	1421.53
150	08/29/84	453	182	64	1	17	6	2	CH	35	6	1	1.5	5.0	390.00	479.43
151	08/29/84	510	138	18	5	9	8	2	CH	36	6	1	1.5	5.0	.	.
152	08/29/84	510	183	64	1	17	8	2	CH	36	6	1	1.5	5.0	490.00	563.36
153	08/30/84	2129	139	18	1	17	12	1	CH	38	6	1	1.5	5.0	1493.52	1411.24
154	08/30/84	2129	184	64	1	9	9	1	CH	38	6	1	1.5	5.0	380.00	456.86
155	08/30/84	2144	140	18	1	17	10	1	CH	38	6	1	1.5	5.0	1584.96	1493.06
156	08/30/84	2144	185	64	1	9	10	1	CH	38	6	1	1.5	5.0	380.00	451.18
157	08/30/84	2158	141	18	1	17	10	1	CH	38	6	1	1.5	5.0	1463.04	1412.39
158	08/30/84	2158	186	64	1	9	9	1	CH	38	6	1	1.5	5.0	510.00	452.72
159	08/30/84	2211	142	18	1	17	10	1	CH	38	6	1	1.5	5.0	1402.08	1495.95
160	08/30/84	2211	187	64	1	9	9	1	CH	38	6	1	1.5	5.0	560.00	494.67
161	08/30/84	2235	143	18	1	17	10	1	CH	37	6	1	1.5	5.0	1584.96	1472.73
162	08/30/84	2235	188	64	1	9	10	1	CH	37	6	1	1.5	5.0	520.00	469.37

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
163	08/30/84	2301	144	18	1	17	8	1	CH	36	6	2	1.5	5.0	1341.12	1458.84
164	08/30/84	2301	189	64	1	9	9	1	CH	36	6	2	1.5	5.0	470.00	483.49
165	08/30/84	2315	145	18	1	17	8	1	CH	36	6	2	1.5	5.0	1341.12	1443.33
166	08/30/84	2315	190	64	1	9	9	1	CH	36	6	2	1.5	5.0	420.00	511.76
167	08/30/84	2328	146	18	1	17	10	1	CH	35	6	2	1.5	5.0	1402.08	1430.09
168	08/30/84	2328	191	64	1	9	9	1	CH	35	6	2	1.5	5.0	430.00	469.91
169	08/30/84	2341	147	18	1	17	10	1	CH	35	6	2	1.5	5.0	1493.52	1489.20
170	08/30/84	2341	192	64	1	9	10	1	CH	35	6	2	1.5	5.0	470.00	492.88
171	08/30/84	2353	148	18	1	17	10	1	CH	35	6	2	1.5	5.0	1554.48	646.71
172	08/30/84	2353	193	64	1	9	10	1	CH	35	6	2	1.5	5.0	480.00	479.92
173	08/31/84	4	194	64	1	9	10	1	CH	35	6	1	1.5	5.0	430.00	494.81
174	08/31/84	18	150	18	1	17	10	1	CH	35	6	1	1.5	5.0	1310.64	1492.32
175	08/31/84	18	195	64	1	9	10	1	CH	35	6	1	1.5	5.0	520.00	500.38
176	08/31/84	34	151	18	1	17	10	1	CH	36	6	2	1.5	5.0	1341.12	1514.69
177	08/31/84	34	196	64	1	9	10	1	CH	36	6	2	1.5	5.0	500.00	486.37
178	08/31/84	45	152	18	1	17	10	1	CH	36	6	2	1.5	5.0	1463.04	1518.46
179	08/31/84	45	197	64	1	9	10	1	CH	36	6	2	1.5	5.0	520.00	506.34
180	08/31/84	59	153	18	1	17	10	1	CH	35	6	1	1.5	5.0	1432.56	1477.31
181	08/31/84	59	198	64	1	9	10	1	CH	35	6	1	1.5	5.0	400.00	489.77
182	08/31/84	112	154	18	1	17	10	2	CH	35	6	1	1.5	5.0	1402.08	1531.59
183	08/31/84	112	199	64	1	9	10	1	CH	35	6	1	1.5	5.0	470.00	465.86
184	08/31/84	124	200	64	1	9	11	1	CH	35	6	1	1.5	5.0	470.00	483.16
185	08/31/84	137	156	18	1	17	12	2	CH	35	6	1	1.5	5.0	1341.12	1423.94
186	08/31/84	137	201	64	1	9	7	1	CH	35	6	1	1.5	5.0	380.00	491.89
187	08/31/84	206	157	18	1	17	10	2	CH	36	6	2	1.5	5.0	1432.56	1493.46
188	08/31/84	206	202	64	1	9	10	1	CH	36	6	2	1.5	5.0	430.00	483.01
189	08/31/84	244	158	18	1	17	10	2	CH	36	6	2	1.5	5.0	1310.64	1449.80
190	08/31/84	244	203	64	1	9	11	1	CH	36	6	2	1.5	5.0	430.00	504.02
191	08/31/84	301	159	18	1	17	10	2	CH	36	6	2	1.5	5.0	1341.12	1426.04
192	08/31/84	301	204	64	1	9	10	1	CH	36	6	2	1.5	5.0	470.00	484.46
193	08/31/84	316	160	18	1	17	11	2	CH	36	6	2	1.5	5.0	1402.08	1518.81
194	08/31/84	316	205	64	1	9	10	1	CH	36	6	2	1.5	5.0	450.00	484.32
195	08/31/84	328	161	18	1	17	10	1	CH	36	6	2	1.5	5.0	1493.52	1497.99
196	08/31/84	328	206	64	1	9	10	1	CH	36	6	2	1.5	5.0	380.00	486.19
197	08/31/84	342	162	18	1	17	12	1	CH	35	6	2	1.5	5.1	1676.40	1496.40
198	08/31/84	342	207	64	1	9	10	1	CH	35	6	2	1.5	5.0	550.00	490.49
199	08/31/84	354	163	18	1	17	12	1	CH	35	6	2	1.5	5.0	1463.04	1521.23
200	08/31/84	354	208	64	1	9	10	1	CH	35	6	2	1.5	5.0	610.00	499.39
201	08/31/84	406	164	18	1	17	12	1	CH	35	6	1	1.5	5.0	1432.56	1508.19
202	08/31/84	406	209	64	1	9	10	1	CH	35	6	1	1.5	5.0	400.00	517.77
203	08/31/84	419	165	18	2	17	12	1	CH	35	6	1	1.5	5.0	.	256.28
204	08/31/84	419	210	64	1	9	10	1	CH	35	6	1	1.5	5.0	470.00	494.32
205	08/31/84	449	166	18	1	17	13	.	CH	38	6	.	1.5	5.0	1554.48	1527.47
206	08/31/84	449	211	64	1	9	11	1	CH	38	6	1	1.5	5.0	450.00	534.57
207	08/31/84	510	167	18	1	17	11	1	CH	38	6	1	1.5	5.0	1310.64	1401.55
208	08/31/84	510	212	64	1	9	9	1	CH	38	6	1	1.5	5.0	400.00	461.61
209	08/31/84	522	168	18	1	17	11	1	CH	38	6	1	1.5	5.0	1341.12	1450.83
210	08/31/84	522	213	64	1	9	11	1	CH	38	6	1	1.5	5.0	440.00	501.14
211	08/31/84	536	169	18	1	17	10	1	CH	38	6	1	1.5	5.0	1371.60	1536.56
212	08/31/84	536	214	64	1	9	10	1	CH	38	6	1	1.5	5.0	500.00	526.38
213	08/31/84	2038	276	18	1	17	10	2	CH	34	6	1	1.5	5.0	1127.76	1322.98
214	08/31/84	2038	215	64	1	9	10	2	CH	34	6	1	1.5	5.0	310.00	433.21
215	08/31/84	2059	277	18	1	17	7	2	TZ	33	6	1	1.5	5.0	1310.64	1498.47
216	08/31/84	2059	216	64	1	9	7	2	TZ	33	6	1	1.5	5.0	460.00	470.33

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
217	08/31/84	2113	278	18	1	17	7	2	TZ	33	6	1	1.5	5	1463.04	1610.27
218	08/31/84	2113	217	64	1	9	7	2	TZ	33	6	1	1.5	5	440.00	492.30
219	08/31/84	2128	279	18	1	17	8	2	TZ	32	6	1	1.5	5	1432.56	1450.65
220	08/31/84	2128	218	64	1	9	8	2	TZ	32	6	1	1.5	5	480.00	501.28
221	08/31/84	2142	280	18	1	17	8	2	TZ	32	6	1	1.5	5	1402.08	1377.93
222	08/31/84	2142	219	64	1	9	7	2	TZ	32	6	1	1.5	5	510.00	480.82
223	08/31/84	2204	281	18	1	17	10	2	CH	34	6	1	1.5	5	1432.56	1367.17
224	08/31/84	2204	220	64	1	9	10	2	CH	34	6	1	1.5	5	360.00	473.88
225	08/31/84	2245	282	18	1	17	8	2	CH	35	6	1	1.5	5	1341.12	1512.78
226	08/31/84	2245	221	64	1	9	8	2	CH	35	6	1	1.5	5	510.00	511.81
227	08/31/84	2259	283	18	1	17	8	2	CH	35	6	1	1.5	5	1554.48	1538.17
228	08/31/84	2259	222	64	1	9	8	2	CH	35	6	1	1.5	5	530.00	498.32
229	08/31/84	2311	284	18	5	17	8	2	CH	35	6	1	1.5	5	.	.
230	08/31/84	2311	223	64	1	17	8	2	CH	35	6	1	1.5	5	460.00	455.01
231	08/31/84	2357	285	18	1	17	8	1	CH	35	6	1	1.5	5	1524.00	1581.65
232	08/31/84	2357	224	64	1	17	8	.	CH	35	6	.	1.5	5	540.00	487.66
233	09/01/84	10	286	18	1	17	8	1	CH	35	6	1	1.5	5	1432.56	1567.33
234	09/01/84	10	225	64	1	9	8	2	CH	35	6	1	1.5	5	550.00	491.28
235	09/01/84	23	287	18	1	17	8	1	CH	35	6	1	1.5	5	1493.52	1535.10
236	09/01/84	23	226	64	1	9	8	1	CH	35	6	1	1.5	5	550.00	479.36
237	09/01/84	38	288	18	1	17	8	1	CH	35	6	1	1.5	5	1371.60	1452.14
238	09/01/84	38	227	64	1	9	8	1	CH	35	6	1	1.5	5	510.00	490.76
239	09/01/84	51	289	18	1	17	10	1	CH	35	6	1	1.5	5	1463.04	1455.76
240	09/01/84	51	228	64	1	9	5	1	CH	35	6	1	1.5	5	450.00	478.16
241	09/01/84	106	290	18	1	17	9	1	CH	35	6	1	1.5	5	1524.00	1559.75
242	09/01/84	106	229	64	1	9	8	1	CH	35	6	1	1.5	5	440.00	468.59
243	09/01/84	121	291	18	1	17	8	1	CH	35	6	1	1.5	5	1432.56	1484.44
244	09/01/84	121	230	64	1	9	8	1	CH	35	6	1	1.5	5	500.00	496.45
245	09/01/84	134	292	18	1	17	9	1	CH	35	6	1	1.5	5	1463.04	1506.41
246	09/01/84	134	231	64	1	9	8	1	CH	35	6	1	1.5	5	460.00	478.16
247	09/01/84	149	293	18	1	17	8	1	CH	35	6	1	1.5	5	1463.04	1416.40
248	09/01/84	149	232	64	1	9	7	1	CH	35	6	1	1.5	5	550.00	478.50
249	09/01/84	212	294	18	5	17	10	1	CH	35	6	1	1.5	5	.	.
250	09/01/84	212	233	64	1	9	10	1	CH	35	6	1	1.5	5	480.00	451.43
251	09/01/84	225	295	18	1	17	10	1	CH	35	6	1	1.5	5	1371.60	1224.47
252	09/01/84	225	234	64	1	9	10	1	CH	35	6	1	1.5	5	460.00	548.25
253	09/01/84	238	296	18	1	17	10	1	CH	35	6	1	1.5	5	1341.12	1464.75
254	09/01/84	238	235	64	1	9	10	1	CH	35	6	1	1.5	5	480.00	550.88
255	09/01/84	252	297	18	1	17	10	1	CH	35	6	1	1.5	5	1371.60	1339.38
256	09/01/84	252	236	64	1	9	10	1	CH	35	6	1	1.5	5	460.00	520.82
257	09/01/84	305	298	18	1	17	10	1	CH	35	6	1	1.5	5	1310.64	1392.79
258	09/01/84	305	237	64	1	9	10	2	CH	35	6	1	1.5	5	420.00	457.90
259	09/01/84	318	299	18	1	17	10	1	CH	35	6	1	1.5	5	1432.56	1440.64
260	09/01/84	318	238	64	1	9	10	2	CH	35	6	1	1.5	5	410.00	501.57
261	09/01/84	332	300	18	1	17	10	1	CH	35	6	1	1.5	5	1341.12	1429.06
262	09/01/84	332	239	64	1	9	10	2	CH	35	6	1	1.5	5	460.00	450.45
263	09/01/84	345	301	18	1	17	10	2	CH	35	6	1	1.5	5	1463.04	1336.45
264	09/01/84	345	240	64	1	9	10	2	CH	35	6	1	1.5	5	410.00	463.22
265	09/01/84	357	302	18	2	17	10	2	CH	38	6	1	1.5	5	.	53.10
266	09/01/84	357	241	64	1	9	10	2	CH	35	6	1	1.5	5	550.00	472.28
267	09/01/84	410	303	18	1	17	10	2	CH	35	6	1	1.5	5	1341.12	1464.70
268	09/01/84	410	242	64	1	9	10	1	CH	35	6	1	1.5	5	410.00	463.47
269	09/01/84	423	304	18	1	17	10	2	CH	35	6	1	1.5	5	1341.12	1458.02
270	09/01/84	423	243	64	1	9	10	2	CH	35	6	1	1.5	5	510.00	462.02

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
271	09/01/84	436	305	18	1	17	10	2	CH	35	6	1	1.5	5.0	1341.12	1403.22
272	09/01/84	436	244	64	1	9	10	2	CH	35	6	1	1.5	5.0	480.00	465.53
273	09/12/84	2043	245	18	5	18	10	1	CH	38	6	1	1.5	5.0	.	.
274	09/12/84	2043	306	64	1	17	10	1	CH	38	6	1	1.5	5.0	410.00	323.79
275	09/12/84	2105	246	18	2	18	10	1	CH	38	6	1	1.5	5.0	.	1254.58
276	09/12/84	2105	307	64	1	17	10	1	CH	38	6	1	1.5	5.0	420.00	361.99
277	09/12/84	2128	247	18	1	18	10	1	CH	38	6	1	1.5	5.0	1219.20	1205.78
278	09/12/84	2128	308	64	1	17	10	1	CH	38	6	1	1.5	5.0	380.00	385.28
279	09/12/84	2141	248	18	1	18	10	1	CH	38	6	1	1.5	5.0	1097.28	1206.87
280	09/12/84	2141	309	64	1	17	10	1	CH	38	6	1	1.5	5.0	370.00	369.58
281	09/12/84	2209	249	18	1	18	10	1	CH	36	6	2	1.5	5.0	1310.64	1337.74
282	09/12/84	2209	310	64	1	17	10	1	CH	36	6	2	1.5	5.0	390.00	385.66
283	09/12/84	2221	250	18	1	18	10	1	CH	35	6	2	1.5	5.0	1310.64	1438.27
284	09/12/84	2221	311	64	1	17	10	1	CH	35	6	2	1.5	5.0	390.00	376.40
285	09/12/84	2232	251	18	1	18	10	1	CH	35	6	2	1.5	5.0	1280.16	1119.08
286	09/12/84	2232	312	64	1	17	10	1	CH	35	6	2	1.5	5.0	410.00	385.53
287	09/12/84	2246	252	18	1	18	10	1	CH	35	6	1	1.5	5.0	1280.16	1374.68
288	09/12/84	2246	313	64	1	17	10	1	CH	35	6	1	1.5	5.0	380.00	381.04
289	09/12/84	2300	253	18	1	18	8	1	CH	35	6	1	1.5	5.0	1280.16	1265.97
290	09/12/84	2300	314	64	1	17	7	1	CH	35	6	1	1.5	5.0	350.00	374.02
291	09/12/84	2312	254	18	1	18	10	1	CH	35	6	1	1.5	5.0	1280.16	1598.65
292	09/12/84	2312	315	64	1	17	10	1	CH	35	6	1	1.5	5.1	420.00	394.95
293	09/12/84	2323	255	18	1	18	10	1	CH	35	6	1	1.5	5.0	1280.16	1294.39
294	09/12/84	2323	316	64	1	17	10	1	CH	35	6	1	1.5	5.0	430.00	405.84
295	09/12/84	2338	256	18	1	18	10	1	CH	36	6	1	1.5	5.0	1310.64	1443.25
296	09/12/84	2338	317	64	1	17	10	1	CH	36	6	1	1.5	5.1	440.00	387.92
297	09/12/84	2351	257	18	1	18	10	1	CH	36	6	1	1.5	5.0	1341.12	979.77
298	09/12/84	2351	318	64	1	17	10	1	CH	36	6	1	1.5	5.0	440.00	372.19
299	09/13/84	5	258	18	1	18	10	1	CH	36	6	2	1.5	5.0	1249.68	1255.40
300	09/13/84	5	319	64	1	17	10	1	CH	36	6	2	1.5	5.0	390.00	372.29
301	09/13/84	15	259	18	1	18	10	1	CH	36	6	2	1.5	5.0	1188.72	1463.62
302	09/13/84	15	320	64	1	17	10	1	CH	36	6	2	1.5	5.1	420.00	384.34
303	09/13/84	26	260	18	1	18	10	1	CH	36	6	2	1.5	5.0	1280.16	1229.16
304	09/13/84	26	321	64	1	17	10	1	CH	36	6	2	1.5	5.0	380.00	409.88
305	09/13/84	38	261	18	1	18	10	1	CH	35	6	1	1.5	5.0	1341.12	1417.96
306	09/13/84	38	322	64	1	17	10	1	CH	35	6	1	1.5	5.0	420.00	416.03
307	09/13/84	49	262	18	1	18	10	1	CH	36	6	1	1.5	5.0	1341.12	1595.44
308	09/13/84	49	323	64	1	17	10	1	CH	36	6	1	1.5	5.1	450.00	388.78
309	09/13/84	101	263	18	1	18	10	1	CH	37	6	1	1.5	5.0	1341.12	1428.18
310	09/13/84	101	324	64	1	17	8	1	CH	37	6	1	1.5	5.0	440.00	384.20
311	09/13/84	113	264	18	1	18	10	1	CH	37	6	1	1.5	5.0	1280.16	1428.32
312	09/13/84	113	325	64	1	17	10	1	CH	37	6	1	1.5	5.0	430.00	373.65
313	09/13/84	124	265	18	1	18	10	1	CH	37	6	1	1.5	5.0	1402.08	1358.52
314	09/13/84	124	326	64	1	17	10	1	CH	37	6	1	1.5	5.0	440.00	398.22
315	09/13/84	158	266	18	1	18	11	1	CH	38	6	1	1.5	5.0	1493.52	1448.49
316	09/13/84	158	327	64	1	17	11	1	CH	38	6	1	1.5	5.0	430.00	366.45
317	09/13/84	210	267	18	5	18	10	1	CH	38	6	1	1.5	5.0	.	.
318	09/13/84	210	328	64	1	17	10	1	CH	38	6	1	1.5	5.0	450.00	407.00
319	09/13/84	230	268	18	1	18	15	1	CH	38	6	2	1.5	5.0	1402.08	1360.64
320	09/13/84	230	329	64	1	17	15	1	CH	38	6	2	1.5	5.0	400.00	383.63
321	09/13/84	243	269	18	1	18	15	1	CH	38	6	2	1.5	5.0	1280.16	1391.72
322	09/13/84	243	330	64	1	17	15	1	CH	38	6	2	1.5	5.1	420.00	409.26
323	09/13/84	254	270	18	1	18	11	1	CH	37	6	2	1.5	5.0	1402.08	1373.86
324	09/13/84	254	331	64	1	17	11	1	CH	37	6	2	1.5	5.0	430.00	395.69

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
325	09/13/84	306	271	18	1	18	10	1	CH	37	6	2	1.5	5.0	1493.52	1236.79
326	09/13/84	306	332	64	1	17	10	1	CH	37	6	2	1.5	5.0	430.00	382.35
327	09/13/84	319	272	18	1	18	11	1	CH	36	6	2	1.5	5.0	1280.16	1341.69
328	09/13/84	319	333	64	1	17	11	1	CH	36	6	2	1.5	5.2	450.00	411.51
329	09/13/84	330	273	18	1	18	10	1	CH	35	6	2	1.5	5.0	1463.04	1389.81
330	09/13/84	330	334	64	1	17	10	1	CH	35	6	2	1.5	5.0	460.00	381.97
331	09/13/84	346	274	18	1	18	10	1	CH	35	6	1	1.5	5.0	1554.48	1194.40
332	09/13/84	346	335	64	1	17	10	1	CH	35	6	1	1.5	5.0	390.00	380.39
333	09/13/84	420	275	18	1	18	10	1	CH	35	6	1	1.5	5.0	1158.24	1285.05
334	09/13/84	420	336	64	1	17	10	1	CH	35	6	1	1.5	5.0	370.00	367.38
335	09/13/84	433	396	18	5	18	10	1	CH	35	6	1	1.5	5.0	.	.
336	09/13/84	433	337	64	1	17	10	1	CH	35	6	1	1.5	5.0	380.00	372.52
337	09/13/84	446	397	18	1	18	15	1	CH	35	6	1	.	5.0	1158.24	1489.93
338	09/13/84	446	338	64	1	17	10	1	CH	35	6	1	1.5	5.0	380.00	366.67
339	09/13/84	512	398	18	1	18	10	1	CH	36	6	1	1.5	5.0	1402.08	1357.84
340	09/13/84	512	339	64	1	17	10	1	CH	36	6	1	1.5	5.0	370.00	395.04
341	09/13/84	525	399	18	1	18	10	1	CH	36	6	1	1.5	5.0	1249.68	1245.79
342	09/13/84	525	340	64	1	17	10	1	CH	36	6	1	1.5	5.0	370.00	383.10
343	09/13/84	538	400	18	1	18	10	1	CH	37	6	1	1.5	5.0	1310.64	1307.20
344	09/13/84	538	341	64	1	17	10	1	CH	37	6	1	1.5	5.2	380.00	405.19
345	09/13/84	551	401	18	1	18	10	1	CH	37	6	1	1.5	5.0	1127.76	1175.25
346	09/13/84	551	342	64	1	17	10	1	CH	37	6	1	1.5	5.0	370.00	339.52
347	09/13/84	604	402	18	1	18	10	1	CH	38	6	1	1.5	5.0	1097.28	1178.86
348	09/13/84	604	343	64	1	17	10	1	CH	38	6	1	1.5	5.0	320.00	341.82
349	09/13/84	2000	403	18	1	18	10	2	CH	35	6	2	1.5	5.0	1066.80	1169.45
350	09/13/84	2006	344	64	1	17	10	2	CH	35	6	2	1.5	5.0	420.00	357.47
351	09/13/84	2022	404	18	1	18	9	1	CH	35	6	2	1.5	5.0	1341.12	1256.01
352	09/13/84	2022	345	64	1	17	9	1	CH	35	6	2	1.5	5.0	430.00	377.06
353	09/13/84	2036	405	18	1	18	8	1	CH	35	6	2	1.5	5.0	1249.68	1240.61
354	09/13/84	2036	346	64	1	17	8	1	CH	35	6	2	1.5	5.0	460.00	396.59
355	09/13/84	2050	406	18	1	18	9	1	CH	35	6	1	1.5	5.0	1158.24	800.92
356	09/13/84	2050	347	64	1	17	9	1	CH	35	6	1	1.5	5.0	390.00	358.50
357	09/13/84	2102	407	18	1	18	9	1	CH	35	6	1	1.5	5.0	1097.28	1293.02
358	09/13/84	2102	348	64	1	17	9	1	CH	35	6	1	1.5	5.1	390.00	382.33
359	09/13/84	2117	408	18	1	18	9	1	CH	35	6	1	1.5	5.0	1249.68	1200.26
360	09/13/84	2117	349	64	1	17	9	1	CH	35	6	1	1.5	5.0	410.00	362.64
361	09/13/84	2132	409	18	1	18	9	2	CH	36	6	1	1.5	5.1	1280.16	1321.54
362	09/13/84	2132	350	64	1	17	9	2	CH	36	6	1	1.5	5.1	430.00	416.96
363	09/13/84	2145	410	18	1	18	9	3	CH	37	6	1	1.5	5.0	1280.16	1261.74
364	09/13/84	2145	351	64	1	17	9	3	CH	37	6	1	1.5	5.0	460.00	388.12
365	09/13/84	2159	411	18	1	18	10	3	CH	37	6	2	1.5	5.0	1158.24	1184.86
366	09/13/84	2159	352	64	1	17	10	3	CH	37	6	2	1.5	5.0	400.00	383.63
367	09/13/84	2210	412	18	1	18	10	3	CH	36	6	2	1.5	5.0	1158.24	1183.09
368	09/13/84	2210	353	64	1	17	10	3	CH	36	6	2	1.5	5.0	430.00	375.02
369	09/13/84	2221	413	18	1	18	10	3	CH	36	6	2	1.5	5.0	1158.24	1225.34
370	09/13/84	2221	354	64	1	17	10	3	CH	36	6	2	1.5	5.0	380.00	366.80
371	09/13/84	2234	414	18	1	18	10	2	CH	35	6	2	1.5	5.0	1097.28	1383.20
372	09/13/84	2234	355	64	1	17	10	2	CH	35	6	2	1.5	5.0	410.00	366.07
373	09/13/84	2246	415	18	1	18	10	1	CH	35	6	2	1.5	5.0	1249.68	1345.92
374	09/13/84	2246	356	64	1	17	10	1	CH	35	6	2	1.5	5.0	410.00	375.38
375	09/13/84	2257	416	18	1	18	10	1	CH	35	6	2	1.5	5.0	1249.68	1155.69
376	09/13/84	2257	357	64	1	17	10	1	CH	35	6	2	1.5	5.0	400.00	365.85
377	09/13/84	2320	417	18	1	18	10	1	CH	35	6	1	1.5	5.0	1188.72	1344.42
378	09/13/84	2320	358	64	1	17	10	1	CH	35	6	1	1.5	5.0	410.00	426.56

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
379	09/13/84	2334	418	18	1	18	10	1	CH	35	6	1	1.5	5.0	1188.72	1358.39
380	09/13/84	2334	359	64	1	17	10	1	CH	35	6	1	1.5	5.0	410.00	374.12
381	09/13/84	2351	419	18	1	18	10	2	CH	35	6	1	1.5	5.0	1188.72	1374.13
382	09/13/84	2351	360	64	1	17	10	2	CH	35	6	1	1.5	5.0	410.00	371.56
383	09/14/84	8	420	18	1	18	10	2	CH	35	6	2	1.5	5.0	1158.24	1306.72
384	09/14/84	8	361	64	1	17	10	2	CH	35	6	2	1.5	5.0	420.00	379.99
385	09/14/84	22	421	18	1	18	10	1	CH	35	6	2	1.5	5.0	1158.24	777.68
386	09/14/84	22	362	64	1	17	10	1	CH	35	6	2	1.5	5.0	400.00	369.38
387	09/14/84	35	422	18	5	18	10	1	CH	35	6	2	1.5	5.0	.	.
388	09/14/84	35	363	64	1	17	10	1	CH	35	6	2	1.5	5.0	380.00	342.83
389	09/14/84	49	423	18	1	18	10	1	CH	35	6	2	1.5	5.0	1341.12	1265.83
390	09/14/84	49	364	64	1	17	10	1	CH	35	6	2	1.5	5.0	440.00	383.55
391	09/14/84	101	424	18	2	18	10	1	CH	35	6	1	1.5	5.0	.	1153.30
392	09/14/84	101	365	64	1	17	10	1	CH	35	6	1	1.5	5.0	400.00	386.08
393	09/14/84	111	425	18	1	18	10	1	CH	35	6	1	1.5	5.0	1249.68	1407.87
394	09/14/84	111	366	64	1	17	10	1	CH	35	6	1	1.5	5.0	420.00	386.86
395	09/14/84	121	367	64	1	17	10	2	CH	35	6	1	1.5	5.0	410.00	386.16
396	09/14/84	121	426	64	1	18	10	2	CH	35	6	1	1.5	5.0	390.00	481.00
397	09/14/84	134	427	18	1	18	10	2	CH	35	6	2	1.5	5.0	1188.72	1318.99
398	09/14/84	134	368	64	1	17	10	2	CH	35	6	2	1.5	5.0	430.00	418.41
399	09/14/84	147	428	18	1	18	10	2	CH	35	6	2	1.5	5.0	1341.12	1338.35
400	09/14/84	147	369	64	1	17	10	2	CH	35	6	2	1.5	5.0	450.00	375.25
401	09/14/84	205	429	18	5	18	8	1	CH	35	6	1	1.5	5.0	.	.
402	09/14/84	205	370	64	1	17	8	1	CH	35	6	1	1.5	5.0	350.00	358.30
403	09/14/84	216	430	18	1	18	10	1	CH	35	6	1	1.5	5.0	1188.72	1469.69
404	09/14/84	216	371	64	1	17	10	1	CH	35	6	1	1.5	5.0	420.00	386.94
405	09/14/84	226	431	18	1	18	10	2	CH	35	6	1	1.5	5.0	1341.12	1467.37
406	09/14/84	226	372	64	1	17	10	2	CH	35	6	1	1.5	5.0	360.00	361.86
407	09/14/84	236	432	18	1	18	10	3	CH	36	6	1	1.5	5.0	1249.68	1318.24
408	09/14/84	236	373	64	1	17	10	3	CH	36	6	1	1.5	5.0	440.00	389.44
409	09/14/84	247	433	18	1	18	10	3	CH	36	6	1	1.5	5.0	1402.08	1670.21
410	09/14/84	247	374	64	1	17	10	3	CH	36	6	1	1.5	5.0	420.00	389.32
411	09/14/84	259	434	18	1	18	10	3	CH	36	6	2	1.5	5.0	1249.68	1351.23
412	09/14/84	259	375	64	1	17	10	3	CH	36	6	2	1.5	5.0	410.00	358.47
413	09/14/84	309	435	18	1	18	10	3	CH	36	6	2	1.5	5.0	1432.56	1275.24
414	09/14/84	309	376	64	1	17	10	3	CH	36	6	2	1.5	5.0	420.00	381.75
415	09/14/84	321	436	18	5	18	10	2	CH	35	6	2	1.5	5.0	.	.
416	09/14/84	321	377	64	1	17	10	2	CH	35	6	2	1.5	5.0	380.00	377.68
417	09/14/84	335	437	18	1	18	10	1	CH	35	6	2	1.5	5.0	1402.08	1359.73
418	09/14/84	335	378	64	1	17	10	1	CH	35	6	2	1.5	5.0	450.00	387.44
419	09/14/84	2059	379	64	2	17	10	2	CH	37	4	1	1.5	5.0	.	404.39
420	09/14/84	2059	438	64	1	18	12	2	CH	37	4	1	1.5	5.0	360.00	238.68
421	09/14/84	2117	380	64	1	17	8	1	CH	37	4	1	1.5	5.0	390.00	406.05
422	09/14/84	2117	439	64	1	18	8	1	CH	37	4	1	1.5	5.0	420.00	496.21
423	09/14/84	2137	381	64	2	17	12	2	CH	37	4	1	1.5	5.0	.	361.16
424	09/14/84	2137	440	64	1	18	12	2	CH	37	4	1	1.5	5.0	390.00	481.75
425	09/14/84	2206	385	64	1	17	9	2	CH	36	4	2	1.5	5.1	450.00	393.52
426	09/14/84	2211	382	64	5	17	10	1	CH	36	4	1	1.5	5.0	.	.
427	09/14/84	2211	441	64	1	18	10	1	CH	36	4	1	1.5	5.0	400.00	452.57
428	09/14/84	2234	383	64	1	17	10	1	CH	36	4	1	1.5	5.0	500.00	376.73
429	09/14/84	2234	442	64	1	18	10	1	CH	36	4	1	1.5	5.0	440.00	509.60
430	09/14/84	2249	384	64	1	17	10	2	CH	36	4	2	1.5	5.0	390.00	373.70
431	09/14/84	2249	443	64	1	18	10	2	CH	36	4	2	1.5	5.0	390.00	533.96
432	09/14/84	2306	444	64	5	18	9	2	CH	36	4	2	1.5	5.0	.	.

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
433	09/14/84	2321	386	64	5	17	10	1	CH	36	4	2	1.5	.	.	.
434	09/14/84	2331	445	64	1	18	10	1	CH	36	4	2	1.5	5.0	390.00	525.19
435	09/15/84	38	387	64	1	17	12	2	CH	34	6	2	1.5	5.0	380.00	368.30
436	09/15/84	38	446	64	5	18	12	2	CH	34	6	2	1.5	5.0	.	.
437	09/15/84	53	388	64	1	17	14	2	CH	34	6	2	1.5	5.0	460.00	366.90
438	09/15/84	53	447	64	5	18	14	2	CH	34	6	2	1.5	5.0	.	.
439	09/15/84	151	389	64	1	17	9	1	TZ	33	6	2	1.5	5.0	350.00	394.06
440	09/15/84	151	448	64	1	18	9	1	TZ	33	6	2	1.5	5.0	380.00	496.13
441	09/15/84	207	390	64	1	17	9	1	TZ	33	6	2	1.5	5.0	350.00	349.50
442	09/15/84	207	449	64	1	18	9	1	TZ	33	6	2	1.5	5.0	370.00	497.06
443	09/15/84	220	391	64	1	17	9	1	TZ	32	6	2	1.5	5.0	390.00	372.19
444	09/15/84	220	450	64	1	18	9	1	TZ	32	6	2	1.5	5.0	370.00	458.59
445	09/15/84	242	392	64	1	17	9	1	TZ	33	6	2	1.5	5.0	390.00	372.32
446	09/15/84	242	451	64	1	18	9	1	TZ	33	6	2	1.5	5.0	420.00	471.72
447	09/15/84	258	393	64	1	17	9	1	TZ	33	6	1	1.5	5.0	460.00	409.81
448	09/15/84	258	452	64	1	18	9	1	TZ	33	6	1	1.5	5.0	390.00	447.98
449	09/15/84	326	394	64	1	17	7	1	TZ	33	6	2	1.5	5.0	390.00	490.80
450	09/15/84	326	453	64	1	18	10	1	TZ	33	6	2	1.5	5.0	380.00	522.54
451	09/15/84	343	395	64	1	17	8	1	TZ	32	6	2	1.5	5.0	430.00	379.76
452	09/15/84	343	454	64	1	18	8	1	TZ	32	6	2	1.5	5.0	400.00	485.06
453	09/15/84	356	455	64	1	18	10	1	TZ	32	6	2	1.5	5.0	380.00	508.72
454	09/15/84	358	469	64	1	17	10	1	TZ	32	6	2	1.5	5.0	470.00	396.14
455	09/15/84	422	456	64	1	18	13	1	TZ	32	6	2	1.5	5.0	460.00	489.29
456	09/15/84	422	470	64	1	17	13	1	TZ	32	6	2	1.5	5.1	490.00	390.01
457	09/15/84	440	457	64	5	18	12	2	TZ	31	6	1	1.5	.	.	.
458	09/15/84	440	471	64	1	17	12	2	TZ	31	6	1	1.5	5.0	470.00	390.57
459	09/15/84	453	458	64	1	18	12	2	TZ	31	6	1	1.5	5.0	380.00	446.44
460	09/15/84	453	472	64	1	17	12	2	TZ	31	6	1	1.5	5.0	380.00	359.53
461	09/15/84	537	459	64	1	18	14	2	CH	34	6	1	1.5	5.0	270.00	452.23
462	09/15/84	537	473	64	1	17	14	2	CH	34	6	1	1.5	5.1	320.00	359.99
463	09/15/84	2004	460	18	1	18	10	1	IP	39	6	1	1.5	5.0	975.36	1078.26
464	09/15/84	2004	474	64	1	17	10	1	IP	39	6	1	1.5	5.1	340.00	373.96
465	09/15/84	2024	461	18	1	18	11	2	CH	38	6	1	1.5	5.0	944.88	1283.83
466	09/15/84	2024	475	64	1	17	11	2	CH	38	6	1	1.5	5.2	310.00	384.42
467	09/15/84	2048	462	18	1	18	12	2	CH	37	6	1	1.5	5.0	1005.84	1181.04
468	09/15/84	2048	476	64	1	17	12	2	CH	37	6	1	1.5	5.0	360.00	352.00
469	09/15/84	2147	463	18	1	18	10	3	CH	36	6	1	1.5	5.0	1219.20	1357.19
470	09/15/84	2147	477	64	2	17	10	3	CH	36	6	1	1.5	5.1	.	1049.79
471	09/15/84	2202	464	18	5	18	10	2	CH	36	6	1	1.5	5.0	.	.
472	09/15/84	2202	478	64	5	17	10	2	CH	36	6	1	1.5	5.1	.	.
473	09/15/84	2231	465	18	1	18	10	2	CH	36	6	1	1.5	5.0	1188.72	1409.74
474	09/15/84	2231	479	64	1	17	10	2	CH	36	6	1	1.5	5.0	490.00	413.77
475	09/15/84	2247	466	18	1	18	10	2	CH	36	6	2	1.5	5.0	1402.08	1337.57
476	09/15/84	2247	480	64	1	17	10	2	CH	36	6	2	1.5	5.1	410.00	404.02
477	09/15/84	2300	467	18	1	18	10	2	CH	35	6	2	1.5	5.0	1158.24	1341.44
478	09/15/84	2300	481	64	1	17	10	2	CH	35	6	2	1.5	5.0	410.00	393.84
479	09/15/84	2316	468	18	1	18	10	2	CH	35	6	1	1.5	5.0	1249.68	1280.55
480	09/15/84	2316	482	64	1	17	10	2	CH	35	6	1	1.5	5.0	410.00	364.92
481	09/15/84	2331	501	18	1	18	10	2	CH	35	6	3	1.5	5.0	1219.20	1277.43
482	09/15/84	2331	483	64	1	17	10	2	CH	35	6	3	1.5	5.0	430.00	382.80
483	09/16/84	30	502	18	1	18	14	3	TZ	30	4	2	1.5	5.0	914.40	1374.00
484	09/16/84	30	484	64	1	17	14	3	TZ	30	4	2	1.5	5.2	400.00	350.04
485	09/16/84	43	485	64	1	17	15	3	TZ	30	4	2	1.5	5.2	390.00	412.84
486	09/16/84	43	503	64	1	18	14	3	TZ	30	4	2	1.5	5.0	330.00	504.52

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
487	09/24/84	1939	601	18	1	18	10	1	CH	35	6	3	1.5	5.0	944.88	1425.76
488	09/24/84	1939	486	64	1	17	10	1	CH	35	6	3	1.5	5.0	380.00	396.52
489	09/24/84	1959	602	18	2	18	10	1	CH	35	6	3	1.5	6.0	.	1343.13
490	09/24/84	1959	487	64	1	17	10	1	CH	35	6	3	1.5	5.0	330.00	365.24
491	09/24/84	2015	488	64	1	17	10	1	CH	35	6	3	1.5	5.1	350.00	417.65
492	09/24/84	2028	604	18	1	18	10	1	CH	35	6	3	1.5	5.0	1188.72	1484.85
493	09/24/84	2028	489	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	425.39
494	09/24/84	2045	605	18	1	18	10	1	CH	35	6	3	1.5	5.0	1188.72	1512.64
495	09/24/84	2045	490	64	1	17	10	1	CH	35	6	3	1.5	5.0	410.00	438.36
496	09/24/84	2100	606	18	1	18	10	1	CH	35	6	3	1.5	5.0	975.36	1490.56
497	09/24/84	2100	491	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	462.68
498	09/24/84	2115	607	18	1	18	10	1	CH	35	6	3	1.5	5.0	1310.64	1414.62
499	09/24/84	2115	492	64	1	17	10	1	CH	35	6	3	1.5	5.5	430.00	457.26
500	09/24/84	2138	608	18	1	18	8	1	CH	35	6	3	1.5	5.0	1645.92	1458.99
501	09/24/84	2138	493	64	1	17	10	1	CH	35	6	3	1.5	5.0	370.00	413.44
502	09/24/84	2153	609	18	1	18	10	1	CH	35	6	3	1.5	5.0	1371.60	1332.00
503	09/24/84	2153	494	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	448.70
504	09/24/84	2214	610	18	1	18	10	1	CH	35	6	3	1.5	5.0	1219.20	1318.58
505	09/24/84	2214	495	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	432.65
506	09/24/84	2235	611	18	1	18	10	1	CH	35	6	3	1.5	5.0	1127.76	1340.39
507	09/24/84	2235	496	64	1	17	10	1	CH	35	6	3	1.5	5.0	380.00	438.63
508	09/24/84	2309	612	18	1	18	10	1	CH	35	6	3	1.5	5.0	1249.68	1304.00
509	09/24/84	2309	497	64	1	17	10	1	CH	35	6	3	1.5	5.0	430.00	446.53
510	09/24/84	2328	613	18	1	18	10	1	CH	35	6	3	1.5	5.0	1127.76	1364.06
511	09/24/84	2328	498	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	432.37
512	09/24/84	2345	614	18	1	18	10	1	CH	35	6	3	1.5	5.0	1341.12	1415.17
513	09/24/84	2345	499	64	1	17	10	1	CH	35	6	3	1.5	5.0	410.00	437.42
514	09/25/84	4	615	18	1	18	10	1	CH	35	6	3	1.5	5.0	1219.20	1394.05
515	09/25/84	4	500	64	1	17	10	1	CH	35	6	3	1.5	5.0	410.00	445.49
516	09/25/84	29	616	18	1	18	10	1	CH	35	6	3	1.5	5.0	1249.68	1593.82
517	09/25/84	29	504	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	442.81
518	09/25/84	47	617	18	1	18	8	1	CH	35	6	3	1.5	5.0	1127.76	1530.12
519	09/25/84	47	505	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	453.72
520	09/25/84	108	618	18	5	18	8	1	CH	35	6	3	1.5	5.0	.	.
521	09/25/84	108	506	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	444.75
522	09/25/84	122	619	18	2	18	9	1	CH	35	6	3	1.5	5.0	.	1426.38
523	09/25/84	122	507	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	462.56
524	09/25/84	143	620	18	1	18	8	1	CH	35	6	3	1.5	5.0	1036.32	1342.04
525	09/25/84	143	508	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	452.17
526	09/25/84	204	621	18	1	18	8	1	CH	35	6	3	1.5	5.0	1219.20	1348.78
527	09/25/84	204	509	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	434.58
528	09/25/84	223	622	18	2	18	7	1	CH	35	6	3	1.5	5.0	.	723.82
529	09/25/84	223	510	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	445.04
530	09/25/84	256	623	18	1	18	8	1	CH	35	6	3	1.5	5.0	1158.24	1098.66
531	09/25/84	256	511	64	1	17	10	1	CH	35	6	3	1.5	5.0	380.00	440.35
532	09/25/84	314	624	18	2	18	9	1	CH	35	6	3	1.5	5.0	.	1192.08
533	09/25/84	314	512	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	435.45
534	09/25/84	336	625	18	1	18	8	2	CH	36	6	1	1.5	5.0	1097.28	1311.84
535	09/25/84	336	513	64	1	17	10	1	CH	36	6	1	1.5	5.6	450.00	508.13
536	09/25/84	1920	626	18	1	18	10	2	CH	38	6	2	1.5	5.0	1158.24	1240.23
537	09/25/84	1920	514	64	1	17	10	2	CH	38	6	2	1.5	5.0	400.00	438.36
538	09/25/84	1937	627	18	1	18	10	2	CH	37	6	2	1.5	5.0	1036.32	993.48
539	09/25/84	1937	515	64	1	17	10	2	CH	37	6	2	1.5	5.0	410.00	431.60
540	09/25/84	1952	628	18	1	18	10	1	CH	37	6	2	1.5	5.0	1219.20	1301.32

DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
541	09/25/84	1952	516	64	1	17	10	1	CH	37	6	2	1.5	5	390.00	413.91
542	09/25/84	2007	629	18	1	18	10	1	CH	36	6	2	1.5	5	1127.76	1280.41
543	09/25/84	2007	517	64	1	17	10	1	CH	36	6	2	1.5	5	380.00	425.96
544	09/25/84	2023	630	18	1	18	10	1	CH	36	6	2	1.5	5	1158.24	1258.87
545	09/25/84	2023	518	64	1	17	10	1	CH	36	6	2	1.5	5	380.00	427.28
546	09/25/84	2041	631	18	1	18	10	1	CH	36	6	2	1.5	5	1097.28	1229.71
547	09/25/84	2041	519	64	2	17	10	1	CH	36	6	2	1.5	5	.	459.45
548	09/25/84	2125	632	18	1	18	10	1	CH	35	6	2	1.5	5	1341.12	1332.07
549	09/25/84	2125	520	64	1	17	10	1	CH	35	6	2	1.5	5	370.00	427.25
550	09/25/84	2140	633	18	2	18	10	1	CH	35	6	4	1.5	5	.	1323.54
551	09/25/84	2140	521	64	1	17	10	1	CH	35	6	4	1.5	5	440.00	429.17
552	09/25/84	2157	634	18	1	18	10	1	CH	35	6	4	1.5	5	1249.68	1242.30
553	09/25/84	2157	522	64	1	17	10	1	CH	35	6	4	1.5	5	450.00	448.90
554	09/25/84	2222	635	18	1	18	10	1	CH	35	6	3	1.5	5	1127.76	1214.37
555	09/25/84	2222	523	64	1	17	10	1	CH	35	6	3	1.5	5	400.00	438.46
556	09/25/84	2237	636	18	1	18	10	1	CH	35	6	3	1.5	5	1127.76	1264.38
557	09/25/84	2237	524	64	1	17	10	1	CH	35	6	3	1.5	5	380.00	437.52
558	09/25/84	2251	637	18	1	18	10	1	CH	35	6	1	1.5	5	1402.08	1419.57
559	09/25/84	2251	525	64	1	17	10	1	CH	35	6	1	1.5	5	420.00	439.13
560	09/25/84	2306	638	18	1	18	10	1	CH	36	6	1	1.5	5	1493.52	1397.69
561	09/25/84	2306	526	64	1	17	10	1	CH	36	6	1	1.5	5	460.00	439.75
562	09/25/84	2325	639	18	1	18	10	1	CH	36	6	1	1.5	5	1005.84	1322.57
563	09/25/84	2325	527	64	1	17	10	1	CH	36	6	1	1.5	5	440.00	437.12
564	09/25/84	2343	640	18	1	18	10	1	CH	37	6	1	1.5	5	1371.60	1386.89
565	09/25/84	2343	528	64	1	17	10	1	CH	37	6	1	1.5	5	490.00	453.81
566	09/26/84	1	641	18	1	18	10	1	CH	37	6	2	1.5	5	1097.28	1339.22
567	09/26/84	1	529	64	1	17	10	1	CH	37	6	2	1.5	5	380.00	422.14
568	09/26/84	16	642	18	1	18	10	1	CH	37	6	2	1.5	5	1066.80	1209.14
569	09/26/84	16	530	64	1	17	10	1	CH	37	6	2	1.5	5	420.00	423.53
570	09/26/84	36	643	18	1	18	10	1	CH	36	6	2	1.5	5	944.88	1176.67
571	09/26/84	36	531	64	1	17	10	1	CH	36	6	2	1.5	5	440.00	435.28
572	09/26/84	54	644	18	1	18	10	1	CH	36	6	2	1.5	5	1127.76	1354.49
573	09/26/84	54	532	64	1	17	10	1	CH	36	6	2	1.5	5	470.00	423.70
574	09/26/84	111	645	18	2	18	10	1	CH	36	6	1	1.5	5	.	1282.47
575	09/26/84	111	533	64	1	17	10	1	CH	36	6	1	1.5	5	400.00	430.68
576	09/26/84	128	646	18	2	18	37	2	CH	37	6	1	1.5	5	.	1269.33
577	09/26/84	128	534	64	1	17	10	2	CH	37	6	1	1.5	5	400.00	426.14
578	09/26/84	147	647	18	1	18	10	2	CH	37	6	1	1.5	5	1402.08	1292.65
579	09/26/84	147	535	64	1	17	10	2	CH	37	6	1	1.5	5	380.00	427.68
580	09/26/84	209	648	18	1	18	10	2	CH	37	6	2	1.5	5	1127.76	1311.16
581	09/26/84	209	536	64	1	17	10	2	CH	37	6	2	1.5	5	450.00	424.45
582	09/26/84	228	649	18	2	18	10	2	CH	36	6	2	1.5	5	.	1293.20
583	09/26/84	228	537	64	1	17	10	2	CH	36	6	2	1.5	5	460.00	414.16
584	09/26/84	248	650	18	1	18	10	2	CH	36	6	1	1.5	5	1036.32	1134.57
585	09/26/84	248	538	64	1	17	10	2	CH	36	6	1	1.5	5	400.00	436.67
586	09/26/84	304	651	18	1	18	10	2	CH	37	6	1	1.5	5	975.36	1143.79
587	09/26/84	304	539	64	1	17	10	2	CH	37	6	1	1.5	5	370.00	423.78
588	09/26/84	324	652	18	1	18	10	2	CH	37	6	1	1.5	5	1097.28	1148.67
589	09/26/84	324	540	64	1	17	10	2	CH	37	6	1	1.5	5	390.00	442.44
590	09/26/84	342	653	18	1	18	10	2	CH	37	6	1	1.5	5	1097.28	1000.84
591	09/26/84	342	541	64	1	17	10	2	CH	37	6	1	1.5	5	370.00	418.09
592	09/26/84	402	654	18	1	18	10	2	CH	37	6	2	1.5	5	1584.96	1210.17
593	09/26/84	402	542	64	1	17	10	2	CH	37	6	2	1.5	5	470.00	403.95
594	09/26/84	420	655	18	1	18	10	2	CH	37	6	2	1.5	5	1371.60	992.58

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
595	09/26/84	420	543	64	1	17	10	2	CH	37	6	2	1.5	5	460.00	427.53
596	09/26/84	440	656	18	1	18	10	2	CH	36	6	1	1.5	5	1066.80	1232.94
597	09/26/84	440	544	64	5	17	10	2	CH	36	6	1	1.5	.	.	.
598	09/26/84	456	657	18	1	18	10	2	CH	37	6	1	1.5	5	1097.28	1306.41
599	09/26/84	456	545	64	1	17	10	2	CH	37	6	1	1.5	5	360.00	430.29
600	09/26/84	2222	546	64	1	17	10	2	CH	38	6	1	1.5	5	490.00	434.41
601	09/26/84	2223	658	18	1	18	10	2	CH	38	6	1	1.5	5	1645.92	1282.06
602	09/26/84	2240	659	18	1	18	10	2	CH	38	6	2	1.5	5	1066.80	1422.94
603	09/26/84	2240	547	64	1	17	10	2	CH	38	6	2	1.5	5	360.00	513.45
604	09/26/84	2253	660	18	1	18	10	2	CH	38	6	2	1.5	5	1188.72	1407.46
605	09/26/84	2253	548	64	1	17	10	2	CH	38	6	2	1.5	5	370.00	450.29
606	09/26/84	2308	661	18	1	18	10	2	CH	38	6	2	1.5	5	1036.32	1371.35
607	09/26/84	2308	549	64	1	17	10	2	CH	38	6	2	1.5	5	360.00	435.20
608	09/26/84	2324	662	18	1	18	10	2	CH	37	6	2	1.5	5	1158.24	1313.01
609	09/26/84	2324	550	64	1	17	10	2	CH	37	6	2	1.5	5	350.00	416.17
610	09/26/84	2340	663	18	1	18	10	2	CH	37	6	2	1.5	5	1188.72	1276.83
611	09/26/84	2340	551	64	1	17	10	2	CH	37	6	2	1.5	5	360.00	420.20
612	09/27/84	2024	552	18	1	17	8	1	CH	38	6	2	1.5	5	1645.92	1666.94
613	09/27/84	2024	664	64	1	9	8	1	CH	38	6	2	1.5	5	490.00	509.40
614	09/27/84	2041	553	18	1	17	8	1	CH	37	6	2	1.5	5	1554.48	1503.50
615	09/27/84	2041	665	64	1	9	8	1	CH	37	6	2	1.5	5	500.00	483.99
616	09/27/84	2055	554	18	1	17	8	1	CH	36	6	2	1.5	5	1463.04	1642.20
617	09/27/84	2055	666	64	1	9	8	1	CH	36	6	2	1.5	5	480.00	486.52
618	09/27/84	2111	555	18	1	17	8	1	CH	36	6	2	1.5	5	1402.08	1452.86
619	09/27/84	2111	667	64	1	9	8	1	CH	36	6	2	1.5	5	400.00	501.83
620	09/27/84	2131	556	18	5	17	8	1	CH	38	6	2	1.5	5	.	.
621	09/27/84	2131	668	64	1	9	9	1	CH	38	6	2	1.5	5	380.00	433.05
622	09/29/84	2015	603	18	1	18	10	1	CH	35	6	3	1.5	5	1066.80	1387.72

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
1	08/16/84	2149	31	18	1	17	10	1	CH	38	6	1	1.5	5.2	1249.68	1275.21
2	08/16/84	2149	1	64	1	9	10	1	CH	38	6	1	1.5	5.0	370.00	507.29
3	08/16/84	2214	32	18	1	17	10	1	CH	38	6	1	1.5	5.2	1280.16	1074.20
4	08/16/84	2214	2	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	485.79
5	08/16/84	2238	33	18	5	17	10	1	CH	38	6	1	.	.	.	.
6	08/16/84	2238	3	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	424.39
7	08/16/84	2251	34	18	1	17	10	1	CH	38	6	1	1.5	5.0	1158.24	1078.37
8	08/16/84	2251	4	64	1	9	10	1	CH	38	6	1	1.5	5.0	430.00	405.70
9	08/16/84	2312	35	18	1	17	10	1	CH	38	6	1	1.5	5.2	1249.68	1216.21
10	08/16/84	2312	5	64	1	9	10	1	CH	38	6	1	1.5	5.0	410.00	477.60
11	08/16/84	2334	36	18	1	17	10	1	CH	38	6	1	1.5	5.2	1432.56	1248.29
12	08/16/84	2334	6	64	1	9	10	1	CH	38	6	1	1.5	5.0	460.00	415.77
13	08/16/84	2352	37	18	1	17	10	1	CH	38	6	1	1.5	5.2	1432.56	1258.37
14	08/16/84	2352	7	64	1	9	10	1	CH	38	6	1	1.5	5.0	510.00	466.06
15	08/17/84	17	38	18	1	17	10	1	CH	37	6	1	1.5	5.2	2834.64	1362.54
16	08/17/84	17	8	64	1	9	10	1	CH	37	6	1	1.5	5.0	500.00	495.16
17	08/17/84	35	39	18	1	17	10	1	CH	37	6	1	1.5	5.2	1584.96	1305.97
18	08/17/84	35	9	64	1	9	10	1	CH	37	6	1	1.5	5.0	540.00	482.45
19	08/17/84	51	40	18	1	17	12	1	CH	38	6	1	1.5	5.7	1463.04	1227.16
20	08/17/84	51	10	64	1	9	12	1	CH	38	6	1	1.5	5.0	520.00	464.52
21	08/17/84	112	41	18	1	17	13	1	CH	38	6	1	1.5	5.8	1584.96	1401.80
22	08/17/84	112	11	64	1	9	12	1	CH	38	6	1	1.5	5.0	530.00	489.40
23	08/17/84	135	42	18	1	17	14	1	CH	38	6	1	1.5	5.5	1615.44	1320.52
24	08/17/84	135	12	64	1	9	13	1	CH	38	6	1	1.5	5.0	510.00	491.98
25	08/17/84	201	43	18	1	17	14	2	CH	38	6	1	1.5	5.5	1645.92	1339.06
26	08/17/84	201	13	64	1	9	13	2	CH	38	6	1	1.5	5.0	590.00	490.95
27	08/17/84	226	44	18	1	17	14	2	CH	38	6	1	1.5	5.5	1645.92	1361.47
28	08/17/84	226	14	64	1	9	13	2	CH	38	6	1	1.5	5.0	540.00	477.15
29	08/17/84	248	45	18	1	17	14	2	CH	38	6	1	1.5	5.5	1645.92	1307.61
30	08/17/84	248	15	64	1	9	14	2	CH	38	6	1	1.5	5.0	550.00	451.34
31	08/17/84	316	46	18	1	17	14	2	CH	38	6	1	1.5	5.5	1615.44	1339.54
32	08/17/84	316	16	64	1	9	14	2	CH	38	6	1	1.5	5.0	590.00	442.98
33	08/17/84	334	47	18	1	17	12	2	CH	38	6	2	1.5	5.5	1097.28	1228.28
34	08/17/84	334	17	64	1	9	12	2	CH	38	6	2	1.5	5.0	540.00	480.14
35	08/17/84	407	48	18	1	17	14	2	CH	38	6	1	1.5	5.5	1371.60	1212.48
36	08/17/84	407	18	64	1	9	13	2	CH	38	6	1	1.5	5.0	410.00	447.20
37	08/17/84	428	49	18	1	17	12	2	CH	38	6	1	1.5	5.5	1371.60	1158.66
38	08/17/84	428	19	64	1	9	12	2	CH	38	6	1	1.5	5.0	450.00	481.34
39	08/17/84	447	50	18	1	17	12	1	CH	38	6	1	1.5	5.5	1249.68	1244.18
40	08/17/84	447	20	64	1	9	12	1	CH	38	6	1	1.5	5.0	500.00	488.15
41	08/17/84	2131	51	18	1	17	12	1	CH	38	6	1	1.5	5.5	1249.68	1249.45
42	08/17/84	2131	21	64	1	9	10	1	CH	38	6	1	1.5	5.0	400.00	443.29
43	08/17/84	2151	52	18	2	17	12	1	CH	38	6	1	1.5	5.5	.	1256.21
44	08/17/84	2151	22	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	486.42
45	08/17/84	2210	53	18	1	17	12	1	CH	38	6	1	1.5	5.5	1158.24	1268.06
46	08/17/84	2210	23	64	1	9	10	1	CH	38	6	1	1.5	5.0	460.00	497.19
47	08/17/84	2229	54	18	1	17	12	2	CH	38	6	1	1.5	5.5	1066.80	1168.81
48	08/17/84	2229	24	64	1	9	10	2	CH	38	6	1	1.5	5.0	410.00	441.64
49	08/17/84	2312	55	18	1	17	12	2	CH	38	6	1	1.5	5.5	1249.68	1221.42
50	08/17/84	2312	25	64	1	9	10	2	CH	38	6	1	1.5	5.0	400.00	436.29
51	08/17/84	2330	56	18	5	.	.	.	CH	38	6	.	.	.	.	.
52	08/17/84	2330	26	64	1	9	11	1	CH	38	6	1	1.5	5.0	370.00	439.67
53	08/18/84	15	57	18	1	17	12	1	CH	38	6	1	1.5	5.5	1310.64	1139.21
54	08/18/84	15	27	64	1	9	10	1	CH	38	6	1	1.5	5.0	440.00	455.92

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
55	08/18/84	38	58	18	1	17	12	1	CH	38	6	1	1.5	5.5	1432.56	1300.12
56	08/18/84	38	28	64	1	9	11	1	CH	38	6	1	1.5	5.0	500.00	544.59
57	08/18/84	57	59	18	2	17	12	1	CH	38	6	2	1.5	5.5	.	27.22
58	08/18/84	57	29	64	1	9	10	1	CH	38	6	2	1.5	5.0	420.00	441.93
59	08/18/84	114	60	18	1	17	12	1	CH	38	6	2	1.5	5.5	1097.28	1134.77
60	08/18/84	114	30	64	1	9	10	1	CH	38	6	2	1.5	5.0	410.00	441.64
61	08/18/84	132	61	18	1	17	12	1	CH	38	6	2	1.5	5.5	1158.24	1098.80
62	08/18/84	132	101	64	1	9	10	1	CH	38	6	2	1.5	5.0	400.00	504.47
63	08/18/84	152	62	18	1	17	12	1	IP	39	6	2	1.5	5.5	1036.32	1201.08
64	08/18/84	152	102	64	1	9	10	1	IP	39	6	2	1.5	5.0	390.00	453.49
65	08/18/84	210	63	18	1	17	10	1	IP	39	6	2	1.5	5.5	1158.24	1151.17
66	08/18/84	210	103	64	1	9	10	1	IP	39	6	2	1.5	5.0	410.00	463.13
67	08/18/84	229	64	18	1	17	10	1	IP	39	6	2	1.5	5.5	975.36	1070.49
68	08/18/84	229	104	64	1	9	10	1	IP	39	6	2	1.5	5.0	370.00	447.20
69	08/18/84	247	65	18	1	17	10	1	IP	39	6	2	1.5	5.5	1036.32	1186.59
70	08/18/84	247	105	64	1	9	10	1	IP	39	6	2	1.5	5.0	350.00	434.67
71	08/18/84	305	66	18	1	17	10	1	IP	39	6	2	1.5	5.5	975.36	1030.14
72	08/18/84	305	106	64	1	9	10	1	IP	39	6	2	1.5	5.0	390.00	410.33
73	08/18/84	323	67	18	1	17	10	1	CH	38	6	2	1.5	5.5	1005.84	1205.81
74	08/18/84	323	107	64	1	9	10	1	CH	38	6	2	1.5	5.0	400.00	505.10
75	08/18/84	345	68	18	2	17	10	1	IP	39	6	2	1.5	5.5	.	853.60
76	08/18/84	345	108	64	1	9	10	1	IP	39	6	2	1.5	5.0	390.00	456.22
77	08/18/84	412	69	18	1	17	12	1	CH	38	6	2	1.5	5.5	1219.20	1223.75
78	08/18/84	412	109	64	5	9	10	1	CH	38	6	2	1.5	5.0	.	.
79	08/18/84	435	70	18	1	17	12	2	CH	38	6	2	1.5	5.5	1188.72	1173.02
80	08/18/84	435	110	64	1	9	10	2	CH	38	6	2	1.5	5.0	410.00	470.91
81	08/18/84	454	71	18	1	17	12	2	IP	39	6	2	1.5	5.0	1188.72	1236.01
82	08/18/84	454	111	64	1	9	10	2	IP	39	6	2	1.5	5.0	410.00	464.84
83	08/18/84	512	72	18	2	17	12	2	CH	38	6	1	1.5	5.5	.	1183.70
84	08/18/84	512	112	64	1	9	10	2	CH	38	6	1	1.5	5.0	420.00	438.89
85	08/18/84	2053	73	18	1	17	12	1	CH	38	6	1	1.5	5.5	1158.24	1158.11
86	08/18/84	2053	113	64	1	9	10	1	CH	38	6	1	1.5	5.0	350.00	443.26
87	08/18/84	2113	74	18	1	17	12	1	CH	38	6	1	1.5	5.5	975.36	1162.64
88	08/18/84	2113	114	64	1	9	10	1	CH	38	6	1	1.5	5.0	350.00	428.57
89	08/18/84	2133	75	18	1	17	12	1	CH	38	6	1	1.5	5.5	1036.32	1082.70
90	08/18/84	2133	115	64	1	9	10	1	CH	38	6	1	1.5	5.0	330.00	414.39
91	08/18/84	2150	76	18	1	17	10	1	CH	38	6	1	1.5	5.5	1158.24	1253.31
92	08/18/84	2150	116	64	1	9	10	1	CH	38	6	1	1.5	5.0	380.00	426.16
93	08/18/84	2207	77	18	1	17	12	1	CH	38	6	1	1.5	5.5	1097.28	1300.28
94	08/18/84	2207	117	64	1	9	10	1	CH	38	6	1	1.5	5.0	360.00	458.43
95	08/18/84	2225	78	18	5	17	12	1	CH	38	6	1	1.5	.	.	.
96	08/18/84	2225	118	64	1	9	10	1	CH	38	6	1	1.5	5.0	320.00	429.43
97	08/18/84	2307	79	18	1	17	11	1	CH	38	6	1	1.5	5.5	1158.24	1159.90
98	08/18/84	2307	119	64	1	9	10	1	CH	38	6	1	1.5	5.0	390.00	415.23
99	08/18/84	2325	80	18	1	17	10	1	CH	38	6	2	1.5	5.5	1310.64	1291.45
100	08/18/84	2325	120	64	1	9	10	1	CH	38	6	2	1.5	5.0	430.00	425.03
101	08/18/84	2342	81	18	1	17	10	1	CH	38	6	2	1.5	5.5	1371.60	1241.79
102	08/18/84	2342	121	64	1	9	10	1	CH	38	6	2	1.5	5.0	410.00	433.30
103	08/19/84	17	83	18	1	17	10	1	CH	38	6	2	1.5	5.5	1249.68	1257.11
104	08/19/84	17	123	64	1	9	10	1	CH	38	6	2	1.5	5.0	420.00	455.27
105	08/19/84	33	84	18	1	17	12	1	CH	38	6	2	1.5	5.5	1127.76	1008.48
106	08/19/84	33	124	64	1	9	10	1	CH	38	6	2	1.5	5.0	380.00	373.63
107	08/19/84	53	85	18	1	17	12	1	CH	38	6	2	1.5	5.5	1127.76	1142.99
108	08/19/84	53	125	64	1	9	10	1	CH	38	6	2	1.5	5.0	460.00	448.91

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
109	08/19/84	115	86	18	1	17	13	1	CH	38	6	2	1.5	5.5	1127.76	1210.19
110	08/19/84	115	126	64	1	9	10	1	CH	38	6	2	1.5	5.0	370.00	443.09
111	08/19/84	136	87	18	1	17	12	1	CH	38	6	2	1.5	5.5	1127.76	1150.29
112	08/19/84	136	127	64	1	9	10	1	CH	38	6	2	1.5	5.0	440.00	420.84
113	08/19/84	156	88	18	1	17	12	1	CH	38	6	2	1.5	5.5	1066.80	1006.35
114	08/19/84	156	128	64	1	9	10	1	CH	38	6	2	1.5	5.0	320.00	416.74
115	08/19/84	216	89	18	1	17	14	1	CH	38	6	2	1.5	5.5	1127.76	1222.35
116	08/19/84	216	129	64	1	9	10	1	CH	38	6	2	1.5	5.0	440.00	514.32
117	08/19/84	235	90	18	1	17	14	1	CH	38	6	2	1.5	5.5	1066.80	1122.81
118	08/19/84	235	130	64	1	9	10	1	CH	38	6	2	1.5	5.0	400.00	424.26
119	08/19/84	301	91	18	1	17	14	1	CH	38	6	2	1.5	5.5	1066.80	998.28
120	08/19/84	301	131	64	1	9	10	1	CH	38	6	2	1.5	5.0	370.00	424.55
121	08/19/84	321	92	18	1	17	14	1	CH	38	6	2	1.5	5.5	1127.76	1239.09
122	08/19/84	321	132	64	1	9	10	1	CH	38	6	2	1.5	5.0	390.00	437.66
123	08/19/84	2400	82	18	1	17	10	1	CH	38	6	2	1.5	5.5	1249.68	1183.58
124	08/19/84	2400	122	64	1	9	10	1	CH	38	6	2	1.5	5.0	460.00	456.68
125	08/29/84	106	93	18	1	9	12	2	CH	38	6	2	1.5	5.0	1280.16	1338.81
126	08/29/84	106	170	64	1	17	12	2	CH	38	6	2	1.5	5.0	380.00	403.36
127	08/29/84	121	94	18	1	9	12	2	CH	38	6	2	1.5	5.0	762.00	1297.23
128	08/29/84	121	171	64	5	17	12	2	CH	38	6	2	1.5	5.0	.	.
129	08/29/84	141	95	18	1	9	12	2	CH	38	6	2	1.5	5.0	1158.24	1371.31
130	08/29/84	141	172	64	1	17	12	2	CH	38	6	2	1.5	5.0	410.00	473.07
131	08/29/84	158	96	18	1	9	12	2	CH	38	6	1	1.5	5.0	1524.00	1578.74
132	08/29/84	158	173	64	1	17	12	2	CH	38	6	1	1.5	5.0	510.00	488.52
133	08/29/84	221	97	18	1	9	12	2	CH	38	6	2	1.5	5.0	1432.56	1565.21
134	08/29/84	221	174	64	1	17	12	2	CH	38	6	2	1.5	5.0	460.00	524.30
135	08/29/84	239	98	18	1	9	12	2	CH	38	6	2	1.5	5.0	1584.96	1413.68
136	08/29/84	239	175	64	1	17	12	2	CH	38	6	2	1.5	5.0	430.00	457.18
137	08/29/84	255	99	18	1	9	11	2	CH	37	6	2	1.5	5.0	1737.36	1494.88
138	08/29/84	255	176	64	1	17	12	2	CH	37	6	2	1.5	5.0	450.00	448.26
139	08/29/84	322	100	18	1	9	10	2	CH	35	6	1	1.5	5.0	1341.12	1538.44
140	08/29/84	322	177	64	1	17	10	2	CH	35	6	1	1.5	5.0	430.00	494.42
141	08/29/84	338	133	18	1	9	10	2	CH	35	6	1	1.5	5.0	1554.48	1546.17
142	08/29/84	338	178	64	1	17	9	2	CH	35	6	1	1.5	5.0	470.00	479.01
143	08/29/84	352	134	18	1	9	9	2	CH	35	6	1	1.5	5.0	1097.28	1460.94
144	08/29/84	352	179	64	1	17	9	2	CH	35	6	1	1.5	5.0	440.00	504.84
145	08/29/84	412	135	18	1	9	9	2	CH	35	6	1	1.5	5.0	1554.48	1401.89
146	08/29/84	412	180	64	1	17	9	2	CH	35	6	1	1.5	5.0	450.00	547.45
147	08/29/84	433	136	18	1	9	8	2	CH	35	6	1	1.5	5.0	1280.16	1366.96
148	08/29/84	433	181	64	1	17	8	2	CH	35	6	1	1.5	5.0	450.00	511.78
149	08/29/84	453	137	18	1	9	6	2	CH	35	6	1	1.5	5.0	1524.00	1421.53
150	08/29/84	453	182	64	1	17	6	2	CH	35	6	1	1.5	5.0	390.00	479.43
151	08/29/84	510	138	18	5	9	8	2	CH	36	6	1	1.5	5.0	.	.
152	08/29/84	510	183	64	1	17	8	2	CH	36	6	1	1.5	5.0	490.00	563.36
153	08/30/84	2129	139	18	1	17	12	1	CH	38	6	1	1.5	5.0	1493.52	1411.24
154	08/30/84	2129	184	64	1	9	9	1	CH	38	6	1	1.5	5.0	380.00	456.86
155	08/30/84	2144	140	18	1	17	10	1	CH	38	6	1	1.5	5.0	1584.96	1493.06
156	08/30/84	2144	185	64	1	9	10	1	CH	38	6	1	1.5	5.0	380.00	451.18
157	08/30/84	2158	141	18	1	17	10	1	CH	38	6	1	1.5	5.0	1463.04	1412.39
158	08/30/84	2158	186	64	1	9	9	1	CH	38	6	1	1.5	5.0	510.00	452.72
159	08/30/84	2211	142	18	1	17	10	1	CH	38	6	1	1.5	5.0	1402.08	1495.95
160	08/30/84	2211	187	64	1	9	9	1	CH	38	6	1	1.5	5.0	560.00	494.67
161	08/30/84	2235	143	18	1	17	10	1	CH	37	6	1	1.5	5.0	1584.96	1472.73
162	08/30/84	2235	188	64	1	9	10	1	CH	37	6	1	1.5	5.0	520.00	469.37

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
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AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
163	08/30/84	2301	144	18	1	17	8	1	CH	36	6	2	1.5	5.0	1341.12	1458.84
164	08/30/84	2301	189	64	1	9	9	1	CH	36	6	2	1.5	5.0	470.00	483.49
165	08/30/84	2315	145	18	1	17	8	1	CH	36	6	2	1.5	5.0	1341.12	1443.33
166	08/30/84	2315	190	64	1	9	9	1	CH	36	6	2	1.5	5.0	420.00	511.76
167	08/30/84	2328	146	18	1	17	10	1	CH	35	6	2	1.5	5.0	1402.08	1430.09
168	08/30/84	2328	191	64	1	9	9	1	CH	35	6	2	1.5	5.0	430.00	469.91
169	08/30/84	2341	147	18	1	17	10	1	CH	35	6	2	1.5	5.0	1493.52	1489.20
170	08/30/84	2341	192	64	1	9	10	1	CH	35	6	2	1.5	5.0	470.00	492.88
171	08/30/84	2353	148	18	1	17	10	1	CH	35	6	2	1.5	5.0	1554.48	646.71
172	08/30/84	2353	193	64	1	9	10	1	CH	35	6	2	1.5	5.0	480.00	479.92
173	08/31/84	4	194	64	1	9	10	1	CH	35	6	1	1.5	5.0	430.00	494.81
174	08/31/84	18	150	18	1	17	10	1	CH	35	6	1	1.5	5.0	1310.64	1492.32
175	08/31/84	18	195	64	1	9	10	1	CH	35	6	1	1.5	5.0	520.00	500.38
176	08/31/84	34	151	18	1	17	10	1	CH	36	6	2	1.5	5.0	1341.12	1514.69
177	08/31/84	34	196	64	1	9	10	1	CH	36	6	2	1.5	5.0	500.00	486.37
178	08/31/84	45	152	18	1	17	10	1	CH	36	6	2	1.5	5.0	1463.04	1518.46
179	08/31/84	45	197	64	1	9	10	1	CH	36	6	2	1.5	5.0	520.00	506.34
180	08/31/84	59	153	18	1	17	10	1	CH	35	6	1	1.5	5.0	1432.56	1477.31
181	08/31/84	59	198	64	1	9	10	1	CH	35	6	1	1.5	5.0	400.00	489.77
182	08/31/84	112	154	18	1	17	10	2	CH	35	6	1	1.5	5.0	1402.08	1531.59
183	08/31/84	112	199	64	1	9	10	1	CH	35	6	1	1.5	5.0	470.00	465.86
184	08/31/84	124	200	64	1	9	11	1	CH	35	6	1	1.5	5.0	470.00	483.16
185	08/31/84	137	156	18	1	17	12	2	CH	35	6	1	1.5	5.0	1341.12	1423.94
186	08/31/84	137	201	64	1	9	7	1	CH	35	6	1	1.5	5.0	380.00	491.89
187	08/31/84	206	157	18	1	17	10	2	CH	36	6	2	1.5	5.0	1432.56	1493.46
188	08/31/84	206	202	64	1	9	10	1	CH	36	6	2	1.5	5.0	430.00	483.01
189	08/31/84	244	158	18	1	17	10	2	CH	36	6	2	1.5	5.0	1310.64	1449.80
190	08/31/84	244	203	64	1	9	11	1	CH	36	6	2	1.5	5.0	430.00	504.02
191	08/31/84	301	159	18	1	17	10	2	CH	36	6	2	1.5	5.0	1341.12	1426.04
192	08/31/84	301	204	64	1	9	10	1	CH	36	6	2	1.5	5.0	470.00	484.46
193	08/31/84	316	160	18	1	17	11	2	CH	36	6	2	1.5	5.0	1402.08	1518.81
194	08/31/84	316	205	64	1	9	10	1	CH	36	6	2	1.5	5.0	450.00	484.32
195	08/31/84	328	161	18	1	17	10	1	CH	36	6	2	1.5	5.0	1493.52	1497.99
196	08/31/84	328	206	64	1	9	10	1	CH	36	6	2	1.5	5.0	380.00	486.19
197	08/31/84	342	162	18	1	17	12	1	CH	35	6	2	1.5	5.1	1676.40	1496.40
198	08/31/84	342	207	64	1	9	10	1	CH	35	6	2	1.5	5.0	550.00	490.49
199	08/31/84	354	163	18	1	17	12	1	CH	35	6	2	1.5	5.0	1463.04	1521.23
200	08/31/84	354	208	64	1	9	10	1	CH	35	6	2	1.5	5.0	610.00	499.39
201	08/31/84	406	164	18	1	17	12	1	CH	35	6	1	1.5	5.0	1432.56	1508.19
202	08/31/84	406	209	64	1	9	10	1	CH	35	6	1	1.5	5.0	400.00	517.77
203	08/31/84	419	165	18	2	17	12	1	CH	35	6	1	1.5	5.0	.	256.28
204	08/31/84	419	210	64	1	9	10	1	CH	35	6	1	1.5	5.0	470.00	494.32
205	08/31/84	449	166	18	1	17	13	.	CH	38	6	.	1.5	5.0	1554.48	1527.47
206	08/31/84	449	211	64	1	9	11	1	CH	38	6	1	1.5	5.0	450.00	534.57
207	08/31/84	510	167	18	1	17	11	1	CH	38	6	1	1.5	5.0	1310.64	1401.55
208	08/31/84	510	212	64	1	9	9	1	CH	38	6	1	1.5	5.0	400.00	461.61
209	08/31/84	522	168	18	1	17	11	1	CH	38	6	1	1.5	5.0	1341.12	1450.83
210	08/31/84	522	213	64	1	9	11	1	CH	38	6	1	1.5	5.0	440.00	501.14
211	08/31/84	536	169	18	1	17	10	1	CH	38	6	1	1.5	5.0	1371.60	1536.56
212	08/31/84	536	214	64	1	9	10	1	CH	38	6	1	1.5	5.0	500.00	526.38
213	08/31/84	2038	276	18	1	17	10	2	CH	34	6	1	1.5	5.0	1127.76	1322.98
214	08/31/84	2038	215	64	1	9	10	2	CH	34	6	1	1.5	5.0	310.00	433.21
215	08/31/84	2059	277	18	1	17	7	2	TZ	33	6	1	1.5	5.0	1310.64	1498.47
216	08/31/84	2059	216	64	1	9	7	2	TZ	33	6	1	1.5	5.0	460.00	470.33

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
217	08/31/84	2113	278	18	1	17	7	2	TZ	33	6	1	1.5	5	1463.04	1610.27
218	08/31/84	2113	217	64	1	9	7	2	TZ	33	6	1	1.5	5	440.00	492.30
219	08/31/84	2128	279	18	1	17	8	2	TZ	32	6	1	1.5	5	1432.56	1450.65
220	08/31/84	2128	218	64	1	9	8	2	TZ	32	6	1	1.5	5	480.00	501.28
221	08/31/84	2142	280	18	1	17	8	2	TZ	32	6	1	1.5	5	1402.08	1377.93
222	08/31/84	2142	219	64	1	9	7	2	TZ	32	6	1	1.5	5	510.00	480.82
223	08/31/84	2204	281	18	1	17	10	2	CH	34	6	1	1.5	5	1432.56	1367.17
224	08/31/84	2204	220	64	1	9	10	2	CH	34	6	1	1.5	5	360.00	473.88
225	08/31/84	2245	282	18	1	17	8	2	CH	35	6	1	1.5	5	1341.12	1512.78
226	08/31/84	2245	221	64	1	9	8	2	CH	35	6	1	1.5	5	510.00	511.81
227	08/31/84	2259	283	18	1	17	8	2	CH	35	6	1	1.5	5	1554.48	1538.17
228	08/31/84	2259	222	64	1	9	8	2	CH	35	6	1	1.5	5	530.00	498.32
229	08/31/84	2311	284	18	5	17	8	2	CH	35	6	1	1.5	5	.	.
230	08/31/84	2311	223	64	1	17	8	2	CH	35	6	1	1.5	5	460.00	455.01
231	08/31/84	2357	285	18	1	17	8	1	CH	35	6	1	1.5	5	1524.00	1581.65
232	08/31/84	2357	224	64	1	17	8	.	CH	35	6	.	1.5	5	540.00	487.66
233	09/01/84	10	286	18	1	17	8	1	CH	35	6	1	1.5	5	1432.56	1567.33
234	09/01/84	10	225	64	1	9	8	2	CH	35	6	1	1.5	5	550.00	491.28
235	09/01/84	23	287	18	1	17	8	1	CH	35	6	1	1.5	5	1493.52	1535.10
236	09/01/84	23	226	64	1	9	8	1	CH	35	6	1	1.5	5	550.00	479.36
237	09/01/84	38	288	18	1	17	8	1	CH	35	6	1	1.5	5	1371.60	1452.14
238	09/01/84	38	227	64	1	9	8	1	CH	35	6	1	1.5	5	510.00	490.76
239	09/01/84	51	289	18	1	17	10	1	CH	35	6	1	1.5	5	1463.04	1455.76
240	09/01/84	51	228	64	1	9	5	1	CH	35	6	1	1.5	5	450.00	478.16
241	09/01/84	106	290	18	1	17	9	1	CH	35	6	1	1.5	5	1524.00	1559.75
242	09/01/84	106	229	64	1	9	8	1	CH	35	6	1	1.5	5	440.00	468.59
243	09/01/84	121	291	18	1	17	8	1	CH	35	6	1	1.5	5	1432.56	1484.44
244	09/01/84	121	230	64	1	9	8	1	CH	35	6	1	1.5	5	500.00	496.45
245	09/01/84	134	292	18	1	17	9	1	CH	35	6	1	1.5	5	1463.04	1506.41
246	09/01/84	134	231	64	1	9	8	1	CH	35	6	1	1.5	5	460.00	478.16
247	09/01/84	149	293	18	1	17	8	1	CH	35	6	1	1.5	5	1463.04	1416.40
248	09/01/84	149	232	64	1	9	7	1	CH	35	6	1	1.5	5	550.00	478.50
249	09/01/84	212	294	18	5	17	10	1	CH	35	6	1	1.5	5	.	.
250	09/01/84	212	233	64	1	9	10	1	CH	35	6	1	1.5	5	480.00	451.43
251	09/01/84	225	295	18	1	17	10	1	CH	35	6	1	1.5	5	1371.60	1224.47
252	09/01/84	225	234	64	1	9	10	1	CH	35	6	1	1.5	5	460.00	548.25
253	09/01/84	238	296	18	1	17	10	1	CH	35	6	1	1.5	5	1341.12	1464.75
254	09/01/84	238	235	64	1	9	10	1	CH	35	6	1	1.5	5	480.00	550.88
255	09/01/84	252	297	18	1	17	10	1	CH	35	6	1	1.5	5	1371.60	1339.38
256	09/01/84	252	236	64	1	9	10	1	CH	35	6	1	1.5	5	460.00	520.82
257	09/01/84	305	298	18	1	17	10	1	CH	35	6	1	1.5	5	1310.64	1392.79
258	09/01/84	305	237	64	1	9	10	2	CH	35	6	1	1.5	5	420.00	457.90
259	09/01/84	318	299	18	1	17	10	1	CH	35	6	1	1.5	5	1432.56	1440.64
260	09/01/84	318	238	64	1	9	10	2	CH	35	6	1	1.5	5	410.00	501.57
261	09/01/84	332	300	18	1	17	10	1	CH	35	6	1	1.5	5	1341.12	1429.06
262	09/01/84	332	239	64	1	9	10	2	CH	35	6	1	1.5	5	460.00	450.45
263	09/01/84	345	301	18	1	17	10	2	CH	35	6	1	1.5	5	1463.04	1336.45
264	09/01/84	345	240	64	1	9	10	2	CH	35	6	1	1.5	5	410.00	463.22
265	09/01/84	357	302	18	2	17	10	2	CH	38	6	1	1.5	5	.	53.10
266	09/01/84	357	241	64	1	9	10	2	CH	35	6	1	1.5	5	550.00	472.28
267	09/01/84	410	303	18	1	17	10	2	CH	35	6	1	1.5	5	1341.12	1464.70
268	09/01/84	410	242	64	1	9	10	1	CH	35	6	1	1.5	5	410.00	463.47
269	09/01/84	423	304	18	1	17	10	2	CH	35	6	1	1.5	5	1341.12	1458.02
270	09/01/84	423	243	64	1	9	10	2	CH	35	6	1	1.5	5	510.00	462.02

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
271	09/01/84	436	305	18	1	17	10	2	CH	35	6	1	1.5	5.0	1341.12	1403.22
272	09/01/84	436	244	64	1	9	10	2	CH	35	6	1	1.5	5.0	480.00	465.53
273	09/12/84	2043	245	18	5	18	10	1	CH	38	6	1	1.5	5.0	.	.
274	09/12/84	2043	306	64	1	17	10	1	CH	38	6	1	1.5	5.0	410.00	323.79
275	09/12/84	2105	246	18	2	18	10	1	CH	38	6	1	1.5	5.0	.	1254.58
276	09/12/84	2105	307	64	1	17	10	1	CH	38	6	1	1.5	5.0	420.00	361.99
277	09/12/84	2128	247	18	1	18	10	1	CH	38	6	1	1.5	5.0	1219.20	1205.78
278	09/12/84	2128	308	64	1	17	10	1	CH	38	6	1	1.5	5.0	380.00	385.28
279	09/12/84	2141	248	18	1	18	10	1	CH	38	6	1	1.5	5.0	1097.28	1206.87
280	09/12/84	2141	309	64	1	17	10	1	CH	38	6	1	1.5	5.0	370.00	369.58
281	09/12/84	2209	249	18	1	18	10	1	CH	36	6	2	1.5	5.0	1310.64	1337.74
282	09/12/84	2209	310	64	1	17	10	1	CH	36	6	2	1.5	5.0	390.00	385.66
283	09/12/84	2221	250	18	1	18	10	1	CH	35	6	2	1.5	5.0	1310.64	1438.27
284	09/12/84	2221	311	64	1	17	10	1	CH	35	6	2	1.5	5.0	390.00	376.40
285	09/12/84	2232	251	18	1	18	10	1	CH	35	6	2	1.5	5.0	1280.16	1119.08
286	09/12/84	2232	312	64	1	17	10	1	CH	35	6	2	1.5	5.0	410.00	385.53
287	09/12/84	2246	252	18	1	18	10	1	CH	35	6	1	1.5	5.0	1280.16	1374.68
288	09/12/84	2246	313	64	1	17	10	1	CH	35	6	1	1.5	5.0	380.00	381.04
289	09/12/84	2300	253	18	1	18	8	1	CH	35	6	1	1.5	5.0	1280.16	1265.97
290	09/12/84	2300	314	64	1	17	7	1	CH	35	6	1	1.5	5.0	350.00	374.02
291	09/12/84	2312	254	18	1	18	10	1	CH	35	6	1	1.5	5.0	1280.16	1598.65
292	09/12/84	2312	315	64	1	17	10	1	CH	35	6	1	1.5	5.1	420.00	394.95
293	09/12/84	2323	255	18	1	18	10	1	CH	35	6	1	1.5	5.0	1280.16	1294.39
294	09/12/84	2323	316	64	1	17	10	1	CH	35	6	1	1.5	5.0	430.00	405.84
295	09/12/84	2338	256	18	1	18	10	1	CH	36	6	1	1.5	5.0	1310.64	1443.25
296	09/12/84	2338	317	64	1	17	10	1	CH	36	6	1	1.5	5.1	440.00	387.92
297	09/12/84	2351	257	18	1	18	10	1	CH	36	6	1	1.5	5.0	1341.12	979.77
298	09/12/84	2351	318	64	1	17	10	1	CH	36	6	1	1.5	5.0	440.00	372.19
299	09/13/84	5	258	18	1	18	10	1	CH	36	6	2	1.5	5.0	1249.68	1255.40
300	09/13/84	5	319	64	1	17	10	1	CH	36	6	2	1.5	5.0	390.00	372.29
301	09/13/84	15	259	18	1	18	10	1	CH	36	6	2	1.5	5.0	1188.72	1463.62
302	09/13/84	15	320	64	1	17	10	1	CH	36	6	2	1.5	5.1	420.00	384.34
303	09/13/84	26	260	18	1	18	10	1	CH	36	6	2	1.5	5.0	1280.16	1229.16
304	09/13/84	26	321	64	1	17	10	1	CH	36	6	2	1.5	5.0	380.00	409.88
305	09/13/84	38	261	18	1	18	10	1	CH	35	6	1	1.5	5.0	1341.12	1417.96
306	09/13/84	38	322	64	1	17	10	1	CH	35	6	1	1.5	5.0	420.00	416.03
307	09/13/84	49	262	18	1	18	10	1	CH	36	6	1	1.5	5.0	1341.12	1595.44
308	09/13/84	49	323	64	1	17	10	1	CH	36	6	1	1.5	5.1	450.00	388.78
309	09/13/84	101	263	18	1	18	10	1	CH	37	6	1	1.5	5.0	1341.12	1428.18
310	09/13/84	101	324	64	1	17	8	1	CH	37	6	1	1.5	5.0	440.00	384.20
311	09/13/84	113	264	18	1	18	10	1	CH	37	6	1	1.5	5.0	1280.16	1428.32
312	09/13/84	113	325	64	1	17	10	1	CH	37	6	1	1.5	5.0	430.00	373.65
313	09/13/84	124	265	18	1	18	10	1	CH	37	6	1	1.5	5.0	1402.08	1358.52
314	09/13/84	124	326	64	1	17	10	1	CH	37	6	1	1.5	5.0	440.00	398.22
315	09/13/84	158	266	18	1	18	11	1	CH	38	6	1	1.5	5.0	1493.52	1448.49
316	09/13/84	158	327	64	1	17	11	1	CH	38	6	1	1.5	5.0	430.00	366.45
317	09/13/84	210	267	18	5	18	10	1	CH	38	6	1	1.5	5.0	.	.
318	09/13/84	210	328	64	1	17	10	1	CH	38	6	1	1.5	5.0	450.00	407.00
319	09/13/84	230	268	18	1	18	15	1	CH	38	6	2	1.5	5.0	1402.08	1360.64
320	09/13/84	230	329	64	1	17	15	1	CH	38	6	2	1.5	5.0	400.00	383.63
321	09/13/84	243	269	18	1	18	15	1	CH	38	6	2	1.5	5.0	1280.16	1391.72
322	09/13/84	243	330	64	1	17	15	1	CH	38	6	2	1.5	5.1	420.00	409.26
323	09/13/84	254	270	18	1	18	11	1	CH	37	6	2	1.5	5.0	1402.08	1373.86
324	09/13/84	254	331	64	1	17	11	1	CH	37	6	2	1.5	5.0	430.00	395.69

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
325	09/13/84	306	271	18	1	18	10	1	CH	37	6	2	1.5	5.0	1493.52	1236.79
326	09/13/84	306	332	64	1	17	10	1	CH	37	6	2	1.5	5.0	430.00	382.35
327	09/13/84	319	272	18	1	18	11	1	CH	36	6	2	1.5	5.0	1280.16	1341.69
328	09/13/84	319	333	64	1	17	11	1	CH	36	6	2	1.5	5.2	450.00	411.51
329	09/13/84	330	273	18	1	18	10	1	CH	35	6	2	1.5	5.0	1463.04	1389.81
330	09/13/84	330	334	64	1	17	10	1	CH	35	6	2	1.5	5.0	460.00	381.97
331	09/13/84	346	274	18	1	18	10	1	CH	35	6	1	1.5	5.0	1554.48	1194.40
332	09/13/84	346	335	64	1	17	10	1	CH	35	6	1	1.5	5.0	390.00	380.39
333	09/13/84	420	275	18	1	18	10	1	CH	35	6	1	1.5	5.0	1158.24	1285.05
334	09/13/84	420	336	64	1	17	10	1	CH	35	6	1	1.5	5.0	370.00	367.38
335	09/13/84	433	396	18	5	18	10	1	CH	35	6	1	1.5	5.0	.	.
336	09/13/84	433	337	64	1	17	10	1	CH	35	6	1	1.5	5.0	380.00	372.52
337	09/13/84	446	397	18	1	18	15	1	CH	35	6	1	.	5.0	1158.24	1489.93
338	09/13/84	446	338	64	1	17	10	1	CH	35	6	1	1.5	5.0	380.00	366.67
339	09/13/84	512	398	18	1	18	10	1	CH	36	6	1	1.5	5.0	1402.08	1357.84
340	09/13/84	512	339	64	1	17	10	1	CH	36	6	1	1.5	5.0	370.00	395.04
341	09/13/84	525	399	18	1	18	10	1	CH	36	6	1	1.5	5.0	1249.68	1245.79
342	09/13/84	525	340	64	1	17	10	1	CH	36	6	1	1.5	5.0	370.00	383.10
343	09/13/84	538	400	18	1	18	10	1	CH	37	6	1	1.5	5.0	1310.64	1307.20
344	09/13/84	538	341	64	1	17	10	1	CH	37	6	1	1.5	5.2	380.00	405.19
345	09/13/84	551	401	18	1	18	10	1	CH	37	6	1	1.5	5.0	1127.76	1175.25
346	09/13/84	551	342	64	1	17	10	1	CH	37	6	1	1.5	5.0	370.00	339.52
347	09/13/84	604	402	18	1	18	10	1	CH	38	6	1	1.5	5.0	1097.28	1178.86
348	09/13/84	604	343	64	1	17	10	1	CH	38	6	1	1.5	5.0	320.00	341.82
349	09/13/84	2000	403	18	1	18	10	2	CH	35	6	2	1.5	5.0	1066.80	1169.45
350	09/13/84	2006	344	64	1	17	10	2	CH	35	6	2	1.5	5.0	420.00	357.47
351	09/13/84	2022	404	18	1	18	9	1	CH	35	6	2	1.5	5.0	1341.12	1256.01
352	09/13/84	2022	345	64	1	17	9	1	CH	35	6	2	1.5	5.0	430.00	377.06
353	09/13/84	2036	405	18	1	18	8	1	CH	35	6	2	1.5	5.0	1249.68	1240.61
354	09/13/84	2036	346	64	1	17	8	1	CH	35	6	2	1.5	5.0	460.00	396.59
355	09/13/84	2050	406	18	1	18	9	1	CH	35	6	1	1.5	5.0	1158.24	800.92
356	09/13/84	2050	347	64	1	17	9	1	CH	35	6	1	1.5	5.0	390.00	358.50
357	09/13/84	2102	407	18	1	18	9	1	CH	35	6	1	1.5	5.0	1097.28	1293.02
358	09/13/84	2102	348	64	1	17	9	1	CH	35	6	1	1.5	5.1	390.00	382.33
359	09/13/84	2117	408	18	1	18	9	1	CH	35	6	1	1.5	5.0	1249.68	1200.26
360	09/13/84	2117	349	64	1	17	9	1	CH	35	6	1	1.5	5.0	410.00	362.64
361	09/13/84	2132	409	18	1	18	9	2	CH	36	6	1	1.5	5.1	1280.16	1321.54
362	09/13/84	2132	350	64	1	17	9	2	CH	36	6	1	1.5	5.1	430.00	416.96
363	09/13/84	2145	410	18	1	18	9	3	CH	37	6	1	1.5	5.0	1280.16	1261.74
364	09/13/84	2145	351	64	1	17	9	3	CH	37	6	1	1.5	5.0	460.00	388.12
365	09/13/84	2159	411	18	1	18	10	3	CH	37	6	2	1.5	5.0	1158.24	1184.86
366	09/13/84	2159	352	64	1	17	10	3	CH	37	6	2	1.5	5.0	400.00	383.63
367	09/13/84	2210	412	18	1	18	10	3	CH	36	6	2	1.5	5.0	1158.24	1183.09
368	09/13/84	2210	353	64	1	17	10	3	CH	36	6	2	1.5	5.0	430.00	375.02
369	09/13/84	2221	413	18	1	18	10	3	CH	36	6	2	1.5	5.0	1158.24	1225.34
370	09/13/84	2221	354	64	1	17	10	3	CH	36	6	2	1.5	5.0	380.00	366.80
371	09/13/84	2234	414	18	1	18	10	2	CH	35	6	2	1.5	5.0	1097.28	1383.20
372	09/13/84	2234	355	64	1	17	10	2	CH	35	6	2	1.5	5.0	410.00	366.07
373	09/13/84	2246	415	18	1	18	10	1	CH	35	6	2	1.5	5.0	1249.68	1345.92
374	09/13/84	2246	356	64	1	17	10	1	CH	35	6	2	1.5	5.0	410.00	375.38
375	09/13/84	2257	416	18	1	18	10	1	CH	35	6	2	1.5	5.0	1249.68	1155.69
376	09/13/84	2257	357	64	1	17	10	1	CH	35	6	2	1.5	5.0	400.00	365.85
377	09/13/84	2320	417	18	1	18	10	1	CH	35	6	1	1.5	5.0	1188.72	1344.42
378	09/13/84	2320	358	64	1	17	10	1	CH	35	6	1	1.5	5.0	410.00	426.56

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
379	09/13/84	2334	418	18	1	18	10	1	CH	35	6	1	1.5	5.0	1188.72	1358.39
380	09/13/84	2334	359	64	1	17	10	1	CH	35	6	1	1.5	5.0	410.00	374.12
381	09/13/84	2351	419	18	1	18	10	2	CH	35	6	1	1.5	5.0	1188.72	1374.13
382	09/13/84	2351	360	64	1	17	10	2	CH	35	6	1	1.5	5.0	410.00	371.56
383	09/14/84	8	420	18	1	18	10	2	CH	35	6	2	1.5	5.0	1158.24	1306.72
384	09/14/84	8	361	64	1	17	10	2	CH	35	6	2	1.5	5.0	420.00	379.99
385	09/14/84	22	421	18	1	18	10	1	CH	35	6	2	1.5	5.0	1158.24	777.68
386	09/14/84	22	362	64	1	17	10	1	CH	35	6	2	1.5	5.0	400.00	369.38
387	09/14/84	35	422	18	5	18	10	1	CH	35	6	2	1.5	5.0	.	.
388	09/14/84	35	363	64	1	17	10	1	CH	35	6	2	1.5	5.0	380.00	342.83
389	09/14/84	49	423	18	1	18	10	1	CH	35	6	2	1.5	5.0	1341.12	1265.83
390	09/14/84	49	364	64	1	17	10	1	CH	35	6	2	1.5	5.0	440.00	383.55
391	09/14/84	101	424	18	2	18	10	1	CH	35	6	1	1.5	5.0	.	1153.30
392	09/14/84	101	365	64	1	17	10	1	CH	35	6	1	1.5	5.0	400.00	386.08
393	09/14/84	111	425	18	1	18	10	1	CH	35	6	1	1.5	5.0	1249.68	1407.87
394	09/14/84	111	366	64	1	17	10	1	CH	35	6	1	1.5	5.0	420.00	386.86
395	09/14/84	121	367	64	1	17	10	2	CH	35	6	1	1.5	5.0	410.00	386.16
396	09/14/84	121	426	64	1	18	10	2	CH	35	6	1	1.5	5.0	390.00	481.00
397	09/14/84	134	427	18	1	18	10	2	CH	35	6	2	1.5	5.0	1188.72	1318.99
398	09/14/84	134	368	64	1	17	10	2	CH	35	6	2	1.5	5.0	430.00	418.41
399	09/14/84	147	428	18	1	18	10	2	CH	35	6	2	1.5	5.0	1341.12	1338.35
400	09/14/84	147	369	64	1	17	10	2	CH	35	6	2	1.5	5.0	450.00	375.25
401	09/14/84	205	429	18	5	18	8	1	CH	35	6	1	1.5	5.0	.	.
402	09/14/84	205	370	64	1	17	8	1	CH	35	6	1	1.5	5.0	350.00	358.30
403	09/14/84	216	430	18	1	18	10	1	CH	35	6	1	1.5	5.0	1188.72	1469.69
404	09/14/84	216	371	64	1	17	10	1	CH	35	6	1	1.5	5.0	420.00	386.94
405	09/14/84	226	431	18	1	18	10	2	CH	35	6	1	1.5	5.0	1341.12	1467.37
406	09/14/84	226	372	64	1	17	10	2	CH	35	6	1	1.5	5.0	360.00	361.86
407	09/14/84	236	432	18	1	18	10	3	CH	36	6	1	1.5	5.0	1249.68	1318.24
408	09/14/84	236	373	64	1	17	10	3	CH	36	6	1	1.5	5.0	440.00	389.44
409	09/14/84	247	433	18	1	18	10	3	CH	36	6	1	1.5	5.0	1402.08	1670.21
410	09/14/84	247	374	64	1	17	10	3	CH	36	6	1	1.5	5.0	420.00	389.32
411	09/14/84	259	434	18	1	18	10	3	CH	36	6	2	1.5	5.0	1249.68	1351.23
412	09/14/84	259	375	64	1	17	10	3	CH	36	6	2	1.5	5.0	410.00	358.47
413	09/14/84	309	435	18	1	18	10	3	CH	36	6	2	1.5	5.0	1432.56	1275.24
414	09/14/84	309	376	64	1	17	10	3	CH	36	6	2	1.5	5.0	420.00	381.75
415	09/14/84	321	436	18	5	18	10	2	CH	35	6	2	1.5	5.0	.	.
416	09/14/84	321	377	64	1	17	10	2	CH	35	6	2	1.5	5.0	380.00	377.68
417	09/14/84	335	437	18	1	18	10	1	CH	35	6	2	1.5	5.0	1402.08	1359.73
418	09/14/84	335	378	64	1	17	10	1	CH	35	6	2	1.5	5.0	450.00	387.44
419	09/14/84	2059	379	64	2	17	10	2	CH	37	4	1	1.5	5.0	.	404.39
420	09/14/84	2059	438	64	1	18	12	2	CH	37	4	1	1.5	5.0	360.00	238.68
421	09/14/84	2117	380	64	1	17	8	1	CH	37	4	1	1.5	5.0	390.00	406.05
422	09/14/84	2117	439	64	1	18	8	1	CH	37	4	1	1.5	5.0	420.00	496.21
423	09/14/84	2137	381	64	2	17	12	2	CH	37	4	1	1.5	5.0	.	361.16
424	09/14/84	2137	440	64	1	18	12	2	CH	37	4	1	1.5	5.0	390.00	481.75
425	09/14/84	2206	385	64	1	17	9	2	CH	36	4	2	1.5	5.1	450.00	393.52
426	09/14/84	2211	382	64	5	17	10	1	CH	36	4	1	1.5	5.0	.	.
427	09/14/84	2211	441	64	1	18	10	1	CH	36	4	1	1.5	5.0	400.00	452.57
428	09/14/84	2234	383	64	1	17	10	1	CH	36	4	1	1.5	5.0	500.00	376.73
429	09/14/84	2234	442	64	1	18	10	1	CH	36	4	1	1.5	5.0	440.00	509.60
430	09/14/84	2249	384	64	1	17	10	2	CH	36	4	2	1.5	5.0	390.00	373.70
431	09/14/84	2249	443	64	1	18	10	2	CH	36	4	2	1.5	5.0	390.00	533.96
432	09/14/84	2306	444	64	5	18	9	2	CH	36	4	2	1.5	5.0	.	.

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
433	09/14/84	2321	386	64	5	17	10	1	CH	36	4	2	1.5	.	.	.
434	09/14/84	2331	445	64	1	18	10	1	CH	36	4	2	1.5	5.0	390.00	525.19
435	09/15/84	38	387	64	1	17	12	2	CH	34	6	2	1.5	5.0	380.00	368.30
436	09/15/84	38	446	64	5	18	12	2	CH	34	6	2	1.5	5.0	.	.
437	09/15/84	53	388	64	1	17	14	2	CH	34	6	2	1.5	5.0	460.00	366.90
438	09/15/84	53	447	64	5	18	14	2	CH	34	6	2	1.5	5.0	.	.
439	09/15/84	151	389	64	1	17	9	1	TZ	33	6	2	1.5	5.0	350.00	394.06
440	09/15/84	151	448	64	1	18	9	1	TZ	33	6	2	1.5	5.0	380.00	496.13
441	09/15/84	207	390	64	1	17	9	1	TZ	33	6	2	1.5	5.0	350.00	349.50
442	09/15/84	207	449	64	1	18	9	1	TZ	33	6	2	1.5	5.0	370.00	497.06
443	09/15/84	220	391	64	1	17	9	1	TZ	32	6	2	1.5	5.0	390.00	372.19
444	09/15/84	220	450	64	1	18	9	1	TZ	32	6	2	1.5	5.0	370.00	458.59
445	09/15/84	242	392	64	1	17	9	1	TZ	33	6	2	1.5	5.0	390.00	372.32
446	09/15/84	242	451	64	1	18	9	1	TZ	33	6	2	1.5	5.0	420.00	471.72
447	09/15/84	258	393	64	1	17	9	1	TZ	33	6	1	1.5	5.0	460.00	409.81
448	09/15/84	258	452	64	1	18	9	1	TZ	33	6	1	1.5	5.0	390.00	447.98
449	09/15/84	326	394	64	1	17	7	1	TZ	33	6	2	1.5	5.0	390.00	490.80
450	09/15/84	326	453	64	1	18	10	1	TZ	33	6	2	1.5	5.0	380.00	522.54
451	09/15/84	343	395	64	1	17	8	1	TZ	32	6	2	1.5	5.0	430.00	379.76
452	09/15/84	343	454	64	1	18	8	1	TZ	32	6	2	1.5	5.0	400.00	485.06
453	09/15/84	356	455	64	1	18	10	1	TZ	32	6	2	1.5	5.0	380.00	508.72
454	09/15/84	358	469	64	1	17	10	1	TZ	32	6	2	1.5	5.0	470.00	396.14
455	09/15/84	422	456	64	1	18	13	1	TZ	32	6	2	1.5	5.0	460.00	489.29
456	09/15/84	422	470	64	1	17	13	1	TZ	32	6	2	1.5	5.1	490.00	390.01
457	09/15/84	440	457	64	5	18	12	2	TZ	31	6	1	1.5	.	.	.
458	09/15/84	440	471	64	1	17	12	2	TZ	31	6	1	1.5	5.0	470.00	390.57
459	09/15/84	453	458	64	1	18	12	2	TZ	31	6	1	1.5	5.0	380.00	446.44
460	09/15/84	453	472	64	1	17	12	2	TZ	31	6	1	1.5	5.0	380.00	359.53
461	09/15/84	537	459	64	1	18	14	2	CH	34	6	1	1.5	5.0	270.00	452.23
462	09/15/84	537	473	64	1	17	14	2	CH	34	6	1	1.5	5.1	320.00	359.99
463	09/15/84	2004	460	18	1	18	10	1	IP	39	6	1	1.5	5.0	975.36	1078.26
464	09/15/84	2004	474	64	1	17	10	1	IP	39	6	1	1.5	5.1	340.00	373.96
465	09/15/84	2024	461	18	1	18	11	2	CH	38	6	1	1.5	5.0	944.88	1283.83
466	09/15/84	2024	475	64	1	17	11	2	CH	38	6	1	1.5	5.2	310.00	384.42
467	09/15/84	2048	462	18	1	18	12	2	CH	37	6	1	1.5	5.0	1005.84	1181.04
468	09/15/84	2048	476	64	1	17	12	2	CH	37	6	1	1.5	5.0	360.00	352.00
469	09/15/84	2147	463	18	1	18	10	3	CH	36	6	1	1.5	5.0	1219.20	1357.19
470	09/15/84	2147	477	64	2	17	10	3	CH	36	6	1	1.5	5.1	.	1049.79
471	09/15/84	2202	464	18	5	18	10	2	CH	36	6	1	1.5	5.0	.	.
472	09/15/84	2202	478	64	5	17	10	2	CH	36	6	1	1.5	5.1	.	.
473	09/15/84	2231	465	18	1	18	10	2	CH	36	6	1	1.5	5.0	1188.72	1409.74
474	09/15/84	2231	479	64	1	17	10	2	CH	36	6	1	1.5	5.0	490.00	413.77
475	09/15/84	2247	466	18	1	18	10	2	CH	36	6	2	1.5	5.0	1402.08	1337.57
476	09/15/84	2247	480	64	1	17	10	2	CH	36	6	2	1.5	5.1	410.00	404.02
477	09/15/84	2300	467	18	1	18	10	2	CH	35	6	2	1.5	5.0	1158.24	1341.44
478	09/15/84	2300	481	64	1	17	10	2	CH	35	6	2	1.5	5.0	410.00	393.84
479	09/15/84	2316	468	18	1	18	10	2	CH	35	6	1	1.5	5.0	1249.68	1280.55
480	09/15/84	2316	482	64	1	17	10	2	CH	35	6	1	1.5	5.0	410.00	364.92
481	09/15/84	2331	501	18	1	18	10	2	CH	35	6	3	1.5	5.0	1219.20	1277.43
482	09/15/84	2331	483	64	1	17	10	2	CH	35	6	3	1.5	5.0	430.00	382.80
483	09/16/84	30	502	18	1	18	14	3	TZ	30	4	2	1.5	5.0	914.40	1374.00
484	09/16/84	30	484	64	1	17	14	3	TZ	30	4	2	1.5	5.2	400.00	350.04
485	09/16/84	43	485	64	1	17	15	3	TZ	30	4	2	1.5	5.2	390.00	412.84
486	09/16/84	43	503	64	1	18	14	3	TZ	30	4	2	1.5	5.0	330.00	504.52

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
487	09/24/84	1939	601	18	1	18	10	1	CH	35	6	3	1.5	5.0	944.88	1425.76
488	09/24/84	1939	486	64	1	17	10	1	CH	35	6	3	1.5	5.0	380.00	396.52
489	09/24/84	1959	602	18	2	18	10	1	CH	35	6	3	1.5	6.0	.	1343.13
490	09/24/84	1959	487	64	1	17	10	1	CH	35	6	3	1.5	5.0	330.00	365.24
491	09/24/84	2015	488	64	1	17	10	1	CH	35	6	3	1.5	5.1	350.00	417.65
492	09/24/84	2028	604	18	1	18	10	1	CH	35	6	3	1.5	5.0	1188.72	1484.85
493	09/24/84	2028	489	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	425.39
494	09/24/84	2045	605	18	1	18	10	1	CH	35	6	3	1.5	5.0	1188.72	1512.64
495	09/24/84	2045	490	64	1	17	10	1	CH	35	6	3	1.5	5.0	410.00	438.36
496	09/24/84	2100	606	18	1	18	10	1	CH	35	6	3	1.5	5.0	975.36	1490.56
497	09/24/84	2100	491	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	462.68
498	09/24/84	2115	607	18	1	18	10	1	CH	35	6	3	1.5	5.0	1310.64	1414.62
499	09/24/84	2115	492	64	1	17	10	1	CH	35	6	3	1.5	5.5	430.00	457.26
500	09/24/84	2138	608	18	1	18	8	1	CH	35	6	3	1.5	5.0	1645.92	1458.99
501	09/24/84	2138	493	64	1	17	10	1	CH	35	6	3	1.5	5.0	370.00	413.44
502	09/24/84	2153	609	18	1	18	10	1	CH	35	6	3	1.5	5.0	1371.60	1332.00
503	09/24/84	2153	494	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	448.70
504	09/24/84	2214	610	18	1	18	10	1	CH	35	6	3	1.5	5.0	1219.20	1318.58
505	09/24/84	2214	495	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	432.65
506	09/24/84	2235	611	18	1	18	10	1	CH	35	6	3	1.5	5.0	1127.76	1340.39
507	09/24/84	2235	496	64	1	17	10	1	CH	35	6	3	1.5	5.0	380.00	438.63
508	09/24/84	2309	612	18	1	18	10	1	CH	35	6	3	1.5	5.0	1249.68	1304.00
509	09/24/84	2309	497	64	1	17	10	1	CH	35	6	3	1.5	5.0	430.00	446.53
510	09/24/84	2328	613	18	1	18	10	1	CH	35	6	3	1.5	5.0	1127.76	1364.06
511	09/24/84	2328	498	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	432.37
512	09/24/84	2345	614	18	1	18	10	1	CH	35	6	3	1.5	5.0	1341.12	1415.17
513	09/24/84	2345	499	64	1	17	10	1	CH	35	6	3	1.5	5.0	410.00	437.42
514	09/25/84	4	615	18	1	18	10	1	CH	35	6	3	1.5	5.0	1219.20	1394.05
515	09/25/84	4	500	64	1	17	10	1	CH	35	6	3	1.5	5.0	410.00	445.49
516	09/25/84	29	616	18	1	18	10	1	CH	35	6	3	1.5	5.0	1249.68	1593.82
517	09/25/84	29	504	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	442.81
518	09/25/84	47	617	18	1	18	8	1	CH	35	6	3	1.5	5.0	1127.76	1530.12
519	09/25/84	47	505	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	453.72
520	09/25/84	108	618	18	5	18	8	1	CH	35	6	3	1.5	5.0	.	.
521	09/25/84	108	506	64	1	17	10	1	CH	35	6	3	1.5	5.0	390.00	444.75
522	09/25/84	122	619	18	2	18	9	1	CH	35	6	3	1.5	5.0	.	1426.38
523	09/25/84	122	507	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	462.56
524	09/25/84	143	620	18	1	18	8	1	CH	35	6	3	1.5	5.0	1036.32	1342.04
525	09/25/84	143	508	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	452.17
526	09/25/84	204	621	18	1	18	8	1	CH	35	6	3	1.5	5.0	1219.20	1348.78
527	09/25/84	204	509	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	434.58
528	09/25/84	223	622	18	2	18	7	1	CH	35	6	3	1.5	5.0	.	723.82
529	09/25/84	223	510	64	1	17	10	1	CH	35	6	3	1.5	5.0	420.00	445.04
530	09/25/84	256	623	18	1	18	8	1	CH	35	6	3	1.5	5.0	1158.24	1098.66
531	09/25/84	256	511	64	1	17	10	1	CH	35	6	3	1.5	5.0	380.00	440.35
532	09/25/84	314	624	18	2	18	9	1	CH	35	6	3	1.5	5.0	.	1192.08
533	09/25/84	314	512	64	1	17	10	1	CH	35	6	3	1.5	5.0	400.00	435.45
534	09/25/84	336	625	18	1	18	8	2	CH	36	6	1	1.5	5.0	1097.28	1311.84
535	09/25/84	336	513	64	1	17	10	1	CH	36	6	1	1.5	5.6	450.00	508.13
536	09/25/84	1920	626	18	1	18	10	2	CH	38	6	2	1.5	5.0	1158.24	1240.23
537	09/25/84	1920	514	64	1	17	10	2	CH	38	6	2	1.5	5.0	400.00	438.36
538	09/25/84	1937	627	18	1	18	10	2	CH	37	6	2	1.5	5.0	1036.32	993.48
539	09/25/84	1937	515	64	1	17	10	2	CH	37	6	2	1.5	5.0	410.00	431.60
540	09/25/84	1952	628	18	1	18	10	1	CH	37	6	2	1.5	5.0	1219.20	1301.32

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
541	09/25/84	1952	516	64	1	17	10	1	CH	37	6	2	1.5	5	390.00	413.91
542	09/25/84	2007	629	18	1	18	10	1	CH	36	6	2	1.5	5	1127.76	1280.41
543	09/25/84	2007	517	64	1	17	10	1	CH	36	6	2	1.5	5	380.00	425.96
544	09/25/84	2023	630	18	1	18	10	1	CH	36	6	2	1.5	5	1158.24	1258.87
545	09/25/84	2023	518	64	1	17	10	1	CH	36	6	2	1.5	5	380.00	427.28
546	09/25/84	2041	631	18	1	18	10	1	CH	36	6	2	1.5	5	1097.28	1229.71
547	09/25/84	2041	519	64	2	17	10	1	CH	36	6	2	1.5	5	.	459.45
548	09/25/84	2125	632	18	1	18	10	1	CH	35	6	2	1.5	5	1341.12	1332.07
549	09/25/84	2125	520	64	1	17	10	1	CH	35	6	2	1.5	5	370.00	427.25
550	09/25/84	2140	633	18	2	18	10	1	CH	35	6	4	1.5	5	.	1323.54
551	09/25/84	2140	521	64	1	17	10	1	CH	35	6	4	1.5	5	440.00	429.17
552	09/25/84	2157	634	18	1	18	10	1	CH	35	6	4	1.5	5	1249.68	1242.30
553	09/25/84	2157	522	64	1	17	10	1	CH	35	6	4	1.5	5	450.00	448.90
554	09/25/84	2222	635	18	1	18	10	1	CH	35	6	3	1.5	5	1127.76	1214.37
555	09/25/84	2222	523	64	1	17	10	1	CH	35	6	3	1.5	5	400.00	438.46
556	09/25/84	2237	636	18	1	18	10	1	CH	35	6	3	1.5	5	1127.76	1264.38
557	09/25/84	2237	524	64	1	17	10	1	CH	35	6	3	1.5	5	380.00	437.52
558	09/25/84	2251	637	18	1	18	10	1	CH	35	6	1	1.5	5	1402.08	1419.57
559	09/25/84	2251	525	64	1	17	10	1	CH	35	6	1	1.5	5	420.00	439.13
560	09/25/84	2306	638	18	1	18	10	1	CH	36	6	1	1.5	5	1493.52	1397.69
561	09/25/84	2306	526	64	1	17	10	1	CH	36	6	1	1.5	5	460.00	439.75
562	09/25/84	2325	639	18	1	18	10	1	CH	36	6	1	1.5	5	1005.84	1322.57
563	09/25/84	2325	527	64	1	17	10	1	CH	36	6	1	1.5	5	440.00	437.12
564	09/25/84	2343	640	18	1	18	10	1	CH	37	6	1	1.5	5	1371.60	1386.89
565	09/25/84	2343	528	64	1	17	10	1	CH	37	6	1	1.5	5	490.00	453.81
566	09/26/84	1	641	18	1	18	10	1	CH	37	6	2	1.5	5	1097.28	1339.22
567	09/26/84	1	529	64	1	17	10	1	CH	37	6	2	1.5	5	380.00	422.14
568	09/26/84	16	642	18	1	18	10	1	CH	37	6	2	1.5	5	1066.80	1209.14
569	09/26/84	16	530	64	1	17	10	1	CH	37	6	2	1.5	5	420.00	423.53
570	09/26/84	36	643	18	1	18	10	1	CH	36	6	2	1.5	5	944.88	1176.67
571	09/26/84	36	531	64	1	17	10	1	CH	36	6	2	1.5	5	440.00	435.28
572	09/26/84	54	644	18	1	18	10	1	CH	36	6	2	1.5	5	1127.76	1354.49
573	09/26/84	54	532	64	1	17	10	1	CH	36	6	2	1.5	5	470.00	423.70
574	09/26/84	111	645	18	2	18	10	1	CH	36	6	1	1.5	5	.	1282.47
575	09/26/84	111	533	64	1	17	10	1	CH	36	6	1	1.5	5	400.00	430.68
576	09/26/84	128	646	18	2	18	37	2	CH	37	6	1	1.5	5	.	1269.33
577	09/26/84	128	534	64	1	17	10	2	CH	37	6	1	1.5	5	400.00	426.14
578	09/26/84	147	647	18	1	18	10	2	CH	37	6	1	1.5	5	1402.08	1292.65
579	09/26/84	147	535	64	1	17	10	2	CH	37	6	1	1.5	5	380.00	427.68
580	09/26/84	209	648	18	1	18	10	2	CH	37	6	2	1.5	5	1127.76	1311.16
581	09/26/84	209	536	64	1	17	10	2	CH	37	6	2	1.5	5	450.00	424.45
582	09/26/84	228	649	18	2	18	10	2	CH	36	6	2	1.5	5	.	1293.20
583	09/26/84	228	537	64	1	17	10	2	CH	36	6	2	1.5	5	460.00	414.16
584	09/26/84	248	650	18	1	18	10	2	CH	36	6	1	1.5	5	1036.32	1134.57
585	09/26/84	248	538	64	1	17	10	2	CH	36	6	1	1.5	5	400.00	436.67
586	09/26/84	304	651	18	1	18	10	2	CH	37	6	1	1.5	5	975.36	1143.79
587	09/26/84	304	539	64	1	17	10	2	CH	37	6	1	1.5	5	370.00	423.78
588	09/26/84	324	652	18	1	18	10	2	CH	37	6	1	1.5	5	1097.28	1148.67
589	09/26/84	324	540	64	1	17	10	2	CH	37	6	1	1.5	5	390.00	442.44
590	09/26/84	342	653	18	1	18	10	2	CH	37	6	1	1.5	5	1097.28	1000.84
591	09/26/84	342	541	64	1	17	10	2	CH	37	6	1	1.5	5	370.00	418.09
592	09/26/84	402	654	18	1	18	10	2	CH	37	6	2	1.5	5	1584.96	1210.17
593	09/26/84	402	542	64	1	17	10	2	CH	37	6	2	1.5	5	470.00	403.95
594	09/26/84	420	655	18	1	18	10	2	CH	37	6	2	1.5	5	1371.60	992.58

AUGUST - SEPTEMBER 1984 GEAR COMPARISON STUDY (TASK_CD 01)
DEPLOYMENT DATA SUMMARY FOR 3 METER BEAM TRAWL
AND 1 METER SQUARE EPIBENTIC SLED

OBS	DATE	TIME	SAMPLE	GEAR	USE_CODE	VESL_CD	DPTH_RIV	WAVE_HT	REGION	RIV_MILE	SITE	TOW_DIR	TOW_SPD	DURATION	TOW_AREA	VOLUME
595	09/26/84	420	543	64	1	17	10	2	CH	37	6	2	1.5	5	460.00	427.53
596	09/26/84	440	656	18	1	18	10	2	CH	36	6	1	1.5	5	1066.80	1232.94
597	09/26/84	440	544	64	5	17	10	2	CH	36	6	1	1.5	.	.	.
598	09/26/84	456	657	18	1	18	10	2	CH	37	6	1	1.5	5	1097.28	1306.41
599	09/26/84	456	545	64	1	17	10	2	CH	37	6	1	1.5	5	360.00	430.29
600	09/26/84	2222	546	64	1	17	10	2	CH	38	6	1	1.5	5	490.00	434.41
601	09/26/84	2223	658	18	1	18	10	2	CH	38	6	1	1.5	5	1645.92	1282.06
602	09/26/84	2240	659	18	1	18	10	2	CH	38	6	2	1.5	5	1066.80	1422.94
603	09/26/84	2240	547	64	1	17	10	2	CH	38	6	2	1.5	5	360.00	513.45
604	09/26/84	2253	660	18	1	18	10	2	CH	38	6	2	1.5	5	1188.72	1407.46
605	09/26/84	2253	548	64	1	17	10	2	CH	38	6	2	1.5	5	370.00	450.29
606	09/26/84	2308	661	18	1	18	10	2	CH	38	6	2	1.5	5	1036.32	1371.35
607	09/26/84	2308	549	64	1	17	10	2	CH	38	6	2	1.5	5	360.00	435.20
608	09/26/84	2324	662	18	1	18	10	2	CH	37	6	2	1.5	5	1158.24	1313.01
609	09/26/84	2324	550	64	1	17	10	2	CH	37	6	2	1.5	5	350.00	416.17
610	09/26/84	2340	663	18	1	18	10	2	CH	37	6	2	1.5	5	1188.72	1276.83
611	09/26/84	2340	551	64	1	17	10	2	CH	37	6	2	1.5	5	360.00	420.20
612	09/27/84	2024	552	18	1	17	8	1	CH	38	6	2	1.5	5	1645.92	1666.94
613	09/27/84	2024	664	64	1	9	8	1	CH	38	6	2	1.5	5	490.00	509.40
614	09/27/84	2041	553	18	1	17	8	1	CH	37	6	2	1.5	5	1554.48	1503.50
615	09/27/84	2041	665	64	1	9	8	1	CH	37	6	2	1.5	5	500.00	483.99
616	09/27/84	2055	554	18	1	17	8	1	CH	36	6	2	1.5	5	1463.04	1642.20
617	09/27/84	2055	666	64	1	9	8	1	CH	36	6	2	1.5	5	480.00	486.52
618	09/27/84	2111	555	18	1	17	8	1	CH	36	6	2	1.5	5	1402.08	1452.86
619	09/27/84	2111	667	64	1	9	8	1	CH	36	6	2	1.5	5	400.00	501.83
620	09/27/84	2131	556	18	5	17	8	1	CH	38	6	2	1.5	5	.	.
621	09/27/84	2131	668	64	1	9	9	1	CH	38	6	2	1.5	5	380.00	433.05
622	09/29/84	2015	603	18	1	18	10	1	CH	35	6	3	1.5	5	1066.80	1387.72

To John Young –
FYI

TEXAS INSTRUMENTS
INCORPORATED

POST OFFICE BOX 5621 • DALLAS, TEXAS 75222

Science Services Division

P.O. Box 237, Buchanan, New York 10511

1 February 1979

Mr. L. Ray Tuttle
Consolidated Edison Company of New York, Inc.
P.O. Box 237
Buchanan, New York 10511

Dear Mr. Tuttle:

In reviewing the analyses presented in the 1977 beach seine efficiency study report, we discovered two minor errors in Appendix D, page D-6. Both errors occur in the analysis for equality of catches.

For juvenile striped bass, the probability level should be changed from 0.201 to >0.50. The change has no effect on any results.

For white perch, the number of catches (n) should be 21, T* should be 0.956, and p should be 0.339. The implications of this second change are that catches in the first and second tows are not significantly different ($\alpha = 0.05$); hence both tows can be used to calculate catch efficiency. If both tows are used in the analysis, the weighted mean catch efficiency changes from 0.069 to 0.064.

Sincerely,

Irvin R. Savidge, Ph.D.
Program Manager

IRS:ib

CATCH EFFICIENCY OF 100-FT (30-M) BEACH SEINES FOR ESTIMATING DENSITY OF YOUNG-OF-THE-YEAR STRIPED BASS AND WHITE PERCH IN THE SHORE ZONE OF THE HUDSON RIVER ESTUARY

JUNE 1978

FINAL

Prepared for

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

4 Irving Place
New York, New York 10003

Prepared by

TEXAS INSTRUMENTS INCORPORATED

Science Services Division
P.O. Box 5621
Dallas, Texas 75222

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June 1978
by
Consolidated Edison Company of New York, Inc.

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SECTION I

INTRODUCTION

The estimation of the absolute sizes of fish populations in large bodies of water has been the objective of much fisheries research (Ricker 1975, EIFAC 1974). Various techniques exist for estimating population size, such as area-density extrapolations, mark/recapture, direct count, and acoustic sampling. All of these methods are subject to biases and limitations common to field sampling; thus at least two techniques should be employed concurrently whenever possible to aid in interpreting the biases. Since 1973, Texas Instruments (TI) has conducted a program designed to estimate the numbers of juvenile striped bass and white perch in the Hudson River estuary through mark/recapture and area-density extrapolation methods. The area-density extrapolations were derived from stratified random sampling designs and used to estimate the number of fish in various geographical regions and depth strata (TI 1975).

Shallow areas of the estuary near the shore (10 ft or less in depth) are important feeding and nursery habitats for many Hudson River fishes. These near-shore areas can be sampled effectively and economically using beach seines. The TI beach seine survey program is designed to monitor distributions and densities of key Hudson River species throughout a 140 mile (224 km) segment of the estuary. Data collected in the survey can be used to estimate with standardized sampling techniques, the population size by area-density extrapolations.

Density estimates that are calculated without corrections for catch efficiencies are subject to a negative bias (Kjelson 1977). It is beneficial to determine catch efficiency, defined in Kjelson (1977) as "the number of fish collected divided by the number actually present in the area or volume sampled" for each gear type used and each species; however, it is a difficult parameter to evaluate. Relatively few papers in the fisheries literature address this topic compared to extensive literature on fishing gear comparability and selectivity. Although catch efficiency estimates for beach seines are not available in the literature for fish species found in the Hudson River, studies on other species have indicated that seining efficiencies can be substantially less than 100% (Kjelson and Colby 1977).

Accurate estimates of catch efficiencies and knowledge of factors which affect efficiency are needed to produce unbiased population estimates. Kjelson (1977) has suggested four ways to estimate catch efficiency of fishing gear: (1) release a known number of marked fish into the path of the sampling gear immediately prior to sampling; (2) release a known number of marked fish into an enclosed area and then sample the area; (3) enclose an area containing unmarked fish, sample to estimate the density, then obtain true density by direct count or other means; (4) use acoustic tags to monitor the reactions of individual fish to the sampling gear. The particular species, size of fish, habitat type, fish density, and environmental conditions must be considered when designing a catch efficiency study (Kjelson 1977) or applying the results (Kjelson and Johnson 1978).

All of these methods require some assumptions about the behavior of the fish. Methods (1) and (4) assume that the marked and tagged fish will react to the fishing gear in the same manner as unmarked fish. This assumption may not be true, especially for fish handled immediately before the test. Methods (2) and (3) assume that fish are distributed uniformly or at random throughout the enclosed area. If fish exhibit some type of patchy distribution due to schooling behavior, a non-homogeneous test area, or disturbances caused by sampling, then calculated efficiencies will contain a systematic bias and thus will not meet Kjelson's definition of catch efficiency. Any study to estimate catch efficiency, regardless of methods chosen, should include some way to evaluate the necessary assumptions.

This report presents the results of a study designed to meet the following objectives:

- estimate the catch efficiency of 100-ft (30 m) beach seines for various sizes of striped bass and white perch in the Hudson River estuary
- provide a means to evaluate the assumptions used to estimate efficiency
- determine the influence of some of the factors which may affect catch efficiency

A modification of Kjelson's third method was chosen to provide the data needed to evaluate assumptions about fish distribution. Validity of the assumptions could thus be evaluated by comparing the sampling distribution of the catch from an enclosed area with the sampling distribution of the catch from other beach seine sampling programs.

SECTION II

METHODS

A. DATA COLLECTION

Four seine sites were selected for the efficiency tests (Figure II-1); each was sampled once per week during the day from 11 September through 19 November 1977. The four sites were chosen on the basis of relatively high expected catches of striped bass, ease of conducting the tests with a minimum of sampling problems, and proximity to each other. All of the sites were relatively shallow with a gradually sloping bottom. Bottom types, depths, and vegetation varied somewhat among sites (Table II-1).

At the beginning of each test, one end of a 500-ft (152 m) seine, wings 375 ft x 10 ft (114 x 3 m) and 75 ft x 10 ft (23 m x 3 m) with 3/8-in. (0.95 cm) mesh bag 50 ft x 12 ft (15 m x 4 m) with 1/4-in. (0.64 cm) mesh was secured on the shoreline near the high water line. The boat was then backed from shore as the net was played out over the bow. When 167 feet (51 m) of net had been released, an anchor was tied to the lead line and set in the bottom to keep the net in place. The boat was turned 90°, and the next 167 feet of net were set parallel to the shore line. Another anchor was placed on the lead line, the boat turned 90°, and the remaining net was set toward the shore line. This procedure produced an approximately square test area large enough to permit use of the 100-ft (30 m) seine, wings 40 ft x 8 ft (12 m x 2.4 m) with 3/8 in. (0.95 cm) mesh, bag 20 ft x 10 ft (6 m x 3 m) with 3/16 in. (0.48 cm) mesh inside the enclosure (Figure II-2).

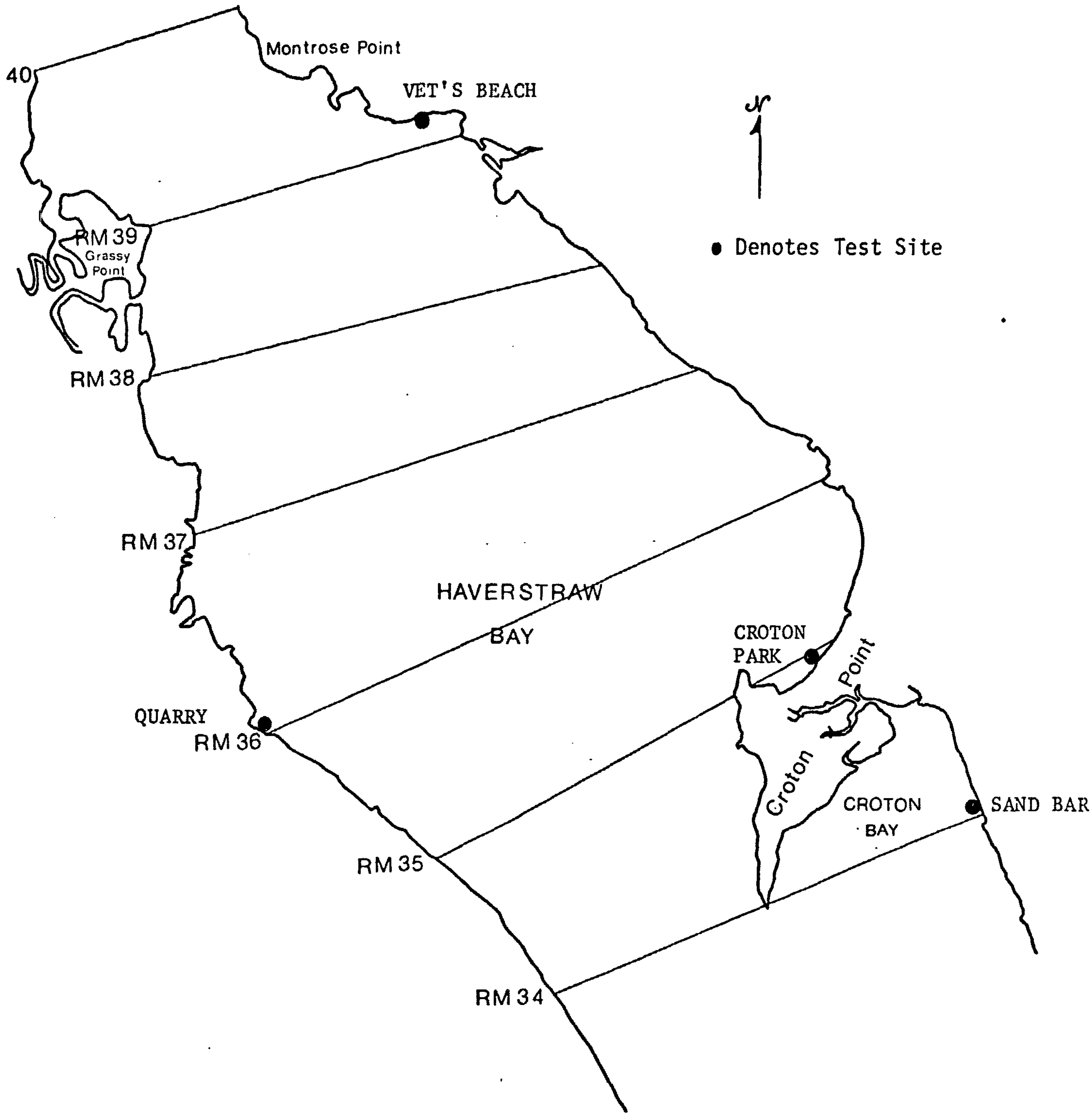

Figure II-1. Sites Used for Beach Seine Efficiency Tests.(RM = river mile).

Table II-1

Physical Characteristics of Sampling Sites Used in Beach Seine Efficiency Tests

Site	Location		Bottom type	Orientation	Vegetation	Depth*
	River Mile	Side				
1) Sand Bar	34	East	Sand	SW	Sparse	2ft(0.6m)
2) Quarry	36	West	Fine Sand changing to mud	NE	Moderate	4ft(1.3m)
3) Croton Park	35	East	Sand	NW	Sparse-Moderate	2ft(0.6m)
4) Vet's Beach	39	East	Coarse Sand and Gravel	S	Sparse	6ft(2.0m)

*At mean low water approximately 100 ft (30 m) from shore.

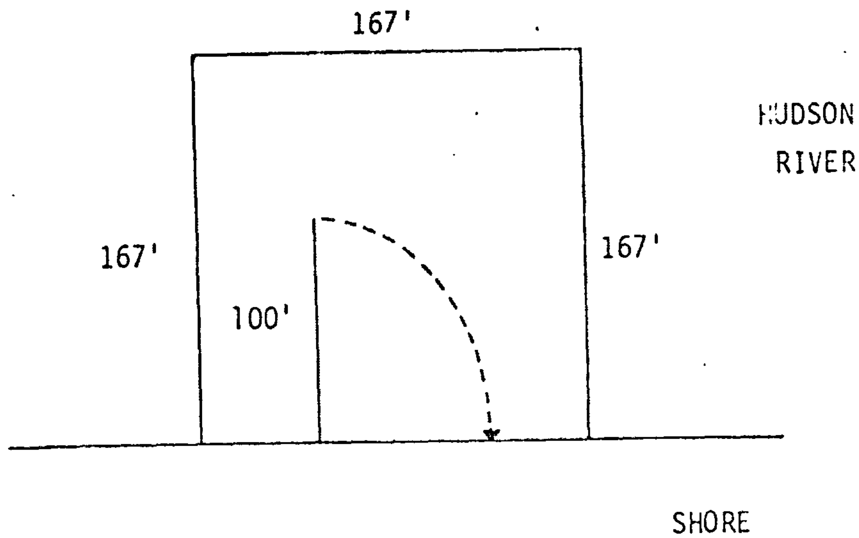

Figure II-2. Net Arrangement for Beach Seine Efficiency Tests.

After waiting 1 hr for the fish to recover from the disturbance caused by setting the 500-ft net, the efficiency tests were begun. A 16-ft (4.9 m) boat was drifted over the 500-ft net and run to the shore under power. One end of the 100-ft net was held at the shoreline while the boat was backed away from the shore to extend the net perpendicular to the shore line. When the net was fully extended, the boat was turned and the net was towed toward shore to form an arc. The 100-ft net was then hauled to the beach. This procedure followed standard 100-ft beach seine sampling techniques described in TI (1975).

The fish collected in each beach seine tow were identified by species and counted. Striped bass and white perch were marked by clipping the tip of the upper lobe of the caudal fin. Other species hardy enough to withstand clipping and handling (e.g. centrarchids, carp, goldfish) were also marked. During some weeks the tip of one operculum was also clipped to distinguish the fish from those marked in prior tests. All fish in good condition were then released inside the enclosure.

One hour after release, sampling with the 100-ft seine was repeated. Striped bass, white perch, and other markable species were marked by clipping the tip of the lower caudal lobe. Again all fish in good condition were released inside the enclosure. Previously marked fish were counted but not clipped again.

After marked fish were allowed to disperse (15-30 minutes), the anchors were detached from the 500-ft net and the net was hauled to shore. All fish were counted and identified. Marked fish were preserved in 10% formalin. Unmarked striped bass and white perch were marked according to standard mark/recapture procedures (TI 1975) and released. All other fish were released unmarked.

B. DATA ANALYSIS

The efficiency of the 100-ft seine was calculated as the ratio of fish density determined from 100-ft seine samples to density determined from direct count of the 500-ft seine sample corrected for escapement:

$$E_{100i} = \left(\frac{C_{100i}}{A_{100}}\right) \Big/ \left(\frac{C_{500i}}{A_{500} \cdot e_{500i}}\right) \qquad (1)$$

where

E_{100i} = estimated catch efficiency of 100-ft seine for species i

C_{100i} = catch of species i in the 100-ft seine

A_{100} = area swept by 100-ft seine

C_{500i} = catch of species i in the 500-ft seine

e_{500i} = fraction of marked fish of species i caught in 500-ft seine

A_{500} = area enclosed by 500-ft seine

Fish were assumed to be randomly distributed throughout the enclosure. Since A_{500} was approximately 27900 ft^2 and A_{100} was estimated at 4844 ft^2* (TI 1975) equation (1) was rearranged to

$$E_{100i} = \left(\frac{A_{500}}{A_{100}}\right) \cdot \left(C_{100_i} \Big/ \frac{C_{500i}}{e_{500i}}\right)$$

$$= \left(\frac{27900\ ft^2}{4844\ ft^2}\right) \cdot \left(C_{100i} \Big/ \frac{C_{500i}}{e_{500i}}\right)$$

$$\approx \frac{6 \cdot C_{100i} \cdot e_{500i}}{C_{500i}} \qquad (2)$$

Equation (2) was used to calculate efficiency values used in the analysis.

Escapement from the 500-ft net ($1-e_{500i}$) was estimated from the fraction of marked fish which were recaptured from the 500-ft net. The nature of the escapement, whether continuous or occurring only during net retrieval, was determined by comparing recapture rates for fish marked in the first and second 100-ft seine samples with a Wilcoxon signed-rank test (Hollander and Wolfe 1973). If escapement from the 500-ft net was continuous, then the recapture rate for fish marked in the first tow should be lower, since those marked fish had a longer time to escape. If recapture rates from both tows were approximately equal, then it could be surmised that escapement occurred primarily as the 500-ft seine was hauled. To avoid large variability in recapture rates due to small samples, only tests with at least 5 fish marked from each tow were compared. Thus, erroneous results based on tests with too few fish to adequately estimate e_{500} were eliminated.

*Determined graphically from length of the seine, tow path, and distance between ends of the seine at completion of the tow.

Non-parametric statistics, often recommended in fisheries research when sampling distributions may be non-normal or sample sizes too small to adequately describe the distribution (Moyle and Lound 1960), were used to analyze the catch data. Wilcoxon's rank sum test and the Kolmogorov-Smirnov test (Hollander and Wolfe 1973) were used to compare catches in the efficiency tests (BSET) with Beach Seine Survey (BSS) data from the same area (RM 30-40) and time period to determine the applicability of the test data. Catches in the first and second tows of the efficiency tests were compared with Wilcoxon's signed-rank test. These comparisons helped evaluate the BSET data to detect behavior different from that encountered in standard sampling efforts (BSS). The efficiencies were subjected to a two-way analysis of variance to identify site or time-related effects, and scatter plots were used to investigate relationships of efficiency with environmental parameters.

SECTION III

RESULTS AND DISCUSSION

The ability of the tests to measure true catch efficiency was determined by the spatial disposition of the fish within the 500-ft net. Three general cases of spatial disposition were considered: (1) the fish inside the enclosure were positioned randomly; (2) fish inside the net were aggregated to some degree, however the aggregation was similar to that of fish which were not enclosed; (3) fish inside the enclosure were aggregated to a different degree than fish outside the enclosure.

For the first case, in which fish inside the enclosure are dispersed at random (Figure III-1), the catch would be distributed as a Poisson variable (Pielou 1969) with an expected value equal to the mean density multiplied by the area swept. Poisson distributions are characterized by a variance/mean ratio near 1.0. Unfortunately the amount of sampling inside the enclosure that would be required to establish the sampling distribution could certainly be expected to affect the behavior of the fish and thus produce an atypical situation. Kjelson and Johnson (1978) encountered similar problems with intensive trawl sampling inside a 5-hectare enclosure. After three to four tows the catch-per-tow declined drastically. Thus a random spatial pattern within the enclosure could not be demonstrated empirically. The variation in catches of the 100-ft seine within a test (Appendix A), however, suggests that the fish were not randomly dispersed.

If fish inside the enclosure are aggregated in a manner similar to their normal spatial positioning (Figure III-2), then the distribution of the catches for the 100-ft seine in the efficiency tests should be similar to the distribution produced in beach seine survey sampling. Although many different models of spatial pattern can produce the same sampling distribution (Boswell and Patil 1971), animals which are

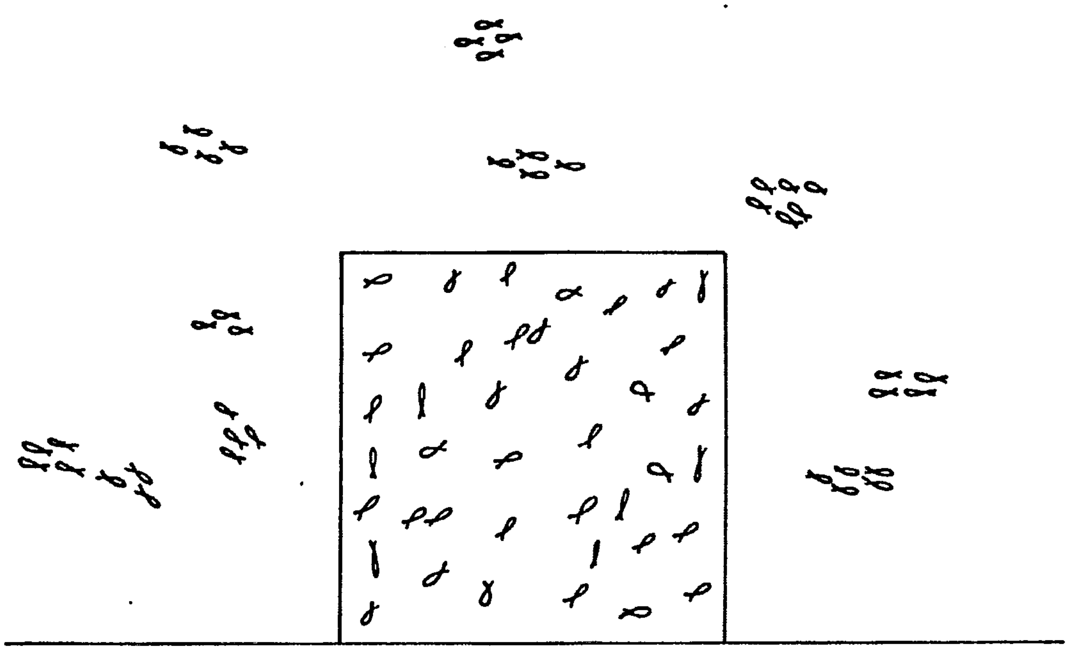

Figure III-1. Case 1: Fish inside Enclosure Are Randomly Distributed

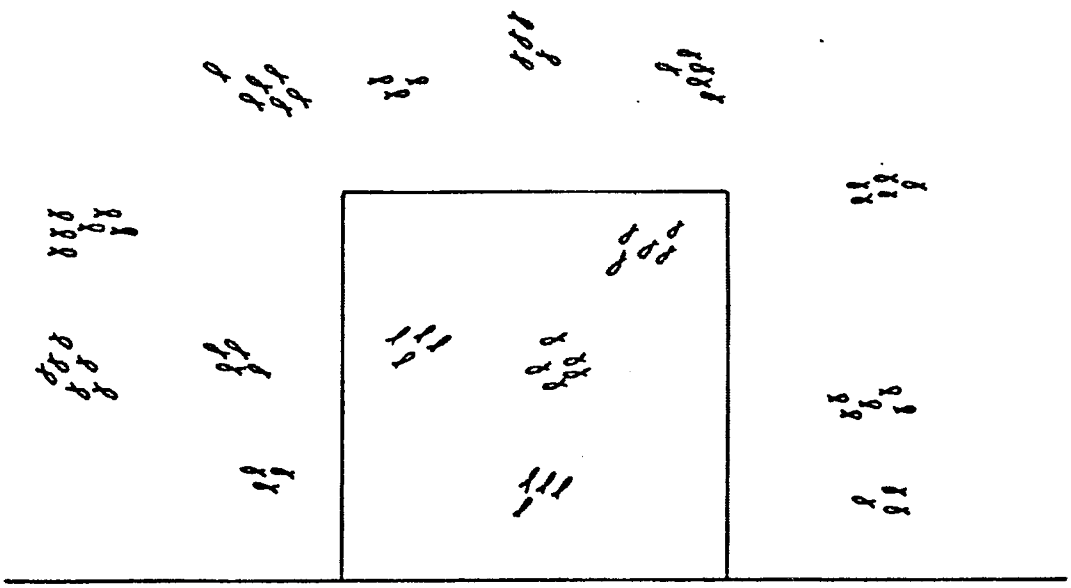

Figure III-2. Case 2: Fish inside Enclosure Are Aggregated to Same Degree as Those outside Enclosure significantly disturbed would be unlikely to produce a natural sample distribution, as evidenced by Kjelson and Johnson (1978). Thus a deviation from usual sampling statistics would be an indication of abnormal behavior.

When distinct deviation from normal behavior is in evidence (Figure III-3), the application of the test results to standard beach seine sampling is questionable. The tests would measure our ability to estimate density within an enclosed area but they would be of little value in determining catch efficiency when standard sampling techniques are used.

A. YOUNG-OF-THE-YEAR STRIPED BASS

Young-of-the-year (yoy) striped bass did not appear to alter their behavior during tests; thus a Case 2 situation apparently prevailed. None of the three methods used to detect altered behavior indicated that the bass behaved abnormally in the test situation. A Wilcoxon signed-rank test comparing the first and second tows of each test showed that there was no significant difference ($p>0.05$); thus no systematic bias was present (Appendix D) which would indicate altered behavior. Even though the mean catches for the efficiency tests and beach seine survey sampling appeared quite different for some weeks (Table III-1), a comparison of medians using the Wilcoxon rank sum test (Hollander and Wolfe 1973) and of sampling distributions using the Kolmogorov-Smirnov test (Hollander and Wolfe 1973) indicated no significant differences between the two types of samples (Table III-2).

Recapture rates (number of marked fish recaptured in the 500-ft net/number of fish marked) ranged from 0-1.0 for tests in which at least five fish were marked (Table III-3) (Mark and recapture data are presented in Appendix D). In tests where five or more fish were marked in each 100-ft seine tow (11 of 40 tests) recapture rates for fish marked from the first and second samples were not significantly different ($p>0.05$, Wilcoxon signed-rank test). This indicated that escapement from the enclosure was not a continuous process but occurred primarily after the

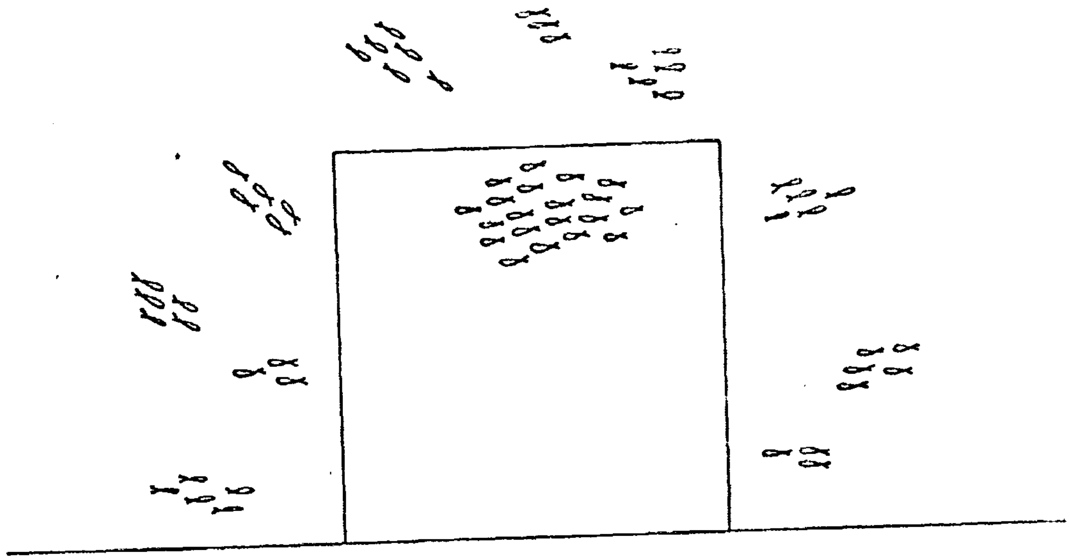

Figure III-3. Case 3: Fish inside Enclosure Are Distributed Neither Randomly Nor Similarly to Fish outisde Enclosure

Table III-1

Mean and Variance of Catches of Young-of-the-Year Striped Bass in 100-ft (30-m) Seine Samples from Beach Seine Efficiency Tests (BSET) and Beach Seine Survey (BSS) Sampling (RM 30-40)

Dates	BSET			BSS		
	Mean	S^2	n	Mean	S^2	n
09/11-09/17	16.25	168.2	8	13.03	123.96	31
09/18-09/24	18.13	179.6	8	9.00	90.88	17
09/25-10/01	7.00	20.86	8	11.85	80.81	13
10/02-10/08	7.38	29.12	8	7.89	113.64	27
10/09-10/15	2.25	8.21	8	2.65	7.06	23
10/16-10/22	5.12	32.41	8	5.55	26.90	29
10/23-10/29	2.62	3.70	8	2.33	5.38	27
10/30-11/05	2.38	5.41	8	1.96	6.97	31
11/06-11/12	3.75	16.78	8	5.07	67.92	28
11/13-11/19	1.50	3.71	8	2.21	7.29	42

S^2 = variance

Table III-2

Statistical Analysis of Catches of Young-of-the-Year Striped Bass in 100-ft (30-m) Seine Samples from Beach Seine Efficiency Test (BSET) and Beach Seine Survey (BSS) Samples

	Wilcoxon Rank Sum Test for Equality of Medians					Kolmogorov-Smirnov Test for Identical Distributions (samples pooled biweekly)	
Dates	W	m	n	W*	p	J_3'	p
09/11-09/17	175	31	8	0.52	0.603	1.08	0.194
09/18-09/24	137	17	8	1.93	0.054		
09/25-10/01	69.5	13	8	-1.34	0.180	0.76	0.610
10/02-10/08	169.5	27	8	1.00	0.317		
10/09-10/15	116.5	23	8	-0.53	0.596	0.57	0.901
10/16-10/22	167.5	29	8	0.57	0.569		
10/23-10/29	165.5	27	8	0.86	0.390	0.56	0.912
10/30-11/05	180	31	8	0.72	0.472		
11/06-11/12	146	28	8	-0.08	0.936	0.33	>0.99
11/13-11/19	184	42	8	-0.54	0.589		

W = sum of ranks of BSET samples

m = number of BSS samples

n = number of BSET samples

W*= normalized test statistic

J_3'= large sample test statistic

p = probability of a larger value of W* or J_3' if no difference exists between BSS and BSET samples

Table III-3

Recapture Rates (Number Recaptured in 500-ft Net/Number Marked) for YOY Striped Bass during Beach Seine Efficiency Tests of 1977. Values in Table Are for Tests in Which Five or More Fish Were Marked. Tests in Which Fewer Than Five Fish Were Marked Are Denoted by '*'

Dates	TEST SITE				Week Mean
	Sand Bar	Quarry	Croton Park	Vet's Beach	
09/11 - 09/17	1.000	0.556	0.767	0.353	0.669
09/18 - 09/24	0.750	0.705	0.846	0.571	0.718
09/25 - 10/01	0.800	0.778	0.619	0.750	0.737
10/02 - 10/08	*	0.571	0.538	0.800	0.636
10/09 - 10/15	0.375	*	0.000	*	0.188
10/16 - 10/22	*	0.333	0.696	*	0.515
10/23 - 10/29	0.167	1.000	*	*	0.584
10/30 - 11/05	*	1.000	*	0.667	0.834
11/06 - 11/12	0.545	0.769	*	*	0.657
11/13 - 11/19	*	0.571	*	*	0.571
SITE MEAN	0.606	0.698	0.578	0.628	
GRAND MEAN					0.636

second 100-ft seine tow, probably when the 500-ft net was hauled. Since recapture rates were not significantly different, fish marked in both tows were pooled to calculate e_{500}. To avoid using the extremely unlikely escape rates of 0.0 and 1.0, data from tests that had fewer than five fish marked and thus a high probability of obtaining a value of 0.0 or 1.0, (denoted by * in Table III-3) were not used. Instead the mean recapture rate from tests with five or more fish marked for the same sample site was used as e_{500}.

Catch efficiency estimates for yoy striped bass ranged from 0 to 1.886 with a mean of 0.406 (Table III-4). Catch efficiency estimates greater than 1 for individual samples resulted from the non-random spatial disposition of fish within the 500-ft seine. Arithmetic means for the four sites ranged from 0.290 to 0.575. The analysis of variance indicated that the sampling period-site interaction and the site had a significant effect on efficiency ($p<0.05$, Table III-5). The significant interaction was apparently the result of an increasing trend in efficiency at the quarry site (RM 34), while efficiency either declined or showed no trend at the other sites (Table III-4). Data were insufficient to stringently test the assumptions for the analysis of variance, so the results can only be used to give a general indication of significant effects. The analysis of variance produced similar results using square root transformed efficiencies.

A scatter plot of catch efficiency vs. estimated number of striped bass enclosed showed no apparent trend in efficiency (Appendix C) although there was more variability in efficiency at low densities. For this reason, a mean weighted by the estimated number of striped bass enclosed (Appendix D) would be a better indicator of overall efficiency since it would give more weight to the more precise estimates. The weighted mean was 0.390 for juvenile striped bass. Catch efficiency did not seem to be related to other environmental parameters. Scatter plots of catch efficiency vs. turbidity and catch efficiency vs. water temperature also showed no clear relationship (Appendix C).

Table III-4

Catch Efficiencies for YOY Striped Bass during 1977 Beach Seine Efficiency Tests

Dates	TEST SITE								Week Mean
	Sand Bar		Quarry		Croton Park		Vet's Beach		
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	
09/11-09/17	0.933	0.267	0.182	0.628	0.579	0.842	0.434	0.543	0.551
09/18-09/24	0.044	0.309	0.590	0.427	1.171	0.641	0.251	0.440	0.484
09/25-10/01	0.610	0.610	0.156	0.194	0.183	0.418	0.333	0.000	0.313
10/02-10/08	0.169	0.000	0.500	0.571	0.612	0.306	0.568	0.379	0.388
10/09-10/15	0.041	0.327	0.000	0.254	1.239	0.500	0.000	0.000	0.295
10/16-10/22	0.235	0.235	1.000	0.571	0.313	0.940	0.000	0.087	0.423
10/23-10/29	0.173	0.069	0.490	0.612	0.000	0.040	0.149	0.050	0.198
10/30-11/05	0.000	0.000	0.706	1.412	0.165	0.330	0.584	0.250	0.431
11/06-11/12	0.344	1.886	0.679	1.086	0.000	0.000	0.471	0.000	0.558
11/13-11/19	0.227	0.000	1.082	0.361	0.231	0.231	1.256	0.000	0.424
SITE MEAN	0.324		0.575		0.437		0.290		
GRAND MEAN									0.406

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Table III-5

Analysis of Variance of Untransformed† Catch Efficiencies of 100-ft Beach Seines for YOY Striped Bass

Source of Variation	df	SS	MS	F	p
Sampling Period	9	0.929	1.103	0.99	0.463
Site	3	0.996	0.332	3.19	0.034*
Sampling Period X Site	27	5.586	0.207	1.99	0.024*
Error	40	4.166	0.104		
Total	79	11.677			

df = degrees of freedom

SS = sum of squares

MS = mean square

F = test statistic

p = probability of a larger F value

* = p>0.05

†square root transformed data produced similar results.

B. YOUNG-OF-THE-YEAR WHITE PERCH

Young-of-the-year white perch also demonstrated a Case 2 situation in which fish apparently behaved normally in the tests. The relatively small catches of yoy white perch compared to the number of fish actually present (Appendix A) suggested that spatial disposition was definitely non-random. The comparison of the first and second tows however indicated a significant difference ($p<0.05$, Wilcoxon signed-rank test, Appendix D) thus only catches from the first tow were used to calculate efficiency. The weekly mean catches at times appeared quite different (Table III-6), but, as for striped bass, the medians and sampling distributions were not significantly different (Table III-7) even though catch data from both tows were included to increase the power of the tests.

Only two of the 23 tests produced five or more yoy white perch marked in each tow (Appendix D), so the nature of escapement, continuous or occurring as the 500-ft net was hauled, could not be readily evaluated. It was assumed that escapement occurred primarily as the 500-ft net was hauled to shore, as it had with striped bass, thus marking and recapture data from both tows were combined. Even after combining tows, only four tests had five or more fish marked. In order to use more of the available data, yet not be unduly influenced by the tests with very few marked fish, the marked and recaptured fish were pooled over all tests and the ratio of the sums (the sum of the number recaptured/sum of the number marked), 0.629, was used as the recapture rate (e_{500}) for all tests.

Catch efficiency values for yoy white perch, calculated from only the first tow of each test, averaged 0.238 and ranged from 0 to 3.774 (Table III-8). Site means ranged from 0.062 to 0.590. The weighted mean, 0.069, was very different from the arithmetic mean as the low density samples were much more variable than high density samples (Appendix C).

The analysis of variance showed no significant main effects when either untransformed or transformed efficiencies were used (Table

Table III-6

Mean and Variance of Catches of Young-of-the-Year White Perch in 100-ft (30-m) Seine Samples from the Beach Seine Efficiency Test (BSET) and Beach Seine Survey Sampling (RM 30-40)

	BSET			BSS		
Dates	Mean	S^2	n	Mean	S^2	n
09/11-09/17	0.50	0.57	8	7.68	609.36	31
09/18-09/24	0.25	0.21	8	2.94	25.31	17
09/25-10/01	3.25	50.21	8	6.62	136.09	13
10/02-10/08	2.38	7.12	8	4.00	132.00	27
10/09-10/15	0.38	0.55	8	4.17	53.40	23
10/16-10/22	1.50	1.71	8	1.34	2.80	29
10/23-10/29	0.25	0.21	8	0.89	2.41	27
10/30-11/05	0.75	1.07	8	0.58	2.38	31
11/06-11/12	2.00	6.00	8	7.04	413.44	28
11/13-11/19	0.25	0.21	8	1.26	25.37	42

S^2 = variance

Table III-7

Results of Comparison of Catches of Young-of-the-Year White Perch in 100-ft (30-m) Seine Samples from Beach Seine Efficiency Test and Beach Seine Survey Samples

	Wilcoxon Rank Sum Test					Kolmogorov-Smirnov Test	
Dates	W	m	n	W*	p	J_3'	p
09/11-09/17	132.5	31	8	-1.04	0.298	1.15	0.142
09/18-09/24	83	17	8	-1.38	0.168		
09/25-10/01	72	13	8	-1.25	0.211	0.42	>0.99
10/02-10/08	167	27	8	0.96	0.337		
10/09-10/15	101	23	8	-1.36	0.174	0.74	0.644
10/16-10/22	168.5	29	8	0.63	0.529		
10/23-10/29	128	27	8	-0.76	0.447	0.37	>0.99
10/30-11/05	183.5	31	8	1.16	0.246		
11/06-11/12	135	28	8	-0.51	0.610	0.41	>0.99
11/13-11/19	201	42	8	-0.11	0.912		

W = sum of ranks of BSET samples

m = number of BSS samples

n = number of BSET samples

W*= normalized test statistic

J_3'= large sample test statistic

p = probability of a larger value of W* or J_3' if no difference exists between BSS and BSET samples

Table III-8

Catch Efficiencies for YOY White Perch during 1977 Beach Seine Efficiency Tests

Dates	TEST SITE				Week Mean
	Sand Bar Tow 1	Quarry Tow 1	Croton Park Tow 1	Vet's Beach Tow 1	
09/11-09/17	0.000	0.000	0.057	0.000	0.014
09/18-09/24	0.000	0.000	0.000	0.189	0.047
09/25-10/01	0.000	0.000	0.073	---	0.024
10/02-10/08	0.058	0.220	0.686	0.314	0.320
10/09-10/15	0.000	0.000	0.444	0.000	0.111
10/16-10/22	0.298	0.333	0.314	0.000	0.236
10/23-10/29	0.000	0.236	0.000	0.000	0.059
10/30-11/05	0.000	0.058	---	0.839	0.299
11/06-11/12	0.202	0.039	---	0.197	0.146
11/13-11/19	---	0.000	---	3.774	1.887
SITE MEAN	0.062	0.089	0.225	0.590	
GRAND MEAN					0.238

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III-9). As with yoy striped bass, other environmental factors showed no clear relationships with catch efficiency. Neither the turbidity nor the temperature seemed to be a reliable predictor of catch efficiency (Appendix C).

The consistently low efficiency for yoy white perch (weighted mean of 0.069) was apparently caused by the fish being distributed just beyond the reach of the 100-ft seines. During the efficiency study, the 100-ft seine samples often produced few yoy white perch, yet substantial numbers were caught in the 500-ft seine (Appendix A and D). If these results represent the natural distribution pattern of yoy white perch, then density over the entire shore zone could be many times greater than the density calculated from 100-ft seines.

C. YEARLING AND OLDER WHITE PERCH

Yearling and older white perch were caught infrequently and in small numbers (Appendix A). The data were thus insufficient to analyze for catch efficiency. Pooled recapture rates were 0.831 for fish $\leq$150 mm (total length) and 0.333 for fish >150 mm.

Table III-9

Analysis of Variance of Untransformed† Catch Efficiencies of 100-ft Beach Seines for YOY White Perch

Source of Variation	df	SS	MS	F	p
Sampling Period	9	6.177	0.686	2.19	>0.05
Site	3	1.201	0.400	1.28	>0.05
Error	22	6.887	0.313		
Total	34	14.265			

df = degrees of freedom

SS = sum of squares

MS = mean square

F = test statistic

p = probability of a larger F value

†Square root transformed data produced similar results

SECTION IV

SUMMARY AND CONCLUSIONS

The beach seine efficiency study was designed to determine catch efficiency of a 100-ft seine for yoy striped bass and white perch in the Hudson River. Four proximate sites with varied depths and bottom types were selected. Efforts were made to sample similar tidal conditions and to conduct the tests quickly to avoid large fluctuations in time, temperature, dissolved oxygen, and turbidity during a test. Even with these constraints sampling variability was large, probably due to the clumped spatial disposition of the fish.

The test results present a good measure of the efficiency of the density estimates for yoy striped bass in the Hudson River based upon daytime beach seining. Statistical analysis detected no difference in beach seine efficiency test and beach seine survey sampling, thus striped bass in the tests were assumed to behave normally. The mean catch efficiency of 0.406 for yoy striped bass falls near the range of 0.41 to 0.72 given for seines in Kjelson (1977) and indicates that density estimates based on uncorrected beach seine data are likely to be underestimates. However, if the efficiency estimates are to be used as correction factors for beach seine catches, a mean weighted by the number of fish enclosed would be more appropriate as the tests late in the season contained fewer fish and thus were less precise. The weighted mean for yoy striped bass was 0.390.

The effects of environmental variables such as test site, temperature, turbidity, and density could not be determined as the variability of the efficiency values was large. Many of the beaches sampled in BSS sampling are not as well-suited for seining as the efficiency test beaches; mean efficiency on a river wide basis could therefore be less than 0.390.

The Case 2 situation also seemed to apply to yoy white perch even though the test procedures produced a detectable change in the catches. Mean catch efficiency, 0.238, was much lower than for striped bass, apparently because the white perch were lying beyond the reach of the 100-ft net in deeper water. The weighted mean efficiency was only 0.069 as most of the very high efficiency values occurred when only few fish were present. Environmental factors again did not seem to be related to efficiency.

SECTION V

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APPENDIX A

FISH AND ENVIRONMENTAL DATA FOR BEACH SEINE EFFICIENCY TEST SAMPLES

LEGEND

OBS	= OBSERVATION NUMBER
TASK CODE	= TASK CODE (BEACH SEINE SURVEY = 23 BEACH SEINE EFFICIENCY TEST = 24)
SAMPLE NO	= SAMPLE NUMBER
USECD	= USE CODE
DATE	= MONTH, DAY, AND YEAR THE SAMPLE WAS COLLECTED
TIME	= TIME OF DAY, USING THE 24-HOUR CLOCK, THAT THE GEAR WAS DEPLOYED
RM	= RIVER MILE WHERE SAMPLE WAS TAKEN
SITE	= SIDE OF RIVER WHERE SAMPLE WAS TAKEN (1 = WEST, 3 = EAST)
TIDE	= TIDAL STAGE (1 = LOW SLACK, 2 = FLOOD, 3 = HIGH SLACK, 4 = EBB)
GEAR	= SAMPLING DEVICE (12 = 100-FT SEINE, 53 = 500-FT SEINE)
LENGTH GROUP	1 = (0 - Xmm) YOUNG-OF-THE-YEAR FISH 2 = (X+1 - 150mm) 3 = (151 - 250mm) 4 = (250+mm)
TEMP	= TEMPERATURE (°C)
DO	= DISSOLVED OXYGEN (PPM)
pH	= pH
COND	= CONDUCTIVITY (mS)
TURB	= TURBIDITY (FTU)

BEACH SEINE EFFICIENCY REPORT
WEEK OF SEPTEMBER 11 TO 17, 1977

LEGEND : SPECIES - SBASS = STRIPED BASS, PERCH = WHITE PERCH, SHAD = AMERICAN SHAD, AWIFE = ALEWIFE, BLHER = BLUEBACK HERRING
A = LENGTH GROUP 1, B = LENGTH GROUP 2, C = LENGTH GROUPS 3 & 4 COMBINED, D = LENGTH GROUPS 2,3, & 4 COMBINED

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS A	SBASS B	SBASS C	PERCH A	PERCH B	PERCH C	SHAD A	SHAD D	AWIFE A	AWIFE D	BLHER A	BLHER D	TEMP	DO	PH	COND	TURB
1	24	2	1	91277	1203	36	1	4	12	11	0	0	0	0	0	0	0	0	0	0	0	23.6	7.6	7.80	11500	2.5
2	24	3	1	91277	1320	36	1	4	12	38	0	0	1	3	0	1	0	0	0	0	0	24.1	7.1	7.80	11424	11.0
3	24	1	1	91277	1100	36	1	2	53	202	0	0	47	29	7	28	0	64	0	25	0	23.8	6.9	7.70	11322	2.9
4	24	5	1	91377	1025	35	3	2	12	22	0	0	1	0	0	2	0	0	0	0	0	21.2	7.8	7.70	11340	4.7
5	24	6	1	91377	1150	35	3	4	12	32	0	0	2	0	0	1	0	0	0	0	0	21.0	8.0	7.60	10980	2.6
6	24	4	1	91377	925	35	1	2	53	175	0	1	66	14	2	17	0	33	0	80	0	23.6	7.6	7.60	11070	3.5
7	24	8	1	91477	1130	34	3	3	12	7	0	1	0	1	0	1	0	0	0	0	0	20.2	8.0	7.50	12875	14.0
8	24	9	1	91477	1248	34	3	4	12	2	0	0	0	0	0	2	0	2	0	0	0	20.9	8.3	7.70	12460	16.0
9	24	7	1	91477	1030	34	3	2	53	45	0	1	41	2	0	7	0	29	0	1	1	20.7	8.2	7.70	12240	17.0
10	24	11	1	91577	1145	39	3	2	12	8	0	0	0	0	0	0	0	0	0	0	0	22.3	7.9	7.70	10815	2.6
11	24	12	1	91577	1302	39	3	4	12	10	0	0	0	0	0	1	0	0	0	0	0	22.4	7.9	7.60	10815	3.9
12	24	10	1	91577	1030	39	3	2	53	39	0	0	1	0	1	4	0	10	0	0	0	21.3	7.6	7.50	10710	3.8
13*	24	14	1	91677	1220	40	1	2	12	5	0	0	1	3	2	7	0	14	0	0	0	22.1	7.2	7.60	9512	5.0
14*	24	15	1	91677	1350	40	1	3	12	15	0	0	4	0	0	1	0	5	0	1	0	22.2	7.1	7.60	9504	5.3
15*	24	13	1	91677	1115	40	1	2	53	93	0	0	185	25	4	54	0	224	0	7	0	22.8	7.6	7.60	9504	5.3

*Supplementary samples not used in analysis.

BEACH SEINE EFFICIENCY REPORT
WEEK OF SEPTEMBER 18 TO 24, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	17	1	91977	1457	34	3	2	12	1	0	0	0	0	0	0	0	0	0	0	0	25.1	7.9	7.60	11125	3.6
2	24	18	1	91977	1615	34	3	4	12	7	0	0	0	0	0	0	0	0	0	0	0	25.2	8.5	7.60	11000	3.3
3	24	16	1	91977	1355	34	3	2	53	102	0	0	226	14	3	2	0	0	0	47	0	24.9	7.8	7.50	11094	4.0
4	24	20	1	92077	1048	35	3	4	12	42	0	0	0	0	0	0	0	0	0	0	0	22.9	7.6	7.50	10218	5.3
5	24	21	1	92077	1217	35	3	2	12	23	0	0	0	0	0	0	0	0	0	0	0	23.0	8.1	7.80	10032	5.9
6	24	19	1	92077	935	35	3	4	53	182	0	1	45	2	0	2	0	0	0	0	0	23.0	7.5	7.60	10218	4.5
7	24	23	1	92177	1115	39	3	4	12	8	0	0	1	0	0	0	0	0	0	0	0	21.9	7.7	7.60	8512	14.0
8	24	24	1	92177	1250	39	3	2	12	14	0	0	0	0	0	0	0	0	0	0	0	21.9	7.5	7.50	7504	12.0
9	24	22	1	92177	1005	39	3	4	53	109	0	0	20	0	0	3	0	0	0	0	0	22.0	7.1	7.60	8664	6.6
10	24	26	1	92277	1045	36	1	4	12	29	0	0	0	0	1	4	0	0	0	0	0	20.6	7.1	7.60	5929	6.6
11	24	27	1	92277	1200	36	1	4	12	21	0	0	1	0	0	0	0	0	0	0	0	20.5	7.1	7.60	6171	6.1
12	24	25	1	92277	945	36	1	4	53	208	0	0	84	23	3	26	0	2	0	40	0	20.5	7.0	7.50	6050	11.0

[redacted]

BEACH SEINE EFFICIENCY REPORT
WEEK OF SEPTEMBER 25 TO OCTOBER 1, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	29	1	92677	1235	35	3	4	12	7	0	0	6	0	1	1	0	0	0	0	0	19.2	.	7.40	4536	6.5
2	24	30	1	92677	1405	35	3	4	12	16	0	0	20	6	0	0	0	0	0	0	0	20.1	.	7.10	4578	5.0
3	24	28	1	92677	1135	35	3	4	53	142	0	2	310	7	2	24	0	26	0	1	0	19.1	.	7.50	4590	6.3
4	24	32	1	92777	1105	36	1	4	12	4	0	0	0	0	0	0	0	0	0	0	0	21.7	7.6	7.40	1498	5.1
5	24	33	1	92777	1220	36	1	4	12	5	0	0	0	0	0	0	0	0	0	1	0	20.8	7.8	7.40	1484	7.4
6	24	31	1	92777	945	36	1	2	53	120	0	2	162	13	1	0	0	2	0	14	0	20.8	7.6	7.70	1552	5.5
7	24	35	1	92877	1015	34	3	2	12	8	0	0	0	0	0	0	0	0	0	0	0	19.1	7.9	7.60	2800	6.0
8	24	36	1	92877	1125	34	3	4	12	8	0	0	0	0	0	0	0	0	0	0	0	20.6	8.5	7.60	2781	5.1
9	24	34	1	92877	910	34	3	2	53	63	0	5	254	4	1	1	0	0	0	36	0	18.9	8.0	7.60	3296	4.8
10	24	38	1	92977	1020	39	3	2	12	8	0	0	0	0	0	0	0	0	0	0	0	18.2	8.4	7.50	534	4.7
11	24	39	1	92977	1135	39	3	2	12	0	0	0	0	0	0	0	0	0	0	0	0	19.0	8.3	7.60	486	5.8
12	24	37	1	92977	920	39	3	2	53	108	0	0	0	1	0	19	0	0	0	465	0	17.9	8.4	7.50	715	4.5

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 2 TO OCTOBER 8, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	41	1	100377	1137	34	3	2	12	2	0	0	1	0	1	0	0	0	0	0	0	14.9	10.6	7.70	1197	24.0
2	24	42	1	100377	1250	34	3	2	12	0	0	0	0	0	0	0	0	0	0	0	0	14.9	10.9	7.80	1380	21.0
3	24	40	1	100377	1030	34	3	2	53	43	0	0	65	0	4	7	0	0	0	45	2	15.0	10.4	8.00	1049	19.0
4	24	44	1	100477	1015	35	3	2	12	18	0	0	2	1	0	1	0	2	0	198	0	13.3	11.2	8.00	418	16.0
5	24	45	1	100477	1135	35	3	2	12	9	0	0	0	0	0	7	0	1	0	221	0	13.3	11.8	8.00	413	28.0
6	24	43	1	100477	915	35	3	4	53	95	0	2	11	9	4	16	0	23	0	3598	1	13.3	11.0	8.00	406	21.0
7	24	47	1	100577	1037	36	1	4	12	7	0	0	6	3	0	0	0	0	0	6	0	17.6	9.7	7.50	275	46.0
8	24	48	1	100577	1150	36	1	2	12	8	0	0	7	2	1	0	0	0	0	0	0	19.0	9.8	7.40	298	53.0
9	24	46	1	100577	935	36	1	4	53	48	0	0	103	17	4	14	0	9	0	332	0	17.2	9.6	7.40	265	21.0
10	24	50	1	100677	1008	39	3	4	12	9	0	0	1	0	0	3	0	0	0	59	0	16.6	9.8	7.60	257	7.6
11	24	51	1	100677	1122	39	3	4	12	6	0	0	2	0	0	0	0	0	0	8	0	16.3	10.0	7.60	297	17.0
12	24	49	1	100677	905	39	3	4	53	76	0	0	12	2	0	40	0	1	0	78	0	16.5	9.4	7.50	255	[illegible]

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 9 TO 15, 1977

OBS	TASKCODE	SAMPLENO	USECODE	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	53	1	101077	1100	34	3	4	12	1	0	0	0	0	0	0	0	0	0	1	0	13.2	10.3	8.20	1033	15.0
2	24	54	1	101077	1205	34	3	4	12	8	0	0	1	0	0	0	0	0	0	1	0	13.1	10.4	8.20	1025	15.0
3	24	52	1	101077	1000	34	3	4	53	55	0	0	116	2	2	7	0	5	0	19	0	13.9	10.0	8.20	908	15.0
4	24	56	1	101177	1025	35	3	4	12	5	0	0	2	0	0	0	0	0	0	1075	0	12.8	10.1	7.70	2344	3.4
5	24	57	1	101177	1150	35	3	4	12	2	0	0	0	1	0	3	0	0	0	76	0	14.0	10.3	7.70	2725	4.6
6	24	55	1	101177	925	35	3	3	53	14	0	0	17	0	1	19	0	2	0	11820	0	13.0	10.3	7.80	2420	3.6
7	24	59	1	101277	1025	36	1	4	12	0	0	0	0	0	0	6	0	0	0	640	0	14.8	8.9	7.50	1661	6.3
8	24	60	1	101277	1150	36	1	4	12	2	0	0	0	0	0	4	0	0	0	240	0	14.8	8.9	7.50	1722	5.6
9	24	58	1	101277	925	36	1	2	53	33	0	0	44	4	0	56	0	0	0	2469	0	15.1	8.7	7.50	2030	5.0
10	24	62	1	101377	1022	39	3	2	12	0	0	0	0	0	0	0	0	0	0	4	0	13.3	9.8	7.40	851	6.2
11	24	63	1	101377	1135	39	3	3	12	0	0	0	0	0	0	3	0	0	0	0	0	13.8	9.8	7.40	865	7.0
12	24	61	1	101377	920	39	3	2	53	22	0	0	48	1	2	17	0	1	0	107	0	13.6	9.6	7.40	851	10.1

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 16 TO 22, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	65	1	101777	1210	36	1	2	12	7	0	0	3	0	0	3	0	0	0	4	0	12.2	10.8	7.60	525	15.0
2	24	66	1	101777	1330	36	1	2	12	4	0	0	0	0	0	1	0	0	0	1	0	12.7	11.5	7.50	541	14.0
3	24	64	1	101777	1110	36	1	2	53	14	0	0	34	3	3	38	0	2	0	477	0	12.9	10.5	7.50	525	15.0
4	24	68	1	101877	1225	34	3	2	12	2	0	0	3	0	0	0	0	0	0	5	0	10.1	.	8.30	1025	21.0
5	24	69	1	101877	1340	34	3	2	12	2	0	0	1	0	0	0	0	0	0	8	0	10.6	.	8.40	1260	16.0
6	24	67	1	101877	1125	34	3	2	53	31	0	0	38	1	4	0	0	1	0	98	0	9.5	.	8.40	1219	20.0
7	24	71	1	101977	1010	35	3	4	12	6	0	0	1	0	0	0	0	0	0	0	0	12.0	9.0	7.60	242	10.1
8	24	72	1	101977	1130	35	3	2	12	18	0	0	3	3	0	0	0	0	0	43	0	12.5	10.5	7.60	243	5.9
9	24	70	1	101977	905	35	3	4	53	80	0	0	12	11	2	4	0	1	0	321	0	12.0	9.9	7.50	242	5.3
10	24	74	1	102077	1012	39	3	4	12	0	0	0	0	0	0	0	0	0	0	44	0	12.0	10.2	7.50	201	11.0
11	24	75	1	102077	1125	39	3	4	12	2	0	0	1	0	0	0	0	0	0	35	0	12.1	10.3	7.50	206	10.5
12	24	73	1	102077	905	39	3	4	53	87	0	0	98	2	0	10	0	5	0	3843	0	12.0	10.3	7.50	198	7.3

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 23 TO 29, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	77	1	102477	1235	36	1	4	12	4	0	0	1	1	0	0	0	0	0	0	0	10.8	10.4	7.70	194	84.0
2	24	78	1	102477	1350	36	1	4	12	5	0	0	1	0	0	0	0	0	0	0	0	10.9	10.4	7.70	189	31.0
3	24	76	1	102477	1130	36	1	3	53	49	0	0	16	1	0	0	0	0	0	20	0	10.0	10.8	7.70	186	10.1
4	24	80	1	102577	1040	34	3	2	12	5	0	0	0	0	0	0	0	0	0	1	0	11.6	.	8.20	239	4.4
5	24	81	1	102577	1200	34	3	4	12	2	0	0	0	0	1	0	0	0	0	0	0	12.0	.	8.20	239	4.0
6	24	79	1	102577	930	34	3	2	53	29	0	0	17	2	3	2	0	4	0	42	0	11.0	.	8.10	239	10.1
7	24	83	1	102677	1020	35	3	2	12	0	0	0	0	0	0	0	0	0	0	0	0	11.6	.	7.80	203	6.6
8	24	84	1	102677	1125	35	3	4	12	1	0	0	0	0	0	1	0	0	0	0	0	11.5	.	7.60	204	6.7
9	24	82	1	102677	920	35	3	2	53	86	0	1	6	3	5	7	0	0	0	115	0	11.8	.	7.70	194	7.1
10	24	86	1	102777	1030	39	3	2	12	3	0	0	0	0	0	0	0	0	0	88	0	11.8	.	7.50	192	11.0
11	24	87	1	102777	1145	39	3	3	12	1	0	0	0	0	0	0	0	1	0	20	0	12.8	.	7.50	208	10.0
12	24	85	1	102777	920	39	3	2	53	76	0	7	2	2	1	10	0	13	0	4686	0	11.7	.	7.60	198	11.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 30 TO NOVEMBER 5, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	89	1	103177	1120	34	3	2	12	0	0	0	0	0	0	1	0	0	0	12	0	11.5	11.4	7.60	205	4.6
2	24	90	1	103177	1235	34	3	2	12	0	0	0	0	0	0	0	0	0	0	0	0	11.7	11.2	7.70	205	4.6
3	24	88	1	103177	1020	34	3	2	53	19	0	0	10	0	6	0	0	1	0	162	0	10.6	12.6	7.90	218	4.5
4	24	92	1	110177	1000	35	3	2	12	1	0	0	0	0	0	0	0	0	0	0	0	10.1	11.2	7.60	194	5.2
5	24	93	1	110177	1110	35	3	2	12	2	0	0	0	0	0	0	0	0	0	0	0	11.1	11.2	7.70	189	12.0
6	24	91	1	110177	900	35	3	2	53	21	0	0	0	13	2	2	0	0	0	2	0	9.5	11.2	7.70	200	5.0
7	24	95	1	110377	1020	36	1	2	12	2	0	0	2	0	0	1	0	0	0	0	0	12.3	.	7.40	666	20.0
8	24	96	1	110377	1130	36	1	2	12	4	0	0	2	0	0	0	0	0	0	0	0	12.3	.	7.50	689	19.0
9	24	94	1	110377	920	35	1	4	53	17	0	0	130	7	2	7	0	0	0	19	0	12.3	.	7.40	681	17.0
10	24	98	1	110477	1005	39	3	4	12	7	0	0	2	0	0	0	0	0	0	18	0	12.9	10.3	7.50	826	27.0
11	24	99	1	110477	1115	39	3	2	12	3	0	0	0	0	0	0	0	0	0	9	0	13.5	9.4	7.50	804	16.0
12	24	97	1	110477	900	39	3	4	53	48	0	0	9	5	0	1	0	0	0	336	0	13.0	9.2	7.50	838	15.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF NOVEMBER 6 TO 12, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	101	1	110777	1100	34	3	4	12	2	0	0	6	0	0	0	0	0	0	25	0	12.4	.	7.40	4726	15.0
2	24	102	1	110777	1215	34	3	4	12	11	0	0	0	2	0	0	0	0	0	27	0	12.5	.	7.50	4824	14.0
3	24	100	1	110777	1000	34	3	4	53	19	0	0	112	6	1	0	0	0	0	419	0	12.5	.	7.50	4658	15.0
4	24	104	1	110977	1005	35	3	4	12	0	0	0	0	0	0	0	0	0	0	0	0	12.1	.	7.60	6930	11.0
5	24	105	1	110977	1117	35	3	4	12	0	0	0	0	0	0	0	0	0	0	0	0	12.7	.	7.60	6300	11.0
6	24	107	1	110977	1310	39	3	4	12	4	0	0	5	0	0	0	0	0	0	68	0	13.4	.	7.50	4095	16.0
7	24	108	1	110977	1420	39	3	4	12	0	0	0	0	0	0	1	0	0	0	179	0	13.7	.	7.50	4095	8.5
8	24	103	1	110977	900	35	3	4	53	2	0	0	0	0	0	0	0	0	0	31	0	11.8	.	7.60	5670	17.0
9	24	106	1	110977	1205	39	3	4	53	32	1	2	96	13	0	2	0	1	0	1442	0	13.7	.	7.50	3990	14.0
10	24	110	1	111077	1305	36	1	4	12	5	0	0	3	0	0	0	0	0	0	0	0	11.4	.	7.40	1107	42.0
11	24	111	1	111077	1415	36	1	4	12	8	0	0	2	0	0	0	0	0	0	0	0	11.2	.	7.50	1243	32.0
12	24	109	1	111077	1155	36	1	4	53	34	0	0	288	17	6	1	0	0	0	11	0	11.2	.	7.50	1243	40.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF NOVEMBER 13 TO 19, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	24	113	1	111477	1105	36	1	2	12	6	0	0	0	0	0	0	0	0	0	0	0	7.9	.	7.70	222	22.0
2	24	114	1	111477	1215	36	1	2	12	2	0	0	1	0	0	0	0	0	0	0	0	8.4	.	7.80	211	20.0
3	24	112	1	111477	1000	36	1	2	53	19	0	1	28	5	1	0	0	0	0	0	0	7.8	.	7.50	222	23.0
4	24	116	1	111577	1025	34	3	2	12	1	0	0	0	0	0	0	0	0	0	0	0	8.0	.	7.80	250	5.9
5	24	117	1	111577	1130	34	3	2	12	0	0	0	0	0	0	0	0	0	0	0	0	8.4	.	7.80	223	4.7
6	24	115	1	111577	920	34	3	2	53	16	0	0	0	0	1	0	0	0	0	0	0	8.5	.	7.80	209	5.2
7	24	119	1	111677	1030	35	3	2	12	1	0	0	0	0	0	0	0	0	0	0	0	8.8	.	7.50	242	14.0
8	24	120	1	111677	1140	35	3	2	12	1	0	0	0	0	0	0	0	0	0	0	0	9.1	.	7.60	219	13.0
9	24	118	1	111677	920	35	3	2	53	15	0	0	0	1	0	0	0	0	0	0	0	8.4	.	7.60	220	16.0
10	24	122	1	111777	1035	39	3	2	12	1	0	0	1	0	0	0	0	0	0	0	0	10.2	.	7.50	206	63.0
11	24	123	1	111777	1155	39	3	2	12	0	0	0	0	0	1	0	0	2	0	1	0	10.2	.	7.40	245	36.0
12	24	121	1	111777	930	39	3	2	53	3	0	0	1	0	1	0	0	0	0	10	0	10.0	.	7.50	202	36.0

APPENDIX B

FISH AND ENVIRONMENTAL DATA FOR
CONCURRENT BEACH SEINE SURVEY SAMPLES
RM 30-40

LEGEND

OBS	= OBSERVATION NUMBER
TASK CODE	= TASK CODE (BEACH SEINE SURVEY = 23 BEACH SEINE EFFICIENCY TEST = 24)
SAMPLE NO	= SAMPLE NUMBER
USECD	= USE CODE
DATE	= MONTH, DAY, AND YEAR THE SAMPLE WAS COLLECTED
TIME	= TIME OF DAY, USING THE 24-HOUR CLOCK, THAT THE GEAR WAS DEPLOYED
RM	= RIVER MILE WHERE SAMPLE WAS TAKEN
SITE	= SIDE OF RIVER WHERE SAMPLE WAS TAKEN (1 = WEST, 3 = EAST)
TIDE	= TIDAL STAGE (1 = LOW SLACK, 2 = FLOOD, 3 = HIGH SLACK, 4 = EBB)
GEAR	= SAMPLING DEVICE (12 = 100-FT SEINE, 53 = 500-FT SEINE)
LENGTH GROUP	1 = (0 - Xmm) YOUNG-OF-THE-YEAR FISH 2 = (X+1 - 150mm) 3 = (151 - 250mm) 4 = (250+mm)
TEMP	= TEMPERATURE (°C)
DO	= DISSOLVED OXYGEN (PPM)
pH	= pH
COND	= CONDUCTIVITY (mS)
TURB	= TURBIDITY (FTU)

BEACH SEINE EFFICIENCY REPORT
WEEK OF SEPTEMBER 11 TO 17, 1977

LEGEND : SPECIES - SBASS = STRIPED BASS, PERCH = WHITE PERCH, SHAD = AMERICAN SHAD, AWIFE = ALEWIFE, BLHER = BLUEBACK HERRING
A = LENGTH GROUP 1, B = LENGTH GROUP 2, C = LENGTH GROUPS 3 & 4 COMBINED, D = LENGTH GROUPS 2,3, & 4 COMBINED

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	2437	1	91277	940	39	3	2	12	8	0	0	17	1	0	3	0	0	0	0	0	21.9	7.1	7.60	11660	4.9
2	23	2493	1	91277	1000	37	3	2	12	22	0	0	137	1	1	5	0	1	0	0	0	20.9	7.2	7.70	10810	4.5
3	23	2474	1	91277	1005	39	3	2	12	0	0	0	0	0	0	2	0	0	0	1	0	21.7	7.2	7.50	11776	4.4
4	23	2475	1	91277	1025	39	1	3	12	18	0	0	15	18	5	0	0	0	0	0	0	23.5	6.5	7.60	9752	4.1
5	23	2494	1	91277	1040	36	3	2	12	0	0	0	14	10	0	19	0	10	0	52	0	21.0	7.9	7.70	10176	4.2
6	23	2495	1	91277	1115	35	3	2	12	39	0	0	0	0	0	10	0	2	0	0	0	21.0	8.7	7.80	10056	3.5
7	23	2496	1	91277	1140	35	3	2	12	10	0	0	3	8	3	47	0	3	0	3	0	21.0	8.1	7.80	9831	6.4
8	23	2497	1	91277	1240	34	3	2	12	41	0	0	9	0	0	6	0	0	0	2	0	22.4	7.3	7.60	12654	6.0
9	23	2498	1	91277	1300	34	3	4	12	14	0	0	0	0	0	0	0	0	0	0	0	21.9	9.0	8.00	11343	4.3
10	23	2499	1	91277	1315	35	1	4	12	10	0	0	0	0	0	0	0	0	0	0	0	24.0	7.2	7.60	11766	3.0
11	23	2500	1	91277	1330	35	1	4	12	19	1	0	5	27	1	47	0	1	0	4	0	23.5	8.5	7.80	11978	3.2
12	23	2501	1	91277	1415	36	1	4	12	30	0	0	7	27	0	19	0	0	0	0	0	23.0	6.7	7.70	11400	6.9
13	23	2565	1	91477	930	32	3	2	12	2	0	0	0	3	1	7	0	0	0	0	0	21.1	7.7	7.60	13080	13.0
14	23	2566	1	91477	1000	32	3	2	12	8	0	1	0	5	53	5	0	0	0	4	0	21.3	7.7	7.60	13080	11.0
15	23	2584	1	91477	1315	40	1	4	12	14	0	0	0	0	0	5	0	0	0	9	0	23.8	6.3	7.50	11340	6.7
16	23	2585	1	91477	1330	40	3	4	12	0	0	0	0	0	0	3	0	14	0	1	0	22.5	6.7	7.50	11340	4.1
17	23	2586	1	91477	1340	40	3	4	12	1	0	0	0	0	0	0	0	0	0	4	0	23.1	6.8	7.60	11445	5.1
18	23	2587	1	91477	1400	39	1	4	12	0	0	0	4	0	0	64	0	7	0	92	0	22.9	6.7	7.50	10464	6.5
19	23	2588	1	91477	1415	39	1	4	12	12	0	0	1	0	0	2	0	0	0	15	0	22.6	6.7	7.60	10900	5.0
20	23	2573	1	91477	1430	30	1	4	12	2	0	0	1	4	6	16	0	1	0	0	1	22.0	7.2	7.60	14715	13.0
21	23	2589	1	91477	1435	39	3	4	12	5	0	0	2	17	5	4	0	0	0	1	0	20.9	7.7	7.70	11445	14.0
22	23	2574	1	91477	1510	32	1	4	12	6	0	0	1	5	1	4	0	0	1	1	1	22.0	7.2	7.60	14715	36.0
23	23	2575	1	91577	900	38	3	2	12	20	0	0	0	0	0	2	0	0	0	2	0	21.5	7.2	7.60	11235	6.4
24	23	2576	1	91577	930	35	3	2	12	18	0	0	21	8	0	15	0	2	0	2	0	19.9	8.6	7.60	12420	11.0
25	23	2577	1	91577	1000	34	3	2	12	16	0	0	0	1	6	3	0	0	0	0	0	20.2	8.3	7.70	12430	12.0
26	23	2578	1	91577	1025	34	3	2	12	34	0	0	1	0	0	1	0	0	0	0	0	20.0	8.2	7.60	12305	6.6
27	23	2579	1	91577	1050	35	1	2	12	13	0	0	0	13	4	29	0	0	0	120	0	23.8	7.2	7.50	10379	2.6
28	23	2580	1	91577	1130	35	1	2	12	13	0	0	0	0	0	1	0	0	0	0	0	23.9	7.1	7.60	10700	3.2
29	23	2601	1	91577	1150	36	1	2	12	13	0	0	0	0	0	5	0	0	0	0	0	23.5	7.2	7.60	10692	4.3
30	23	2602	1	91577	1245	37	1	4	12	6	0	0	0	0	0	0	0	0	0	0	0	23.8	7.1	7.60	9951	3.9
31	23	2604	1	91577	1405	38	1	4	12	10	0	0	0	0	0	10	0	0	0	0	0	24.0	7.3	7.60	9844	4.4

BEACH SEINE EFFICIENCY REPORT
WEEK OF SEPTEMBER 18 TO 24, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	2607	1	91977	1020	38	1	4	12	20	0	0	1	1	0	0	0	5	0	12	0	24.1	7.0	7.60	8944	8.0
2	23	2609	1	91977	1120	36	1	4	12	3	0	0	3	1	0	0	0	0	0	0	0	24.9	8.0	7.60	9476	7.3
3	23	2610	1	91977	1145	35	1	4	12	13	0	0	0	0	0	10	0	0	0	0	0	24.3	6.9	7.40	9568	3.4
4	23	2611	1	91977	1210	35	1	4	12	9	0	0	6	13	1	14	0	0	0	0	0	24.2	7.1	7.40	9240	5.2
5	23	2612	1	91977	1330	35	3	2	12	37	7	0	8	794	26	1	0	0	0	0	0	25.1	7.2	7.80	10400	3.9
6	23	2655	1	92077	1000	32	1	4	12	3	0	0	1	1	3	2	0	0	0	0	0	23.0	7.2	7.60	10346	30.0
7	23	2656	1	92077	1030	30	1	4	12	6	0	0	19	9	2	0	0	0	0	0	0	22.0	7.0	7.60	12713	53.0
8	23	2672	1	92077	1515	39	3	3	12	5	0	0	0	0	0	2	0	0	0	1	0	23.5	7.2	7.60	8959	5.6
9	23	2673	1	92177	1000	32	3	4	12	0	0	0	0	0	0	0	0	0	0	0	0	20.3	7.2	7.70	10716	6.7
10	23	2674	1	92177	1020	39	1	4	12	0	0	0	0	0	0	0	0	0	0	0	0	21.8	7.3	7.60	10260	3.3
11	23	2666	1	92177	1110	40	1	4	12	17	0	1	0	0	0	5	0	0	0	0	0	22.1	7.2	7.70	6215	6.4
12	23	2667	1	92177	1130	40	3	4	12	6	0	0	0	0	0	0	0	0	0	25	0	22.0	7.1	7.50	7040	4.6
13	23	2709	1	92177	1305	39	1	2	12	1	0	0	8	2	0	2	0	7	0	0	0	21.2	7.4	7.50	7040	4.9
14	23	2710	1	92177	1335	39	3	2	12	17	0	0	4	7	1	0	0	0	0	0	0	22.5	6.9	7.50	7040	6.1
15	23	2712	1	92277	905	32	3	4	12	9	0	0	0	0	0	0	0	0	0	0	0	20.5	7.7	7.50	7564	3.0
16	23	2713	1	92277	925	32	3	4	12	6	0	0	0	0	0	0	0	0	0	0	0	20.5	7.6	7.50	7626	3.1
17	23	2714	1	92277	945	32	1	4	12	1	0	1	0	0	1	0	0	0	0	2	0	20.5	7.7	7.50	9075	11.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF SEPTEMBER 25 TO OCTOBER 1, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	2679	1	92777	955	32	1	2	12	12	0	0	1	0	1	1	0	0	0	0	0	20.7	7.6	7.40	3180	7.0
2	23	2695	1	92777	1020	32	1	2	12	0	0	0	0	0	1	0	0	0	0	0	0	20.7	7.7	7.60	4134	10.1
3	23	2696	1	92777	1045	30	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	20.4	7.8	7.60	4452	6.0
4	23	2725	1	92877	700	36	3	2	12	17	0	0	23	25	4	8	0	1	0	17	0	19.0	7.7	7.50	2576	4.6
5	23	2775	1	92877	735	35	3	2	12	30	1	1	10	4	0	5	0	0	0	243	0	19.1	7.6	7.60	2712	7.3
6	23	2776	1	92877	815	34	3	2	12	22	0	0	39	0	0	2	0	0	0	137	0	19.1	6.8	7.50	2744	7.3
7	23	2777	1	92877	845	34	3	2	12	19	0	0	0	0	0	0	0	0	0	0	0	20.0	7.6	7.50	2034	7.6
8	23	2778	1	92877	920	34	3	2	12	11	0	0	3	0	0	7	0	0	0	11	0	19.9	8.0	7.40	672	7.5
9	23	2779	1	92877	940	35	1	2	12	10	0	0	0	0	1	7	0	0	0	13	0	20.1	7.1	7.50	693	10.1
10	23	2780	1	92877	1000	37	1	2	12	11	0	0	0	0	0	0	0	0	0	10	0	20.8	7.4	7.40	616	10.1
11	23	2781	1	92877	1025	38	1	2	12	3	0	0	5	3	0	1	0	0	0	0	0	20.3	7.3	7.40	726	6.7
12	23	2762	1	92877	1050	38	1	2	12	16	0	1	1	1	0	0	0	0	0	0	0	20.3	7.7	7.40	719	7.5
13	23	2761	1	93077	910	30	1	2	12	3	0	0	4	5	0	0	0	0	0	4	0	19.0	8.4	7.60	1566	13.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 2 TO OCTOBER 8, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	2827	1	100377	930	38	1	4	12	4	0	0	0	0	0	4	0	0	0	0	0	17.8	9.0	7.40	293	6.1
2	23	2828	1	100377	945	38	1	4	12	7	0	0	1	0	0	11	0	0	0	138	0	18.6	9.0	7.50	353	5.6
3	23	2550	1	100377	955	39	3	2	12	31	0	0	36	1	1	7	0	1	0	15	0	17.3	8.6	7.60	328	5.6
4	23	2829	1	100377	1010	37	1	4	12	3	0	0	0	2	1	0	0	0	0	89	0	19.0	8.5	7.40	269	6.1
5	23	2831	1	100377	1050	35	1	4	12	4	0	0	0	1	0	16	0	1	0	88	0	18.0	9.3	7.50	288	6.8
6	23	2833	1	100377	1140	34	3	4	12	7	0	0	0	1	1	5	0	0	0	44	0	17.2	9.7	7.50	529	14.0
7	23	2834	1	100377	1155	34	3	4	12	2	0	0	0	0	0	0	0	0	0	0	0	17.0	10.2	7.70	414	15.0
8	23	2835	1	100377	1210	35	3	4	12	0	0	0	0	0	0	1	0	1	0	40	0	16.0	10.6	7.80	460	23.0
9	23	2855	1	100477	1320	30	1	2	12	6	0	0	5	3	0	6	0	0	0	1	0	18.4	9.8	8.00	363	5.8
10	23	2856	1	100477	1350	32	1	2	12	4	0	1	1	0	0	2	0	0	0	13	0	18.5	9.6	7.90	286	5.8
11	23	2857	1	100477	1420	32	1	2	12	17	0	0	0	1	2	44	0	1	0	82	0	18.3	10.1	7.90	276	10.5
12	23	2858	1	100477	1500	32	3	2	12	7	0	0	1	0	0	2	0	0	0	169	0	16.8	10.8	8.00	459	10.1
13	23	2891	1	100577	924	32	3	4	12	3	0	0	0	0	0	0	0	0	0	14	0	15.9	10.2	7.60	341	6.0
14	23	2892	1	100577	939	32	3	1	12	9	0	0	0	0	0	4	0	0	0	17	0	16.3	10.3	7.70	308	5.0
15	23	2904	1	100577	1325	30	1	2	12	6	0	0	4	2	0	8	0	1	0	4	0	18.2	10.6	7.90	335	5.6
16	23	2905	1	100577	1349	32	1	2	12	5	0	0	0	0	0	8	0	0	0	139	0	18.8	10.0	7.80	286	4.9
17	23	2826	1	100677	845	40	1	4	12	1	0	0	0	1	0	0	0	0	0	0	0	17.4	8.0	7.40	236	7.3
18	23	2906	1	100677	855	34	3	4	12	23	0	0	0	3	13	5	0	0	0	12	0	16.5	10.3	7.90	387	7.4
19	23	2896	1	100677	905	39	1	4	12	2	0	0	2	1	1	13	0	32	0	53	0	16.2	8.3	7.40	288	10.5
20	23	2898	1	100677	950	39	3	4	12	1	0	0	50	1	0	9	0	31	0	44	0	16.5	8.4	7.50	264	7.4
21	23	2907	1	100677	1017	34	3	4	12	5	0	0	3	0	0	8	0	0	0	9	0	16.4	10.2	7.50	286	5.9
22	23	2899	1	100677	1020	40	3	4	12	14	0	0	1	1	0	3	0	0	0	457	0	17.3	8.3	7.40	248	6.6
23	23	2908	1	100677	1035	34	3	4	12	47	0	0	3	0	0	2	0	0	0	19	0	16.5	10.2	7.70	290	5.4
24	23	2909	1	100677	1057	35	3	4	12	5	0	0	1	0	0	0	0	0	0	807	0	16.1	10.0	7.80	290	3.4
25	23	2910	1	100677	1128	35	1	4	12	0	0	0	0	0	0	32	0	0	0	1663	0	17.2	8.5	7.40	254	6.0
26	23	2923	1	100677	1449	37	1	2	12	0	0	0	0	0	0	7	0	0	0	3	0	18.0	9.2	7.50	260	3.6
27	23	2924	1	100677	1502	38	1	2	12	0	0	0	0	0	0	10	0	0	0	8	0	17.9	9.4	7.40	253	5.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 9 TO 15, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	2872	1	101077	935	38	3	4	12	4	1	0	0	6	0	11	0	3	0	128	3	15.5	8.9	7.80	2016	11.0
2	23	2873	1	101077	1010	36	3	4	12	2	0	0	9	3	0	23	0	5	0	469	0	15.1	9.8	8.10	1464	13.0
3	23	2919	1	101077	1020	39	1	2	12	1	0	0	8	3	3	13	0	26	0	103	0	15.0	8.6	7.70	1441	10.1
4	23	2874	1	101077	1045	34	3	4	12	1	0	0	0	0	0	92	0	0	0	345	0	15.0	10.1	7.60	2460	13.0
5	23	2875	1	101077	1105	34	3	4	12	6	0	0	2	0	0	33	0	0	0	105	0	15.0	10.7	7.90	1827	7.1
6	23	2926	1	101077	1120	39	3	4	12	6	0	0	31	5	0	48	0	24	0	800	0	15.4	9.6	7.90	2574	15.0
7	23	2976	1	101077	1125	34	3	4	12	5	0	0	1	3	3	3	0	0	0	52	0	14.7	10.8	8.10	1260	12.0
8	23	2877	1	101077	1200	35	1	4	12	0	0	0	0	0	0	9	0	0	0	1856	0	15.8	9.1	7.60	3375	7.1
9	23	2878	1	101077	1325	38	1	4	12	5	0	0	17	12	6	51	0	0	0	986	0	16.3	8.5	7.60	2867	5.1
10	23	2976	1	101177	925	32	1	2	12	2	0	0	0	0	0	19	0	0	0	54	0	15.0	9.5	7.80	3924	5.9
11	23	2977	1	101177	1000	32	1	3	12	0	0	0	0	0	0	11	0	17	0	10	9	16.2	9.6	7.90	4104	6.8
12	23	2984	1	101177	1400	32	3	4	12	2	0	0	0	0	0	5	0	0	0	190	0	14.0	9.6	7.80	4142	3.5
13	23	2985	1	101177	1430	32	3	4	12	0	0	0	0	0	0	5	0	0	0	13	0	16.0	10.1	7.80	3161	4.5
14	23	2986	1	101277	910	36	3	2	12	0	0	0	1	0	0	17	0	0	0	37	0	.	.	7.80	2760	3.6
15	23	2987	1	101277	1010	35	3	2	12	2	0	0	0	0	0	8	0	0	0	4	0	.	.	7.70	2940	3.6
16	23	2988	1	101277	1025	35	3	2	12	6	0	0	0	0	0	5	0	0	0	1	0	.	.	7.80	2992	3.4
17	23	2989	1	101277	1050	34	3	4	12	10	0	0	1	1	1	58	0	0	0	30	0	.	.	7.90	3220	13.0
18	23	2990	1	101277	1110	34	3	4	12	2	0	0	0	0	0	1	0	0	0	107	0	.	.	8.10	3021	6.5
19	23	3013	1	101277	1150	35	1	4	12	1	0	0	5	0	0	11	0	0	0	58	0	.	.	7.60	2987	10.1
20	23	3014	1	101277	1210	35	1	4	12	0	0	1	0	0	0	9	0	0	0	39	0	.	.	7.60	2070	4.9
21	23	3015	1	101277	1330	36	1	4	12	4	0	0	6	2	1	12	0	0	0	822	0	.	.	7.50	1697	5.1
22	23	3016	1	101277	1400	38	1	4	12	0	0	0	0	0	0	4	0	0	0	12	0	.	.	7.50	1725	6.7
23	23	3017	1	101277	1425	38	1	4	12	2	0	0	7	7	0	12	0	0	0	6	0	.	.	7.50	2185	14.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 16 TO 22, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	3044	1	101777	1010	36	3	4	12	6	0	0	4	3	1	6	0	3	0	9	0	12.1	11.2	7.50	824	30.0
2	23	3045	1	101777	1035	35	3	4	12	3	0	0	1	0	1	12	0	1	0	39	0	12.5	10.8	7.50	890	17.0
3	23	2960	1	101777	1045	40	1	2	12	12	0	1	5	0	0	7	0	0	0	36	0	14.0	9.1	7.30	223	15.0
4	23	3046	1	101777	1115	34	3	4	12	5	0	0	1	5	6	6	0	0	0	0	0	12.1	11.1	7.50	1310	14.0
5	23	2961	1	101777	1115	40	3	2	12	1	0	0	2	2	0	30	0	6	0	201	0	12.5	9.4	7.60	391	23.0
6	23	3047	1	101777	1145	35	1	4	12	4	0	0	1	0	0	23	0	0	0	67	0	15.0	10.7	7.50	525	15.0
7	23	3048	1	101777	1220	36	1	4	12	3	0	0	2	3	2	9	0	0	0	0	0	12.9	10.2	7.50	408	14.0
8	23	3049	1	101777	1235	37	1	4	12	15	0	0	0	0	2	8	0	0	0	715	0	13.0	9.6	7.50	364	14.0
9	23	3050	1	101777	1410	38	1	2	12	4	0	0	1	0	0	2	0	0	0	15	0	13.1	11.4	7.50	302	10.5
10	23	3051	1	101777	1430	38	1	2	12	2	0	0	1	0	0	10	0	0	0	34	0	13.2	10.6	7.50	330	13.0
11	23	2821	1	101877	930	33	1	2	12	5	0	0	1	1	4	2	0	0	0	15	0	12.5	10.8	7.70	336	16.0
12	23	2822	1	101877	1000	30	1	2	12	10	0	0	1	2	0	3	0	0	0	2	0	11.9	10.6	7.80	594	29.0
13	23	3087	1	101877	1430	32	3	2	12	0	0	0	0	0	0	4	0	0	0	56	0	12.5	10.7	7.70	519	13.0
14	23	3088	1	101877	1450	32	3	2	12	0	0	0	0	0	0	6	0	0	0	5	0	12.6	10.4	7.60	509	14.0
15	23	3063	1	101977	855	38	1	4	12	6	0	0	0	0	0	7	0	0	0	0	0	12.0	9.8	7.40	252	10.1
16	23	3104	1	101977	900	32	3	4	12	6	0	0	0	0	2	0	0	0	0	15	0	12.0	10.2	7.60	381	10.1
17	23	3105	1	101977	915	32	3	4	12	2	0	0	0	0	0	10	0	0	0	60	0	12.2	10.0	7.60	320	6.6
18	23	3064	1	101977	1030	38	1	4	12	3	0	0	0	1	0	7	0	0	0	1	0	12.2	10.0	7.50	230	6.1
19	23	3067	1	101977	1130	35	1	2	12	17	0	2	1	1	0	8	0	0	0	23	0	13.0	9.9	7.50	226	16.0
20	23	3068	1	101977	1155	35	1	2	12	1	0	0	2	0	0	12	0	0	0	1	0	13.0	10.0	7.60	226	10.1
21	23	3069	1	101977	1225	34	3	2	12	11	0	0	5	2	0	62	0	0	0	3	0	12.3	10.2	7.60	262	6.6
22	23	3070	1	101977	1245	34	3	2	12	17	0	0	2	10	0	22	0	0	0	6	0	12.5	10.1	7.60	242	6.4
23	23	3071	1	101977	1310	35	3	2	12	3	0	0	0	0	0	3	0	0	0	8	0	12.5	11.2	7.60	242	5.4
24	23	3112	1	101977	1310	32	1	2	12	0	0	0	0	0	0	8	0	1	0	54	0	13.0	9.8	7.60	226	13.0
25	23	3113	1	101977	1330	32	1	2	12	1	0	0	0	0	0	16	0	0	0	8	0	13.0	9.9	7.60	244	7.9
26	23	3072	1	101977	1330	35	3	2	12	6	0	0	0	0	0	0	0	0	0	7	0	12.4	10.9	7.70	254	4.9
27	23	2879	1	102077	850	39	3	4	12	3	0	0	6	0	0	8	0	6	0	20	0	12.0	10.5	7.50	202	10.1
28	23	3028	1	102077	950	39	1	4	12	14	0	0	1	1	0	0	34	0	0	4	0	11.6	10.7	7.50	236	14.0
29	23	3029	1	102077	1345	39	1	2	12	1	0	0	2	0	1	16	0	7	0	17	0	12.6	10.5	7.50	213	15.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 23 TO 29, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	3120	1	102477	915	38	1	2	12	0	0	0	0	0	0	5	0	0	0	0	0	9.0	11.8	7.60	201	7.1
2	23	3121	1	102477	930	38	1	2	12	2	0	0	0	2	0	0	0	0	0	0	0	9.8	11.2	7.60	206	10.1
3	23	3145	1	102477	1010	36	1	2	12	0	0	0	0	0	0	4	0	0	0	0	0	10.1	11.2	7.60	195	7.8
4	23	3146	1	102477	1025	35	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	10.3	10.4	7.70	185	13.0
5	23	3147	1	102477	1040	34	3	4	12	10	0	0	0	0	1	2	0	0	0	0	0	10.7	11.9	7.60	258	6.2
6	23	3148	1	102477	1105	34	3	4	12	5	0	0	2	0	0	1	0	0	0	29	0	10.6	12.0	7.70	225	6.4
7	23	3149	1	102477	1125	35	3	4	12	2	0	0	0	0	0	6	0	0	0	0	0	11.0	11.5	7.60	200	6.3
8	23	3150	1	102477	1140	35	3	4	12	1	0	0	0	0	0	2	0	0	0	0	0	10.9	11.5	7.60	203	6.8
9	23	3151	1	102477	1255	36	3	4	12	2	0	0	0	0	0	5	0	2	0	6	0	11.1	11.4	7.60	213	6.1
10	23	3152	1	102577	900	32	3	2	12	0	0	0	0	0	0	2	0	0	0	0	0	10.5	10.2	7.60	194	5.9
11	23	3153	1	102577	910	32	3	2	12	4	0	0	0	0	0	1	0	0	0	0	0	10.2	10.4	7.60	200	3.6
12	23	3154	1	102577	930	32	1	2	12	2	0	0	0	0	0	2	0	0	0	2	0	9.0	10.8	7.60	201	10.1
13	23	3155	1	102577	940	32	1	2	12	0	0	0	0	0	0	5	0	0	0	0	0	10.6	10.7	7.60	188	7.6
14	23	3237	1	102677	1305	36	1	4	12	2	0	0	2	0	0	0	0	0	0	0	0	12.9	9.6	7.60	191	12.0
15	23	3197	1	102777	1015	37	3	2	12	3	0	0	1	0	0	5	0	0	0	226	0	12.2	11.0	7.50	201	5.8
16	23	3171	1	102777	1040	40	3	2	12	4	0	0	1	0	0	14	0	2	0	168	0	11.6	9.4	7.50	179	15.0
17	23	3198	1	102777	1040	35	3	2	12	2	0	0	0	0	0	2	0	0	0	187	0	12.2	9.8	7.60	201	5.5
18	23	3172	1	102777	1100	39	3	2	12	0	0	0	0	0	0	6	0	0	0	11	0	11.8	9.7	7.60	192	12.0
19	23	3173	1	102777	1115	40	1	2	12	3	0	0	5	0	0	1	0	1	0	3	0	11.9	9.1	7.60	187	10.0
20	23	3234	1	102777	1115	34	3	2	12	4	0	0	0	0	0	7	0	0	0	3	0	12.3	10.0	7.60	191	4.7
21	23	3174	1	102777	1135	40	1	2	12	0	0	0	0	0	0	2	0	0	0	5	0	11.5	9.5	7.50	179	10.0
22	23	3235	1	102777	1145	35	1	4	12	2	0	0	2	0	0	0	0	0	0	46	0	12.5	9.8	7.60	186	8.0
23	23	3236	1	102777	1240	35	1	4	12	6	0	0	5	4	0	0	0	0	0	0	0	12.8	9.8	7.60	187	10.0
24	23	3238	1	102777	1325	38	1	4	12	1	0	0	0	1	0	6	0	0	0	14	0	14.1	9.9	7.60	187	5.5
25	23	3239	1	102777	1345	38	1	4	12	1	0	1	4	5	2	7	0	0	0	51	0	13.1	9.8	7.60	189	7.5
26	23	3240	1	102777	1415	38	1	4	12	2	0	0	2	1	0	6	0	0	0	6	0	18.2	9.9	7.50	189	6.5
27	23	3199	1	102777	1100	34	3	2	14	5	0	0	0	0	0	4	0	0	0	0	0	12.2	10.2	7.60	191	5.6

BEACH SEINE EFFICIENCY REPORT
WEEK OF OCTOBER 30 TO NOVEMBER 5, 1977

OBS	TASKCODE	SAMPLENO	USECODE	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	3309	1	103177	955	38	1	2	12	2	0	0	0	0	0	0	0	0	0	22	0	11.1	10.0	7.70	185	14.0
2	23	2999	1	103177	955	32	3	2	12	3	0	0	0	0	0	0	0	0	0	0	0	11.4	10.3	7.60	194	5.3
3	23	3310	1	103177	1010	38	1	2	12	0	0	0	0	0	0	2	0	0	0	3	0	10.8	10.0	7.60	185	12.0
4	23	3000	1	103177	1015	32	3	2	12	2	0	0	0	0	0	1	0	0	0	0	0	11.7	10.4	7.70	216	5.0
5	23	3311	1	103177	1025	37	1	2	12	0	0	0	0	2	0	1	0	0	0	0	0	11.1	10.1	7.60	185	12.0
6	23	3312	1	103177	1045	36	1	2	12	2	0	0	0	0	0	0	0	0	0	0	0	11.1	10.0	7.60	187	13.0
7	23	3313	1	103177	1100	35	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	11.0	10.2	7.90	184	12.0
8	23	3314	1	103177	1110	35	1	2	12	0	0	0	0	1	0	0	0	0	0	0	0	11.2	10.1	7.60	185	12.0
9	23	3315	1	103177	1130	34	3	2	12	3	0	0	0	0	0	3	0	0	0	0	0	10.8	10.9	7.70	187	6.2
10	23	3316	1	103177	1150	35	3	2	12	4	0	0	0	0	0	0	0	0	0	0	0	11.1	10.5	7.70	185	5.8
11	23	3281	1	103177	1333	32	1	4	12	1	0	0	0	0	0	0	0	0	0	0	0	11.7	11.0	7.80	184	6.5
12	23	3282	1	103177	1340	32	1	4	12	0	0	0	0	0	1	1	0	0	0	0	0	11.4	11.0	7.80	196	6.5
13	23	3318	1	103177	1420	36	3	4	12	0	0	0	0	0	0	1	0	0	0	83	0	11.2	10.4	7.70	198	6.3
14	23	3324	1	110177	1115	40	3	2	12	0	0	0	0	0	0	1	0	1	0	0	0	11.5	10.4	7.70	195	17.0
15	23	3325	1	110177	1135	40	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	11.8	10.0	7.60	189	17.0
16	23	3326	1	110177	1315	39	1	2	12	4	0	0	0	1	0	0	0	0	0	25	0	11.5	10.6	7.60	192	16.0
17	23	3327	1	110177	1340	39	3	2	12	1	0	0	0	0	0	1	0	0	0	2	1	12.0	10.8	7.70	183	14.0
18	23	3328	1	110177	1400	39	3	2	12	5	0	0	5	0	3	0	0	3	0	8	0	12.0	11.0	7.70	189	15.0
19	23	3292	1	110277	915	32	3	4	12	3	0	0	1	0	0	1	0	0	0	0	0	11.6	9.4	7.60	907	5.5
20	23	3329	1	110277	915	35	3	4	12	0	0	0	0	0	0	0	0	0	0	1	0	11.3	9.7	7.60	207	14.0
21	23	3330	1	110277	930	34	3	4	12	8	0	0	0	2	2	2	0	0	0	0	0	11.3	9.8	7.70	305	11.0
22	23	3331	1	110277	950	34	3	2	12	3	0	0	0	0	0	1	0	0	0	0	0	11.4	10.0	7.70	425	5.7
23	23	3332	1	110277	1005	34	3	2	12	11	0	0	0	0	6	3	0	0	0	9	0	11.6	10.2	7.70	691	5.0
24	23	3333	1	110277	1035	35	1	2	12	6	0	0	6	1	0	3	0	0	0	0	0	11.9	10.0	7.60	378	15.0
25	23	3334	1	110277	1055	36	1	2	12	1	0	0	2	1	1	0	0	0	0	0	0	11.7	9.7	7.50	392	16.0
26	23	3335	1	110277	1115	37	1	2	12	0	0	0	0	0	1	1	0	0	0	3	0	11.8	10.2	7.70	335	15.0
27	23	3336	1	110277	1130	38	1	2	12	1	0	0	4	2	0	1	0	0	0	0	0	11.7	9.8	7.60	270	14.0
28	23	3337	1	110277	1145	38	1	2	12	2	0	0	0	0	4	0	0	0	0	0	0	11.7	10.2	7.70	203	12.0
29	23	3338	1	110277	1200	38	1	2	12	0	0	0	0	0	0	0	0	0	0	3	0	11.8	9.8	7.60	283	4.3
30	23	3300	1	110277	1355	32	1	2	12	0	0	0	0	0	0	1	0	0	0	0	0	11.9	9.9	7.70	1199	4.8
31	23	3301	1	110277	1410	32	1	2	12	0	0	0	0	0	0	9	0	0	0	36	0	11.8	9.8	7.60	763	6.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF NOVEMBER 6 TO 12, 1977

OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	3350	1	110777	910	39	3	4	12	3	0	0	1	0	1	3	0	0	0	672	0	12.1	8.8	7.60	4633	17.0
2	23	3351	1	110777	940	39	3	4	12	0	0	0	1	0	0	3	0	0	0	44	0	12.1	8.9	7.50	3696	16.0
3	23	3352	1	110777	955	39	1	4	12	2	0	0	6	2	1	2	0	0	0	65	0	11.9	8.8	7.50	4407	19.0
4	23	3353	1	110777	1015	40	1	4	12	1	0	0	10	0	0	0	0	0	0	19	0	11.6	9.7	7.60	4446	20.0
5	23	3302	1	111077	910	32	3	2	12	13	0	0	2	2	0	2	0	0	0	48	0	11.2	9.2	7.50	1708	23.0
6	23	3303	1	111077	935	32	3	2	12	6	0	0	8	4	1	2	0	0	0	165	0	11.7	9.4	7.60	3094	20.0
7	23	3443	1	111077	1255	30	1	4	12	2	0	1	25	3	1	1	0	5	0	189	0	12.0	10.8	7.60	4961	17.0
8	23	3444	1	111077	1320	32	1	4	12	3	0	0	1	2	0	4	0	1	0	50	0	12.1	10.9	7.50	4403	30.0
9	23	3445	1	111077	1340	32	1	4	12	22	0	0	107	4	0	4	0	0	0	32	0	12.0	10.8	7.50	4463	31.0
10	23	3446	1	111177	650	38	3	2	12	0	0	0	0	0	0	0	0	0	0	24	0	10.0	11.0	7.40	964	43.0
11	23	3427	1	111177	655	40	3	2	12	4	0	0	8	0	0	0	0	3	0	43	0	11.0	10.4	7.50	575	40.0
12	23	3435	1	111177	710	36	3	2	12	4	0	0	1	0	0	1	0	1	0	0	0	10.0	10.0	7.40	601	54.0
13	23	3428	1	111177	715	39	3	2	12	1	0	0	1	0	6	0	0	0	0	1	0	10.8	10.5	7.50	467	58.0
14	23	3436	1	111177	730	35	3	2	12	6	0	0	1	0	2	0	0	0	0	10	0	9.9	9.9	7.30	1825	40.0
15	23	3429	1	111177	740	39	3	2	12	0	0	0	0	0	2	0	0	0	0	1	0	10.9	10.6	7.40	751	42.0
16	23	3437	1	111177	750	34	3	2	12	10	0	0	1	0	4	0	0	0	0	15	0	10.0	9.8	7.40	1974	39.0
17	23	3430	1	111177	755	39	1	2	12	0	0	0	2	0	0	0	0	0	0	28	0	10.6	10.4	7.60	259	22.0
18	23	3431	1	111177	810	39	1	2	12	0	0	0	7	1	0	0	0	1	0	3	0	10.4	10.6	7.50	248	26.0
19	23	3438	1	111177	810	34	3	2	12	2	0	0	1	1	0	0	0	0	0	25	0	11.0	9.8	7.50	1944	28.0
20	23	3439	1	111177	830	34	3	2	12	0	0	0	0	0	0	0	0	0	0	0	0	11.0	10.4	7.70	256	15.0
21	23	3432	1	111177	835	40	1	2	12	1	0	0	0	0	0	0	0	0	0	1	0	10.3	10.4	7.60	209	23.0
22	23	3440	1	111177	855	35	1	2	12	14	0	1	0	0	0	0	0	0	0	76	0	10.2	9.9	7.50	626	29.0
23	23	89	1	111177	930	36	1	2	12	38	0	0	2	0	0	0	0	0	0	4	0	11.1	9.9	7.40	658	25.0
24	23	90	1	111177	1025	38	1	2	12	3	0	0	0	1	0	0	0	0	0	95	0	11.1	9.1	7.50	438	28.0
25	23	91	1	111177	1045	38	3	2	12	3	0	0	1	2	1	1	0	0	0	6	0	11.0	8.8	7.40	586	24.0
26	23	92	1	111177	1110	38	1	2	12	2	0	0	1	0	0	0	0	0	0	2	0	10.6	8.9	7.50	443	24.0
27	23	3392	1	111177	1140	33	3	2	12	1	0	0	0	0	0	1	0	0	0	13	0	10.3	9.7	7.30	2480	27.0
28	23	3393	1	111177	1200	33	3	2	12	1	0	1	0	0	0	1	0	0	0	5	0	11.0	9.9	7.60	1430	18.0

BEACH SEINE EFFICIENCY REPORT
WEEK OF NOVEMBER 13 TO 19, 1977

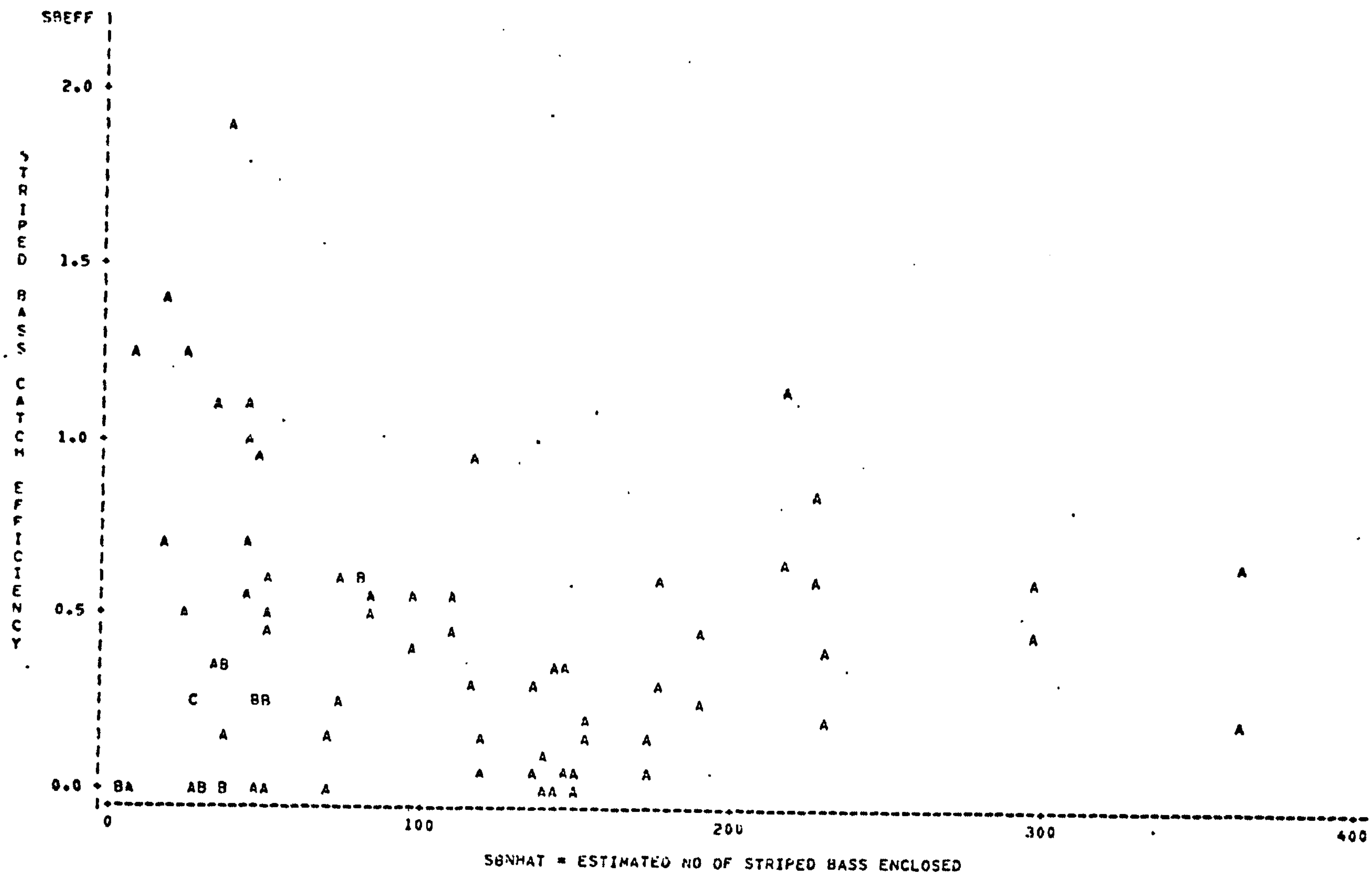
OBS	TASKCODE	SAMPLENO	USECD	DATE	TIME	RM	SITE	TIDE	GEAR	SBASS_A	SBASS_B	SBASS_C	PERCH_A	PERCH_B	PERCH_C	SHAD_A	SHAD_D	AWIFE_A	AWIFE_D	BLHER_A	BLHER_D	TEMP	DO	PH	COND	TURB
1	23	3394	1	111477	1020	32	1	2	12	0	0	0	0	1	0	0	0	0	0	0	0	8.0	12.7	7.70	228	27.0
2	23	3395	1	111477	1040	32	1	2	12	0	0	0	0	0	0	0	0	0	0	2	0	17.6	12.6	7.70	240	29.0
3	23	3396	1	111477	1050	30	1	2	12	2	0	0	4	0	0	0	0	0	0	2	0	7.0	12.6	7.80	310	32.0
4	23	3486	1	111477	1440	32	3	4	12	3	0	0	0	1	0	0	0	0	0	0	0	6.9	11.3	7.70	338	22.0
5	23	3487	1	111477	1500	32	3	4	12	1	0	0	0	1	0	0	0	0	0	0	0	6.4	10.4	7.80	341	23.0
6	23	3455	1	111577	913	39	3	2	12	1	0	0	0	1	1	0	0	0	0	0	0	8.0	10.0	7.50	236	25.0
7	23	3489	1	111577	935	37	3	2	12	2	0	0	0	0	0	2	0	0	0	0	0	8.8	11.1	7.70	203	17.0
8	23	3456	1	111577	935	39	1	2	12	0	0	0	0	1	0	0	0	0	0	0	0	9.0	10.0	7.20	181	19.0
9	23	3490	1	111577	955	35	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	8.0	11.4	7.80	214	20.0
10	23	3457	1	111577	1000	40	3	2	12	1	0	0	0	0	0	0	0	0	0	9	0	9.0	10.0	7.40	195	23.0
11	23	3491	1	111577	1010	34	3	2	12	4	0	0	0	0	0	0	0	0	0	0	0	6.9	11.1	7.80	247	22.0
12	23	3458	1	111577	1010	40	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	9.1	10.8	7.50	185	21.0
13	23	3492	1	111577	1035	34	3	2	12	12	0	0	0	0	1	0	0	0	0	0	0	7.1	11.8	7.70	248	22.0
14	23	3493	1	111577	1055	35	1	2	12	0	0	0	1	1	0	0	0	0	0	0	0	10.0	10.5	7.70	185	18.0
15	23	3494	1	111577	1110	35	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	10.1	10.6	7.70	185	19.0
16	23	3495	1	111577	1130	36	1	2	12	2	0	0	0	0	5	0	0	0	0	0	0	10.0	10.7	7.70	196	17.0
17	23	3497	1	111577	1220	38	1	2	12	2	0	0	1	2	0	0	0	0	0	0	0	9.5	10.4	7.70	203	16.0
18	23	3498	1	111577	1240	38	1	2	12	4	0	0	1	0	0	0	0	0	0	0	0	9.8	10.7	7.70	216	17.0
19	23	3499	1	111577	1255	38	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	10.2	10.9	7.70	188	17.0
20	23	3480	1	111777	855	38	1	4	12	1	0	0	0	0	0	0	0	0	0	0	0	11.0	10.0	7.50	192	12.0
21	23	3481	1	111777	910	37	1	4	12	1	0	0	0	0	0	0	0	0	0	0	0	11.0	9.8	7.50	194	15.0
22	23	3482	1	111777	925	35	1	4	12	3	0	0	0	0	1	0	0	0	0	0	0	11.1	9.8	7.30	183	16.0
23	23	93	1	111777	935	35	1	4	12	1	0	0	0	0	3	1	0	0	0	0	0	11.0	10.0	7.40	185	18.0
24	23	95	1	111777	1050	38	3	2	12	1	0	0	0	0	0	1	0	0	0	1	0	9.8	10.2	7.50	229	18.0
25	23	3525	1	111777	1105	35	3	2	12	2	0	0	1	1	0	0	0	0	0	0	0	10.5	9.8	7.40	210	12.0
26	23	3526	1	111777	1125	35	3	2	12	1	0	0	0	0	0	0	0	0	0	0	0	10.4	9.8	7.50	232	8.6
27	23	3527	1	111777	1132	35	3	2	12	0	0	0	0	1	0	0	0	0	0	0	0	10.0	9.8	7.60	207	7.3
28	23	3500	1	111777	1315	40	1	2	12	0	0	0	0	1	0	0	0	0	0	0	0	11.0	10.7	7.60	200	22.0
29	23	3528	1	111777	1335	34	3	2	12	4	0	0	0	0	0	0	0	0	0	0	0	9.2	10.9	7.60	206	7.6
30	23	3529	1	111777	1345	34	3	2	12	3	0	0	0	0	0	0	0	0	0	26	0	10.5	9.4	7.50	206	14.0
31	23	3530	1	111777	1400	36	1	2	12	3	0	0	0	0	0	0	0	0	0	0	0	8.6	11.2	7.60	196	15.0
32	23	3541	1	111877	925	32	1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	9.1	11.2	7.50	197	22.0
33	23	3532	1	111877	925	34	3	4	12	3	0	0	0	0	0	0	0	0	0	0	0	8.6	11.6	7.40	190	13.0
34	23	3542	1	111877	940	32	1	2	12	0	0	0	0	0	1	0	0	0	0	1	0	9.1	11.4	7.50	212	31.0
35	23	3533	1	111877	945	34	3	4	12	7	0	0	0	2	0	0	0	0	0	0	0	9.8	11.3	7.50	247	14.0
36	23	3543	1	111877	1005	32	3	2	12	0	0	0	0	0	0	0	0	0	0	8	0	8.8	11.4	7.50	207	14.0
37	23	3534	1	111877	1005	35	1	4	12	6	0	0	32	6	5	0	0	0	0	0	0	9.6	11.1	7.40	188	34.0
38	23	3535	1	111877	1025	35	1	4	12	7	0	0	0	1	0	0	0	0	0	0	0	9.6	11.4	7.20	189	43.0
39	23	3536	1	111877	1035	36	1	4	12	9	0	0	7	0	1	0	0	0	0	0	0	9.9	10.8	7.40	219	140.0
40	23	3538	1	111877	1115	38	1	4	12	0	0	0	2	3	0	0	0	0	0	0	0	9.2	11.9	7.40	222	59.0
41	23	3539	1	111877	1130	38	1	4	12	4	0	0	1	0	0	0	0	0	0	0	0	9.4	11.2	7.30	233	49.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX C

CATCH EFFICIENCY RELATED TO SELECTED ENVIRONMENTAL PARAMETERS

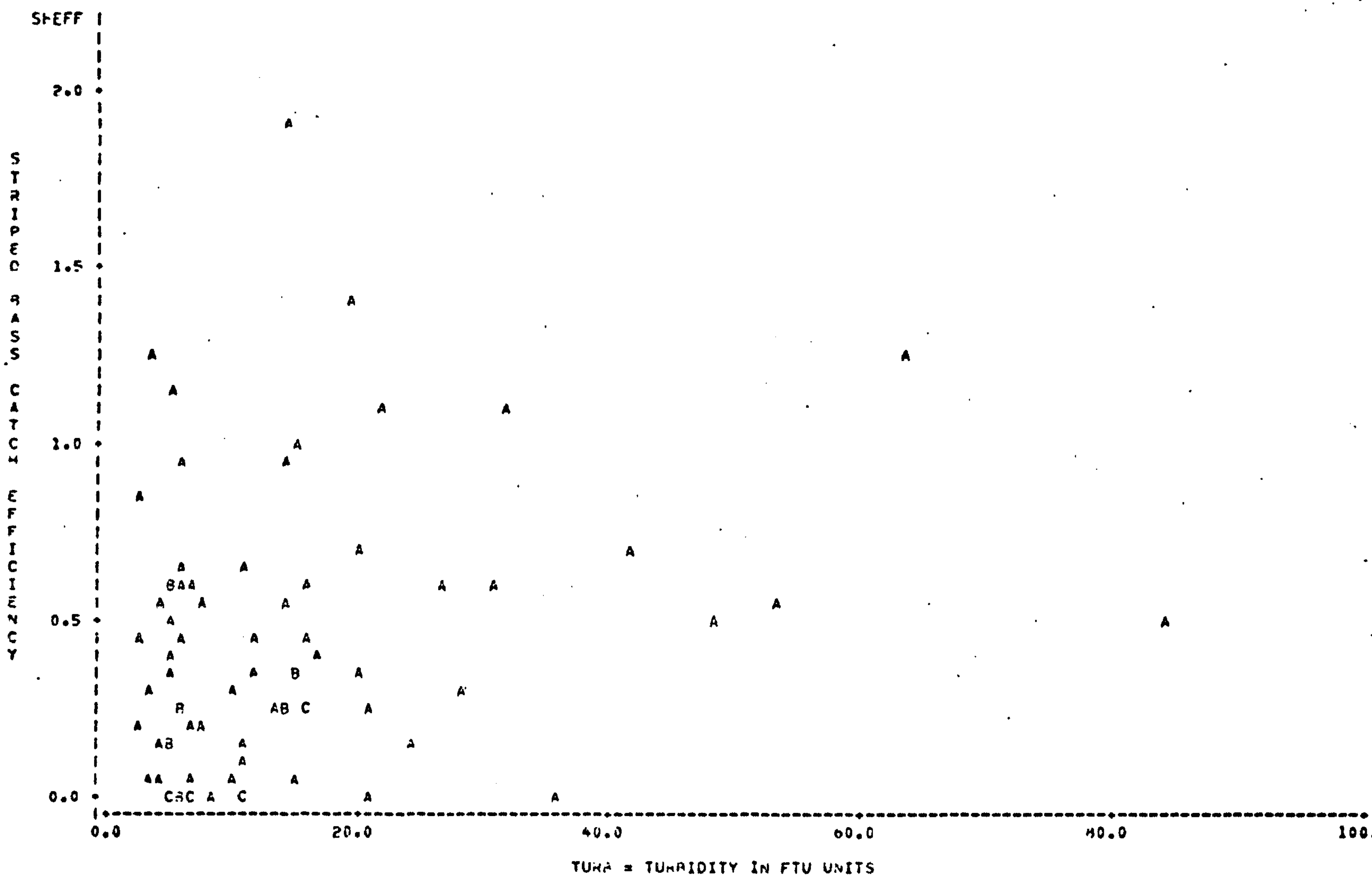
Striped Bass Catch Efficiency vs Various Sampling Parameters

Legend: A = 1 OBS, B = 2 OBS, etc.



Striped Bass Catch Efficiency vs Various Sampling Parameters

Legend: A = 1 OBS, B = 2 OBS, etc.



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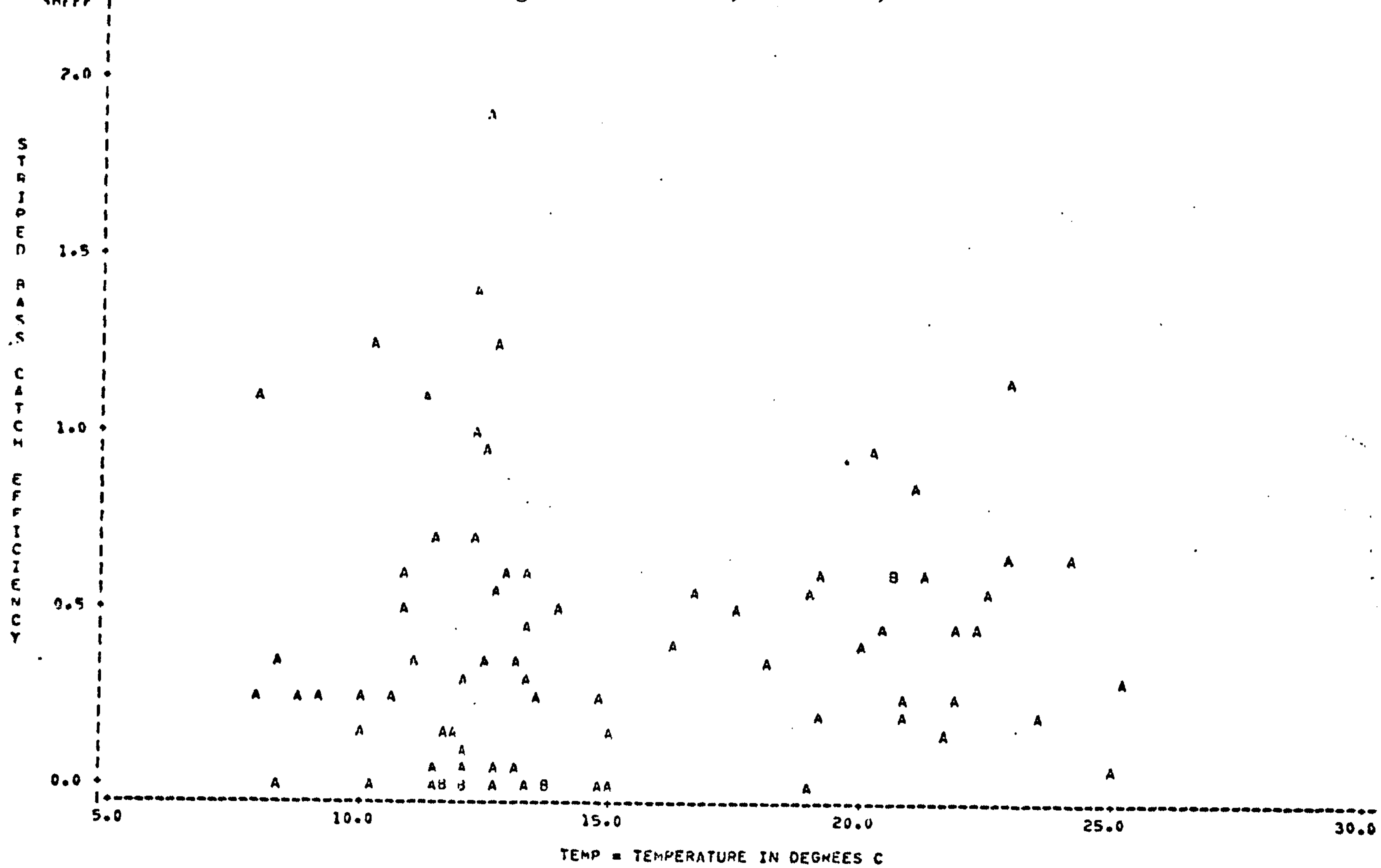
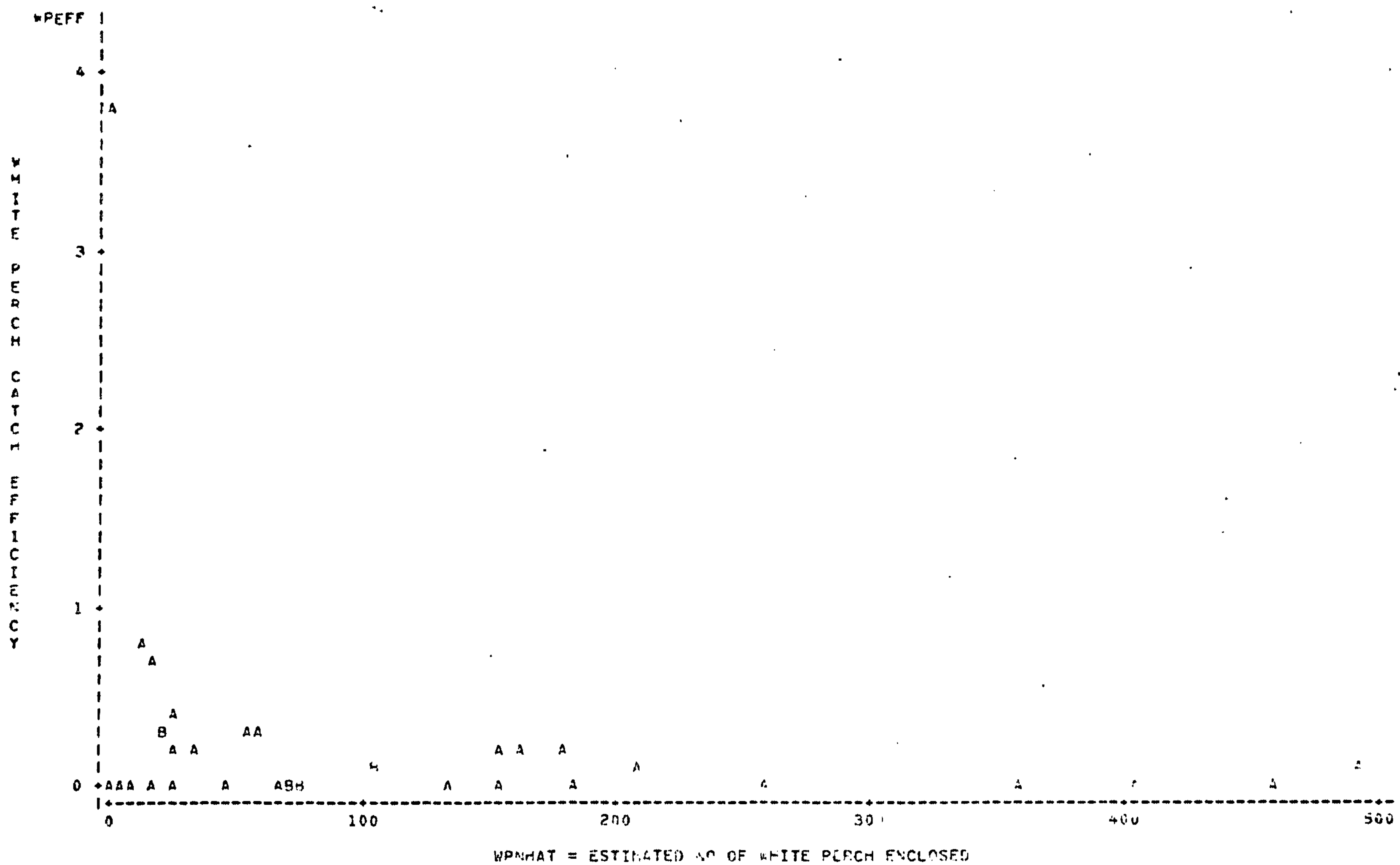
Striped Bass Catch Efficiency vs Various Sampling Parameters

Legend: A = 1 OBS, B = 2 OBS, etc.



White Perch Catch Efficiency vs Various Sampling Parameters

Lengend: A = 1 OBS, B = 2 OBS, etc.



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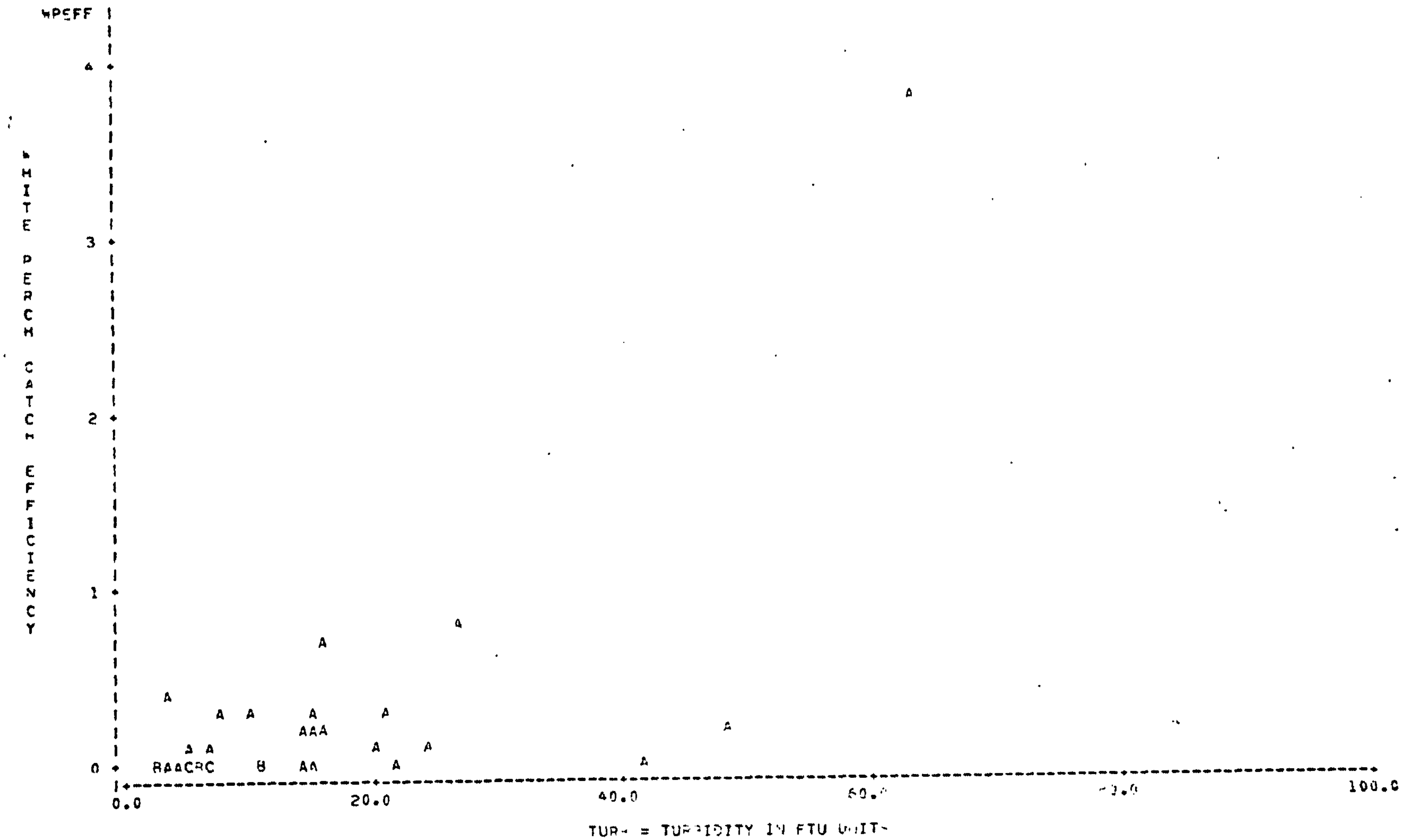
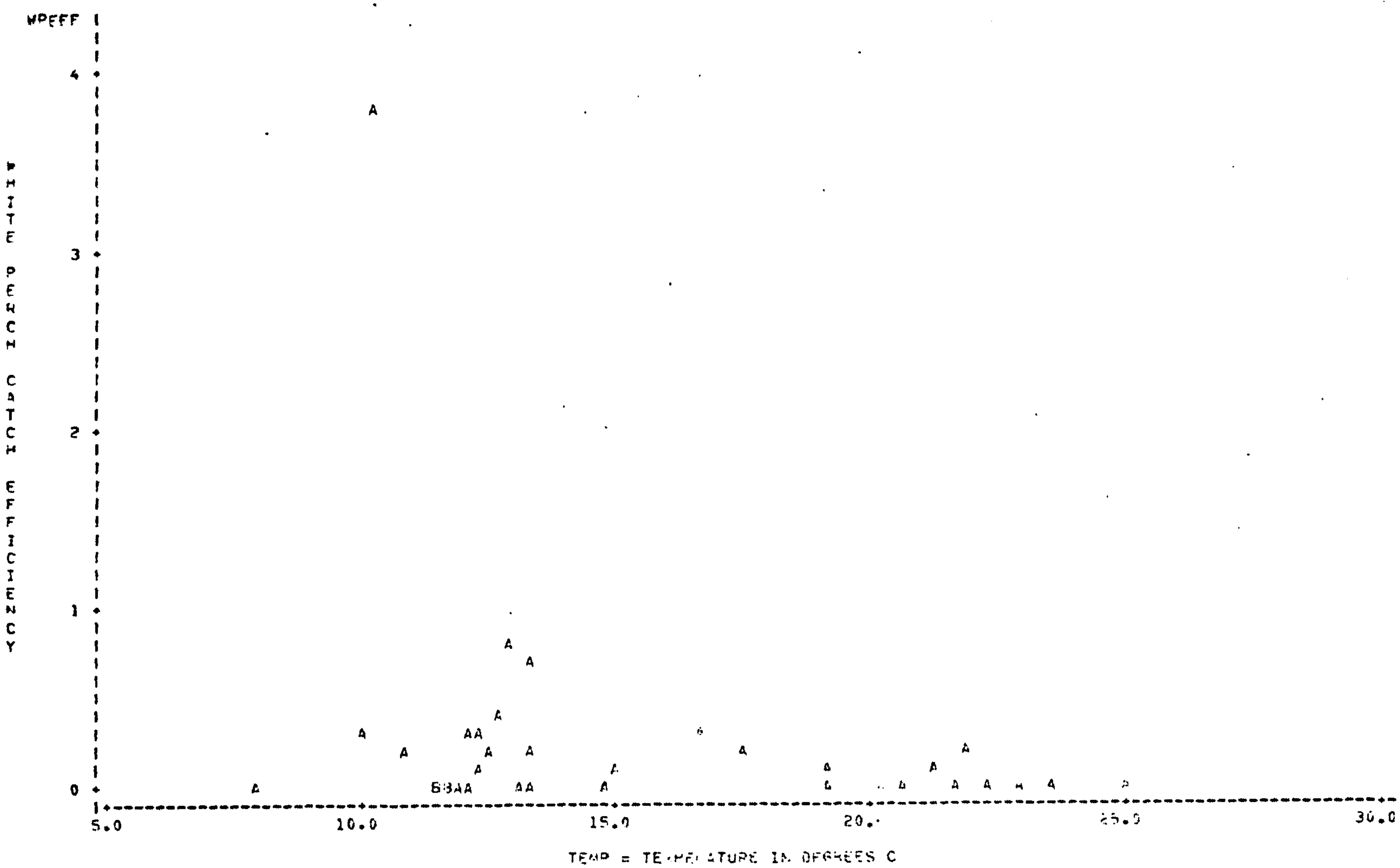
White Perch Catch Efficiency vs Various Sampling Parameters

Legend: A = 1 OBS, B = 2 OBS, etc.



White Perch Catch Efficiency vs Various Sampling Parameters

Legend: A = 1 OBS, B = 2 OBS, etc.



APPENDIX D

SUPPORTING DATA
AND STATISTICAL TESTS

Appendix D

Number of Marked Juvenile Striped Bass Recaptured in the 500-ft Seine Sample/Number of Striped Bass Marked from Each 100-ft Seine Sample

TEST SITE

Dates	Sand Bar		Quarry		Croton Park		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/11-09/17	5/5	2/2	6/11	19/34	10/14	23/29	2/8	4/9
09/18-09/24	1/1	5/7	16/24	15/20	29/36	15/16	6/8	6/13
09/25-10/01	6/8	2/2	2/4	5/5	5/6	8/15	6/8	0/0
10/02-10/08	0/0	0/0	7/7	1/7	8/18	6/8	5/7	3/3
10/09-10/15	1/1	2/7	0/0	2/2	0/4	0/1	0/0	0/0
10/16-10/22	1/1	2/2	3/6	0/3	4/6	12/17	0/0	2/2
10/23-10/29	0/4	1/2	4/4	3/3	0/0	1/1	0/2	1/1
10/30-11/05	0/0	0/0	1/1	4/4	1/1	2/2	4/6	2/3
11/06-11/12	0/1	6/10	3/5	7/8	0/0	0/0	1/1	0/0
11/13-11/19	0/0	0/0	3/5	1/2	1/1	1/1	0/1	0/0

Appendix D

Number of Marked Juvenile White Perch Recaptured in the 500-ft Seine/Number of White Perch Marked from each 100-ft Seine Sample

TEST SITE

Dates	Sand Bar		Quarry		Croton Park		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/11-09/17	0/0	0/0	0/0	0/1	1/1	1/2	0/0	0/0
09/18-09/24	0/0	0/0	0/0	0/0	0/0	0/0	1/1	0/0
09/25-10/01	0/0	0/0	0/0	0/0	4/6	16/20	0/0	0/0
10/02-10/08	1/1	0/0	2/6	4/7	2/2	0/0	1/1	2/2
10/09-10/15	0/0	1/1	0/0	0/0	0/1	0/0	0/0	0/0
10/16-10/22	2/3	1/1	1/3	0/0	1/1	2/3	0/0	1/1
10/23-10/29	0/0	0/0	1/1	0/1	0/0	0/0	0/0	0/0
10/30-11/05	0/0	0/0	1/2	0/2	0/0	0/0	2/2	0/0
11/06-11/12	3/6	0/0	1/3	1/2	0/0	0/0	2/4	0/0
11/13-11/19	0/0	0/0	0/0	1/1	0/0	0/0	0/1	0/0

Appendix D

Estimated Number of Juvenile Striped Bass Enclosed in the 500-ft Seine

	TEST SITE			
Dates	Sand Bar	Quarry	Croton Park	Vet's Beach
09/11-09/17	45	363	228	110
09/18-09/24	136	295	215	191
09/25-10/01	79	154	229	144
10/02-10/08	71	84	177	95
10/09-10/15	147	47	24	35
10/16-10/22	51	42	115	139
10/23-10/29	174	49	149	121
10/30-11/05	31	17	36	72
11/06-11/12	35	44	3	51
11/13-11/19	26	33	26	5

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Appendix D

Estimated Number of Juvenile White Perch Enclosed in the 500-ft Seine

Dates	TEST SITE			
	Sand Bar	Quarry	Croton Park	Vet's Beach
09/11-09/17	65	75	105	2
09/18-09/24	359	134	72	32
09/25-10/01	404	258	493	0
10/02-10/08	103	164	17	19
10/09-10/15	184	70	27	76
10/16-10/22	60	54	19	156
10/23-10/29	27	25	10	3
10/30-11/05	16	207	0	14
11/06-11/12	178	458	0	153
11/13-11/19	0	44	0	2

Appendix D

Results of Wilcoxon Signed Rank Tests for Equality of Catches in First and Second 100-ft Seine Tows and Equality of Recapture Rates for Fish Marked in the First and Second Tows

Equality of Catches

	n	T†	T*	p
Juvenile Striped Bass	34	290	0.128	~~0.201~~ >0.5
Juvenile White Perch	~~19~~ 21	143	1.99 0.156	~~0.047~~ 0.[illegible]

Equality of Recapture Rates

	n	T†	T*	p
Juvenile Striped	11	29		0.764
Juvenile White Perch	insufficient data			

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EFFICIENCY OF A 100-FT BEACH SEINE FOR ESTIMATING SHORE ZONE DENSITIES AT NIGHT OF JUVENILE STRIPED BASS, JUVENILE WHITE PERCH, AND YEARLING AND OLDER (≤150mm) WHITE PERCH

Science Services Division

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EFFICIENCY OF A 100-FT BEACH SEINE FOR ESTIMATING SHORE ZONE DENSITIES AT NIGHT OF JUVENILE STRIPED BASS, JUVENILE WHITE PERCH, AND YEARLING AND OLDER (≤150mm) WHITE PERCH

July, 1979

Prepared for

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
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New York, New York 10003

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by
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Power Authority of the State of New York

Prepared by

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SECTION I

SUMMARY AND CONCLUSIONS

Estimates of the absolute abundance of young striped bass and white perch in the shore zone of the Hudson River estuary based on an area-density method have been underestimates except when the estimates were adjusted for the catch efficiency of the sampling gear.[1] The Day Beach Seine Efficiency Study conducted in the Croton-Haverstraw region from mid-September through mid-November, 1977, yielded weighted mean catch efficiencies of 0.39 for juvenile striped bass and 0.07 for juvenile white perch for the 100-ft seine used during the day (TI 1978a). Estimates of total absolute abundance in the estuary have been derived from the standing crops in the shore zone (catch data collected during the day) combined with standing crops in the shoal and bottom strata (catch data collected at night). Therefore, empirical estimates of catch efficiency for the 100-ft seine used at night were needed, rather than make the assumption of equal efficiencies during day and night.

This study was designed to obtain these night catch efficiency estimates for juvenile striped bass and juvenile white perch. Yearling and older (≤150 mm) white perch were also caught in sufficient numbers to calculate night catch efficiency. The four sites used for the day efficiency study in 1977 were also sampled for the night efficiency study in 1978. The same methods used in 1977 (day) were repeated in 1978 (night), except that the night efficiency study was conducted from early September through early October, while sampling for the day efficiency study was done from mid-September to mid-November.

[1]Estimates of absolute abundance not adjusted for beach seine catch efficiency appeared in several previous reports, including TI (1975, 1977, 1978c, 1978d), McFadden (1977, 1977a), McFadden and Lawler (1977), and McFadden et al. (1978).

Juvenile Striped Bass

The night catch efficiency (weighted mean) was 0.255 (standard error: ± 0.002); efficiency estimates ranged from 0.024 to 0.840. Recapture rates during the efficiency study ranged from 0.308 to 0.962. Most escapement occurred as the 500-ft seine was hauled. Neither escapement nor catch efficiency was related to fish size, number of juvenile striped bass enclosed by the 500-ft seine, water temperature, conductivity, or turbidity.

The catch efficiency of the 100-ft seine was higher during the day (1977) for juvenile striped bass than at night (1978). Densities were similar in 1977 and 1978 in the time period and region where the efficiency studies were conducted. The night to day ratio of juvenile striped bass in the shore zone of the efficiency study area in 1978 unadjusted for catch efficiency was 2.63, indicating a higher density at night. Based on these day-night catch efficiency values and 1978 catch data collected during the night efficiency study, an estimate of the true abundance of juvenile striped bass in the shore zone at night can be obtained by multiplying the observed abundance in the shore zone during the day by an adjustment factor of 10.1.

Juvenile White Perch

The night catch efficiency (weighted mean) was 0.182 (standard error: ± 0.001); efficiency estimates ranged from 0.000 to 0.968. Recapture rates during the efficiency study ranged from 0.222 to 1.000. Most escapement occurred as the 500-ft seine was hauled. Neither escapement nor catch efficiency was related to fish size, number of juvenile white perch enclosed by the 500-ft seine, conductivity, or turbidity. Overall, water temperature did not appear to influence catch efficiency, but a decline in temperature between weeks 2 and 3 may have influenced the observed increase in catch efficiency.

The catch efficiency of the 100-ft seine was generally lower during the day (1977) for juvenile white perch than at night (1978).

Densities were similar in 1977 and 1978 in the time period and region where the efficiency studies were conducted. The night to day ratio of juvenile white perch in the shore zone of the efficiency study area in 1978 unadjusted for catch efficiency was 0.38, indicating a higher density during the day. Based on these day-night catch efficiency values and 1978 catch data collected during the night efficiency study, an estimate of the true abundance of juvenile white perch in the shore zone at night can be obtained by multiplying the observed abundance in the shore zone during the day by an adjustment factor of 2.1.

Yearling and Older (≤150 mm) White Perch

The night catch efficiency (weighted mean) was 0.262 (standard error: ± 0.004); efficiency estimates ranged from 0.000 to 1.756. Recapture rates during the efficiency study ranged from 0.429 to 1.000. Most escapement occurred as the 500-ft seine was hauled. Catch efficiency was unrelated to the number of yearling and older (≤150 mm) white perch enclosed by the 500-ft seine, water temperature, conductivity, or turbidity. Numbers caught were not sufficient to examine any effects of fish size on catch efficiency. No day efficiencies were available; therefore comparisons of day versus night efficiencies for the 100-ft seine were not possible. An estimate of the true abundance of yearling and older (≤150 mm) white perch in the shore zone at night can be obtained by multiplying the observed abundance in the shore zone during the day by an adjustment factor of 3.4. This adjustment factor was based on the 1977 day juvenile white perch catch efficiency, the 1978 night yearling and older (≤150 mm) white perch catch efficiency, and the catch data collected during the 1978 Night Beach Seine Efficiency Study.

SECTION II

INTRODUCTION

Since 1973, Texas Instruments (TI) has conducted a program designed to estimate the absolute abundance of juvenile striped bass and white perch in the Hudson River estuary through mark/recapture and area-density extrapolation methods. The area-density extrapolations were derived from stratified random sampling designs and were used to estimate the number of fish in various geographical regions and depth strata (TI 1975, 1977, 1978c; McFadden et al. 1977).

Density estimates of juvenile striped bass and white perch based on daytime sampling with a 100-ft (30m) beach seine were known to be underestimates of the true shore zone density when catch efficiency was assumed to be 100 percent (TI 1978a). Efficiency estimates from the 1977 day catch efficiency study and night to day catch ratios from sampling conducted in 1973 and 1974 were used to adjust beach seine data collected during the day to estimate standing crops in the shore zone at night. The shore zone estimates were then combined with the standing crop estimate for the shoal and bottom strata (from epibenthic sled samples taken at night) to obtain population estimates of juvenile striped bass and white perch. For recent estimates of population size for juvenile striped bass and white perch (McFadden et al. 1978), it was assumed that the day and night catch efficiences were equal, and that the observed higher densities in the shore zone at night were real and independent of catch efficiency. If, however, catch efficiency of the 100-ft seine at night were significantly different from day catch efficiency, revised adjustment factors should be calculated to convert observed day abundance in the shore zone to estimates of true abundance in the shore zone at night.

Some evidence in the literature suggested that catch efficiencies of sampling gear and shore zone densities for several fish species differed during day versus night. For example, Pennington and Grosslein (1978) reported diel differences in catchability of yellowtail flounders in trawls.

An inverse relationship between light intensity and tow net efficiency for sockeye salmon was observed by Robinson and Barraclough (1978). Kjelson and Colby (1977) found little difference in day and night efficiencies of a 6.1m otter trawl for estimating densities of pinfish and spot. Shore zone fish populations were observed to undergo diel changes in distribution and species composition (McCleave and Fried 1975). Although many of these observed changes were due to real differences in fish distribution, an unknown portion may be caused by changes in the fishes' behavior and ability to avoid the sampling gear used to assess diel changes. The degree to which the changes can be ascribed to increased vulnerability to the gear was dependent upon the species and sampling gear involved.

No data that compare day and night efficiency of a 100-ft seine in the capture of juvenile striped bass and white perch are currently available. This report presents the results of a study conducted in 1978 to acquire the necessary data and to meet the following primary objectives:

- Evaluate the catch efficiency of a 100-ft beach seine for estimating the densities of various sizes of striped bass and white perch in the shore zone at night.
- Compare catch efficiencies during day versus night.
- Provide additional data on night seine catches to enlarge the data base used to estimate the night to day catch ratio.
- Develop an updated set of adjustment factors which include both night catch efficiency and night to day differences in shore zone abundance and can be used to calculate estimates of population size in the shore zone at night for juvenile striped bass and juvenile white perch.

A secondary objective includes evaluation of any influences of fish density and water quality factors on night catch efficiency of the 100-ft seine.

SECTION III

METHODS

A. Data Collection

The four beach seine sites used for the 1977 day seine efficiency study (Figure III-1) were sampled for the 1978 night efficiency study. Night efficiency tests were conducted on four consecutive nights, every other week from 3 September through 7 October. All sites were relatively shallow with a gradually sloping bottom. Bottom types, depths, and vegetation varied somewhat among sites (Table III-1). Sampling commenced about one half hour after dark. The site selected for the efficiency test on a particular night was not sampled during the day of the test.

The general sampling procedures for this study were similar to those used for the day efficiency study (TI 1978a). At the beginning of each test, one end of the 500-ft seine (Table III-2) was secured on the shore line near the high water line. The boat was then backed from shore as the seine was payed out over the bow. When 167-ft (51m) of the net were set, an anchor was tied to the lead line to keep the seine in place. The boat was turned 90° to port and the next 167-ft of the seine were set parallel to the shore line. Another anchor was placed on the lead line, the boat was turned 90° to port, and the remaining seine was set toward the shore line. This procedure produced an approximately square enclosure large enough to permit use of the 100-ft seine (Table III-2) within the enclosure (Figure III-2).

After waiting 1 hour for the fish to recover from the disturbance caused by setting the 500-ft seine, the efficiency tests were begun. A 16-ft boat was drifted over the 500-ft seine and run to shore under power. One end of the 100-ft seine was secured on the shore line while the boat was backed away extending the seine perpendicular to the shore line. When the seine was fully extended, the boat was turned towards port and the seine was towed to shore forming an arc. The 100-ft seine was then hauled to shore.

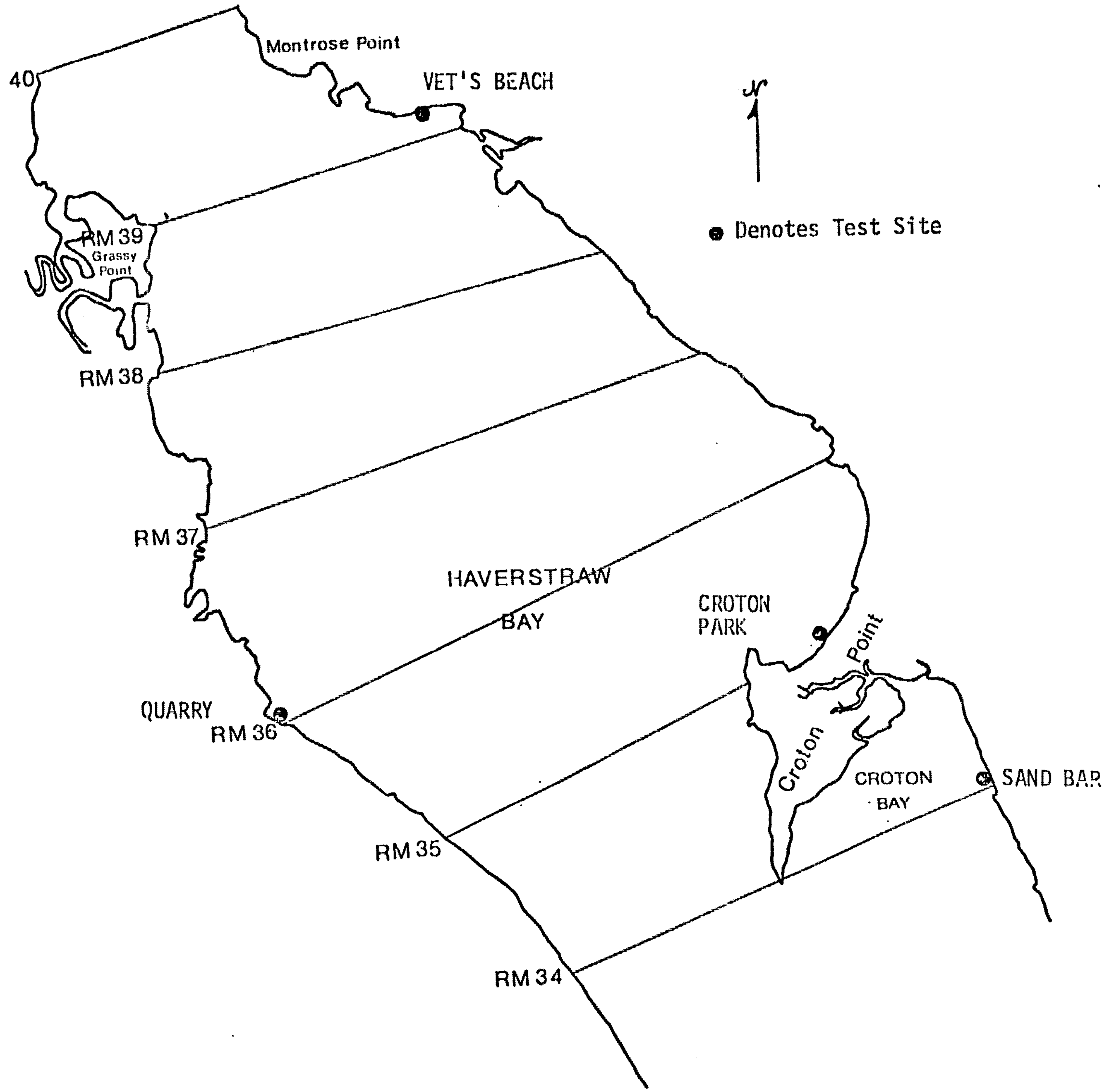

Figure III-1. Sampling Sites Used for Beach Seine Efficiency Studies in 1977 and 1978 (RM = River Mile)

Table III-1

Physical Characteristics of Sampling Sites Used in 1977 and 1978 Beach Seine Efficiency Studies

Site	Location		Bottom Type	Vegetation	Depth*
	River Mile	Site			
1) Sand Bar	34	East Shore	Sand	Sparse	2ft (0.6m)
2) Croton Park	35	East Shore	Sand	Sparse-Moderate	2ft (0.6m)
3) Quarry	36	West Shore	Fine Sand Changing to Mud	Moderate	4ft (1.2m)
4) Vet's Beach	39	East Shore	Coarse Sand and Gravel	Sparse	6ft (1.8m)

*at mean low water approximately 100 ft (30m) from shore.

Table III-2

Dimensions of Beach Seines Used in Catch Efficiency Studies in 1977 and 1978

Gear	Wings	Bag
100-ft (30m) Seine	2-40X8 ft (12X2.4m)	20X10 ft (6X3m)
	Mesh: 3/8 in (0.95cm)	Mesh: 3/16 in (0.48cm)
500-ft (152m) Seine	1-375X10 ft (114X3m)	50X12 ft (15X4m)
	Mesh: 3/8 in (0.95cm)	Mesh: 3/16 in (0.48cm)
	1-75X10 ft (23X3m)	
	Mesh: 3/8 in (0.95cm)	

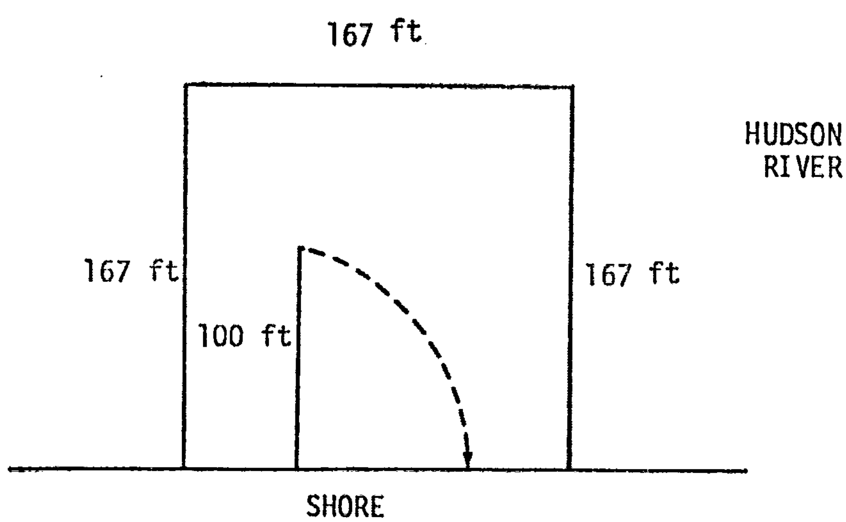

Figure III-2. Net Arrangement for Beach Seine Efficiency Studies

This procedure followed TI's standard sampling technique for the 100-ft beach seine described in TI (1975).

The fish collected from the first 100-ft seine were identified by species and counted by length class (0-Div, Div + 1 mm to 150 mm, 151 mm to 250 mm, 251 mm +).[1] Striped bass and white perch were marked by clipping the tip of the upper lobe of the caudal fin. Other species hardy enough to withstand clipping and handling (e.g. centrarchids and goldfish) were also marked. Test fish were anaesthetized with MS-222 prior to marking. After marking, fish were placed in a recovery bucket and released when equilibrium was regained. Marking mortality was not evaluated but was assumed to be negligible during the short time required for sample workup. Beginning during the first week of testing, combinations of operculum clips were used to help distinguish fish marked from previous tests and the few fish with fin rot. All fish in good condition were then released inside the enclosure.

An hour after the marked fish from the first 100-ft seine tow were released, a second tow was taken with the 100-ft seine. Striped bass, white perch, and other markable species were marked by clipping the operculum and tip of the lower caudal fin lobe. Again all fish in good condition were released inside the 500-ft seine enclosure. Previously marked fish were counted as part of the total catch but were not clipped again.

After the marked fish were allowed to disperse (15 to 30 min), the anchors were detached from the 500-ft seine and it was hauled to shore. All fish were counted and identified. Subsamples of juvenile white perch and striped bass were randomly selected for total length measurements to assess any size-related differences in catch efficiency. Up to 20 fish per species

[1]From 1 January until 1 June, the Div (division) represents the upper total length limit (mm) of yearling fish (except for Atlantic tomcod). On 1 June, the division becomes the upper limit of that year class (young-of-the-year). For Atlantic tomcod, the division represents the upper total length limit for yearling fish from 1 January - 31 March. On 1 April, the division applies to that year class. Since young fish grow rapidly through the sampling season, division limits are updated regularly.

of the test fish which were marked from each of the 100-ft tows and recaptured in the 500-ft seine were measured for total length. A subsample [up to 20 fish per species (same species as test fish)] of unmarked fish collected in the 500-ft seine were also measured. Marked fish were preserved in 10% formalin; all other fish were released.

Each night during the test week while an efficiency test was being conducted on a selected beach site, one sample (defined as supplementary night beach seines) was collected from each of the other three test sites with the 100-ft seine. These samples were collected to provide additional information on seine catches at night during the period of the night seine efficiency study. All fish from these samples were identified, counted by length class, and released.

Water quality factors were measured and a water sample was collected for each 500-ft seine enclosure, 100-ft test seine, and supplementary 100-ft seine sample. These water samples and water quality data were taken after each 100-ft test seine and after initially setting the 500-ft seine enclosure. The procedures used were standard for beach seine sampling and were described in TI (1978b).

B. Data Analysis

The catch efficiency for each of the 100-ft seine tows at night was calculated as the ratio of fish density determined from 100-ft seine samples to the density determined from a direct count of the 500-ft seine sample corrected for escapement:

$$E_{100i} = \left(\frac{C_{100i}}{A_{100}}\right) \Bigg/ \left(\frac{C_{500i}}{A_{500} \cdot e_{500i}}\right) \qquad (1)$$

where

E_{100i} = estimated catch efficiency of 100-ft seine for species i

C_{100i} = catch of species i in the 100-ft seine per individual tow

A_{100} = area swept by 100-ft seine

C_{500i} = catch of species i in the 500-ft seine

A_{500} = area enclosed by 500-ft seine

e_{500i} = fraction of marked fish of species i caught in 500-ft seine

Fish were assumed to be randomly distributed throughout the enclosure. Since A_{500} was approximately 27,900 ft^2 and A_{100} was estimated at 4,844 ft^2 (TI 1978a), equation (1) was rearranged to:

$$E_{100i} = \left(\frac{A_{500}}{A_{100}}\right) \cdot \left(C_{100i} \Big/ \frac{C_{500i}}{e_{500i}}\right) \quad (2)$$

$$= \left(\frac{27{,}900\ \text{ft}^2}{4{,}844\ \text{ft}^2}\right) \cdot \left(C_{100i} \Big/ \frac{C_{500i}}{e_{500i}}\right) \quad (3)$$

$$\approx \frac{6 \cdot C_{100i} \cdot e_{500i}}{C_{500i}} \quad (4)$$

Equation (4) was used to calculate night efficiency values.

The weighted mean catch efficiency ($\bar{E}$) was calculated using the following equation:

$$\bar{E} = \frac{R}{2(\Sigma \hat{n}_i)} (\Sigma \text{ catches } T_1 + T_2) \quad (5)$$

where

$\bar{E}$ = weighted mean catch efficiency

R = ratio of the area swept by the 500-ft seine to the area swept by the 100-ft seine (~6)

$\hat{n}$ = estimated number of fish enclosed in the 500-ft seine after correcting for escapement

Catches $T_1 + T_2$ = Catches of 100-ft seine test tows 1 and 2 combined

The standard error of the weighted mean catch efficiency (S_m) was calculated using the following equation:

$$S_m = \sqrt{\frac{S^2}{n}}$$

where

S^2 = variance

n = number of observations

Adjustments to the shore zone densities to reflect seine catch efficiencies are applied to all of the sampling regions to estimate night standing crops (McFadden et al. 1978). Thus, in the practical application of catch efficiency adjustments, the data are pooled across sampling sites. Therefore, sites were used as replicates in all analyses for the 1978 night efficiency studies. This pooling was further justified because there were no significant differences in catch data among weeks or sites for juvenile striped bass and juvenile white perch (Appendix F, Table F-1).

Catch efficiency values were calculated for juvenile striped bass, juvenile white perch, and yearling and older ($\leq$150 mm) white perch. Escapement from the 500-ft seine ($1-e_{500i}$) was estimated from the fraction of marked fish which were recaptured when the 500-ft seine was hauled. The nature of the escapement, whether continuous or occurring when the 500-ft seine was hauled, was determined by comparing recapture rates for juvenile striped bass, juvenile white perch, and yearling and older ($\leq$150 mm) white perch marked in the first versus the second 100-ft seine sample with a Wilcoxon signed rank test (Hollander and Wolfe 1973). If escapement from the 500-ft seine was continuous, then the recapture rate for fish marked in the first tow should have been lower than for the second tow, since those marked fish caught in the first tow had more time to escape. If recapture rates from both tows were approximately equal, then most escapement probably occurred as the 500-ft seine was hauled. Additional analyses necessary to evaluate some of the factors that could potentially influence the estimation of catch efficiency are described in the following paragraphs.

Analysis of variance (ANOVA) was used to test for any differences among test tows (the two 100-ft seine tows and the 500-ft seine tow), differences across weeks, differences between years for density and catch efficiency, and influences of fish length and water temperature on catch efficiency (Sokal and Rohlf 1969). To meet the assumption of homogeneity of variance, the catch, catch efficiency, and fish length data were transformed using $Z = X^P$ (Healy and Taylor 1962), square root, and Log_{10} x transformations, respectively. A priori orthogonal and non-orthogonal t-tests were used to detect differences in fish lengths between tows and differences in water temperature data among weeks (Kirk 1968).

Analysis of variance was conducted on mean total lengths (mm) from test tows 1 and 2 of the 100-ft seine for juvenile striped bass during weeks 1 and 2 and juvenile white perch during weeks 2 and 3 to assess any observed size-related differences in recapture rates between tows 1 and 2. These weeks were selected because of similarities in sample size (Appendix F, Table F-8). A priori orthogonal t-tests, by week, using a common error term were used on length data from test tows 1 and 2 versus the 500-ft seine tow to determine whether catch efficiency was related to fish size.

Scatter plots were generated to compare catch efficiency versus: the estimated number of the target species and age group enclosed, water temperature, conductivity, and turbidity for juvenile striped bass, juvenile white perch, and yearling and older ($\leq$150 mm) white perch (Appendix E, Figures E-1 to E-14).

Catch efficiencies during the day (1977 study) were compared with night catch efficiencies for juvenile striped bass and juvenile white perch via a 3-way (diel, week, and tow) analysis of variance to determine whether the catch efficiency of the 100-ft seine varied during the day and night. Day catch efficiences were not available for yearling and older ($\leq$150 mm) white perch. Day efficiency tests in 1977 were done weekly beginning 11 September through 19 November, and the night catch efficiency tests were conducted biweekly beginning 3 September through 7 October; therefore, to directly compare catch efficiencies during day and night and catch data between the two years, the following weeks were selected:

	1977 (DAY)	1978 (NIGHT)
Week 1	09/11-17	09/03-09
Week 2	09/18-24	09/17-23
Week 3	10/02-08	10/01-07

To examine any differences in shore zone density of juvenile striped bass and juvenile white perch from 1977 to 1978, catch data collected during the routine Beach Seine Survey (100-ft seine) in each year were compared for the three selected weeks in September through early October (when the efficiency studies were conducted) using analysis of variance. Catches from the Beach Seine Survey (day) and supplementary night beach seines in 1978 were also examined by analysis of variance to detect any variations in day versus night densities for juvenile striped bass and add information to the existing data base on night to day catch ratios for juvenile striped bass and juvenile white perch.

Additional tests were conducted, where appropriate, to evaluate relevant hypotheses that were suggested as the results emerged. These tests are described in the Results and Discussion section.

SECTION IV

RESULTS AND DISCUSSION

The 1978 Night Beach Seine Efficiency study made it possible to calculate and evaluate catch efficiency estimates for the 100-ft seine used at night, compare day (1977) and night (1978) catch efficiencies, and generate 1978 night to day catch ratios for juvenile striped bass and juvenile white perch. Yearling and older (≤150 mm) white perch were also collected in sufficient numbers to calculate catch efficiency for the 100-ft seine at night and a night to day catch ratio.

A. NIGHT CATCH EFFICIENCY ESTIMATES

1. Juvenile Striped Bass

Night catch efficiency estimates for juvenile striped bass ranged from 0.024 to 0.840, with an arithmetic mean of 0.259 (standard error: ±0.040) (Table IV-1). Comparisons of catch efficiency with the estimated number of juvenile striped bass enclosed showed no clear association, but there were indications of increased variation in the efficiency estimates at densities falling near the low end of the observed range (Appendix E, Figure E-1). The absence of variation at the high end of the observed range was due to the fact that few samples containing large numbers of fish were collected. To compensate for any effects that relatively small catches may have on efficiency, a mean efficiency (from test tows 1 and 2 combined) weighted by the estimated number of juvenile striped bass enclosed (Appendix F, Table F-2) was used as a best estimate of night catch efficiency. The weighted mean catch efficiency (from test tows 1 and 2) was 0.255 (± 0.002).

Recapture rates (number of marked fish recaptured in the 500-ft seine/number of fish marked) ranged from 0.308 to 0.962 for all tests that had marked fish (Table IV-2). Mark and recapture data are presented in Appendix F, Table F-9. Recapture rates for fish marked from test tows 1 and 2 with the 100-ft seine were not significantly different (Wilcoxon signed

Table IV-1

Night Catch Efficiencies for Juvenile Striped Bass
in 100-ft Beach Seines in 1978

Dates	Test Site							
	Sand Bar		Croton Park		Quarry		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/03-09	0.210	0.202	0.840	0.647	0.375	0.047	0.267	0.163
09/17-23	0.293	0.155	0.152	0.304	0.449	0.496	0.115	0.208
10/01-07	0.394	0.112	0.290	0.024	0.197	0.131	0.028	0.110

Grand Arithmetic Mean 0.259 (±0.040)*
Weighted Mean Catch Efficiency 0.255 (±0.002)*

*Standard Error

IV-2

Table IV-2

Recapture Rates (Number Recaptured in 500-ft Seine Sample/Number Marked from 100-ft Seine Test Tows 1 and 2) for Juvenile Striped Bass during Night Beach Seine Efficiency Study, 1978

Dates	Test Site			
	Sand Bar	Croton Park	Quarry	Vet's Beach
09/03-09	0.551	0.889	0.857	0.680
09/17-23	0.885	0.516	0.862	0.308
10/01-07	0.962	0.500	0.600	0.400

rank test, Appendix F, Table F-7), which indicated that escapement from the enclosure was not a continuous process, but occurred primarily after the second 100-ft seine tow, probably when the 500-ft seine was hauled. Since recapture rates were not significantly different, fish marked in both 100-ft seine tows were pooled to calculated e_{500} in equation 1.

2. Juvenile White Perch

Night catch efficiencies for juvenile white perch ranged from 0.000 to 0.968, with an arithmetic mean of 0.260 (standard error: $\pm$0.052) (Table IV-3). The scatter plot of catch efficiency versus estimated number of juvenile white perch enclosed suggested no clear association, but an increase in the variation in catch efficiency estimates at low densities was observed (Appendix E, Figure E-4). The absence of variation at the high end of the observed range is due to the fact that few samples containing large numbers of fish were collected. Accordingly, a weighted mean (weighted by the estimated number of juvenile white perch enclosed [Appendix F, Table F-4]) was used as a best estimate of night catch efficiency. The weighted mean catch efficiency (from test tows 1 and 2) was 0.182 ($\pm$ 0.001).

Recapture rates for juvenile white perch ranged from 0.222 to 1.000 for all tests that had marked fish (Table IV-4). Mark and recapture data are presented in Appendix F, Table F-3. Recapture rates from test tows 1 and 2 were not significantly different (Wilcoxon signed rank test, Appendix F, Table F-7); thus most of the escapement occurred when the 500-ft seine was hauled. Since recapture rates were not significantly different, fish marked in both 100-ft seine tows were pooled to calculate e_{500}.

3. Yearling and Older ($\leq$150 mm) White Perch

Night catch efficiencies for yearling and older ($\leq$150 mm) white perch ranged from 0.000 to 1.756, with an arithmetic mean of 0.298 (standard error: $\pm$0.092) (Table IV-5). A scatter plot of catch efficiency versus the estimated number of yearling and older ($\leq$150 mm) white perch enclosed showed

Table IV-3

Night Catch Efficiencies for Juvenile White Perch in 100-ft Beach Seines in 1978

Dates	Test Site							
	Sand Bar		Croton Park		Quarry		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/03-09	0.372	0.212	0.968	0.581	0.120	0.030	0.605	0.233
09/17-23	0.170	0.000	0.167	0.167	0.159	0.094	0.307	0.102
10/01-07	0.395	0.118	0.857	0.000	0.064	0.042	0.268	0.214

Grand Arithmetic Mean 0.260 (±0.052)*
Weighted Mean Catch Efficiency 0.182 (±0.001)*

*Standard Error

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Table IV-4

Recapture Rates (Number Recaptured in 500-ft Seine Sample/Number Marked from 100-ft Seine Test Tows 1 and 2) for Juvenile White Perch during Night Beach Seine Study, 1978

Dates	Test Site			
	Sand Bar	Croton Park	Quarry	Vet's Beach
09/03-09	0.909	0.889	0.857	0.889
09/17-23	0.750	0.500	0.750	0.222
10/01-07	0.846	1.000	0.600	0.667

Table IV-5

Night Catch Efficiencies for Yearling and Older (≤150mm) White Perch in 100-ft Beach Seines in 1978

Dates	Sand Bar		Croton Park		Quarry		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/03-09	0.351	0.146	1.756	0.439	0.250	0.000	0.324	0.000
09/17-23	0.138	0.000	0.000	0.522	0.462	0.000	0.590	0.098
10/01-07	0.162	0.162	1.500	0.000	0.000	0.000	0.088	0.176

Test Site

Grand Arithmetic Mean 0.298 (+0.092)*
Weighted Mean Catch Efficiency 0.262 (±0.004)*

*Standard Error

no clear trend (Appendix E, Figure E-7). But catch efficiency estimates greater than 1.0 for individual samples indicated that the relatively small catches and/or a non-random spatial distribution of fish within the 500-ft seine were affecting the estimation of efficiency. For this reason, a weighted mean catch efficiency [weighted by the estimated number of yearling and older (≤150 mm) white perch enclosed (Appendix F, Table F-6)] was used. The weighted mean catch efficiency (from test tows 1 and 2) was 0.262 (± 0.004).

Recapture rates for yearling and older (≤150 mm) white perch ranged from 0.429 to 1.000 for all tests that had marked fish (Table IV-6). Mark and recapture data are presented in Appendix F, Table F-5. Weighted site mean recapture rates were used to calculate the estimated number of fish enclosed in the 500-ft seine before escapement because several of the weekly site recapture rates were 1.000 due to small sample size. Recapture rates for fish marked from test tows 1 and 2 with the 100-ft seine were not significantly different (Wilcoxon signed rank test, Appendix F, Table F-7). This indicates that escapement from the enclosure was not continuous, but primarily occurred when the 500-ft seine was hauled. Since recapture rates were not significantly different, fish marked in both test tows with the 100-ft seine were pooled to calculate e_{500}.

4. Yearling and Older (>150 mm) White Perch

Yearling and older (>150 mm) white perch were caught infrequently and in small numbers (Appendix B). The data were thus insufficient to analyze for catch efficiency. The pooled recapture rate for yearling and older (>150 mm) white perch was 0.636.

B. ASSOCIATION BETWEEN FISH LENGTH AND NIGHT CATCH EFFICIENCY

There was no apparent relationship between fish length and night catch efficiency for juvenile striped bass and juvenile white perch. The only significant difference in total length was associated with sampling

Table IV-6

Recapture Rates (Number Recaptured in 500-ft Seine Sample/Number Marked from 100-ft Seine Test Tows 1 and 2) for Yearling and Older (≤150mm) White Perch during Night Beach Seine Efficiency Study, 1978. Tests with Zero Fish Marked Are Denoted by (*)

Dates	Test Site			
	Sand Bar	Croton Park	Quarry	Vet's Beach
09/03-09	0.765	0.846	1.000	0.500
09/17-23	1.000	0.500	1.000	0.429
10/01-07	0.500	1.000	*	1.000
Weighted Site Mean[1]	0.762	0.824	1.000	0.545

[1]Weighted site means were used to calculate the estimated number of fish ($\hat{n}$) in the 500-ft net before escapement.

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weeks which simply reflected the growth of the fish over the course of the study (Tables IV-7 and IV-8). There were no differences in length between test tows 1 and 2. The numbers of yearling and older (≤150 mm) white perch collected (See Appendix B) were not sufficient to examine any associations between fish length and catch efficiency.

To determine whether escapement during the efficiency tests was size related, the combined length data from the 100-ft seine tows were compared to length data from the 500-ft seine tows. No significant differences were observed for juvenile striped bass (Table IV-9). There was a significant difference observed for juvenile white perch in week 2 (Table IV-10). Smaller fish were caught in week 2, suggesting that the larger fish may have been avoiding the 100-ft seine. However, the absence of a consistent response over all 3 weeks suggests that this difference was probably due to chance variation. In general, escapement does not appear to be size related for juvenile striped bass or juvenile white perch.

C. ASSOCIATION BETWEEN SELECTED WATER QUALITY FACTORS AND NIGHT CATCH EFFICIENCY

Water temperature and turbidity were selected as two water quality factors which could directly affect night catch efficiency. Within a normal range of water temperatures, the activity of fish can be expected to decrease as water temperatures decrease. Hence, if gear avoidance is a function of activity level, then changes in water temperature may influence the calculated catch efficiency values. Changes in turbidity could also be important if the changes were of sufficient magnitude to interfere with the fishes' vision and reduce their ability to avoid the seine. Conductivity may influence the abundance of juvenile fishes present in the shore zone; hence potential effects of conductivity on catch efficiency were also examined.

Examination of scatter plots of night catch efficiency versus water temperature and turbidity showed no clear associations for juvenile striped bass (Appendix E, Figures E-2 and E-3), juvenile white perch (Appendix E, Figures E-5 and E-6), and yearling and older (≤150 mm) white

Table IV-7

Analysis of Variance on Transformed† Length Data of 100-ft Seine Tows 1 and 2 (Night Beach Seine Efficiency Tests) for Juvenile Striped Bass during Weeks 1 and 2 in 1978

Source of Variation	df	SS	MS	F	p
Weeks (Random)	1	0.02589	0.02589	10.113	0.002*
Tows (Fixed)	1	0.00118	0.00118	4.069	0.340
Weeks x Tows	1	0.00029	0.00029	0.113	0.737
Error	174	0.44544	0.00256		
Total	177	0.47280			

df = degrees of freedom
SS = sum of the squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α=0.05)
† = Log_{10} x transformation

Table IV-8

Analysis of Variance of Transformed†Length Data of 100-ft Seine Tows 1 and 2 (Night Beach Seine Efficiency Tests) for Juvenile White Perch during Weeks 2 and 3 in 1978

Source of Variation	df	SS	MS	F	p
Weeks (Random)	1	0.01539	0.01539	4.949	0.031*
Tows (Fixed)	1	0.00864	0.00864	13.500	0.216
Weeks x Tows	1	0.00064	0.00064	0.206	0.652
Error	44	0.13684	0.00311		
Total	47	0.16151			

df = degrees of freedom
SS = sum of the squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α=0.05)
† = Log_{10} x transformation

Table IV-9

A Priori Orthogonal Tests using t Ratios for Transformed† Length Data of Test Tows 1 and 2 (100-ft Seines) vs 500-ft Seine, by Week, for Juvenile Striped Bass in 1978

Week	Transformed Length Mean for Tow 1 and Tow 2 Combined	Transformed Length Mean for 500-ft Tow	t	p
1	1.910	1.912	0.255	0.806
2	1.934	1.944	1.136	0.266
3	1.960	1.961	0.092	>0.900

df = degrees of freedom = 447
MS = mean square error (common) = 0.002846
α = 0.05
t = test statistic
p = probability of a larger t
† = Log_{10} x transformation

Table IV-10

A Priori Orthogonal Tests Using t Ratios for Transformed†
Length Data of Test Tows 1 and 2 (100-ft Seines)
vs 500-ft Seine, by Week, for Juvenile
White Perch in 1978

Week	Transformed Length Mean for Tow 1 and Tow 2 Combined	Transformed Length Mean for 500-ft Tow	t	p
1	1.862	1.858	0.498	0.628
2	1.844	1.867	2.016	0.045*
3	1.892	1.886	0.508	0.621

df = degrees of freedom = 354
MS = mean square error (common) = 0.002580
* = significant (α=0.05)
t = test statistic
p = probability of a larger t
† = Log_{10} x transformation

perch (Appendix E, Figures E-8 and E-9). Plots of catch efficiency from 1977 and 1978 versus conductivity (Appendix E, Figures E-10 to E-14) indicated no clear associations for juvenile striped bass, juvenile white perch, and yearling and older (≤150 mm) white perch. For the ranges of water temperature (approximately 17 to 27°C), turbidity [approximately 1 to 85 FTU (Formazin Turbity Unit)], and conductivity (approximately 6800 to 11500 in 1978 and 260 to 12900 in 1977) encountered during the night seine efficiency study, there were no discernable effects of these water quality factors on catch efficiency. However, temperature declines between weeks 2 and 3 may have influenced the observed increase in catch efficiency for juvenile white perch (Table IV-19). Colder water temperatures cause fish activity to decrease. This decrease in activity may also decrease the fishes' ability to avoid the seine causing catch efficiency to increase.

D. COMPARISON OF CATCH EFFICIENCIES DURING DAY (1977) AND NIGHT (1978)

1. Juvenile Striped Bass

The catch efficiencies of the 100-ft seine for juvenile striped bass during the day (1977) and night (1978) were significantly different (Table IV-11). Mean (arithmetic) catch efficiency was lower at night than during the day (0.259 versus 0.474). To determine whether this day-night difference could be confounded with differences in density of juvenile striped bass between years, since the day efficiency data were collected in 1977 and the night efficiency data were collected in 1978, day catches in Beach Seine Survey samples collected during the three selected weeks in 1977 and 1978 (see METHODS) and in the region of the beach seine efficiency tests (Croton-Haverstraw) were compared (Table IV-12). Yearly differences were not significant. Furthermore, catches of juvenile striped bass were significantly greater in the shore zone at night in 1978 during the time period (September through early October) and in the region (Croton-Haverstraw) where the night seine efficiency study was conducted (Tables IV-13 and IV-14). Therefore, the day versus night catch efficiency differences appear to reflect a diel difference in the behavior of juvenile

Table IV-11

Analysis of Variance of Transformed†Catch Efficiencies of 100-ft Beach Seine for Juvenile Striped Bass during Day (1977) and Night (1978)

Source of Variation	df	SS	MS	F	p
Diel (Fixed)	1	0.36825	0.36825	127.865	0.008*
Weeks (Random)	2	0.22151	0.11075	2.382	0.107
Diel x Weeks	2	0.00577	0.00288	0.062	0.940
Tows (Fixed)	1	0.04843	0.04843	1.208	0.386
Diel x Tows	1	0.00732	0.00732	0.456	0.569
Weeks x Tows	2	0.08021	0.04010	0.862	0.431
Diel x Weeks x Tows	2	0.03212	0.01606	0.345	0.710
Error	36	1.67386	0.04650		
Total	47	2.43747			

Diel = day vs night
df = degrees of freedom
SS = sum of squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α=0.05)
† = square root transformation

Table IV-12

Analysis of Variance on Transformed†Catch Data from Day Beach Seine (100-ft) Survey Samples for Juvenile Striped Bass in 1977 and 1978

Source of Variation	df	SS	MS	F	p
Year	1	0.01974	0.01974	0.021	0.885
Error	98	93.23016	0.95133		
Total	99	93.24990			

df = degrees of freedom
SS = sum of the squares
MS = mean square
F = test statistic
p = probability of larger F
† = $Z = X^{-0.252}$ [based on previous Supplementary Night Beach Seine (SNBS) transformation]
α = 0.05

Table IV-13

Analysis of Variance on Transformed†Catch Data of Day Beach Seine Survey (100-ft) and Supplementary Night Beach Seines (100-ft) for Juvenile Striped Bass in 1978

Source of Variation	df	SS	MS	F	p
Diel	1	6.33799	6.33799	12.743	<0.001*
Error	70	34.81485	0.49736		
Total	71	41.15284			

Diel = day vs night
df = degrees of freedom
SS = sum of the squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α=0.05)
† = $Z = X^{-0.252}$ (based on previous SNBS transformation)

Table IV-14

Mean and Variance of Catch Data from Day Beach Seine Survey (BSS) and Supplementary Night Beach Seines (SNBS) for Juvenile Striped Bass in 1978

BSS (Day)			SNBS (Night)		
Mean	S^2	n	Mean	S^2	n
15.139	1,240.009	36	39.889	1,044.159	36

S^2 = variance
n = number of observations

striped bass. Studies of diel patterns in the behavior, distribution, and feeding of bluegills indicated that they moved onshore after sunset and offshore after sunrise (Baumann and Kitchell 1974). Emery (1973) found that the number of fish apparent at night in shallow water was greater than in the daytime primarily because of the influx of offshore species and the lack of cover for resting diurnal species.

2. Juvenile White Perch

Night catch efficiencies for juvenile white perch were significantly higher than day catch efficiencies for weeks 1 and 2, but similar for week 3. The analysis of variance on catch efficiencies showed a significant diel by weeks interaction (Table IV-15). Since the interaction was significant, mean catch efficiencies were pooled across diel and week effects to detect the weekly differences (Table IV-16).

To determine whether these day versus night differences in catch efficiency were associated with differences in density between 1977 and 1978, day Beach Seine Survey catch data collected from the same region (Croton-Haverstraw) and time period (September through early October) in 1977 and 1978 were compared. No significant yearly differences were detected (Table IV-17); thus, density differences between years do not appear to be the cause of the diel effect observed in the catch efficiency values.

Rather, the results suggest that there are diel differences in the behavior of juvenile white perch. This possibility was further examined by comparing day Beach Seine Survey catches with catches taken in the night supplementary beach seines in 1978 (Table IV-18). The variances of the mean day and night catches were not equal, so a statistical comparison of the means was not possible, but catches in the shore zone appeared to be greater during the day. The fact that the variances were different demonstrated an important aspect of the day versus night distributions of juvenile white perch in the shore zone. The observed differences between the means and the variances of day and night catches strongly suggest an aggregation of

Table IV-15

Analysis of Variance of Transformed† Catch Efficiencies of 100-ft Beach Seine for Juvenile White Perch during Day (1977) and Night (1978)

Source of Variation	df	SS	MS	F	p
Diel (Fixed)	1	0.70988	0.70988	3.118	0.219
Weeks (Random)	2	0.34128	0.17064	3.392	0.045*
Diel x Weeks	2	0.45536	0.22768	4.526	0.018*
Tows (Fixed)	1	0.26001	0.26001	5.777	0.138
Diel x Tows	1	0.10567	0.10567	10.190	0.086
Weeks x Tows	2	0.09002	0.04501	0.895	0.418
Diel x Weeks x Tows	2	0.02075	0.01037	0.206	0.815
Error	36	1.81100	0.05031		
Total	47	3.79397			

Diel = day vs night
df = degrees of freedom
SS = sum of squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α=0.05)
† = square root transformation

Table IV-16

Mean and Variance of Day vs Night Catch Efficiencies for 100-ft Seine for Juvenile White Perch in 1977 and 1978

Day (1977)				Night (1978)			
Weeks	Mean	S^2	n	Weeks	Mean	S^2	n
09/11-17	0.031	0.002	8	09/03-09	0.390	0.097	8
09/18-24	0.029	0.004	8	09/17-23	0.146	0.008	8
10/02-08	0.270	0.071	8	10/01-07	0.245	0.078	8

S^2 = variance
n = number of observations

Table IV-17

Analysis of Variance on Transformed†Catch Data from Day Beach Seine Survey (100-ft) Samples for Juvenile White Perch in 1977 and 1978

Source of Variation	df	SS	MS	F	p
Week (Random)	2	1.41000	0.70500	4.009	0.021*
Year (Fixed)	1	0.24300	0.24300	2.945	0.228
Week x Year	2	0.16500	0.08250	0.469	0.627
Error	94	16.53084	0.17586		
Total	99	18.34884			

df = degrees of freedom
SS = sum of the squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α=0.05)
† = $Z = X^{-0.074}$ (based on 1977 and 1978 Beach Seine Survey data)

Table IV-18

Mean and Variance of Catch Data from Day Beach Seine Survey (BSS) and Supplementary Night Beach Seines (SNBS) for Juvenile White Perch in 1978

BSS (Day)			SNBS (Night)		
Mean	S^2	n	Mean	S^2	n
32.879	3,093.797	33	12.424	204.127	33

S^2 = variance
n = number of observations

juvenile white perch during the day, and a more uniform, dispersed distribution at night. Spatial distribution of juvenile white perch during the day was described as a case 2 [fish inside the 500-ft seine enclosure were aggregated to the same degree as those outside the enclosure (TI 1978a)]; while a case 1 disposition (fish inside the enclosure are randomly distributed) may have existed for white perch at night. In contrast, juvenile striped bass exhibited a more consistent level of aggregation during day and night [Table IV-14 (possibly a case 2)].

Thus, a summary of the observations is this: even though juvenile striped bass are more abundant in the shore zone at night while juvenile white perch appear to be more abundant in the shore zone during the day, seine catch efficiencies for the two species are similar at night but greater for striped bass than white perch during the day. While these differences are difficult to fully explain with the available data, several plausible explanations can be offered.

The differences in the apparent aggregation behavior of the two Morone species provided an opportunity to examine the relative effects of density-distribution and behavior on the catch efficiency of the 100-ft seine. For example, juvenile striped bass and juvenile white perch differed significantly in density-distribution in the shore zone at night (compare Table IV-14 with Table IV-18), but they had very similar mean (arithmetic) night catch efficiencies (0.259 for striped bass in weeks 1 through 3; and 0.268 for white perch in weeks 1 and 2 only, since the day-night difference in week 3 was inconsistent). These results suggest that density-distribution and behavior have less of an effect on night catch efficiency than on day catch efficiency. During the day, behavioral factors appear to be important influences on the observed differences in mean (arithmetic) catch efficiencies of 0.474 for striped bass (weeks 1 through 3) compared to 0.030 for white perch (weeks 1 and 2 only). Species specific habit preferences may also be involved.

Visual observations by TI's Beach Seine Survey crews and the results of analyses on data collected in the Indian Point Standard Stations program (TI 1976, 1978b; McFadden et al. 1978) indicate that juvenile white perch abundance is generally greatest on those beaches that are sheltered and most heavily vegetated (and also more difficult to seine), while juvenile striped bass seem to prefer open, unvegetated beaches adjacent to deep water (where seining is relatively easy). Thus, the observed differences in the day catch efficiency estimates for the two species may partially reflect basic differences in the ease of seining the two general microhabitats that striped bass and white perch occupy.

If juvenile white perch do aggregate either in or near cover (vegetation) during the day (i.e., in areas difficult to seine), then even if they are most dense in the shore zone during the day, the relatively low day catch efficiency observed for the 100-ft seine was not surprising. Then, if they disperse more at night and move away from cover, catch efficiency at night should increase, as it generally did (Table IV-16).

The diel by weeks interaction for catch efficiency of juvenile white perch (Table IV-15) appeared to be associated with a decline in water temperature. An analysis of water temperature data collected concomittantly with the beach seine hauls demonstrated a significant change in temperature between weeks 2 and 3 (Table IV-19). The change in catch efficiency between weeks 2 and 3 associated with the observed change in temperature suggests that the vulnerability of juvenile white perch to the 100-ft seine increased as water temperatures decreased (Table IV-19), perhaps because they dispersed and moved away from cover.

An explanation of catch efficiency decreasing at night for juvenile striped bass is more difficult. One could hypothesize several patterns of diel differences in the density of young striped bass within the area sampled by the 100-ft seine versus the nearby offshore areas, e.g. Figure IV-1. Evaluations of this hypothesis and other alternative hypotheses were beyond the scope of this study.

In conclusion, the efficiency of the 100-ft seine varies significantly between day and night in collecting juvenile striped bass and juvenile white perch. These differences presumably reflect a number of

Table IV-19

Mean and Variance of Water Temperature during Catch Efficiency Tests in 1977 (Day) and 1978 (Night)

Day				Night			
Weeks	Mean	S^2	n	Weeks	Mean	S^2	n
Week 1 (09/11-17)	21.962	1.899	8	(09/03-09)	24.350	1.457	8
Week 2 (09/18-24)	22.637	3.233	8	(09/17-23)	21.237	1.850	8
Week 3 (10/02-08)	15.737	4.064	8	(10/01-07)	17.975	0.296	8

S^2 = variance
n = number of observations

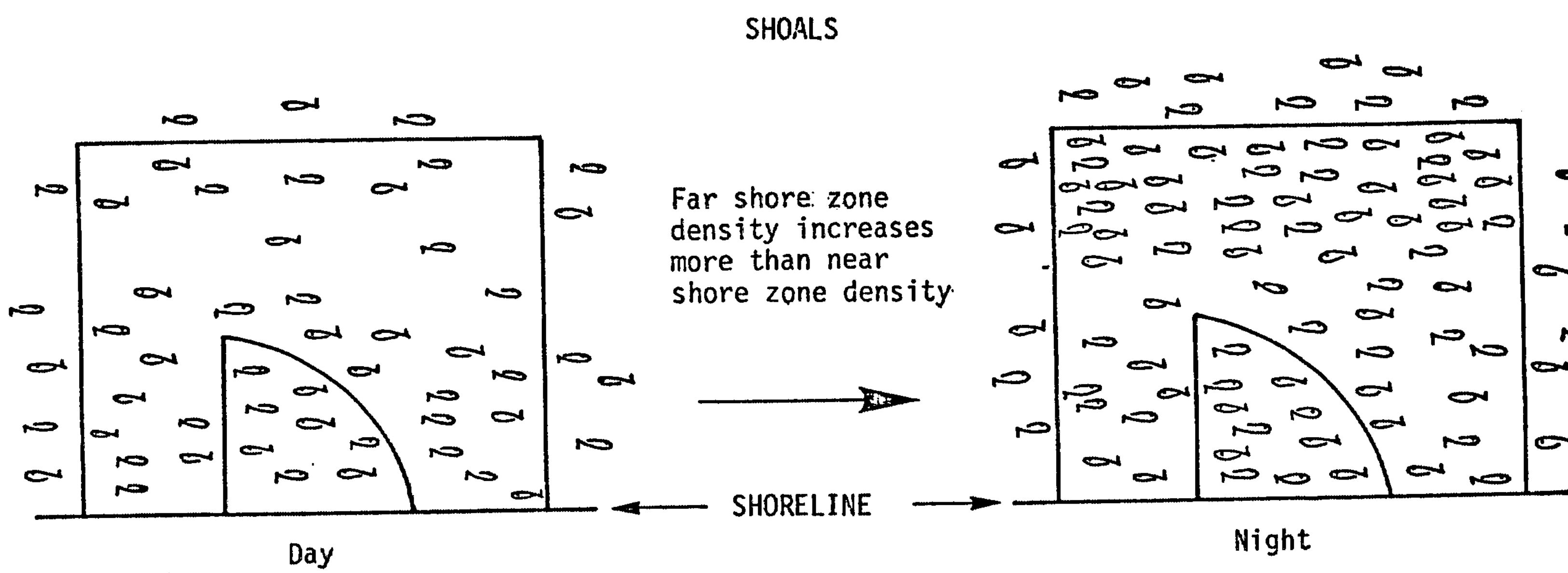

Figure IV-1. A Plausible Day-Night Distribution of Juvenile Striped Bass that Could Yield Decreased Catch Efficiency for 100-ft Seine at Night with Increased Night Abundances in Shore Zone

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factors, including differences in habitat selection by the two species. Species differences in catch efficiency disappear at night when juvenile white perch apparently disperse from vegetative cover and become more uniformly distributed.

3. Yearling and Older (≤150 mm) White Perch

Yearling and older (≤150 mm) white perch seem to exhibit the same trends in behavior as juvenile white perch. Greater catches of yearling and older (≤150 mm) white perch were collected in the shore zone during the day (Table IV-20). The observed differences in the variances of the means also suggests an aggregation of yearling and older (≤150 mm) white perch during the day, and a more uniform dispersed distribution at night. Since yearling and older (≤150 mm) white perch were not collected in substantial quantities during the 1977 day catch efficiency study, day and night catch efficiencies could not be compared.

E. ADJUSTMENT FACTORS FOR AREA-DENSITY EXTRAPOLATIONS OF ABSOLUTE ABUNDANCE IN THE SHORE ZONE

The estimates of catch efficiency for the 100 ft seine obtained from this study and a previous study (TI 1978a) can be used to estimate the absolute abundance of juvenile striped bass and juvenile white perch in the shore zone of the Hudson River estuary using an area-density method. The technique was succinctly stated by Kjelson (1977):

> The area-density method consists of randomly sampling a plot of known area or volume and capturing some or all of the fish present. The average number of fish per unit area or volume is then calculated and multiplied by the total area (volume) to obtain an estimate of the size of the entire population. The area-density method is a refinement over the general catch-per-unit-effort approach in that the area from which the sample is obtained is known, thus providing at least a minimal measure of absolute abundance, as opposed to relative abundance. By correcting for underestimation of abundance, due typically to

Table IV-20

Mean and Variance of Catch Data from Day Beach Seine Survey (BSS) and Supplementary Night Beach Seines (SNBS) for Yearling and Older (≤150mm) White Perch in 1978

BSS (Day)			SNBS (Night)		
Mean	S^2	n	Mean	S^2	n
6.028	677.742	36	5.333	30.000	36

S^2 = variance
n = number of observations

mesh selection or net avoidance, an estimate of absolute abundance is obtained.

The day versus night catch efficiencies (i.e. net avoidance) differed for striped bass and white perch, so the adjustment factors needed to convert day standing crops in the shore zone to night standing crops will also differ for the two species. The adjustment factors can be calculated from the generalized relationship:

$$TNA = ODA \cdot \frac{1}{DCE} \cdot \left(\frac{ONA \cdot \frac{1}{NCE}}{ODA \cdot \frac{1}{DCE}} \right)$$

where

TNA = estimate of true abundance in the shore zone at night

ODA = observed abundance in the shore zone during the day

DCE = catch efficiency of 100-ft seine (expressed as a proportion) during the day

ONA = observed abundance in the shore zone at night

NCE = catch efficiency of 100-ft seine (expressed as a proportion) at night

Based on the 1978 data discussed in this report (36 day tows and 36 night tows with the 100-ft seine, September through early October, Croton-Haverstraw region), an estimate of the true abundance of juvenile striped bass in the shore zone at night (TNA) could be obtained by multiplying the observed abundance in the shore zone during the day (ODA) by a factor of 10.1. This adjustment factor was calculated by the following equation:

$$TNA = ODA \cdot \frac{1}{0.39} \cdot \left(\frac{39.89 \cdot \frac{1}{0.26}}{15.14 \cdot \frac{1}{0.39}} \right)$$

or $$TNA = ODA \cdot 10.1$$

Based on similar 1978 data, an estimate of the true abundance of juvenile white perch in the shore zone at night (TNA) could be obtained by multiplying the observed abundance in the shore zone during the day (ODA) by a factor of at least 2.1. This adjustment factor was calculated by the following equation:

$$TNA = ODA \cdot \frac{1}{0.07} \cdot \left(\frac{12.42 \cdot \frac{1}{0.18}}{32.88 \cdot \frac{1}{0.07}} \right)$$

$$\text{or } TNA = ODA \cdot 2.1$$

Night to day ratios in shore zone abundance of juvenile white perch in previous years have been greater than 2.0 (TI 1975, 1977). If the pattern observed in 1978 (i.e. higher densities during the day) was atypical, then the adjustment factor would increase. For example, if juvenile white perch in 1978 had been 1.5 times more abundant in the shore zone at night than during the day, the adjustment factor would increase from 2.1 to approximately 8.

Yearling and older ($\leq$150 mm) white perch were not collected in sufficient numbers during the 1977 Day Beach Seine Efficiency Study to calculate day catch efficiency. Similar trends in night and day behavior patterns (Table IV-18 and IV-20) were observed during the 1978 Night Beach Seine Efficiency Study for both juvenile white perch and yearling and older ($\leq$150 mm) white perch. Night weighted mean catch efficiency values for juvenile white perch and yearling and older ($\leq$150 mm) white perch (0.182 and 0.262 respectively) are also similar. Thus, the 1977 day beach seine efficiency value for juvenile white perch can be used in the formula to estimate a gear efficiency adjustment factor for yearling and older ($\leq$150 mm) white perch catches. An estimate of the true abundance of yearling and older ($\leq$150 mm) white perch in the shore zone at night (TNA) could then be obtained by multiplying the observed abundance in the shore zone during the day (ODA) by a factor of 3.4. This adjustment was calculated from the following equation:

$$TNA = ODA \cdot \left(\frac{1}{0.07}\right) \cdot \left(\frac{5.333 \cdot \frac{1}{0.26}}{6.028 \cdot \frac{1}{0.07}}\right)$$

or $TNA = ODA \cdot 3.4$

SECTION V

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APPENDIX A

ENVIRONMENTAL DATA FOR NIGHT BEACH SEINE EFFICIENCY TESTS AND SUPPLEMENTARY NIGHT BEACH SEINE TOWS

1978 NIGHT BEACH SEINE EFFICIENCY REPORT

WATER QUALITY DATA LEGEND

S_GROUP	:	SPECIFIES A GROUP OF SAMPLES (THREE TEST AND THREE SUPPLEMENTARY) TAKEN ON THE SAME NIGHT
SAMPLE	:	NIGHT BEACH SEINE EFFICIENCY TEST SAMPLES <= 240036 SUPPLEMENTARY NIGHT BEACH SEINE SAMPLES >= 240225
WEEK	:	1 = 09/03-09/09 2 = 09/17-09/23 3 = 10/01-10/07
DATE	:	MONTH, DAY, AND YEAR THE SAMPLE WAS COLLECTED
TIME	:	TIME OF DAY GEAR WAS DEPLOYED (USING 24 HOUR CLOCK)
RV_MILE	:	RIVER MILE WHERE SAMPLE WAS TAKEN
SITE	:	SIDE OF RIVER WHERE SAMPLE WAS TAKEN (1 = WEST, 3 = EAST)
TIDE	:	TIDAL STAGE WHEN SAMPLE WAS TAKEN (1 = LOW SLACK, 2 = FLOOD, 3 = HIGH SLACK, 4 = EBB)
GEAR	:	SAMPLING DEVICE (BEACH SEINES: 12 = 100FT 53 = 500FT)
TEMP	:	TEMPERATURE (DEGREES CENTIGRADE)
DO	:	DISSOLVED OXYGEN (PPM)
PH	:	PH
COND	:	CONDUCTIVITY (UMHOS/CM @ 25C)
TURB	:	TURBIDITY (FTU)

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
WATER QUALITY DATA FOR ALL SAMPLES

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	23.3	10.4	8.6	10500	4.0
1	240002	1	09/05/78	2340	34	3	2	12	23.4	11.4	8.7	11000	3.0
1	240003	1	09/06/78	100	34	3	2	12	23.3	11.0	8.7	10500	3.0
2	240004	1	09/06/78	2130	35	3	2	53	25.2	9.4	8.4	10500	7.0
2	240005	1	09/06/78	2235	35	3	2	12	25.0	8.8	8.2	10500	9.0
2	240006	1	09/06/78	2355	35	3	2	12	25.8	9.1	8.1	10500	7.0
3	240007	1	09/07/78	2200	36	1	2	53	25.0	7.2	7.8	9650	78.0
3	240008	1	09/07/78	2300	36	1	2	12	24.2	7.3	7.8	9500	85.0
3	240009	1	09/08/78	20	36	1	2	12	24.0	7.6	7.8	9500	39.0
4	240010	1	09/08/78	2150	39	3	2	53	23.1	7.7	.	9450	10.0
4	240011	1	09/08/78	2255	39	3	2	12	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	22.9	7.2	.	9400	5.0
5	240013	2	09/18/78	2145	34	3	2	53	20.1	6.9	7.6	11000	3.0
5	240014	2	09/18/78	2250	34	3	2	12	20.1	7.1	7.5	11000	3.0
5	240015	2	09/19/78	7	34	3	2	12	20.1	7.5	7.6	10500	2.0
6	240016	2	09/19/78	2230	35	3	2	53	19.7	8.0	7.6	9250	4.0
6	240017	2	09/19/78	2340	35	3	2	12	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	20.0	7.4	7.7	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	22.0	6.9	7.7	8850	42.0
7	240020	2	09/20/78	2215	36	1	2	12	21.2	6.8	7.6	8750	14.0
7	240021	2	09/20/78	2338	36	1	2	12	21.5	7.0	7.6	8350	5.0
8	240022	2	09/21/78	2220	39	3	2	53	23.1	7.8	7.7	7100	26.0
8	240023	2	09/21/78	2332	39	3	2	12	23.5	7.8	7.6	6950	10.0
8	240024	2	09/22/78	53	39	3	2	12	23.0	7.7	7.8	7000	9.0
9	240025	3	10/02/78	2015	34	3	2	53	18.1	10.0	8.2	11000	5.0
9	240026	3	10/02/78	2122	34	3	2	12	18.2	10.8	8.6	11500	4.0
9	240027	3	10/02/78	2246	34	3	2	12	17.2	10.8	8.6	11500	3.0
10	240028	3	10/03/78	2025	35	3	2	53	17.7	9.8	8.0	11000	2.0
10	240029	3	10/03/78	2137	35	3	2	12	17.5	9.4	7.6	11000	2.0
10	240030	3	10/03/78	2307	35	3	2	12	17.5	8.2	7.7	11500	3.0
11	240031	3	10/04/78	2145	36	1	2	53	18.0	7.9	7.3	11000	8.0
11	240032	3	10/04/78	2250	36	1	2	12	18.0	7.8	7.6	11000	7.0
11	240033	3	10/05/78	5	36	1	2	12	18.1	7.6	7.6	11000	4.0
12	240034	3	10/05/78	2135	39	3	2	53	18.1	8.3	7.5	10000	7.0
12	240035	3	10/05/78	2243	39	3	2	12	18.8	7.9	7.8	10000	5.0
12	240036	3	10/06/78	6	39	3	2	12	18.5	7.7	7.7	10000	5.0
1	240225	1	09/05/78	2015	39	3	2	12	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	25.2	8.5	8.0	10500	7.0
2	240228	1	09/06/78	2010	39	3	4	12	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	24.9	5.8	7.4	11000	98.0
2	240230	1	09/06/78	2150	34	3	2	12	24.2	9.3	8.8	11000	11.0
3	240231	1	09/07/78	2030	39	3	1	12	24.8	8.6	8.1	9600	10.0
3	240232	1	09/07/78	2105	35	3	2	12	23.8	8.5	8.2	10500	49.0
3	240233	1	09/07/78	2220	34	3	2	12	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	21.5	9.2	.	11500	6.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
WATER QUALITY DATA FOR ALL SAMPLES

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	TEMP	DO	PH	COND	TURB
4	240236	1	09/08/78	2045	35	3	1	12	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	18.6	8.3	7.6	10500	3.0
7	240244	2	09/20/78	1951	39	3	4	12	21.7	7.9	7.8	8250	20.0
7	240245	2	09/20/78	2024	35	3	1	12	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	20.4	8.3	7.8	10050	7.0
8	240247	2	09/21/78	1945	36	1	4	12	23.0	7.6	.	.	0.0
8	240248	2	09/21/78	2017	34	3	4	12	23.5	9.5	8.1	9550	9.0
8	240249	2	09/21/78	2056	35	3	1	12	21.9	7.6	7.3	8350	5.0
9	240250	3	10/02/78	1925	39	3	2	12	19.2	9.2	8.0	11000	8.0
9	240251	3	10/02/78	2033	35	3	2	12	18.0	9.4	8.1	11000	5.0
9	240252	3	10/03/78	134	36	1	4	12	18.2	7.9	7.8	10500	4.0
10	240253	3	10/03/78	1916	39	3	2	12	17.9	8.9	7.7	10500	14.0
10	240254	3	10/03/78	1943	36	1	2	12	18.2	8.2	7.7	11500	60.0
10	240255	3	10/03/78	2044	34	3	2	12	16.1	10.1	7.9	11500	2.0
11	240257	3	10/04/78	1916	39	3	1	12	17.7	9.0	7.5	10500	10.0
11	240258	3	10/04/78	1944	35	3	2	12	17.4	8.4	7.7	11000	2.0
11	240259	3	10/04/78	2020	34	3	2	12	16.5	9.0	7.6	11500	3.0
12	240261	3	10/05/78	1934	36	1	4	12	18.9	7.9	7.8	10500	55.0
12	240262	3	10/05/78	2010	34	3	1	12	16.5	9.3	7.8	11500	26.0
12	240263	3	10/05/78	2045	35	3	2	12	17.5	9.2	7.8	10500	5.0

APPENDIX B

FISH CATCH AND ENVIRONMENTAL DATA FOR NIGHT BEACH SEINE EFFICIENCY TESTS

1978 NIGHT BEACH SEINE EFFICIENCY REPORT

L E G E N D

S_GROUP : SPECIFIES A GROUP OF SAMPLES (THREE TEST AND THREE SUPPLEMENTARY) TAKEN ON THE SAME NIGHT

SAMPLE : NIGHT BEACH SEINE EFFICIENCY TEST SAMPLES <= 240036
SUPPLEMENTARY NIGHT BEACH SEINE SAMPLES >= 240225

WEEK : 1 = 09/03-09/09 2 = 09/17-09/23 3 = 10/01-10/07

DATE : MONTH, DAY, AND YEAR THE SAMPLE WAS COLLECTED

TIME : TIME OF DAY GEAR WAS DEPLOYED (USING 24 HOUR CLOCK)

RV_MILE : RIVER MILE WHERE SAMPLE WAS TAKEN

SITE : SIDE OF RIVER WHERE SAMPLE WAS TAKEN (1 = WEST, 3 = EAST)

TIDE : TIDAL STAGE WHEN SAMPLE WAS TAKEN (1 = LOW SLACK, 2 = FLOOD, 3 = HIGH SLACK, 4 = EBB)

GEAR : SAMPLING DEVICE (BEACH SEINES: 12 = 100FT 53 = 500FT)

LC_1 : TOTAL # CAUGHT IN LENGTH CLASS 1 (0 TO DIV.)

LC_2 : TOTAL # CAUGHT IN LENGTH CLASS 2 (DIV. + 1MM - 150MM)

LC_3 : TOTAL # CAUGHT IN LENGTH CLASS 3 (151MM - 250MM)

LC_4 : TOTAL # CAUGHT IN LENGTH CLASS 4 (251MM +)

TEMP : TEMPERATURE (DEGREES CENTIGRADE)

DO : DISSOLVED OXYGEN (PPM)

PH : PH

COND : CONDUCTIVITY (UMHOS/CM @ 25C)

TURB : TURBIDITY (FTU)

NOTE : ZERO CATCH SAMPLES ARE EXCLUDED.

ACTUAL EFFORT:

TEST = 36 TOTAL SAMPLES
(24 GEAR 12, 12 GEAR 53)

SUPPLEMENTARY = 36 TOTAL SAMPLES

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=ALEWIFE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	7	0	0	0	23.4	11.4	8.7	11000	3.0
1	240003	1	09/06/78	100	34	3	2	12	16	0	0	0	23.3	11.0	8.7	10500	3.0
1	240001	1	09/05/78	2225	34	3	2	53	145	0	0	0	23.3	10.4	8.6	10500	4.0
2	240006	1	09/06/78	2355	35	3	2	12	1	0	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	18	0	0	0	25.2	9.4	8.4	10500	7.0
3	240008	1	09/07/78	2300	36	1	2	12	3	0	0	0	24.2	7.3	7.8	9500	85.0
3	240007	1	09/07/78	2200	36	1	2	53	38	0	0	0	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	5	0	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	4	0	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	60	0	0	0	23.1	7.7	.	9450	10.0
5	240014	2	09/18/78	2250	34	3	2	12	14	0	0	0	20.1	7.1	7.5	11000	3.0
5	240015	2	09/19/78	7	34	3	2	12	7	0	0	0	20.1	7.5	7.6	10500	2.0
5	240013	2	09/18/78	2145	34	3	2	53	128	0	0	0	20.1	6.9	7.6	11000	3.0
6	240018	2	09/20/78	108	35	3	2	12	6	0	0	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	30	0	0	0	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	1	0	0	0	21.2	6.8	7.6	8750	14.0
7	240019	2	09/20/78	2110	36	1	2	53	9	0	0	0	22.0	6.9	7.7	8850	42.0
8	240023	2	09/21/78	2332	39	3	2	12	9	0	0	0	23.5	7.8	7.6	6950	10.0
8	240024	2	09/22/78	53	39	3	2	12	5	0	0	0	23.0	7.7	7.8	7000	9.0
8	240022	2	09/21/78	2220	39	3	2	53	43	0	0	0	23.1	7.8	7.7	7100	26.0
9	240026	3	10/02/78	2122	34	3	2	12	15	0	0	0	18.2	10.8	8.6	11500	4.0
9	240027	3	10/02/78	2246	34	3	2	12	5	0	0	0	17.2	10.8	8.6	11500	3.0
9	240025	3	10/02/78	2015	34	3	2	53	204	0	0	0	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	4	0	0	0	17.5	9.4	7.6	11000	2.0
10	240028	3	10/03/78	2025	35	3	2	53	7	0	0	0	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	1	0	0	0	18.0	7.8	7.6	11000	7.0
11	240033	3	10/05/78	5	36	1	2	12	1	0	0	0	18.1	7.6	7.6	11000	4.0
11	240031	3	10/04/78	2145	36	1	2	53	12	0	0	0	18.0	7.9	7.3	11000	8.0
12	240035	3	10/05/78	2243	39	3	2	12	2	0	0	0	18.8	7.9	7.8	10000	5.0
12	240036	3	10/06/78	6	39	3	2	12	1	0	0	0	18.5	7.7	7.7	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	30	0	0	0	18.1	8.3	7.5	10000	7.0

SPECIES=BAY ANCHOVY

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	0	1	0	0	23.4	11.4	8.7	11000	3.0
1	240003	1	09/06/78	100	34	3	2	12	1	0	0	0	23.3	11.0	8.7	10500	3.0
1	240001	1	09/05/78	2225	34	3	2	53	9	0	0	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	18	0	0	0	25.0	8.8	8.2	10500	9.0
2	240006	1	09/06/78	2355	35	3	2	12	11	1	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	91	0	0	0	25.2	9.4	8.4	10500	7.0
3	240008	1	09/07/78	2300	36	1	2	12	4	0	0	0	24.2	7.3	7.8	9500	85.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=BAY ANCHOVY

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240007	1	09/07/78	2200	36	1	2	53	42	1	0	0	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	1	0	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	1	0	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	8	0	0	0	23.1	7.7	.	9450	10.0
5	240014	2	09/18/78	2250	34	3	2	12	14	0	0	0	20.1	7.1	7.5	11000	3.0
5	240015	2	09/19/78	7	34	3	2	12	22	0	0	0	20.1	7.5	7.6	10500	2.0
5	240013	2	09/18/78	2145	34	3	2	53	11	0	0	0	20.1	6.9	7.6	11000	3.0
6	240017	2	09/19/78	2340	35	3	2	12	52	0	0	0	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	90	0	0	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	249	0	0	0	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	23	0	0	0	21.2	6.8	7.6	8750	14.0
7	240021	2	09/20/78	2338	36	1	2	12	4	0	0	0	21.5	7.0	7.6	8350	5.0
7	240019	2	09/20/78	2110	36	1	2	53	74	0	0	0	22.0	6.9	7.7	8850	42.0
8	240023	2	09/21/78	2332	39	3	2	12	67	0	0	0	23.5	7.8	7.6	6950	10.0
8	240024	2	09/22/78	53	39	3	2	12	57	0	0	0	23.0	7.7	7.8	7000	9.0
8	240022	2	09/21/78	2220	39	3	2	53	79	0	0	0	23.1	7.8	7.7	7100	26.0
9	240026	3	10/02/78	2122	34	3	2	12	40	0	0	0	18.2	10.8	8.6	11500	4.0
9	240027	3	10/02/78	2246	34	3	2	12	30	0	0	0	17.2	10.8	8.6	11500	3.0
9	240025	3	10/02/78	2015	34	3	2	53	62	1	0	0	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	3	0	0	0	17.5	9.4	7.6	11000	2.0
10	240030	3	10/03/78	2307	35	3	2	12	1	0	0	0	17.5	8.2	7.7	11500	3.0
10	240028	3	10/03/78	2025	35	3	2	53	85	1	0	0	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	5	0	0	0	18.0	7.8	7.6	11000	7.0
11	240033	3	10/05/78	5	36	1	2	12	2	0	0	0	18.1	7.6	7.6	11000	4.0
11	240031	3	10/04/78	2145	36	1	2	53	30	1	0	0	18.0	7.9	7.3	11000	8.0
12	240035	3	10/05/78	2243	39	3	2	12	1	0	0	0	18.8	7.9	7.8	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	8	1	0	0	18.1	8.3	7.5	10000	7.0

SPECIES=AMERICAN SHAD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	4	0	0	0	23.3	10.4	8.6	10500	4.0
2	240006	1	09/06/78	2355	35	3	2	12	1	0	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	26	0	0	0	25.2	9.4	8.4	10500	7.0
3	240008	1	09/07/78	2300	36	1	2	12	3	0	0	0	24.2	7.3	7.8	9500	85.0
3	240007	1	09/07/78	2200	36	1	2	53	2	0	0	0	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	1	0	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	2	0	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	26	0	0	0	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	1	0	0	0	20.1	6.9	7.6	11000	3.0
6	240017	2	09/19/78	2340	35	3	2	12	2	0	0	0	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	4	0	0	0	20.0	7.4	7.7	9250	4.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=AMERICAN SHAD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
6	240016	2	09/19/78	2230	35	3	2	53	8	0	0	0	19.7	8.0	7.6	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	1	0	0	0	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	5	0	0	0	23.1	7.8	7.7	7100	26.0
9	240026	3	10/02/78	2122	34	3	2	12	1	0	0	0	18.2	10.8	8.6	11500	4.0
9	240025	3	10/02/78	2015	34	3	2	53	5	0	0	0	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	4	0	0	0	17.5	9.4	7.6	11000	2.0
10	240028	3	10/03/78	2025	35	3	2	53	40	0	0	0	17.7	9.8	8.0	11000	2.0
11	240031	3	10/04/78	2145	36	1	2	53	3	0	0	0	18.0	7.9	7.3	11000	8.0
12	240034	3	10/05/78	2135	39	3	2	53	11	0	0	0	18.1	8.3	7.5	10000	7.0

SPECIES=BLUEFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	1	0	0	0	23.3	10.4	8.6	10500	4.0
2	240004	1	09/06/78	2130	35	3	2	53	3	0	0	0	25.2	9.4	8.4	10500	7.0
4	240010	1	09/08/78	2150	39	3	2	53	0	1	11	0	23.1	7.7	.	9450	10.0
5	240014	2	09/18/78	2250	34	3	2	12	2	0	0	0	20.1	7.1	7.5	11000	3.0
5	240013	2	09/18/78	2145	34	3	2	53	5	0	0	0	20.1	6.9	7.6	11000	3.0
6	240018	2	09/20/78	108	35	3	2	12	1	0	0	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	5	0	0	0	19.7	8.0	7.6	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	1	0	0	0	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	3	0	0	0	23.1	7.8	7.7	7100	26.0
9	240027	3	10/02/78	2246	34	3	2	12	1	0	0	0	17.2	10.8	8.6	11500	3.0
9	240025	3	10/02/78	2015	34	3	2	53	5	0	0	0	18.1	10.0	8.2	11000	5.0
10	240028	3	10/03/78	2025	35	3	2	53	1	0	0	0	17.7	9.8	8.0	11000	2.0
11	240031	3	10/04/78	2145	36	1	2	53	4	0	0	0	18.0	7.9	7.3	11000	8.0

SPECIES=BLUEGILL

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
7	240019	2	09/20/78	2110	36	1	2	53	0	1	0	0	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	0	1	0	0	23.1	7.8	7.7	7100	26.0

SPECIES=BROWN BULLHEAD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240007	1	09/07/78	2200	36	1	2	53	1	2	9	0	25.0	7.2	7.8	9650	78.0
7	240019	2	09/20/78	2110	36	1	2	53	0	0	2	0	22.0	6.9	7.7	8850	42.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=PUMPKINSEED

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	2	0	0	0	23.3	10.4	8.6	10500	4.0
3	240009	1	09/08/78	20	36	1	2	12	0	0	1	0	24.0	7.6	7.8	9500	39.0
3	240007	1	09/07/78	2200	36	1	2	53	0	1	1	0	25.0	7.2	7.8	9650	78.0
4	240010	1	09/08/78	2150	39	3	2	53	0	1	17	0	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	0	3	0	0	20.1	6.9	7.6	11000	3.0
6	240016	2	09/19/78	2230	35	3	2	53	0	1	1	0	19.7	8.0	7.6	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	0	7	13	0	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	0	5	2	0	23.1	7.8	7.7	7100	26.0
9	240025	3	10/02/78	2015	34	3	2	53	1	1	1	0	18.1	10.0	8.2	11000	5.0
11	240031	3	10/04/78	2145	36	1	2	53	3	7	5	0	18.0	7.9	7.3	11000	8.0
12	240034	3	10/05/78	2135	39	3	2	53	0	0	7	0	18.1	8.3	7.5	10000	7.0

SPECIES=CARP

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240003	1	09/06/78	100	34	3	2	12	0	0	0	1	23.3	11.0	8.7	10500	3.0
1	240001	1	09/05/78	2225	34	3	2	53	0	0	0	6	23.3	10.4	8.6	10500	4.0
9	240025	3	10/02/78	2015	34	3	2	53	0	0	0	1	18.1	10.0	8.2	11000	5.0

SPECIES=AMERICAN EEL

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240003	1	09/06/78	100	34	3	2	12	0	0	0	1	23.3	11.0	8.7	10500	3.0
1	240001	1	09/05/78	2225	34	3	2	53	0	0	1	3	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	0	0	1	0	25.0	8.8	8.2	10500	9.0
3	240007	1	09/07/78	2200	36	1	2	53	0	0	4	4	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	0	0	0	1	26.2	7.6	.	9400	7.0
4	240010	1	09/08/78	2150	39	3	2	53	0	0	0	5	23.1	7.7	.	9450	10.0
5	240014	2	09/18/78	2250	34	3	2	12	0	0	0	2	20.1	7.1	7.5	11000	3.0
5	240013	2	09/18/78	2145	34	3	2	53	0	0	1	9	20.1	6.9	7.6	11000	3.0
6	240018	2	09/20/78	108	35	3	2	12	0	0	0	1	20.0	7.4	7.7	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	0	0	5	3	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	0	0	1	1	23.1	7.8	7.7	7100	26.0
9	240025	3	10/02/78	2015	34	3	2	53	0	0	0	2	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	0	1	0	0	17.5	9.4	7.6	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	0	0	1	1	18.0	7.8	7.6	11000	7.0
11	240031	3	10/04/78	2145	36	1	2	53	0	0	2	4	18.0	7.9	7.3	11000	8.0
12	240035	3	10/05/78	2243	39	3	2	12	0	0	0	1	18.8	7.9	7.8	10000	5.0
12	240036	3	10/06/78	6	39	3	2	12	0	0	1	0	18.5	7.7	7.7	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	0	0	1	5	18.1	8.3	7.5	10000	7.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=GOLDFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240010	1	09/08/78	2150	39	3	2	53	0	0	0	1	23.1	7.7	.	9450	10.0
7	240019	2	09/20/78	2110	36	1	2	53	0	0	1	1	22.0	6.9	7.7	8850	42.0
11	240031	3	10/04/78	2145	36	1	2	53	1	0	0	0	18.0	7.9	7.3	11000	8.0

SPECIES=GOLDEN SHINER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
6	240016	2	09/19/78	2230	35	3	2	53	0	0	2	0	19.7	8.0	7.6	9250	4.0
10	240028	3	10/03/78	2025	35	3	2	53	0	0	1	0	17.7	9.8	8.0	11000	2.0
11	240031	3	10/04/78	2145	36	1	2	53	0	1	0	0	18.0	7.9	7.3	11000	8.0

SPECIES=HOGCHOKER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	0	3	0	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	1	0	0	0	25.0	8.8	8.2	10500	9.0
2	240004	1	09/06/78	2130	35	3	2	53	1	1	0	0	25.2	9.4	8.4	10500	7.0
3	240008	1	09/07/78	2300	36	1	2	12	0	1	0	0	24.2	7.3	7.8	9500	85.0
3	240007	1	09/07/78	2200	36	1	2	53	0	23	0	0	25.0	7.2	7.8	9650	78.0
4	240012	1	09/09/78	15	39	3	2	12	0	1	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	0	7	1	0	23.1	7.7	.	9450	10.0
5	240015	2	09/19/78	7	34	3	2	12	1	0	0	0	20.1	7.5	7.6	10500	2.0
5	240013	2	09/18/78	2145	34	3	2	53	0	1	0	0	20.1	6.9	7.6	11000	3.0
6	240018	2	09/20/78	108	35	3	2	12	0	1	0	0	20.0	7.4	7.7	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	0	3	0	0	21.2	6.8	7.6	8750	14.0
7	240019	2	09/20/78	2110	36	1	2	53	0	21	0	0	22.0	6.9	7.7	8850	42.0
8	240023	2	09/21/78	2332	39	3	2	12	0	1	1	0	23.5	7.8	7.6	6950	10.0
8	240022	2	09/21/78	2220	39	3	2	53	1	1	1	0	23.1	7.8	7.7	7100	26.0
9	240025	3	10/02/78	2015	34	3	2	53	0	1	0	0	18.1	10.0	8.2	11000	5.0
11	240031	3	10/04/78	2145	36	1	2	53	0	35	0	0	18.0	7.9	7.3	11000	8.0
12	240034	3	10/05/78	2135	39	3	2	53	0	13	0	0	18.1	8.3	7.5	10000	7.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=TESSEL. DARTER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	0	10	0	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	0	2	0	0	25.0	8.8	8.2	10500	9.0
2	240006	1	09/06/78	2355	35	3	2	12	0	2	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	3	1	0	0	25.2	9.4	8.4	10500	7.0
3	240007	1	09/07/78	2200	36	1	2	53	3	5	0	0	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	5	2	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	1	3	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	7	6	0	0	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	4	9	0	0	20.1	6.9	7.6	11000	3.0
6	240017	2	09/19/78	2340	35	3	2	12	1	0	0	0	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	0	1	0	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	0	1	0	0	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	1	1	0	0	21.2	6.8	7.6	8750	14.0
7	240021	2	09/20/78	2338	36	1	2	12	1	0	0	0	21.5	7.0	7.6	8350	5.0
7	240019	2	09/20/78	2110	36	1	2	53	5	6	0	0	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	3	6	0	0	23.1	7.8	7.7	7100	26.0
9	240025	3	10/02/78	2015	34	3	2	53	1	15	0	0	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	0	3	0	0	17.5	9.4	7.6	11000	2.0
10	240030	3	10/03/78	2307	35	3	2	12	0	2	0	0	17.5	8.2	7.7	11500	3.0
11	240031	3	10/04/78	2145	36	1	2	53	5	1	0	0	18.0	7.9	7.3	11000	8.0
12	240036	3	10/06/78	6	39	3	2	12	1	0	0	0	18.5	7.7	7.7	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	1	3	0	0	18.1	8.3	7.5	10000	7.0

SPECIES=BANDED KILLIFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	35	37	0	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	1	0	0	0	25.0	8.8	8.2	10500	9.0
3	240008	1	09/07/78	2300	36	1	2	12	1	0	0	0	24.2	7.3	7.8	9500	85.0
3	240007	1	09/07/78	2200	36	1	2	53	11	3	0	0	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	1	0	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	1	0	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	1	0	0	0	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	19	29	0	0	20.1	6.9	7.6	11000	3.0
6	240018	2	09/20/78	108	35	3	2	12	1	0	0	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	1	0	0	0	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	1	0	0	0	21.2	6.8	7.6	8750	14.0
7	240019	2	09/20/78	2110	36	1	2	53	9	0	0	0	22.0	6.9	7.7	8850	42.0
9	240025	3	10/02/78	2015	34	3	2	53	7	5	0	0	18.1	10.0	8.2	11000	5.0
11	240033	3	10/05/78	5	36	1	2	12	1	0	0	0	18.1	7.6	7.6	11000	4.0
11	240031	3	10/04/78	2145	36	1	2	53	13	6	0	0	18.0	7.9	7.3	11000	8.0

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CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=MUMMICHOG

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	11	3	0	0	23.3	10.4	8.6	10500	4.0
3	240007	1	09/07/78	2200	36	1	2	53	0	1	0	0	25.0	7.2	7.8	9650	78.0
5	240013	2	09/18/78	2145	34	3	2	53	8	5	0	0	20.1	6.9	7.6	11000	3.0
7	240020	2	09/20/78	2215	36	1	2	12	1	0	0	0	21.2	6.8	7.6	8750	14.0
7	240019	2	09/20/78	2110	36	1	2	53	0	1	0	0	22.0	6.9	7.7	8850	42.0
12	240036	3	10/06/78	6	39	3	2	12	1	1	0	0	18.5	7.7	7.7	10000	5.0

SPECIES=ATL. MENHADEN

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	0	0	3	0	23.4	11.4	8.7	11000	3.0
1	240001	1	09/05/78	2225	34	3	2	53	0	0	11	0	23.3	10.4	8.6	10500	4.0
2	240004	1	09/06/78	2130	35	3	2	53	0	0	3	1	25.2	9.4	8.4	10500	7.0
5	240013	2	09/18/78	2145	34	3	2	53	0	0	2	0	20.1	6.9	7.6	11000	3.0
6	240017	2	09/19/78	2340	35	3	2	12	0	0	10	0	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	0	0	14	2	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	0	0	69	4	19.7	8.0	7.6	9250	4.0
10	240029	3	10/03/78	2137	35	3	2	12	0	0	0	1	17.5	9.4	7.6	11000	2.0
10	240028	3	10/03/78	2025	35	3	2	53	0	0	40	2	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	1	0	0	0	18.0	7.8	7.6	11000	7.0

SPECIES=BLUEBACK HERRING

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	1	0	0	0	23.4	11.4	8.7	11000	3.0
1	240001	1	09/05/78	2225	34	3	2	53	2	0	0	0	23.3	10.4	8.6	10500	4.0
2	240006	1	09/06/78	2355	35	3	2	12	2	0	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	9	0	0	1	25.2	9.4	8.4	10500	7.0
3	240007	1	09/07/78	2200	36	1	2	53	1	0	0	0	25.0	7.2	7.8	9650	78.0
4	240010	1	09/08/78	2150	39	3	2	53	1	0	0	0	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	3	0	0	0	20.1	6.9	7.6	11000	3.0
10	240028	3	10/03/78	2025	35	3	2	53	1	0	0	0	17.7	9.8	8.0	11000	2.0

SPECIES=WHITE SUCKER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240010	1	09/08/78	2150	39	3	2	53	0	0	2	3	23.1	7.7	.	9450	10.0
8	240022	2	09/21/78	2220	39	3	2	53	0	0	0	2	23.1	7.8	7.7	7100	26.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=ATL. SILVERSIDE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240003	1	09/06/78	100	34	3	2	12	0	3	0	0	23.3	11.0	8.7	10500	3.0
3	240008	1	09/07/78	2300	36	1	2	12	0	2	0	0	24.2	7.3	7.8	9500	85.0
3	240007	1	09/07/78	2200	36	1	2	53	0	6	0	0	25.0	7.2	7.8	9650	78.0
5	240014	2	09/18/78	2250	34	3	2	12	1	7	0	0	20.1	7.1	7.5	11000	3.0
5	240013	2	09/18/78	2145	34	3	2	53	1	3	0	0	20.1	6.9	7.6	11000	3.0
6	240016	2	09/19/78	2230	35	3	2	53	0	2	0	0	19.7	8.0	7.6	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	2	0	0	0	22.0	6.9	7.7	8850	42.0
9	240025	3	10/02/78	2015	34	3	2	53	0	1	0	0	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	0	2	0	0	17.5	9.4	7.6	11000	2.0
10	240030	3	10/03/78	2307	35	3	2	12	0	1	0	0	17.5	8.2	7.7	11500	3.0
10	240028	3	10/03/78	2025	35	3	2	53	1	2	0	0	17.7	9.8	8.0	11000	2.0

SPECIES=SPOTTAIL SHINER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	32	1	0	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	1	0	0	0	25.0	8.8	8.2	10500	9.0
2	240004	1	09/06/78	2130	35	3	2	53	11	8	0	0	25.2	9.4	8.4	10500	7.0
3	240007	1	09/07/78	2200	36	1	2	53	1	13	0	0	25.0	7.2	7.8	9650	78.0
4	240010	1	09/08/78	2150	39	3	2	53	2	0	0	0	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	1	1	0	0	20.1	6.9	7.6	11000	3.0
6	240016	2	09/19/78	2230	35	3	2	53	8	6	0	0	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	1	3	0	0	21.2	6.8	7.6	8750	14.0
7	240019	2	09/20/78	2110	36	1	2	53	12	9	0	0	22.0	6.9	7.7	8850	42.0
8	240023	2	09/21/78	2332	39	3	2	12	0	1	0	0	23.5	7.8	7.6	6950	10.0
8	240022	2	09/21/78	2220	39	3	2	53	1	1	0	0	23.1	7.8	7.7	7100	26.0
9	240026	3	10/02/78	2122	34	3	2	12	1	1	0	0	18.2	10.8	8.6	11500	4.0
9	240025	3	10/02/78	2015	34	3	2	53	7	0	0	0	18.1	10.0	8.2	11000	5.0
10	240028	3	10/03/78	2025	35	3	2	53	3	0	0	0	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	2	0	0	0	18.0	7.8	7.6	11000	7.0
11	240031	3	10/04/78	2145	36	1	2	53	13	3	0	0	18.0	7.9	7.3	11000	8.0
12	240034	3	10/05/78	2135	39	3	2	53	1	2	0	0	18.1	8.3	7.5	10000	7.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=STRIPED BASS

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	26	0	0	1	23.4	11.4	8.7	11000	3.0
1	240003	1	09/06/78	100	34	3	2	12	25	0	0	0	23.3	11.0	8.7	10500	3.0
1	240001	1	09/05/78	2225	34	3	2	53	410	0	3	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	48	0	0	0	25.0	8.8	8.2	10500	9.0
2	240006	1	09/06/78	2355	35	3	2	12	37	0	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	305	0	0	0	25.2	9.4	8.4	10500	7.0
3	240008	1	09/07/78	2300	36	1	2	12	16	0	0	0	24.2	7.3	7.8	9500	85.0
3	240009	1	09/08/78	20	36	1	2	12	2	0	0	0	24.0	7.6	7.8	9500	39.0
3	240007	1	09/07/78	2200	36	1	2	53	219	1	0	0	25.0	7.2	7.8	9650	78.0
4	240011	1	09/08/78	2255	39	3	2	12	51	0	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	31	1	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	778	1	1	0	23.1	7.7	.	9450	10.0
5	240014	2	09/18/78	2250	34	3	2	12	17	0	0	0	20.1	7.1	7.5	11000	3.0
5	240015	2	09/19/78	7	34	3	2	12	9	0	0	0	20.1	7.5	7.6	10500	2.0
5	240013	2	09/18/78	2145	34	3	2	53	308	1	1	1	20.1	6.9	7.6	11000	3.0
6	240017	2	09/19/78	2340	35	3	2	12	11	0	0	0	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	22	1	0	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	224	0	5	2	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	19	0	0	0	21.2	6.8	7.6	8750	14.0
7	240021	2	09/20/78	2338	36	1	2	12	21	0	0	0	21.5	7.0	7.6	8350	5.0
7	240019	2	09/20/78	2110	36	1	2	53	219	1	1	0	22.0	6.9	7.7	8850	42.0
8	240023	2	09/21/78	2332	39	3	2	12	5	0	0	0	23.5	7.8	7.6	6950	10.0
8	240024	2	09/22/78	53	39	3	2	12	9	0	0	0	23.0	7.7	7.8	7000	9.0
8	240022	2	09/21/78	2220	39	3	2	53	80	1	0	0	23.1	7.8	7.7	7100	26.0
9	240026	3	10/02/78	2122	34	3	2	12	21	0	0	0	18.2	10.8	8.6	11500	4.0
9	240027	3	10/02/78	2246	34	3	2	12	6	0	1	0	17.2	10.8	8.6	11500	3.0
9	240025	3	10/02/78	2015	34	3	2	53	308	0	4	1	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	12	0	0	0	17.5	9.4	7.6	11000	2.0
10	240030	3	10/03/78	2307	35	3	2	12	1	0	0	0	17.5	8.2	7.7	11500	3.0
10	240028	3	10/03/78	2025	35	3	2	53	124	2	7	4	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	6	0	0	0	18.0	7.8	7.6	11000	7.0
11	240033	3	10/05/78	5	36	1	2	12	4	0	0	0	18.1	7.6	7.6	11000	4.0
11	240031	3	10/04/78	2145	36	1	2	53	110	0	1	0	18.0	7.9	7.3	11000	8.0
12	240035	3	10/05/78	2243	39	3	2	12	1	0	0	0	18.8	7.9	7.8	10000	5.0
12	240036	3	10/06/78	6	39	3	2	12	4	0	0	0	18.5	7.7	7.7	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	87	0	0	0	18.1	8.3	7.5	10000	7.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=ATLANTIC TOMCOD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240007	1	09/07/78	2200	36	1	2	53	3	0	0	0	25.0	7.2	7.8	9650	78.0
5	240013	2	09/18/78	2145	34	3	2	53	3	0	0	0	20.1	6.9	7.6	11000	3.0
6	240016	2	09/19/78	2230	35	3	2	53	1	0	0	0	19.7	8.0	7.6	9250	4.0
7	240019	2	09/20/78	2110	36	1	2	53	37	0	0	0	22.0	6.9	7.7	8850	42.0
8	240022	2	09/21/78	2220	39	3	2	53	1	0	0	0	23.1	7.8	7.7	7100	26.0
9	240025	3	10/02/78	2015	34	3	2	53	1	0	0	0	18.1	10.0	8.2	11000	5.0
11	240032	3	10/04/78	2250	36	1	2	12	1	0	0	0	18.0	7.8	7.6	11000	7.0
11	240033	3	10/05/78	5	36	1	2	12	1	0	0	0	18.1	7.6	7.6	11000	4.0
11	240031	3	10/04/78	2145	36	1	2	53	49	0	0	0	18.0	7.9	7.3	11000	8.0
12	240035	3	10/05/78	2243	39	3	2	12	2	0	0	0	18.8	7.9	7.8	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	2	0	0	0	18.1	8.3	7.5	10000	7.0

SPECIES=WHITE CATFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	0	0	5	6	23.4	11.4	8.7	11000	3.0
1	240001	1	09/05/78	2225	34	3	2	53	0	0	17	109	23.3	10.4	8.6	10500	4.0
2	240004	1	09/06/78	2130	35	3	2	53	0	0	4	8	25.2	9.4	8.4	10500	7.0
4	240010	1	09/08/78	2150	39	3	2	53	0	0	7	15	23.1	7.7	.	9450	10.0
5	240013	2	09/18/78	2145	34	3	2	53	0	0	1	6	20.1	6.9	7.6	11000	3.0
6	240018	2	09/20/78	108	35	3	2	12	0	0	0	1	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	0	0	4	34	19.7	8.0	7.6	9250	4.0
8	240022	2	09/21/78	2220	39	3	2	53	0	3	29	11	23.1	7.8	7.7	7100	26.0
9	240025	3	10/02/78	2015	34	3	2	53	0	0	2	2	18.1	10.0	8.2	11000	5.0
10	240028	3	10/03/78	2025	35	3	2	53	0	0	1	0	17.7	9.8	8.0	11000	2.0
11	240031	3	10/04/78	2145	36	1	2	53	0	0	1	3	18.0	7.9	7.3	11000	8.0
12	240034	3	10/05/78	2135	39	3	2	53	0	0	10	4	18.1	8.3	7.5	10000	7.0

SPECIES=WHITE PERCH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240002	1	09/05/78	2340	34	3	2	12	21	12	3	0	23.4	11.4	8.7	11000	3.0
1	240003	1	09/06/78	100	34	3	2	12	12	5	0	0	23.3	11.0	8.7	10500	3.0
1	240001	1	09/05/78	2225	34	3	2	53	308	156	52	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	15	12	2	0	25.0	8.8	8.2	10500	9.0
2	240006	1	09/06/78	2355	35	3	2	12	9	3	0	0	25.8	9.1	8.1	10500	7.0
2	240004	1	09/06/78	2130	35	3	2	53	83	34	11	0	25.2	9.4	8.4	10500	7.0
3	240008	1	09/07/78	2300	36	1	2	12	12	2	0	0	24.2	7.3	7.8	9500	85.0
3	240009	1	09/08/78	20	36	1	2	12	3	0	0	0	24.0	7.6	7.8	9500	39.0
3	240007	1	09/07/78	2200	36	1	2	53	514	48	6	0	25.0	7.2	7.8	9650	78.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=WHITE PERCH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240011	1	09/08/78	2255	39	3	2	12	13	2	0	0	26.2	7.6	.	9400	7.0
4	240012	1	09/09/78	15	39	3	2	12	5	0	0	0	22.9	7.2	.	9400	5.0
4	240010	1	09/08/78	2150	39	3	2	53	115	20	7	0	23.1	7.7	.	9450	10.0
5	240014	2	09/18/78	2250	34	3	2	12	4	2	0	0	20.1	7.1	7.5	11000	3.0
5	240013	2	09/18/78	2145	34	3	2	53	106	66	33	0	20.1	6.9	7.6	11000	3.0
6	240017	2	09/19/78	2340	35	3	2	12	2	0	1	0	20.5	7.7	7.6	9350	4.0
6	240018	2	09/20/78	108	35	3	2	12	2	2	2	0	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	36	19	40	1	19.7	8.0	7.6	9250	4.0
7	240020	2	09/20/78	2215	36	1	2	12	17	1	0	0	21.2	6.8	7.6	8750	14.0
7	240021	2	09/20/78	2338	36	1	2	12	10	0	0	0	21.5	7.0	7.6	8350	5.0
7	240019	2	09/20/78	2110	36	1	2	53	481	13	4	0	22.0	6.9	7.7	8850	42.0
8	240023	2	09/21/78	2332	39	3	2	12	9	6	2	0	23.5	7.8	7.6	6950	10.0
8	240024	2	09/22/78	53	39	3	2	12	3	1	0	0	23.0	7.7	7.8	7000	9.0
8	240022	2	09/21/78	2220	39	3	2	53	39	33	40	0	23.1	7.8	7.7	7100	26.0
9	240026	3	10/02/78	2122	34	3	2	12	10	1	1	0	18.2	10.8	8.6	11500	4.0
9	240027	3	10/02/78	2246	34	3	2	12	3	1	0	0	17.2	10.8	8.6	11500	3.0
9	240025	3	10/02/78	2015	34	3	2	53	129	28	34	1	18.1	10.0	8.2	11000	5.0
10	240029	3	10/03/78	2137	35	3	2	12	3	2	0	0	17.5	9.4	7.6	11000	2.0
10	240028	3	10/03/78	2025	35	3	2	53	21	7	5	0	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	3	0	0	0	18.0	7.8	7.6	11000	7.0
11	240033	3	10/05/78	5	36	1	2	12	2	0	0	0	18.1	7.6	7.6	11000	4.0
11	240031	3	10/04/78	2145	36	1	2	53	170	2	1	0	18.0	7.9	7.3	11000	8.0
12	240035	3	10/05/78	2243	39	3	2	12	5	1	0	0	18.8	7.9	7.8	10000	5.0
12	240036	3	10/06/78	6	39	3	2	12	4	2	0	0	18.5	7.7	7.7	10000	5.0
12	240034	3	10/05/78	2135	39	3	2	53	75	37	9	0	18.1	8.3	7.5	10000	7.0

SPECIES=NORTH. PIPEFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
2	240005	1	09/06/78	2235	35	3	2	12	0	1	0	0	25.0	8.8	8.2	10500	9.0
3	240007	1	09/07/78	2200	36	1	2	53	0	2	1	0	25.0	7.2	7.8	9650	78.0
5	240013	2	09/18/78	2145	34	3	2	53	0	1	0	0	20.1	6.9	7.6	11000	3.0
7	240020	2	09/20/78	2215	36	1	2	12	1	0	0	0	21.2	6.8	7.6	8750	14.0
7	240019	2	09/20/78	2110	36	1	2	53	0	2	3	0	22.0	6.9	7.7	8850	42.0
9	240025	3	10/02/78	2015	34	3	2	53	0	0	1	0	18.1	10.0	8.2	11000	5.0
10	240030	3	10/03/78	2307	35	3	2	12	0	1	0	0	17.5	8.2	7.7	11500	3.0
10	240028	3	10/03/78	2025	35	3	2	53	0	0	1	0	17.7	9.8	8.0	11000	2.0
11	240032	3	10/04/78	2250	36	1	2	12	0	0	1	0	18.0	7.8	7.6	11000	7.0
11	240031	3	10/04/78	2145	36	1	2	53	0	0	5	0	18.0	7.9	7.3	11000	8.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=REDBREAST SUNFSH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240007	1	09/07/78	2200	36	1	2	53	0	0	3	0	25.0	7.2	7.8	9650	78.0
7	240019	2	09/20/78	2110	36	1	2	53	0	0	4	0	22.0	6.9	7.7	8850	42.0

SPECIES=ATL. NEEDLEFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
8	240024	2	09/22/78	53	39	3	2	12	0	3	0	0	23.0	7.7	7.8	7000	9.0
8	240022	2	09/21/78	2220	39	3	2	53	0	9	0	1	23.1	7.8	7.7	7100	26.0

SPECIES=CREVALLE JACK

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
7	240019	2	09/20/78	2110	36	1	2	53	2	0	0	0	22.0	6.9	7.7	8850	42.0

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SPECIES=WEAKFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
11	240031	3	10/04/78	2145	36	1	2	53	1	0	0	0	18.0	7.9	7.3	11000	8.0

SPECIES=CYPRINID UNID.

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240007	1	09/07/78	2200	36	1	2	53	3	0	0	0	25.0	7.2	7.8	9650	78.0

SPECIES=KING FISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
10	240028	3	10/03/78	2025	35	3	2	53	0	1	0	0	17.7	9.8	8.0	11000	2.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR TEST SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=TIDEWATR SLVSIDE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240001	1	09/05/78	2225	34	3	2	53	0	15	0	0	23.3	10.4	8.6	10500	4.0
2	240005	1	09/06/78	2235	35	3	2	12	0	1	0	0	25.0	8.8	8.2	10500	9.0
2	240004	1	09/06/78	2130	35	3	2	53	1	0	0	0	25.2	9.4	8.4	10500	7.0
3	240007	1	09/07/78	2200	36	1	2	53	0	2	0	0	25.0	7.2	7.8	9650	78.0
5	240014	2	09/18/78	2250	34	3	2	12	1	0	0	0	20.1	7.1	7.5	11000	3.0
5	240013	2	09/18/78	2145	34	3	2	53	0	2	0	0	20.1	6.9	7.6	11000	3.0
7	240019	2	09/20/78	2110	36	1	2	53	0	1	0	0	22.0	6.9	7.7	8850	42.0
9	240025	3	10/02/78	2015	34	3	2	53	1	0	0	0	18.1	10.0	8.2	11000	5.0
10	240028	3	10/03/78	2025	35	3	2	53	0	1	0	0	17.7	9.8	8.0	11000	2.0
11	240031	3	10/04/78	2145	36	1	2	53	0	1	0	0	18.0	7.9	7.3	11000	8.0

SPECIES=ROUGH SILVERSIDE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
2	240004	1	09/06/78	2130	35	3	2	53	0	4	0	0	25.2	9.4	8.4	10500	7.0
7	240019	2	09/20/78	2110	36	1	2	53	1	0	0	0	22.0	6.9	7.7	8850	42.0
10	240028	3	10/03/78	2025	35	3	2	53	0	1	0	0	17.7	9.8	8.0	11000	2.0

SPECIES=HICKORY SHAD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240010	1	09/08/78	2150	39	3	2	53	0	0	1	1	23.1	7.7	.	9450	10.0
6	240018	2	09/20/78	108	35	3	2	12	0	0	0	1	20.0	7.4	7.7	9250	4.0
6	240016	2	09/19/78	2230	35	3	2	53	0	0	0	1	19.7	8.0	7.6	9250	4.0

APPENDIX C

FISH CATCH AND ENVIRONMENTAL DATA FOR SUPPLEMENTARY NIGHT BEACH SEINE SAMPLES

1978 NIGHT BEACH SEINE EFFICIENCY REPORT

L E G E N D

S_GROUP	:	SPECIFIES A GROUP OF SAMPLES (THREE TEST AND THREE SUPPLEMENTARY) TAKEN ON THE SAME NIGHT
SAMPLE	:	NIGHT BEACH SEINE EFFICIENCY TEST SAMPLES <= 240036 SUPPLEMENTARY NIGHT BEACH SEINE SAMPLES >= 240225
WEEK	:	1 = 09/03-09/09 2 = 09/17-09/23 3 = 10/01-10/07
DATE	:	MONTH, DAY, AND YEAR THE SAMPLE WAS COLLECTED
TIME	:	TIME OF DAY GEAR WAS DEPLOYED (USING 24 HOUR CLOCK)
RV_MILE	:	RIVER MILE WHERE SAMPLE WAS TAKEN
SITE	:	SIDE OF RIVER WHERE SAMPLE WAS TAKEN (1 = WEST, 3 = EAST)
TIDE	:	TIDAL STAGE WHEN SAMPLE WAS TAKEN (1 = LOW SLACK, 2 = FLOOD, 3 = HIGH SLACK, 4 = EBB)
GEAR	:	SAMPLING DEVICE (BEACH SEINES: 12 = 100FT 53 = 500FT)
LC_1	:	TOTAL # CAUGHT IN LENGTH CLASS 1 (0 TO DIV.)
LC_2	:	TOTAL # CAUGHT IN LENGTH CLASS 2 (DIV. + 1MM - 150MM)
LC_3	:	TOTAL # CAUGHT IN LENGTH CLASS 3 (151MM - 250MM)
LC_4	:	TOTAL # CAUGHT IN LENGTH CLASS 4 (251MM +)
TEMP	:	TEMPERATURE (DEGREES CENTIGRADE)
DO	:	DISSOLVED OXYGEN (PPM)
PH	:	PH
COND	:	CONDUCTIVITY (UMHOS/CM @ 25C)
TURB	:	TURBIDITY (FTU)
NOTE	:	ZERO CATCH SAMPLES ARE EXCLUDED.

ACTUAL EFFORT:

TEST = 36 TOTAL SAMPLES
(24 GEAR 12, 12 GEAR 53)

SUPPLEMENTARY = 36 TOTAL SAMPLES

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=ALEWIFE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	5	0	0	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	6	0	0	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	1	0	0	0	25.2	8.5	8.0	10500	7.0
2	240228	1	09/06/78	2010	39	3	4	12	9	0	0	0	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	4	0	0	0	24.9	5.8	7.4	11000	98.0
2	240230	1	09/06/78	2150	34	3	2	12	5	0	0	0	24.2	9.3	8.8	11000	11.0
3	240231	1	09/07/78	2030	39	3	1	12	9	0	0	0	24.8	8.6	8.1	9600	10.0
3	240232	1	09/07/78	2105	35	3	2	12	1	0	0	0	23.8	8.5	8.2	10500	49.0
3	240233	1	09/07/78	2220	34	3	2	12	24	0	0	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	8	0	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	49	0	0	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	7	0	0	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	16	3	0	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	5	0	0	0	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	2	0	0	0	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	30	0	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	2	0	0	0	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	24	0	0	0	18.6	8.3	7.6	10500	3.0
7	240244	2	09/20/78	1951	39	3	4	12	19	0	0	0	21.7	7.9	7.8	8250	20.0
7	240245	2	09/20/78	2024	35	3	1	12	6	0	0	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	18	0	0	0	20.4	8.3	7.8	10050	7.0
8	240248	2	09/21/78	2017	34	3	4	12	25	0	0	0	23.5	9.5	8.1	9550	9.0
9	240250	3	10/02/78	1925	39	3	2	12	3	0	0	0	19.2	9.2	8.0	11000	8.0
9	240251	3	10/02/78	2033	35	3	2	12	1	0	0	0	18.0	9.4	8.1	11000	5.0
10	240253	3	10/03/78	1916	39	3	2	12	6	0	0	0	17.9	8.9	7.7	10500	14.0
10	240255	3	10/03/78	2044	34	3	2	12	19	0	0	0	16.1	10.1	7.9	11500	2.0
11	240257	3	10/04/78	1916	39	3	1	12	12	0	0	0	17.7	9.0	7.5	10500	10.0
11	240258	3	10/04/78	1944	35	3	2	12	2	0	0	0	17.4	8.4	7.7	11000	2.0
11	240259	3	10/04/78	2028	34	3	2	12	13	0	0	0	16.5	9.0	7.6	11500	3.0
12	240262	3	10/05/78	2010	34	3	1	12	56	0	0	0	16.5	9.3	7.8	11500	26.0
12	240263	3	10/05/78	2045	35	3	2	12	2	0	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=BAY ANCHOVY

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240226	1	09/05/78	2120	36	1	2	12	10	1	0	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	3	8	0	0	25.2	8.5	8.0	10500	7.0
2	240229	1	09/06/78	2045	36	1	1	12	5	1	0	0	24.9	5.8	7.4	11000	98.0
2	240230	1	09/06/78	2150	34	3	2	12	1	1	0	0	24.2	9.3	8.8	11000	11.0
3	240231	1	09/07/78	2030	39	3	1	12	2	0	0	0	24.8	8.6	8.1	9600	10.0
3	240233	1	09/07/78	2220	34	3	2	12	2	0	0	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	33	4	0	0	24.2	7.0	.	11000	13.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=BAY ANCHOVY

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240235	1	09/08/78	2010	34	3	4	12	33	0	0	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	12	0	0	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	11	0	0	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	3	0	0	0	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	105	0	0	0	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	10	0	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	60	0	0	0	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	4	0	0	0	18.6	8.3	7.6	10500	3.0
7	240244	2	09/20/78	1951	39	3	4	12	28	1	0	0	21.7	7.9	7.8	8250	20.0
7	240245	2	09/20/78	2024	35	3	1	12	155	0	0	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	2	0	0	0	20.4	8.3	7.8	10050	7.0
8	240247	2	09/21/78	1945	36	1	4	12	13	0	0	0	23.0	7.6	.	.	0.0
8	240249	2	09/21/78	2056	35	3	1	12	127	0	0	0	21.9	7.6	7.3	8350	5.0
9	240251	3	10/02/78	2033	35	3	2	12	39	0	0	0	18.0	9.4	8.1	11000	5.0
9	240252	3	10/03/78	134	36	1	4	12	3	0	0	0	18.2	7.9	7.8	10500	4.0
10	240253	3	10/03/78	1916	39	3	2	12	9	0	0	0	17.9	8.9	7.7	10500	14.0
10	240254	3	10/03/78	1943	36	1	2	12	4	0	0	0	18.2	8.2	7.7	11500	60.0
10	240255	3	10/03/78	2044	34	3	2	12	19	0	0	0	16.1	10.1	7.9	11500	2.0
11	240257	3	10/04/78	1916	39	3	1	12	11	1	0	0	17.7	9.0	7.5	10500	10.0
11	240258	3	10/04/78	1944	35	3	2	12	1	0	0	0	17.4	8.4	7.7	11000	2.0
11	240259	3	10/04/78	2020	34	3	2	12	3	0	0	0	16.5	9.0	7.6	11500	3.0
12	240261	3	10/05/78	1934	36	1	4	12	2	0	0	0	18.9	7.9	7.8	10500	55.0
12	240263	3	10/05/78	2045	35	3	2	12	1	0	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=AMERICAN SHAD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	5	0	0	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	2	0	0	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	1	0	1	0	25.2	8.5	8.0	10500	7.0
2	240229	1	09/06/78	2045	36	1	1	12	1	0	0	0	24.9	5.8	7.4	11000	98.0
3	240231	1	09/07/78	2030	39	3	1	12	3	0	0	0	24.8	8.6	8.1	9600	10.0
4	240235	1	09/08/78	2010	34	3	4	12	5	0	0	0	21.5	9.2	.	11500	6.0
5	240237	2	09/18/78	1949	39	3	1	12	5	0	0	0	21.8	7.5	7.4	8750	11.0
5	240239	2	09/18/78	2057	35	3	2	12	5	0	0	0	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	1	0	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	1	0	0	0	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	1	0	0	0	18.6	8.3	7.6	10500	3.0
7	240245	2	09/20/78	2024	35	3	1	12	1	0	0	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	1	0	0	0	20.4	8.3	7.8	10050	7.0
8	240249	2	09/21/78	2056	35	3	1	12	1	0	0	0	21.9	7.6	7.3	8350	5.0
9	240250	3	10/02/78	1925	39	3	2	12	2	0	0	0	19.2	9.2	8.0	11000	8.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=AMERICAN SHAD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
9	240251	3	10/02/78	2033	35	3	2	12	1	0	0	0	18.0	9.4	8.1	11000	5.0
10	240253	3	10/03/78	1916	39	3	2	12	1	0	0	0	17.9	8.9	7.7	10500	14.0
10	240255	3	10/03/78	2044	34	3	2	12	1	0	0	0	16.1	10.1	7.9	11500	2.0
11	240257	3	10/04/78	1916	39	3	1	12	2	0	0	0	17.7	9.0	7.5	10500	10.0

SPECIES=BLUEFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240234	1	09/08/78	1940	36	1	4	12	2	0	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	1	0	0	0	21.5	9.2	.	11500	6.0
5	240237	2	09/18/78	1949	39	3	1	12	1	0	0	0	21.8	7.5	7.4	8750	11.0
5	240239	2	09/18/78	2057	35	3	2	12	1	0	0	0	20.9	7.7	7.4	9350	7.0
9	240252	3	10/03/78	134	36	1	4	12	1	0	0	0	18.2	7.9	7.8	10500	4.0
11	240258	3	10/04/78	1944	35	3	2	12	2	0	0	0	17.4	8.4	7.7	11000	2.0
12	240262	3	10/05/78	2010	34	3	1	12	2	0	0	0	16.5	9.3	7.8	11500	26.0

SPECIES=PUMPKINSEED

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	0	0	1	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	0	0	3	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	1	0	0	0	25.2	8.5	8.0	10500	7.0
2	240229	1	09/06/78	2045	36	1	1	12	2	1	2	0	24.9	5.8	7.4	11000	98.0
3	240231	1	09/07/78	2030	39	3	1	12	0	0	1	0	24.8	8.6	8.1	9600	10.0
4	240234	1	09/08/78	1940	36	1	4	12	1	0	1	0	24.2	7.0	.	11000	13.0
5	240237	2	09/18/78	1949	39	3	1	12	0	0	2	0	21.8	7.5	7.4	8750	11.0
6	240240	2	09/19/78	1958	39	3	1	12	0	0	1	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	0	0	2	0	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	0	0	1	0	18.6	8.3	7.6	10500	3.0
7	240245	2	09/20/78	2024	35	3	1	12	0	0	2	0	22.0	8.1	7.8	9100	5.0
8	240247	2	09/21/78	1945	36	1	4	12	0	0	1	0	23.0	7.6	.	.	0.0
9	240250	3	10/02/78	1925	39	3	2	12	0	0	1	0	19.2	9.2	8.0	11000	8.0
9	240252	3	10/03/78	134	36	1	4	12	0	1	0	0	18.2	7.9	7.8	10500	4.0
10	240255	3	10/03/78	2044	34	3	2	12	0	0	2	0	16.1	10.1	7.9	11500	2.0
11	240258	3	10/04/78	1944	35	3	2	12	0	0	1	0	17.4	8.4	7.7	11000	2.0
12	240261	3	10/05/78	1934	36	1	4	12	0	1	1	0	18.9	7.9	7.8	10500	55.0
12	240263	3	10/05/78	2045	35	3	2	12	0	0	1	0	17.5	9.2	7.8	10500	5.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=CARP

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240227	1	09/05/78	2250	35	3	2	12	0	0	0	2	25.2	8.5	8.0	10500	7.0

SPECIES=AMERICAN EEL

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240227	1	09/05/78	2250	35	3	2	12	0	0	0	3	25.2	8.5	8.0	10500	7.0
2	240228	1	09/06/78	2010	39	3	4	12	0	0	0	1	25.6	8.3	8.0	9700	51.0
3	240232	1	09/07/78	2105	35	3	2	12	0	0	1	1	23.8	8.5	8.2	10500	49.0
3	240233	1	09/07/78	2220	34	3	2	12	0	0	1	1	21.9	7.9	8.5	11000	14.0
4	240236	1	09/08/78	2045	35	3	1	12	0	0	0	1	24.1	8.9	.	11000	2.0
5	240238	2	09/18/78	2031	36	1	2	12	0	0	0	2	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	0	0	0	1	20.9	7.7	7.4	9350	7.0
6	240241	2	09/19/78	2036	36	1	2	12	0	0	0	3	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	0	0	0	1	18.6	8.3	7.6	10500	3.0
7	240245	2	09/20/78	2024	35	3	1	12	0	0	1	2	22.0	8.1	7.8	9100	5.0
8	240249	2	09/21/78	2056	35	3	1	12	0	0	1	0	21.9	7.6	7.3	8350	5.0
9	240251	3	10/02/78	2033	35	3	2	12	0	0	4	1	18.0	9.4	8.1	11000	5.0
11	240257	3	10/04/78	1916	39	3	1	12	0	0	0	2	17.7	9.0	7.5	10500	10.0
12	240261	3	10/05/78	1934	36	1	4	12	0	0	0	2	18.9	7.9	7.8	10500	55.0

SPECIES=GOLDFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TU
8	240247	2	09/21/78	1945	36	1	4	12	0	0	1	0	23.0	7.6	.	.	0.

SPECIES=GOLDEN SHINER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
5	240239	2	09/18/78	2057	35	3	2	12	0	0	1	0	20.9	7.7	7.4	9350	7.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=HOGCHOKER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	1	5	0	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	0	1	0	0	24.8	6.6	7.6	10500	9.0
2	240228	1	09/06/78	2010	39	3	4	12	0	5	0	0	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	0	13	0	0	24.9	5.8	7.4	11000	98.0
3	240231	1	09/07/78	2030	39	3	1	12	0	4	0	0	24.8	8.6	8.1	9600	10.0
3	240232	1	09/07/78	2105	35	3	2	12	0	3	0	0	23.8	8.5	8.2	10500	49.0
4	240236	1	09/08/78	2045	35	3	1	12	1	0	0	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	3	0	0	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	0	2	0	0	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	1	1	0	0	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	2	0	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	0	8	0	0	21.0	7.4	7.7	8350	17.0
8	240249	2	09/21/78	2056	35	3	1	12	1	1	0	0	21.9	7.6	7.3	8350	5.0
9	240250	3	10/02/78	1925	39	3	2	12	1	1	0	0	19.2	9.2	8.0	11000	8.0
9	240251	3	10/02/78	2033	35	3	2	12	0	1	0	0	18.0	9.4	8.1	11000	5.0
9	240252	3	10/03/78	134	36	1	4	12	0	3	0	0	18.2	7.9	7.8	10500	4.0
10	240253	3	10/03/78	1916	39	3	2	12	1	0	0	0	17.9	8.9	7.7	10500	14.0
10	240254	3	10/03/78	1943	36	1	2	12	0	3	0	0	18.2	8.2	7.7	11500	60.0
11	240257	3	10/04/78	1916	39	3	1	12	0	2	0	0	17.7	9.0	7.5	10500	10.0
12	240261	3	10/05/78	1934	36	1	4	12	0	5	0	0	18.9	7.9	7.8	10500	55.0

SPECIES=TESSEL. DARTER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	1	1	0	0	25.2	8.7	7.9	9550	4.0
2	240228	1	09/06/78	2010	39	3	4	12	3	4	0	0	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	1	0	0	0	24.9	5.8	7.4	11000	98.0
2	240230	1	09/06/78	2150	34	3	2	12	0	2	0	0	24.2	9.3	8.8	11000	11.0
3	240231	1	09/07/78	2030	39	3	1	12	3	3	0	0	24.8	8.6	8.1	9600	10.0
3	240233	1	09/07/78	2220	34	3	2	12	1	0	0	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	2	0	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	1	1	0	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	1	1	0	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	1	9	0	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	1	0	0	0	21.6	7.4	7.6	8550	33.0
6	240240	2	09/19/78	1958	39	3	1	12	0	1	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	2	0	0	0	21.0	7.4	7.7	8350	17.0
7	240244	2	09/20/78	1951	39	3	4	12	0	1	0	0	21.7	7.9	7.8	8250	20.0
7	240245	2	09/20/78	2024	35	3	1	12	2	5	0	0	22.0	8.1	7.8	9100	5.0
8	240247	2	09/21/78	1945	36	1	4	12	2	1	0	0	23.0	7.6	.	.	0.0
8	240248	2	09/21/78	2017	34	3	4	12	1	0	0	0	23.5	9.5	8.1	9550	9.0
8	240249	2	09/21/78	2056	35	3	1	12	2	1	0	0	21.9	7.6	7.3	8350	5.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=TESSEL. DARTER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
9	240250	3	10/02/78	1925	39	3	2	12	0	1	0	0	19.2	9.2	8.0	11000	8.0
11	240258	3	10/04/78	1944	35	3	2	12	2	3	0	0	17.4	8.4	7.7	11000	2.0
11	240259	3	10/04/78	2020	34	3	2	12	1	0	0	0	16.5	9.0	7.6	11500	3.0
12	240263	3	10/05/78	2045	35	3	2	12	3	2	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=BANDED KILLIFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240233	1	09/07/78	2220	34	3	2	12	2	0	0	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	2	1	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	1	0	0	0	21.5	9.2	.	11500	6.0
6	240241	2	09/19/78	2036	36	1	2	12	1	0	0	0	21.0	7.4	7.7	8350	17.0
7	240245	2	09/20/78	2024	35	3	1	12	3	0	0	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	4	0	0	0	20.4	8.3	7.8	10050	7.0
8	240248	2	09/21/78	2017	34	3	4	12	1	0	0	0	23.5	9.5	8.1	9550	9.0
10	240254	3	10/03/78	1943	36	1	2	12	1	0	0	0	18.2	8.2	7.7	11500	60.0
12	240261	3	10/05/78	1934	36	1	4	12	5	0	0	0	18.9	7.9	7.8	10500	55.0
12	240262	3	10/05/78	2010	34	3	1	12	1	0	0	0	16.5	9.3	7.8	11500	26.0
12	240263	3	10/05/78	2045	35	3	2	12	3	0	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=LARGEMOUTH BASS

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
11	240257	3	10/04/78	1916	39	3	1	12	0	0	0	1	17.7	9.0	7.5	10500	10.0

SPECIES=MUMMICHOG

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
2	240230	1	09/06/78	2150	34	3	2	12	2	0	0	0	24.2	9.3	8.8	11000	11.0
3	240233	1	09/07/78	2220	34	3	2	12	0	1	0	0	21.9	7.9	8.5	11000	14.0
6	240241	2	09/19/78	2036	36	1	2	12	0	1	0	0	21.0	7.4	7.7	8350	17.0
7	240246	2	09/20/78	2138	34	3	2	12	3	0	0	0	20.4	8.3	7.8	10050	7.0

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CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=ATL. MENHADEN

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240235	1	09/08/78	2010	34	3	4	12	0	0	1	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	0	0	6	1	24.1	8.9	.	11000	2.0
5	240239	2	09/18/78	2057	35	3	2	12	0	0	47	0	20.9	7.7	7.4	9350	7.0
8	240249	2	09/21/78	2056	35	3	1	12	0	0	1	0	21.9	7.6	7.3	8350	5.0
9	240251	3	10/02/78	2033	35	3	2	12	0	0	2	0	18.0	9.4	8.1	11000	5.0

SPECIES=BLUEBACK HERRING

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
4	240234	1	09/08/78	1940	36	1	4	12	0	1	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	5	0	0	0	21.5	9.2	.	11500	6.0
7	240245	2	09/20/78	2024	35	3	1	12	1	0	0	0	22.0	8.1	7.8	9100	5.0
8	240249	2	09/21/78	2056	35	3	1	12	1	0	0	0	21.9	7.6	7.3	8350	5.0
9	240250	3	10/02/78	1925	39	3	2	12	1	0	0	0	19.2	9.2	8.0	11000	8.0
9	240251	3	10/02/78	2033	35	3	2	12	5	0	0	0	18.0	9.4	8.1	11000	5.0
11	240259	3	10/04/78	2020	34	3	2	12	3	0	0	0	16.5	9.0	7.6	11500	3.0

SPECIES=ATL. SILVERSIDE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240232	1	09/07/78	2105	35	3	2	12	0	1	0	0	23.8	8.5	8.2	10500	49.0
3	240233	1	09/07/78	2220	34	3	2	12	0	7	0	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	0	1	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	0	8	0	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	0	2	0	0	24.1	8.9	.	11000	2.0
5	240239	2	09/18/78	2057	35	3	2	12	0	3	0	0	20.9	7.7	7.4	9350	7.0
6	240242	2	09/19/78	2134	34	3	2	12	4	0	0	0	18.6	8.3	7.6	10500	3.0
7	240246	2	09/20/78	2138	34	3	2	12	11	2	0	0	20.4	8.3	7.8	10050	7.0
9	240251	3	10/02/78	2033	35	3	2	12	1	0	0	0	18.0	9.4	8.1	11000	5.0
10	240255	3	10/03/78	2044	34	3	2	12	3	1	0	0	16.1	10.1	7.9	11500	2.0
11	240258	3	10/04/78	1944	35	3	2	12	1	0	0	0	17.4	8.4	7.7	11000	2.0
12	240262	3	10/05/78	2010	34	3	1	12	2	1	0	0	16.5	9.3	7.8	11500	26.0
12	240263	3	10/05/78	2045	35	3	2	12	1	0	0	0	17.5	9.2	7.8	10500	5.0

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CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=SPOTTAIL SHINER

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
2	240230	1	09/06/78	2150	34	3	2	12	0	1	0	0	24.2	9.3	8.8	11000	11.0
3	240232	1	09/07/78	2105	35	3	2	12	1	0	0	0	23.8	8.5	8.2	10500	49.0
4	240235	1	09/08/78	2010	34	3	4	12	1	0	0	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	2	0	0	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	0	1	0	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	0	1	0	0	21.6	7.4	7.6	8550	33.0
6	240241	2	09/19/78	2036	36	1	2	12	2	2	0	0	21.0	7.4	7.7	8350	17.0
7	240245	2	09/20/78	2024	35	3	1	12	2	0	0	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	0	5	0	0	20.4	8.3	7.8	10050	7.0
8	240247	2	09/21/78	1945	36	1	4	12	3	6	0	0	23.0	7.6	.	.	0.0
8	240248	2	09/21/78	2017	34	3	4	12	2	0	0	0	23.5	9.5	8.1	9550	9.0
8	240249	2	09/21/78	2056	35	3	1	12	2	0	0	0	21.9	7.6	7.3	8350	5.0
10	240254	3	10/03/78	1943	36	1	2	12	1	0	0	0	18.2	8.2	7.7	11500	60.0
11	240259	3	10/04/78	2020	34	3	2	12	0	2	0	0	16.5	9.0	7.6	11500	3.0
12	240261	3	10/05/78	1934	36	1	4	12	0	1	0	0	18.9	7.9	7.8	10500	55.0
12	240262	3	10/05/78	2010	34	3	1	12	0	1	0	0	16.5	9.3	7.8	11500	26.0
12	240263	3	10/05/78	2045	35	3	2	12	1	0	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=STRIPED BASS

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	109	1	0	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	37	0	0	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	27	0	0	0	25.2	8.5	8.0	10500	7.0
2	240228	1	09/06/78	2010	39	3	4	12	30	0	0	0	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	13	0	0	0	24.9	5.8	7.4	11000	98.0
2	240230	1	09/06/78	2150	34	3	2	12	6	0	0	0	24.2	9.3	8.8	11000	11.0
3	240231	1	09/07/78	2030	39	3	1	12	89	0	0	0	24.8	8.6	8.1	9600	10.0
3	240232	1	09/07/78	2105	35	3	2	12	11	0	1	0	23.8	8.5	8.2	10500	49.0
3	240233	1	09/07/78	2220	34	3	2	12	31	0	0	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	64	0	0	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	87	0	0	0	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	27	0	0	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	157	0	0	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	18	0	0	0	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	39	1	0	0	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	52	0	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	43	0	0	0	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	39	0	0	0	18.6	8.3	7.6	10500	3.0
7	240244	2	09/20/78	1951	39	3	4	12	31	0	0	0	21.7	7.9	7.8	8250	20.0
7	240245	2	09/20/78	2024	35	3	1	12	38	0	1	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	61	1	2	0	20.4	8.3	7.8	10050	7.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=STRIPED BASS

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
8	240247	2	09/21/78	1945	36	1	4	12	18	0	0	0	23.0	7.6	.	.	0.0
8	240248	2	09/21/78	2017	34	3	4	12	49	0	1	0	23.5	9.5	8.1	9550	9.0
8	240249	2	09/21/78	2056	35	3	1	12	25	0	1	0	21.9	7.6	7.3	8350	5.0
9	240250	3	10/02/78	1925	39	3	2	12	61	1	0	0	19.2	9.2	8.0	11000	8.0
9	240251	3	10/02/78	2033	35	3	2	12	20	0	1	1	18.0	9.4	8.1	11000	5.0
9	240252	3	10/03/78	134	36	1	4	12	17	0	0	0	18.2	7.9	7.8	10500	4.0
10	240253	3	10/03/78	1916	39	3	2	12	16	0	0	0	17.9	8.9	7.7	10500	14.0
10	240254	3	10/03/78	1943	36	1	2	12	12	0	0	0	18.2	8.2	7.7	11500	60.0
10	240255	3	10/03/78	2044	34	3	2	12	38	0	0	0	16.1	10.1	7.9	11500	2.0
11	240257	3	10/04/78	1916	39	3	1	12	11	0	0	0	17.7	9.0	7.5	10500	10.0
11	240258	3	10/04/78	1944	35	3	2	12	11	0	0	0	17.4	8.4	7.7	11000	2.0
11	240259	3	10/04/78	2020	34	3	2	12	38	0	0	0	16.5	9.0	7.6	11500	3.0
12	240261	3	10/05/78	1934	36	1	4	12	7	0	0	0	18.9	7.9	7.8	10500	55.0
12	240262	3	10/05/78	2010	34	3	1	12	83	1	0	0	16.5	9.3	7.8	11500	26.0
12	240263	3	10/05/78	2045	35	3	2	12	20	0	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=ATLANTIC TOMCOD

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
5	240238	2	09/18/78	2031	36	1	2	12	1	0	0	0	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	1	0	0	0	20.9	7.7	7.4	9350	7.0
6	240241	2	09/19/78	2036	36	1	2	12	2	0	0	0	21.0	7.4	7.7	8350	17.0
8	240249	2	09/21/78	2056	35	3	1	12	1	0	0	0	21.9	7.6	7.3	8350	5.0
9	240252	3	10/03/78	134	36	1	4	12	2	0	0	0	18.2	7.9	7.8	10500	4.0
10	240254	3	10/03/78	1943	36	1	2	12	7	0	0	0	18.2	8.2	7.7	11500	60.0
11	240258	3	10/04/78	1944	35	3	2	12	1	0	0	0	17.4	8.4	7.7	11000	2.0
12	240261	3	10/05/78	1934	36	1	4	12	4	0	0	0	18.9	7.9	7.8	10500	55.0

SPECIES=WHITE CATFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	0	0	1	3	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	0	0	1	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	0	0	9	12	25.2	8.5	8.0	10500	7.0
2	240228	1	09/06/78	2010	39	3	4	12	0	0	4	0	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	0	0	0	1	24.9	5.8	7.4	11000	98.0
3	240231	1	09/07/78	2030	39	3	1	12	0	0	1	0	24.8	8.6	8.1	9600	10.0
3	240232	1	09/07/78	2105	35	3	2	12	0	0	1	1	23.8	8.5	8.2	10500	49.0
5	240239	2	09/18/78	2057	35	3	2	12	0	0	0	1	20.9	7.7	7.4	9350	7.0
7	240244	2	09/20/78	1951	39	3	4	12	0	0	0	2	21.7	7.9	7.8	8250	20.0

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CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=WHITE CATFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
9	240251	3	10/02/78	2033	35	3	2	12	0	0	0	1	18.0	9.4	8.1	11000	5.0
9	240252	3	10/03/78	134	36	1	4	12	0	0	0	1	18.2	7.9	7.8	10500	4.0
10	240253	3	10/03/78	1916	39	3	2	12	0	0	1	0	17.9	8.9	7.7	10500	14.0

SPECIES=WHITE PERCH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	35	17	4	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	13	4	1	0	24.8	6.6	7.6	10500	9.0
1	240227	1	09/05/78	2250	35	3	2	12	4	13	15	0	25.2	8.5	8.0	10500	7.0
2	240228	1	09/06/78	2010	39	3	4	12	7	4	8	0	25.6	8.3	8.0	9700	51.0
2	240229	1	09/06/78	2045	36	1	1	12	9	1	2	0	24.9	5.8	7.4	11000	98.0
2	240230	1	09/06/78	2150	34	3	2	12	4	10	11	0	24.2	9.3	8.8	11000	11.0
3	240231	1	09/07/78	2030	39	3	1	12	23	7	1	0	24.8	8.6	8.1	9600	10.0
3	240232	1	09/07/78	2105	35	3	2	12	4	1	11	0	23.8	8.5	8.2	10500	49.0
3	240233	1	09/07/78	2220	34	3	2	12	0	11	10	0	21.9	7.9	8.5	11000	14.0
4	240234	1	09/08/78	1940	36	1	4	12	24	1	1	0	24.2	7.0	.	11000	13.0
4	240235	1	09/08/78	2010	34	3	4	12	10	16	18	1	21.5	9.2	.	11500	6.0
4	240236	1	09/08/78	2045	35	3	1	12	8	8	3	0	24.1	8.9	.	11000	2.0
5	240237	2	09/18/78	1949	39	3	1	12	75	11	3	0	21.8	7.5	7.4	8750	11.0
5	240238	2	09/18/78	2031	36	1	2	12	14	1	0	0	21.6	7.4	7.6	8550	33.0
5	240239	2	09/18/78	2057	35	3	2	12	7	7	11	0	20.9	7.7	7.4	9350	7.0
6	240240	2	09/19/78	1958	39	3	1	12	18	1	0	0	21.1	8.0	7.6	8650	4.0
6	240241	2	09/19/78	2036	36	1	2	12	35	1	0	0	21.0	7.4	7.7	8350	17.0
6	240242	2	09/19/78	2134	34	3	2	12	7	1	1	0	18.6	8.3	7.6	10500	3.0
7	240244	2	09/20/78	1951	39	3	4	12	7	3	0	0	21.7	7.9	7.8	8250	20.0
7	240245	2	09/20/78	2024	35	3	1	12	1	1	0	0	22.0	8.1	7.8	9100	5.0
7	240246	2	09/20/78	2138	34	3	2	12	4	1	1	2	20.4	8.3	7.8	10050	7.0
8	240247	2	09/21/78	1945	36	1	4	12	8	1	0	0	23.0	7.6	.	.	0.0
8	240248	2	09/21/78	2017	34	3	4	12	27	20	3	0	23.5	9.5	8.1	9550	9.0
8	240249	2	09/21/78	2056	35	3	1	12	5	7	17	0	21.9	7.6	7.3	8350	5.0
9	240250	3	10/02/78	1925	39	3	2	12	22	8	6	1	19.2	9.2	8.0	11000	8.0
9	240251	3	10/02/78	2033	35	3	2	12	5	8	5	0	18.0	9.4	8.1	11000	5.0
9	240252	3	10/03/78	134	36	1	4	12	7	0	0	0	18.2	7.9	7.8	10500	4.0
10	240253	3	10/03/78	1916	39	3	2	12	5	1	7	0	17.9	8.9	7.7	10500	14.0
10	240254	3	10/03/78	1943	36	1	2	12	6	0	0	0	18.2	8.2	7.7	11500	60.0
10	240255	3	10/03/78	2044	34	3	2	12	1	1	1	0	16.1	10.1	7.9	11500	2.0
11	240257	3	10/04/78	1916	39	3	1	12	10	4	1	0	17.7	9.0	7.5	10500	10.0
11	240258	3	10/04/78	1944	35	3	2	12	4	0	1	0	17.4	8.4	7.7	11000	2.0
11	240259	3	10/04/78	2020	34	3	2	12	5	4	3	0	16.5	9.0	7.6	11500	3.0
12	240261	3	10/05/78	1934	36	1	4	12	7	0	0	0	18.9	7.9	7.8	10500	55.0
12	240262	3	10/05/78	2010	34	3	1	12	18	13	14	0	16.5	9.3	7.8	11500	26.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=WHITE PERCH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
12	240263	3	10/05/78	2045	35	3	2	12	10	5	5	0	17.5	9.2	7.8	10500	5.0

SPECIES=NORTH. PIPEFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240225	1	09/05/78	2015	39	3	2	12	0	1	0	0	25.2	8.7	7.9	9550	4.0
1	240226	1	09/05/78	2120	36	1	2	12	0	2	0	0	24.8	6.6	7.6	10500	9.0
2	240229	1	09/06/78	2045	36	1	1	12	0	0	1	0	24.9	5.8	7.4	11000	98.0
4	240234	1	09/08/78	1940	36	1	4	12	0	2	1	0	24.2	7.0	.	11000	13.0
4	240236	1	09/08/78	2045	35	3	1	12	0	1	1	0	24.1	8.9	.	11000	2.0
6	240241	2	09/19/78	2036	36	1	2	12	1	3	1	0	21.0	7.4	7.7	8350	17.0
7	240245	2	09/20/78	2024	35	3	1	12	0	1	1	0	22.0	8.1	7.8	9100	5.0
8	240247	2	09/21/78	1945	36	1	4	12	3	0	0	0	23.0	7.6	.	.	0.0
9	240252	3	10/03/78	134	36	1	4	12	0	1	0	0	18.2	7.9	7.8	10500	4.0
10	240254	3	10/03/78	1943	36	1	2	12	0	0	1	0	18.2	8.2	7.7	11500	60.0
11	240258	3	10/04/78	1944	35	3	2	12	0	3	1	0	17.4	8.4	7.7	11000	2.0
12	240261	3	10/05/78	1934	36	1	4	12	6	2	0	0	18.9	7.9	7.8	10500	55.0
12	240263	3	10/05/78	2045	35	3	2	12	1	0	0	0	17.5	9.2	7.8	10500	5.0

SPECIES=REDBREAST SUNFSH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240226	1	09/05/78	2120	36	1	2	12	0	0	1	0	24.8	6.6	7.6	10500	9.0
2	240229	1	09/06/78	2045	36	1	1	12	0	0	1	0	24.9	5.8	7.4	11000	98.0
5	240238	2	09/18/78	2031	36	1	2	12	0	0	1	0	21.6	7.4	7.6	8550	33.0
6	240241	2	09/19/78	2036	36	1	2	12	0	0	1	0	21.0	7.4	7.7	8350	17.0
9	240252	3	10/03/78	134	36	1	4	12	0	1	0	0	18.2	7.9	7.8	10500	4.0
12	240261	3	10/05/78	1934	36	1	4	12	0	0	1	0	18.9	7.9	7.8	10500	55.0

SPECIES=ATL. NEEDLEFISH

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
8	240248	2	09/21/78	2017	34	3	4	12	0	0	0	1	23.5	9.5	8.1	9550	9.0
9	240250	3	10/02/78	1925	39	3	2	12	0	0	1	0	19.2	9.2	8.0	11000	8.0

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
CATCH AND WATER QUALITY DATA FOR SUPPLEMENTARY SAMPLES
(ZERO CATCH SAMPLES ARE EXCLUDED)

SPECIES=TIDEWATR SLVSIDE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
1	240227	1	09/05/78	2250	35	3	2	12	0	1	0	0	25.2	8.5	8.0	10500	7.0
2	240230	1	09/06/78	2150	34	3	2	12	0	1	0	0	24.2	9.3	8.8	11000	11.0
6	240242	2	09/19/78	2134	34	3	2	12	1	4	0	0	18.6	8.3	7.6	10500	3.0
7	240245	2	09/20/78	2024	35	3	1	12	0	1	0	0	22.0	8.1	7.8	9100	5.0
10	240255	3	10/03/78	2044	34	3	2	12	3	0	0	0	16.1	10.1	7.9	11500	2.0
12	240262	3	10/05/78	2010	34	3	1	12	1	0	0	0	16.5	9.3	7.8	11500	26.0

SPECIES=ROUGH SILVERSIDE

S_GROUP	SAMPLE	WEEK	DATE	TIME	RV_MILE	SITE	TIDE	GEAR	LC_1	LC_2	LC_3	LC_4	TEMP	DO	PH	COND	TURB
3	240232	1	09/07/78	2105	35	3	2	12	0	1	0	0	23.8	8.5	8.2	10500	49.0
4	240235	1	09/08/78	2010	34	3	4	12	0	3	0	0	21.5	9.2	.	11500	6.0

APPENDIX D

FISH LENGTH DATA FOR NIGHT BEACH SEINE EFFICIENCY TESTS

1978 NIGHT BEACH SEINE EFFICIENCY REPORT

LENGTH DATA LEGEND

SAMPLE:	NIGHT BEACH SEINE EFFICIENCY TEST SAMPLES <= 240036
GEAR :	SAMPLING DEVICE (BEACH SEINES: 12 = 100 FT, 53 = 500 FT)
TOW :	0 = 500 FT BEACH SEINE TOW 1 = 1ST 100 FT BEACH SEINE TOW 2 = 2ND 100 FT BEACH SEINE TOW
SPEC :	30 = JUVENILE STRIPED BASS 35 = JUVENILE WHITE PERCH
LEN # :	LENGTH OBSERVATION NUMBER

science services division

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
LENGTH DATA

SAMPLE	GEAR	TOW	SPEC	LEN1	LEN2	LEN3	LEN4	LEN5	LEN6	LEN7	LEN8	LEN9	LEN10	LEN11	LEN12	LEN13	LEN14	LEN15	LEN16	LEN17	LEN18	LEN19	LEN20
240001	53	0	30	89	61	88	88	85	90	68	67	88	81	76	79	99	74	82	93	78	74	74	95
240001	53	0	35	75	77	74	85	81	81	72	69	78	70	73	81	83	82	79	78	77	88	74	77
240002	12	1	30	82	88	88	86	86	91	95	74	92	91	.	.	.	.	.	.	.	.	.	.
240002	12	1	35	78	84	82	80	78	88	74	77	74	80	75	86	85	79	78	76	78	85	.	.
240003	12	2	30	89	87	82	96	93	91	98	79	81	94	108	86	81	76	81	87	83	.	.	.
240003	12	2	35	82	81	76	75	85	80	76	76	74	73	76	75	.	.	.	.	.	.	.	.
240004	53	0	30	109	90	99	108	69	68	89	73	79	88	73	88	80	93	91	84	72	77	74	89
240004	53	0	35	65	73	76	65	54	68	61	70	63	66	70	75	75	84	73	67	66	76	65	64
240005	12	1	30	70	95	79	83	83	73	85	67	77	80	78	78	75	89	74	89	77	76	98	86
240005	12	1	35	76	63	80	65	80	73	67	68	64	75	67	70	69	.	.	.	.	.	.	.
240006	12	2	30	91	83	88	82	67	88	71	75	77	75	80	80	65	.	.	.	.	.	.	.
240006	12	2	35	69	34	59	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240007	53	0	30	95	83	74	83	89	96	84	68	81	73	92	61	85	78	92	74	112	86	82	80
240007	53	0	35	67	68	77	75	75	72	66	69	73	83	68	70	76	75	69	75	73	72	75	76
240008	12	1	30	92	76	85	83	99	80	78	82	71	99	82	.	.	.	.	.	.	.	.	.
240008	12	1	35	72	67	70	68	71	65	76	64	73	66	65	.	.	.	.	.	.	.	.	.
240009	12	2	30	84	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240009	12	2	35	75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240010	53	0	30	103	76	108	79	74	91	70	80	80	80	68	83	77	92	77	93	61	67	67	86
240010	53	0	35	72	75	80	74	65	63	60	66	75	67	66	73	75	81	66	73	62	79	76	67
240011	12	1	30	77	69	79	73	80	80	74	74	81	80	74	78	63	86	72	89	98	83	91	88
240011	12	1	35	76	74	72	65	76	84	67	61	67	75	76	70	.	.	.	.	.	.	.	.
240012	12	2	30	70	79	76	72	93	95	73	71	77	76	82	81	75	79	84	82	74	60	.	.
240012	12	2	35	79	72	72	63	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240013	53	0	30	102	87	96	94	82	110	112	93	92	115	87	105	95	92	97	100	103	85	98	85
240013	53	0	35	80	81	84	85	80	90	86	91	70	81	82	84	85	82	84	75	81	80	83	86
240014	12	1	30	82	92	80	84	103	94	101	102	87	100	107	72	77	73	75	.	.	.	.	.
240014	12	1	35	90	80	81	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240015	12	2	30	98	95	108	100	100	86	97	88	.	.	.	.	.	.	.	.	.	.	.	.
240016	53	0	30	98	103	85	90	89	85	101	77	90	88	80	80	95	95	85	88	88	80	87	112
240016	53	0	35	80	64	75	77	68	75	69	69	67	83	67	69	61	47	65	68	80	68	69	69
240017	12	1	30	74	102	100	103	98	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240017	12	1	35	69	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240018	12	2	30	82	89	80	98	80	85	89	82	78	96	87	.	.	.	.	.	.	.	.	.
240018	12	2	35	66	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240019	53	0	30	84	110	75	83	89	85	112	78	83	114	76	71	75	88	105	88	80	73	93	85
240019	53	0	35	72	65	78	52	60	69	75	73	78	73	58	70	63	66	71	77	79	79	77	68
240020	12	1	30	85	94	77	104	85	80	70	80	91	69	87	78	.	.	.	.	.	.	.	.
240020	12	1	35	62	80	74	69	76	65	60	55	80	69	.	.	.	.	.	.	.	.	.	.
240021	12	2	30	72	75	90	94	98	85	83	74	77	82	80	65	57	.	.	.	.	.	.	.
240021	12	2	35	79	62	59	67	77	57	70	75	.	.	.	.	.	.	.	.	.	.	.	.
240022	53	0	30	77	75	79	90	85	78	73	84	84	100	85	76	78	77	77	95	76	75	85	78
240022	53	0	35	69	68	85	80	73	77	74	75	80	74	65	80	76	76	76	75	64	79	77	75

1978 NIGHT BEACH SEINE EFFICIENCY REPORT
LENGTH DATA

SAMPLE	GEAR	TOW	SPEC	LEN1	LEN2	LEN3	LEN4	LEN5	LEN6	LEN7	LEN8	LEN9	LEN10	LEN11	LEN12	LEN13	LEN14	LEN15	LEN16	LEN17	LEN18	LEN19	LEN20
240023	12	1	35	72	65	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240024	12	2	30	98	84	89	76	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240025	53	0	30	99	87	103	114	104	114	100	111	70	88	108	110	99	98	99	101	90	95	115	117
240025	53	0	35	83	92	94	85	88	86	78	94	79	85	87	85	88	87	96	94	92	84	93	86
240026	12	1	30	96	115	95	94	90	100	105	85	95	91	87	70	83	101	94	88	100	97	85	87
240026	12	1	35	90	90	90	92	86	85	85	82	84	.	.	.	.	.	.	.	.	.	.	.
240027	12	2	30	100	87	106	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240027	12	2	35	61	85	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240028	53	0	30	94	97	90	99	95	99	91	118	92	100	119	91	91	89	108	81	104	87	88	87
240028	53	0	35	74	65	67	75	85	78	65	78	83	75	74	70	68	68	61	77	77	73	.	.
240029	12	1	30	91	85	108	90	89	95	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240029	12	1	35	74	56	70	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240031	53	0	30	88	87	80	80	87	92	93	104	75	80	88	88	75	80	80	112	78	100	88	85
240031	53	0	35	78	79	85	70	83	64	77	78	59	79	73	75	69	75	75	66	74	85	84	75
240032	12	1	30	85	75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240032	12	1	35	67	71	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240033	12	2	30	77	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240033	12	2	35	81	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240034	53	0	30	90	85	102	75	93	81	80	90	102	80	84	67	82	94	94	100	80	85	73	72
240034	53	0	35	72	81	88	87	72	67	66	62	69	67	76	81	80	74	72	77	78	73	70	66
240035	12	1	35	86	83	78	75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240036	12	2	30	90	78	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240036	12	2	35	75	65	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

APPENDIX E

SCATTER PLOTS OF CATCH EFFICIENCY AND SELECTED ENVIRONMENTAL DATA FOR BEACH SEINE EFFICIENCY TESTS

KEY TO APPENDIX E

A = One Observation

B = Two Observations

C = Three Observations

1978 Plots Represent Combined Tows 1 and 2 of the 100-ft Seine.

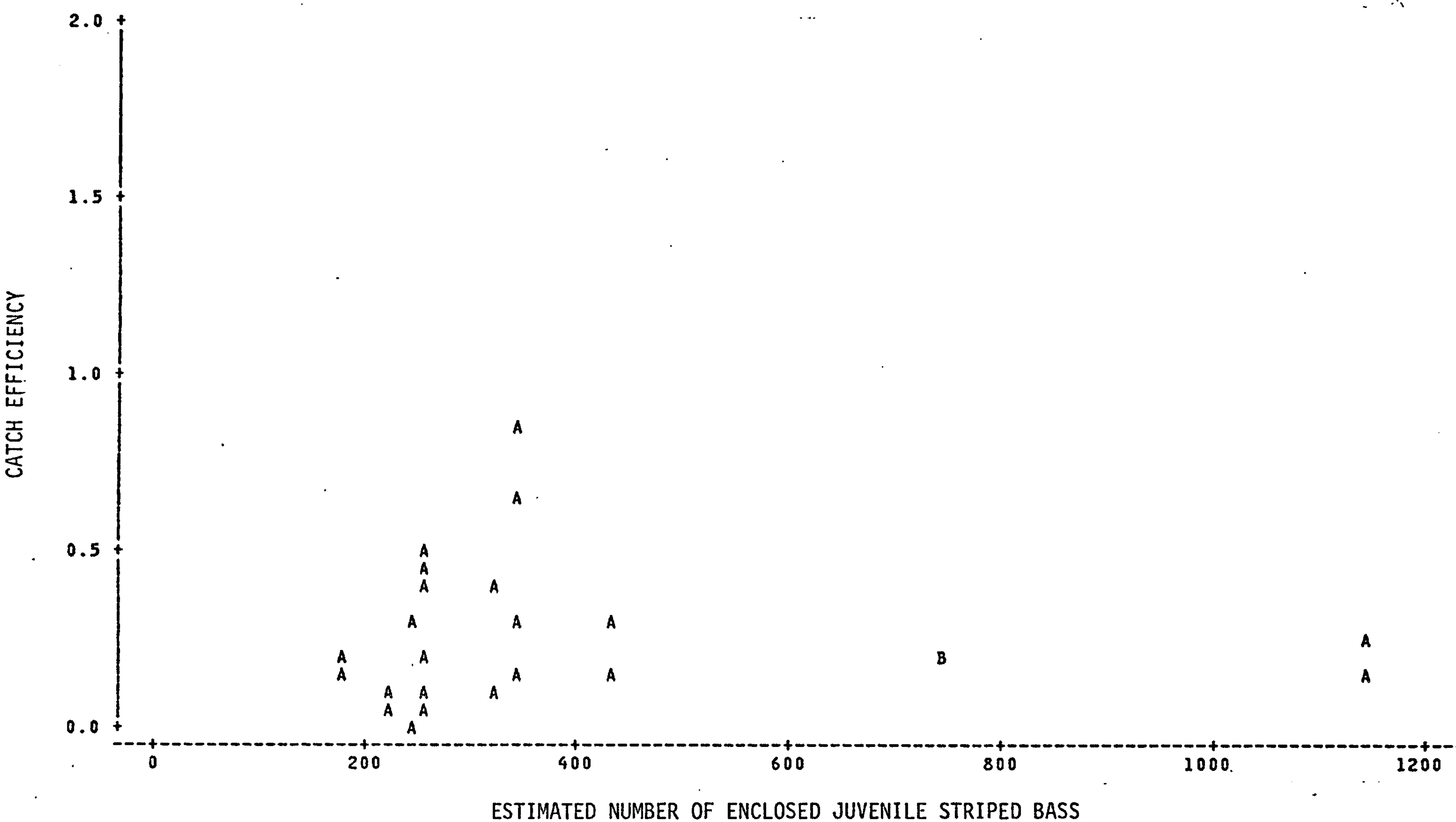

Figure E-1. Night Catch Efficiency for Juvenile Striped Bass in 100-ft Seine versus Estimated Number of Juvenile Striped Bass Enclosed in 500-ft Seine in 1978

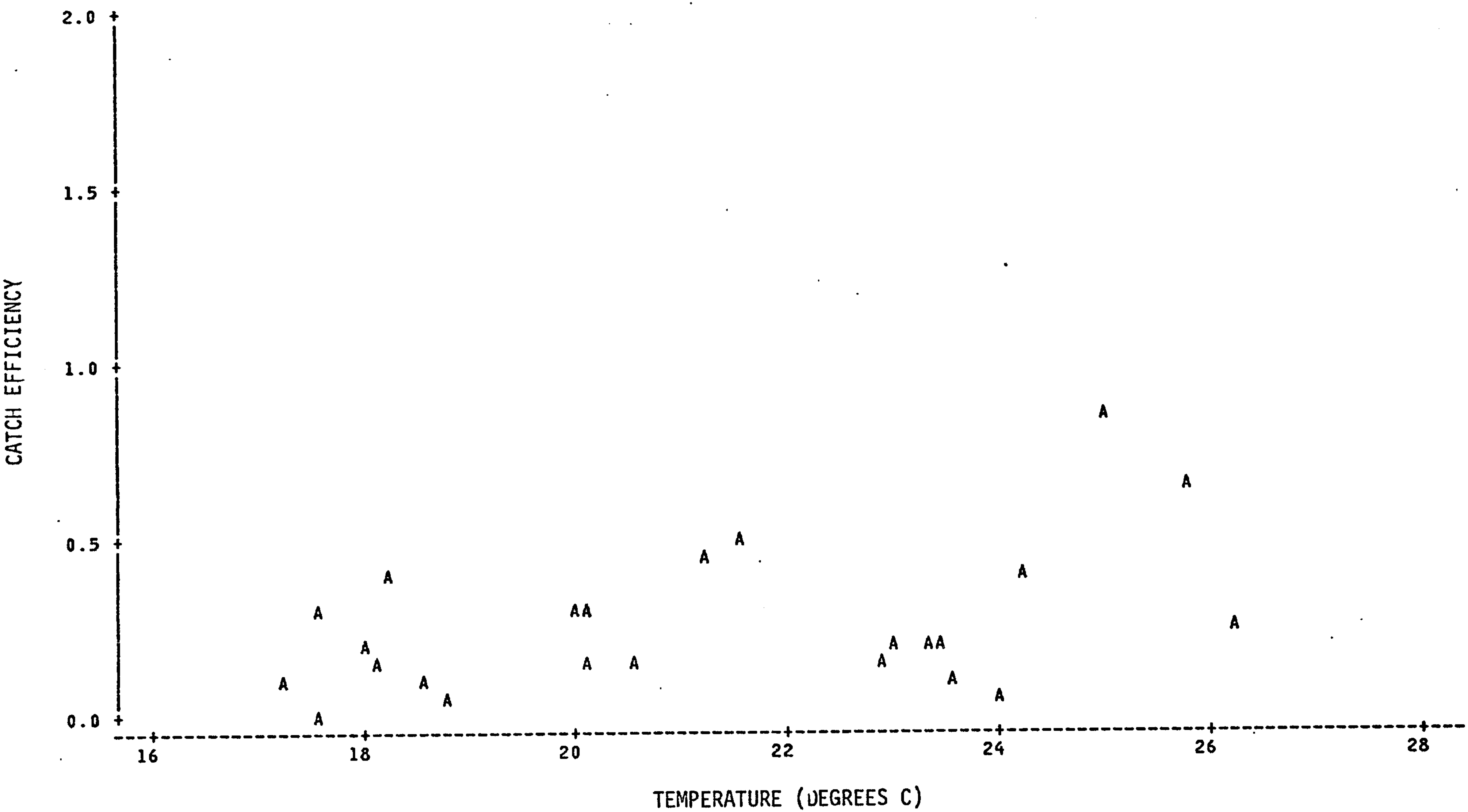

Figure E-2. Night Catch Efficiency for Juvenile Striped Bass in 100-ft Seine versus Water Temperatures in 1978

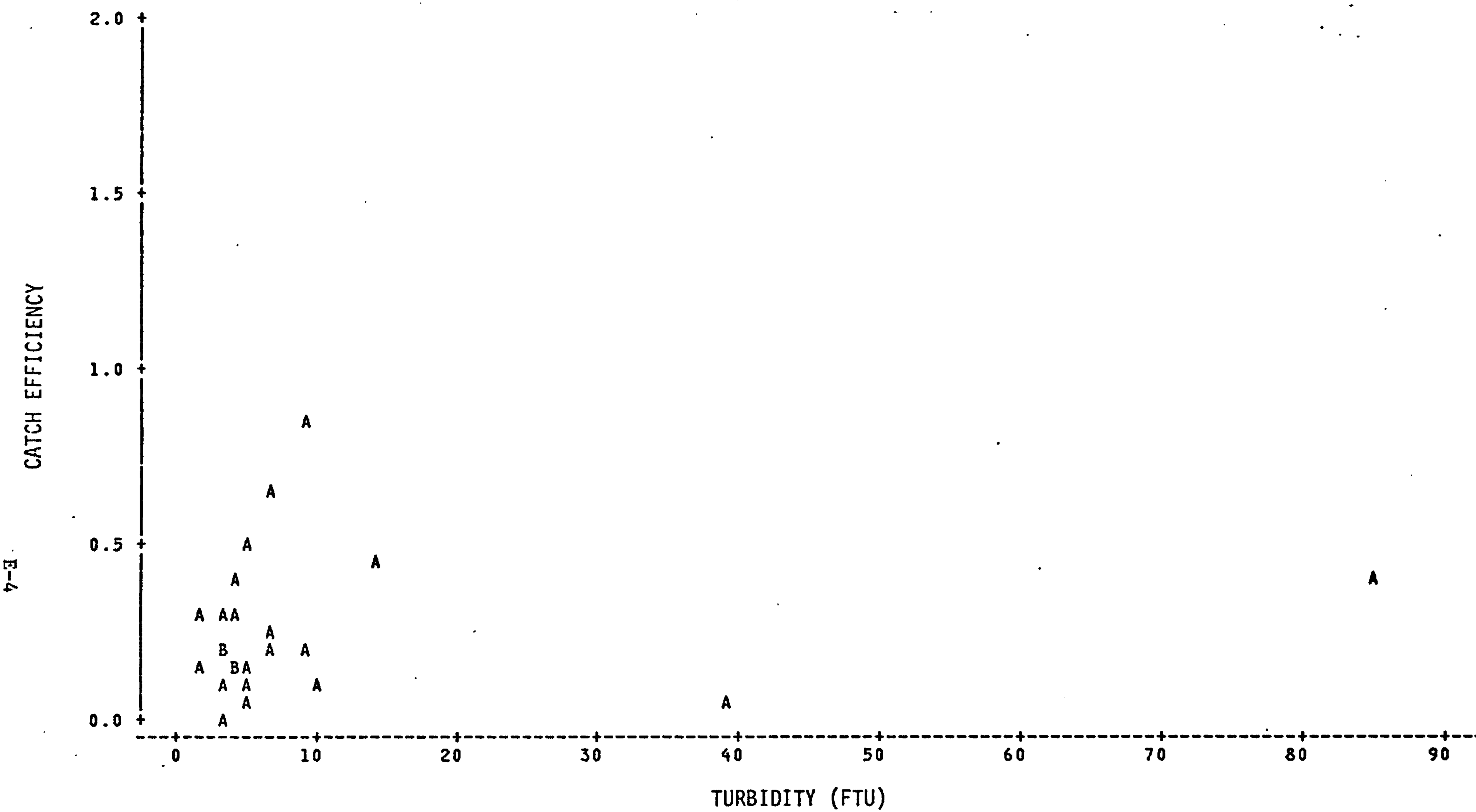

Figure E-3. Night Catch Efficiency for Juvenile Striped Bass in 100-ft Seine versus Turbidity in 1978

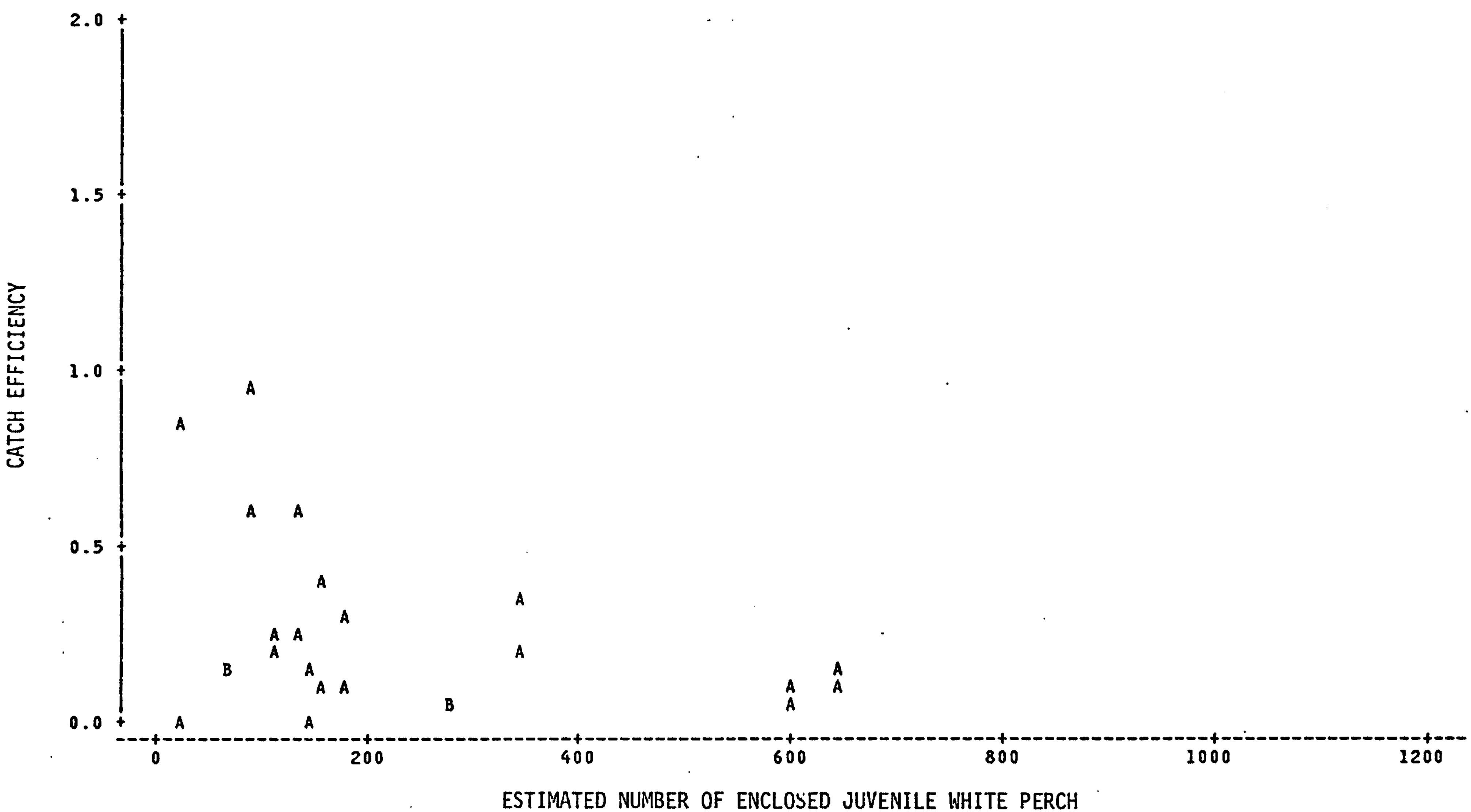

Figure E-4. Night Catch Efficiency for Juvenile White Perch in 100-ft Seine versus Estimated Number of Juvenile White Perch Enclosed in 500-ft Seine in 1978

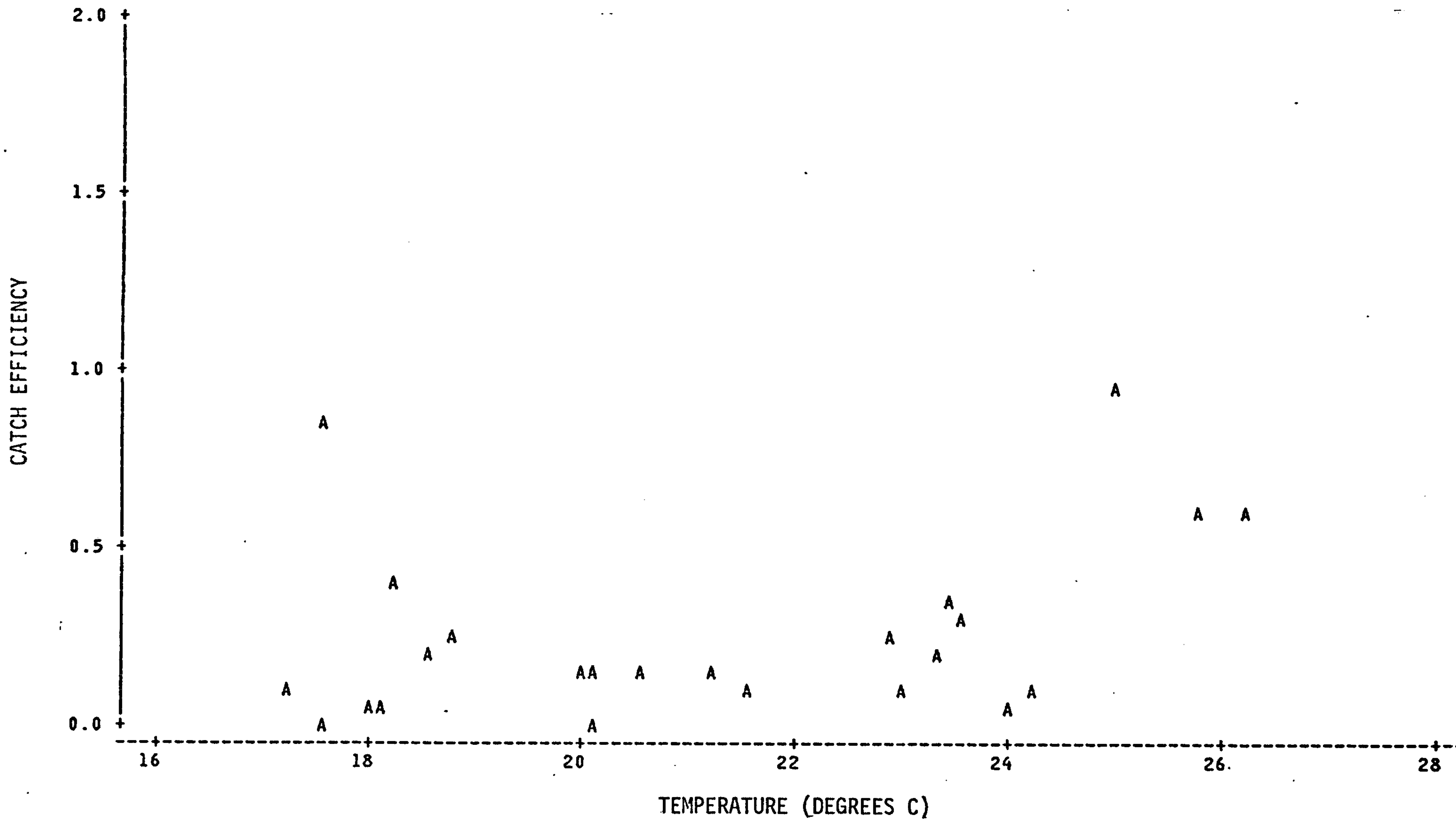

Figure E-5. Night Catch Efficiency of Juvenile White Perch in 100-ft Seine versus Water Temperature in 1978

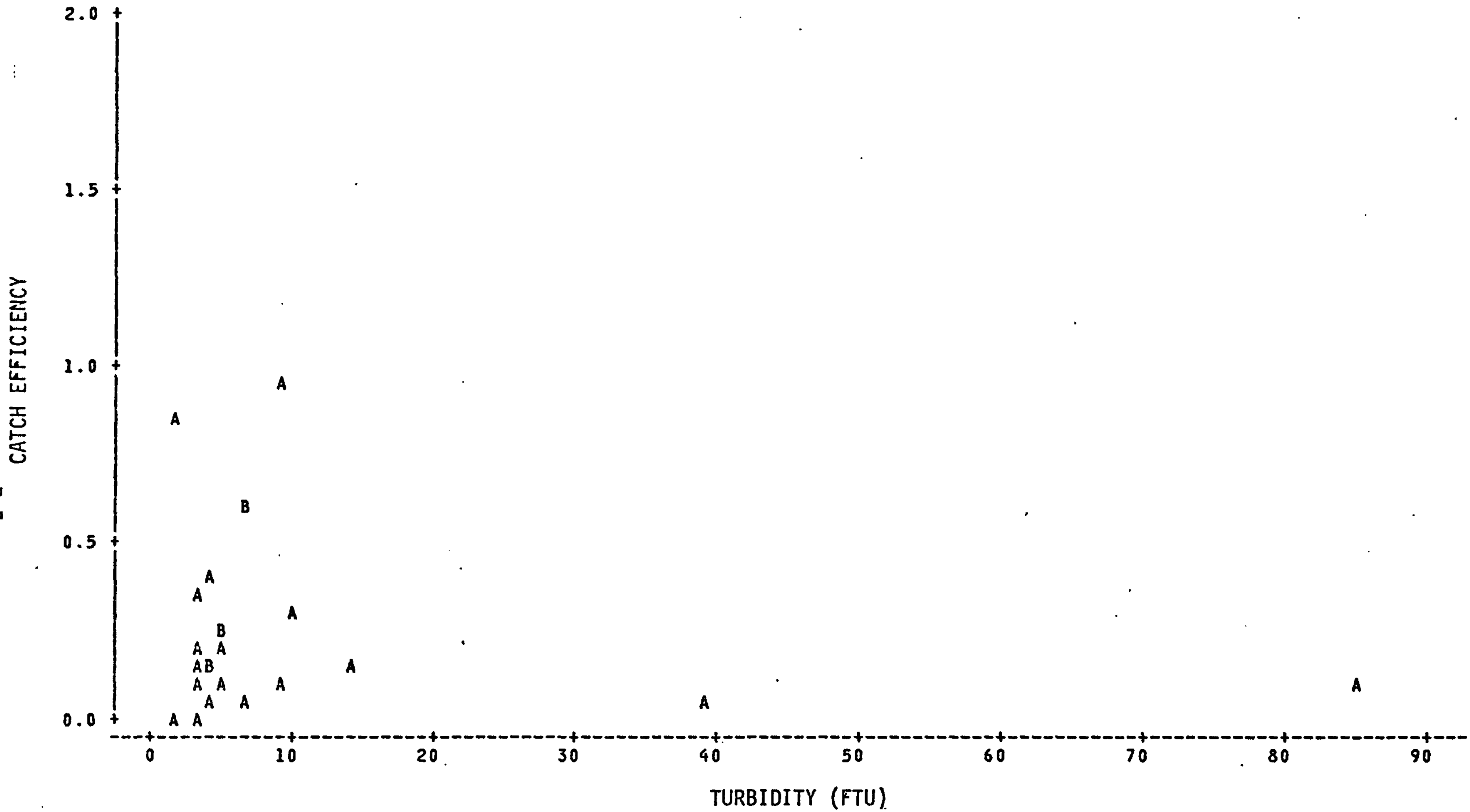

Figure E-6. Night Catch Efficiency of Juvenile White Perch in 100-ft Seine versus Turbidity in 1978

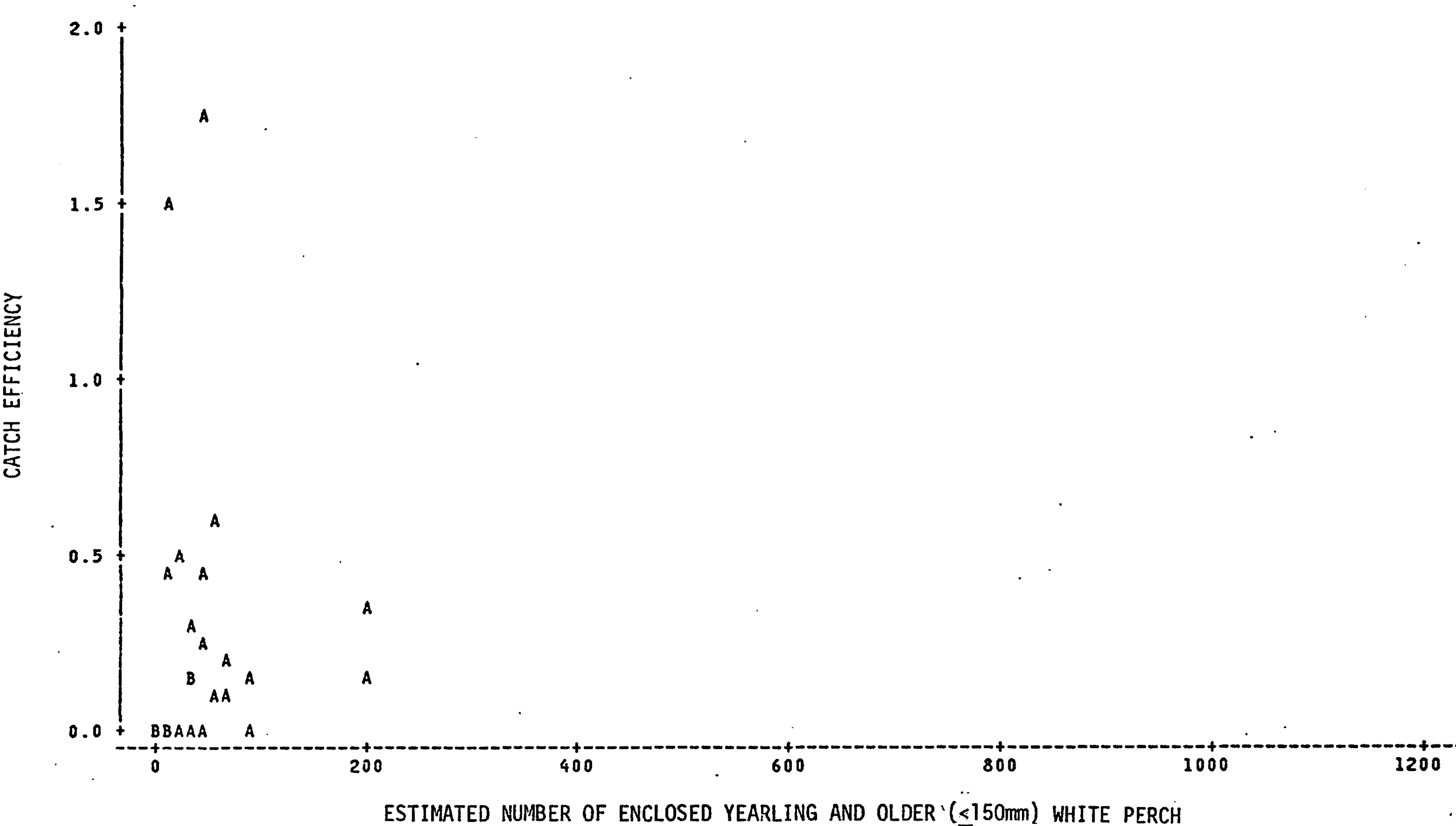

Figure E-7. Night Catch Efficiency for Yearling and Older (≤150mm) White Perch in 100-ft Seine versus Estimated Number of Yearling and Older (≤150mm) White Perch Enclosed in 500-ft Seine in 1978

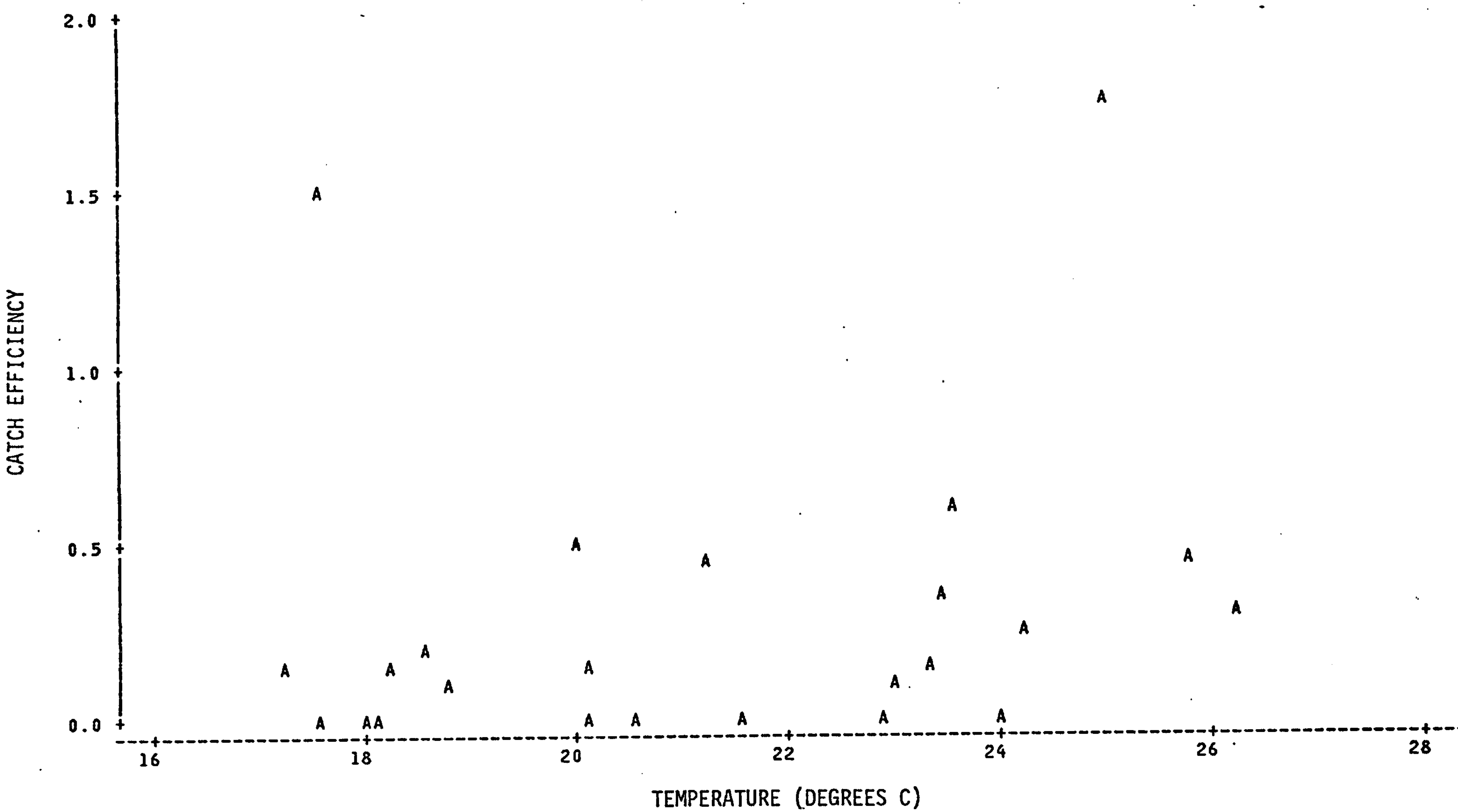

Figure E-8. Night Catch Efficiency of Yearling and Older (≤150mm) White Perch in 100-ft Seine versus Temperature in 1978

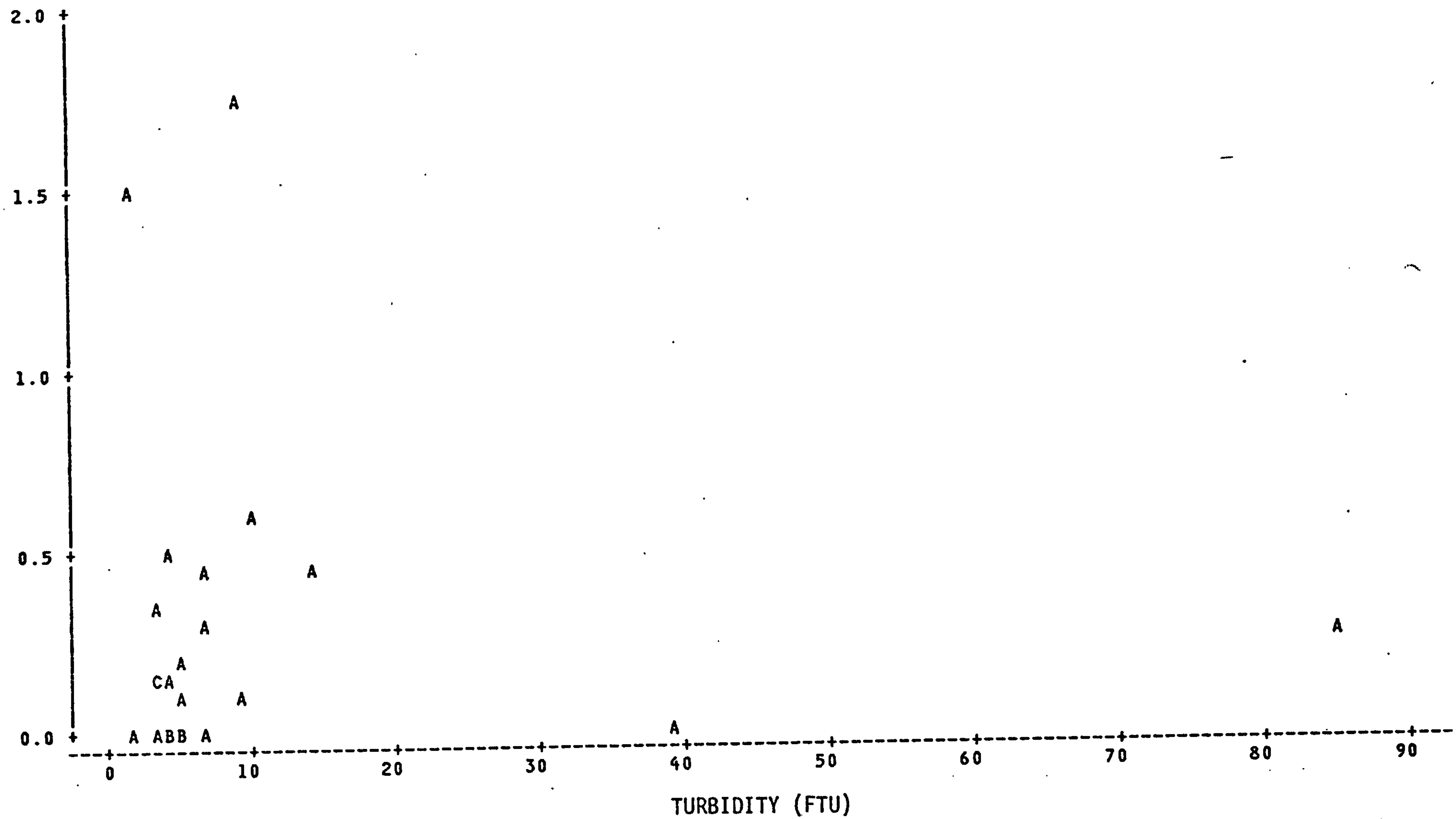

Figure E-9. Night Catch Efficiency of Yearling and Older (≤150mm) White Perch in 100-ft Seine versus Turbidity in 1978

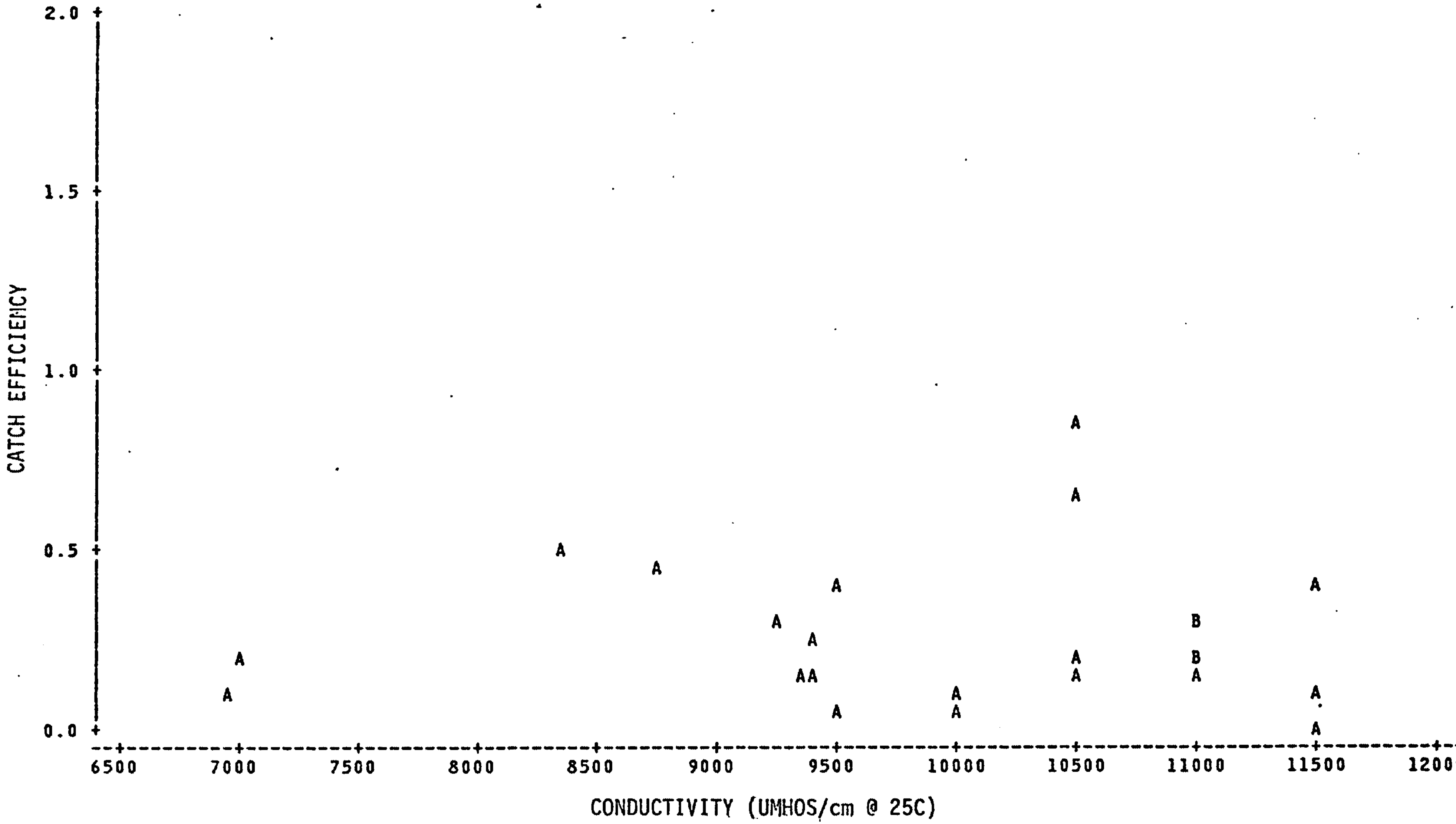

Figure E-10. Night Catch Efficiency of Juvenile Striped Bass in 100-ft Seine versus Conductivity in 1978

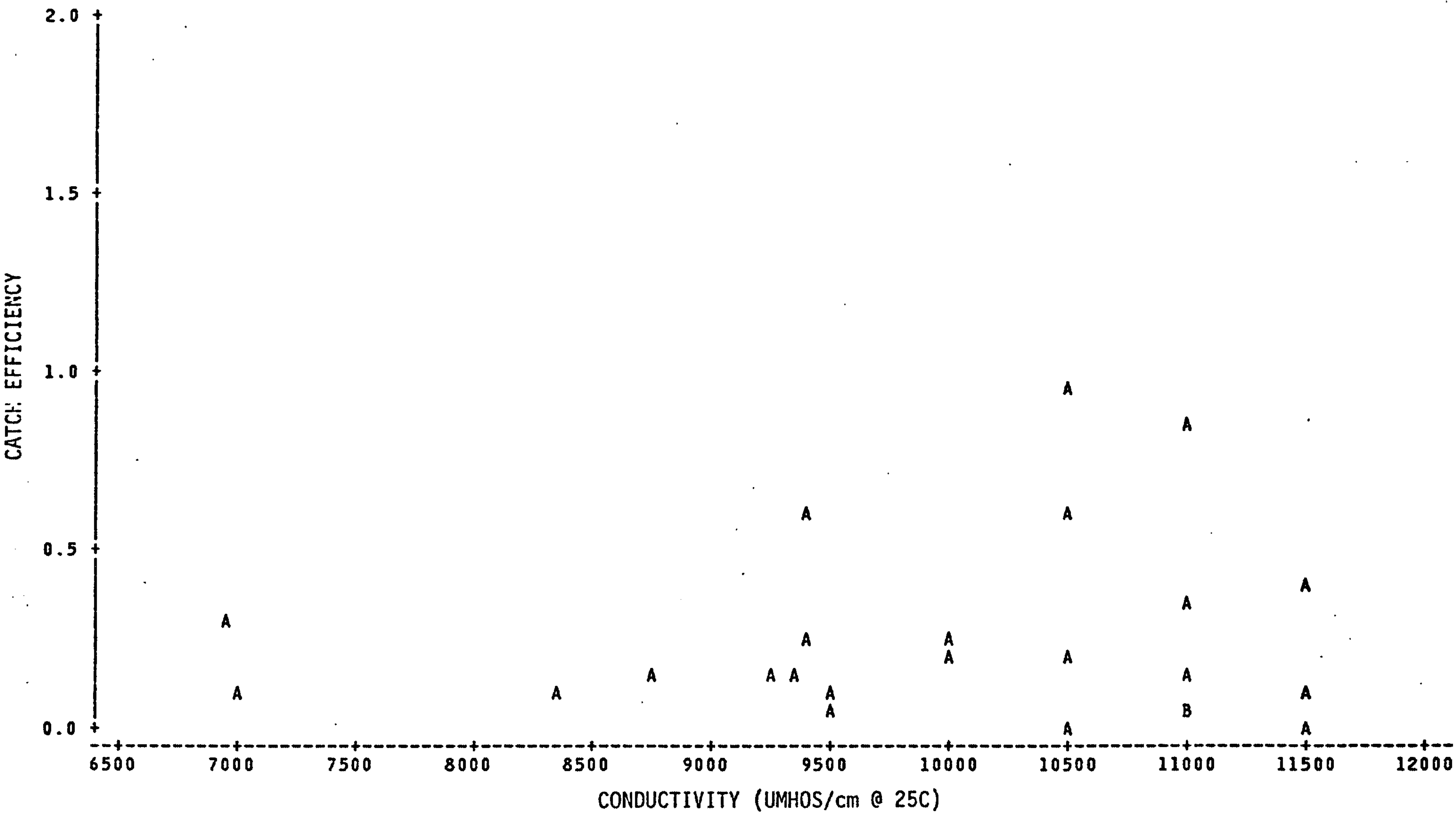

Figure E-11. Night Catch Efficiency of Juvenile White Perch in 100-ft Seine versus Conductivity in 1978

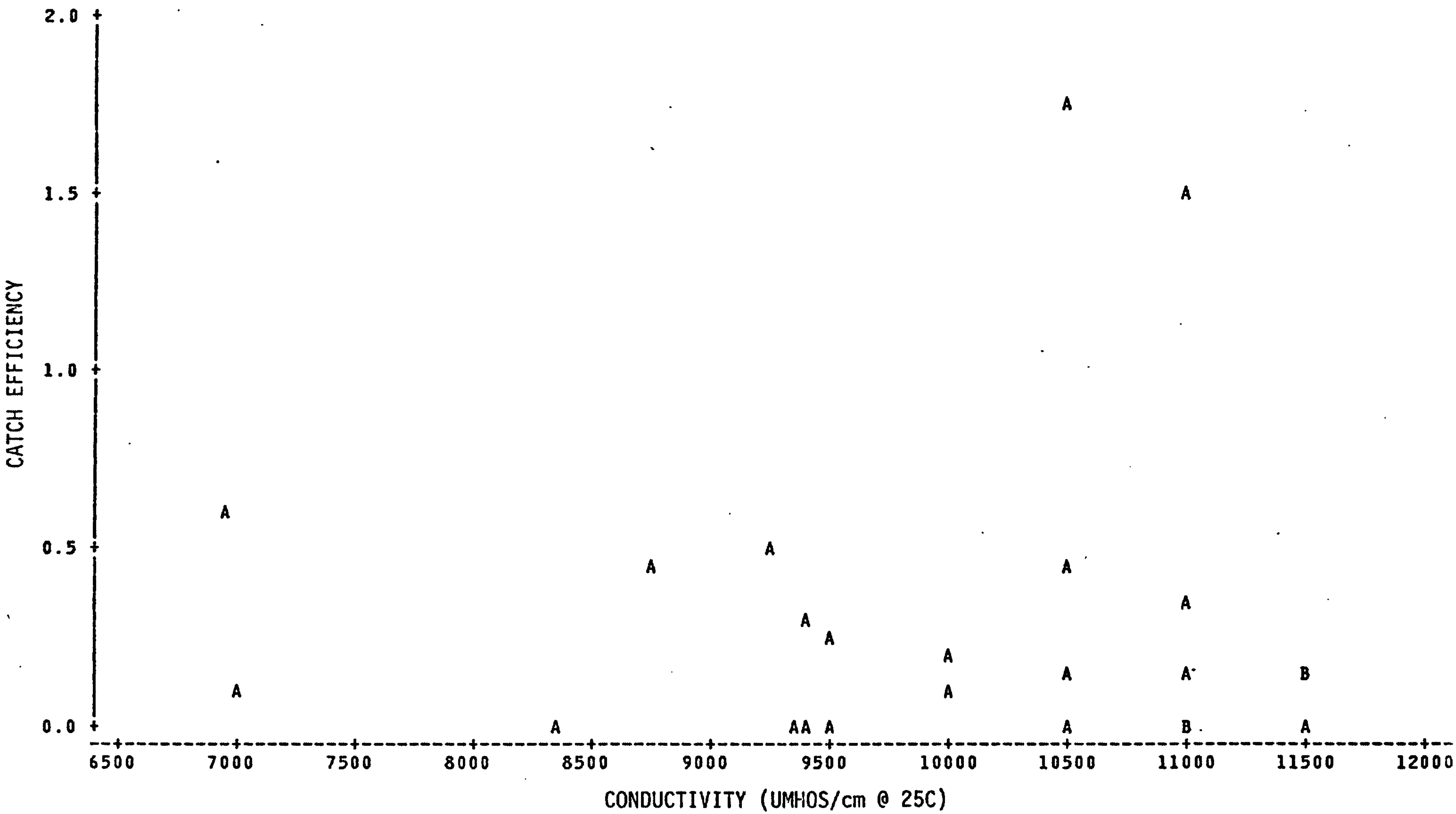

Figure E-12. Night Catch Efficiency of Yearling and Older ($\leq$150mm) White Perch in 100-ft Seine versus Conductivity in 1978

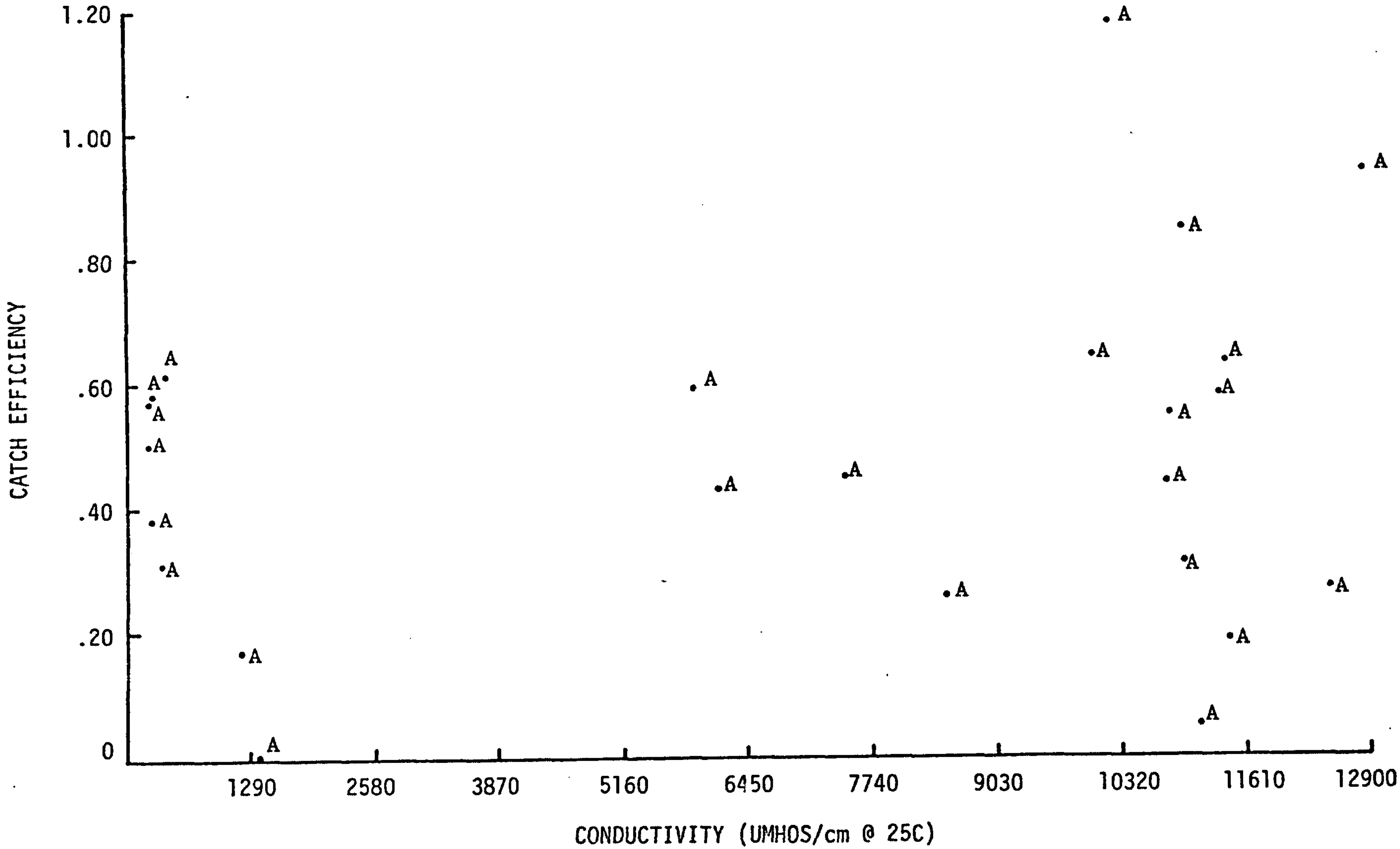

Figure E-13. Day Catch Efficiency of Juvenile Striped Bass in 100-ft Seine versus Conductivity in 1977

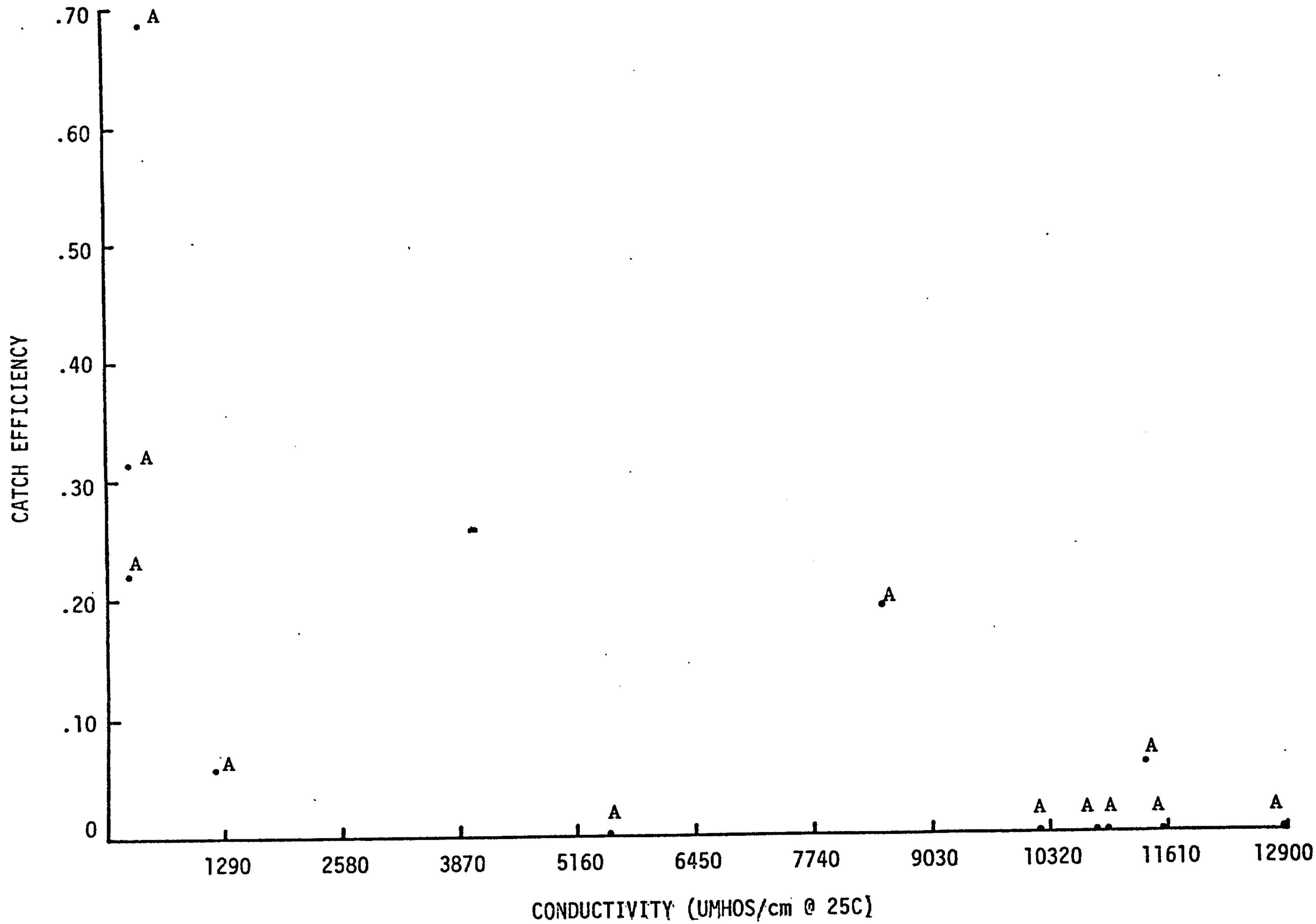

Figure E-14. Day Catch Efficiency of Juvenile White Perch in 100-ft Seine versus Conductivity in 1977

APPENDIX F

SUPPORTING DATA AND STATISTICAL TESTS

Table F-1

Analysis of Variance on Transformed†Catch Data of 100-ft Supplementary Night Beach Seines for Juvenile Striped Bass, Juvenile White Perch, and Yearling and Older (≤150mm) White Perch during 1978

Source of Variation	df	SS	MS	F	p
Juvenile Striped Bass:					
Weeks (Random)	2	0.03000	0.01500	2.669	0.090
Sites (Fixed)	3	0.04401	0.01467	2.046	0.209
Weeks x Sites	6	0.04302	0.00717	1.276	0.305
Error	24	0.13488	0.00562		
Total	35	0.25191			
Juvenile White Perch:					
Weeks (Random)	2	0.07900	0.03950	1.425	0.260
Sites (Fixed)	3	0.16701	0.05567	3.212	0.104
Weeks x Sites	6	0.10398	0.01733	0.625	0.708
Error	24	0.66504	0.02771		
Total	35	1.01503			
Yearling and Older (≤150mm) White Perch					
Weeks (Random)	2	4.28900	2.14450	3.704	0.040*
Sites (Fixed)	3	9.55299	3.18433	14.997	0.003*
Weeks x Sites	6	1.27398	0.21233	0.367	0.893
Error	24	13.89504	0.57896		
Total	35	29.01101			

df = degrees of freedom
SS = sum of the squares
MS = mean square
F = test statistic
p = probability of larger F
* = significant (α= 0.05)
†$Z = X^{-0.252}$: Juvenile Striped Bass
$Z = X^{-0.240}$: Juvenile White Perch
$Z = X^{-0.394}$: Yearling and Older (≤150mm) White Perch
(transformations were based on supplementary night beach seine catch data)

Table F-2

Estimated Number of Juvenile Striped Bass Enclosed in 500-ft Seine in 1978

Week	Test Sites				Week Totals
	Sand Bar	Croton Park	Quarry	Vet's Beach	
09/03-09	744	343	256	1144	2487
09/17-23	348	434	254	260	1296
10/01-07	320	248	183	218	969
Site Totals	1412	1025	693	1622	4752

science services division

Table F-3

Number of Marked Juvenile White Perch Recaptured in 500-ft Seine Sample/Number of Juvenile White Perch Marked from Each 100-ft Seine Sample in 1978

Week	Test Sites							
	Sand Bar		Croton Park		Quarry		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/03-09	18/21	12/12	13/15	03/03	11/12	01/02	12/13	04/05
09/17-23	03/04	00/00	01/02	01/02	10/15	08/09	02/06	00/03
10/01-07	09/10	02/03	03/03	00/00	02/03	01/02	04/05	02/04

science services division

Table F-4

Estimated Number of Juvenile White Perch Enclosed in 500-ft Seine in 1978

Week	Test Sites				Week Totals
	Sand Bar	Croton Park	Quarry	Vet's Beach	
09/03-09	339	93	600	129	1161
09/17-23	141	72	641	176	1030
10/01-07	152	21	283	112	568
Site Totals	632	186	1524	417	2759

Table F-5

Number of Marked Yearling and Older (≤150mm) White Perch Recaptured in 500-ft Seine Sample/Number of Yearling and Older (≤150mm) White Perch Marked from Each 100-ft Seine Sample in 1978

Week	Test Sites							
	Sand Bar		Croton Park		Quarry		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/03-09	09/12	04/05	11/12	00/01	02/02	00/00	01/02	00/00
09/17-23	02/02	00/00	00/00	01/02	01/01	00/00	03/06	00/01
10/01-07	01/01	00/01	02/02	00/00	00/00	00/00	01/01	01/01

science services division

Table F-6

Estimated Number of Yearling and Older (≤150mm) White Perch Enclosed in 500-ft Seine in 1978

Week	Test Sites				Week Totals
	Sand Bar	Croton Park	Quarry	Vet's Beach	
09/03-09	205	41	48	37	331
09/17-23	87	23	13	61	184
10/01-07	37	8	2	68	115
Site Totals	329	72	63	166	630

science services division

Table F-7

Results of Wilcoxon Signed Rank Test for Equality of Recapture Rates for Fish Marked in First and Second 100-ft Seine Tows in 1978

Equality of Recapture Rates			
Species	n	T^+	*p
Juvenile Striped Bass	12	41.5	>0.85
Juvenile White Perch	12	35.0	>0.16
Yearling and Older ($\leq$150mm) White Perch	12	9.0	>0.25

n = the number of paired observations

T^+ = test statistic

$$T^+ = \sum_{i=1}^{n} R_i \Psi_i$$

$R_i \Psi_i$ = positive signed rank

p = probability of obtaining a larger T^+

α = 0.05

*Two tailed test ($H_0: Tow_1 = Tow_2$)

Table F-8

Number of Total Length Measurements Taken from Tow 1 and Tow 2 (Night Beach Seine Efficiency Tests) for Juvenile Striped Bass and White Perch in 1978

	Tow 1	Tow 2
Juvenile Striped Bass:		
09/03-09	61	49
09/17-23	32	36
10/01-07	28	7
Juvenile White Perch:		
09/03-09	54	20
09/17-23	16	9
10/01-07	18	5

Table F-9

Number of Marked Juvenile Striped Bass Recaptured in 500-ft Seine Sample/Number of Juvenile Striped Bass Marked from Each 100-ft Seine Sample in 1978

Week	Test Sites							
	Sand Bar		Croton Park		Quarry		Vet's Beach	
	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2	Tow 1	Tow 2
09/03-09	10/26	17/23	43/47	13/16	11/13	01/01	33/48	18/27
09/17-23	15/17	08/09	05/10	11/21	12/13	13/16	00/05	04/08
10/01-07	21/21	04/05	06/11	00/01	02/02	01/03	00/01	02/04

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Versar INC.

EVALUATION OF HUDSON RIVER BEACH SEINE PROGRAMS CONDUCTED BY THE NEW YORK UTILITIES AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Prepared for

Consolidated Edison Company
of New York, Inc.
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Prepared by

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ESM Operations
9200 Rumsey Road
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Jointly financed by

Central Hudson Gas and
Electric Corporation
Consolidated Edison Company
of New York, Inc.
New York Power Authority
Niagara Mohawk Power Corporation
Orange and Rockland Utilities, Inc.

February 1988

FOREWORD

The Beach Seine Comparison Report was prepared by Versar, Inc., ESM Operations, with the support of Coastal Environmental Services, Inc., for Consolidated Edison Company of New York, Inc., under contract number 620803. The objective of this report is to evaluate the usefulness of beach seine programs being conducted by the New York Utilities and the New York State Department of Environmental Conservation as estimators of relative year class strength of fish in the Hudson River.

EXECUTIVE SUMMARY

Three beach seine programs to monitor fish abundance are presently being conducted in the Hudson River. Two of these programs are being conducted by the New York State Department of Environmental Conservation (NYSDEC striped bass program and NYSDEC shad program) and the other is conducted by the New York Utilities. This study was undertaken to evaluate these beach seine programs for their relative ability to produce reliable indices of abundance for five Hudson River fish species: striped bass, white perch, American shad, Atlantic tomcod, and bay anchovy.

Three major methodological differences between the three beach seine programs were identified:

- Gear -- Both the Utility and NYSDEC shad program use a 30.5-m net (however, the NYSDEC net is 0.6 m deeper). The NYSDEC striped bass program uses a 61-m net.

- Statistical Design -- The NYSDEC striped bass program uses a fixed beach design. The Utility program uses a stratified random design. The NYSDEC shad program switched from a stratified random design to a fixed beach design in 1983.

- Geographic Extent -- The Utility program samples from river mile 12 to river mile 152. The NYSDEC striped bass program samples from river mile 23 to river mile 41. The NYSDEC shad program presently samples several subsets of the area between river miles 55 and 140.

In addition, there are differences in the number of samples taken by each program on each river run, although all programs sample on a biweekly basis.

To conduct the evaluation, data collected in these programs from 1981 to 1985 were analyzed. In addition, offshore data collected by both the NYSDEC and the Utilities were utilized for analyses that focused on estimating the proportion of the riverwide population subject to sampling by the beach seine gear.

The approach taken to compare the three sampling programs was to first develop and characterize a prototype estimator, and then compare the NYSDEC and Utility programs for their abilities to satisfy the requirements of the prototype estimator.

The prototype estimator was identified as a statistic that possesses two major characteristics. First, the variance of the index can be estimated from the catch data to determine its precision. Second, the expected value of the index is equal to the true riverwide abundance of fish multiplied by some constant value which is invariant over years. For the prototype to be extended from an index of relative abundance to one of absolute abundance, a third requirement exists that the invariant proportion of the population occurring in the sampled beaches be known.

The selected prototype estimator was based on mean catch per unit effort and the Utility and NYSDEC programs were described as special cases of a three-stage sampling model for estimating the mean. Algebraic expressions for the estimator of mean catch per unit effort and variance were provided. Estimates of the components of population variance were identified and partitioned, and used to provide a basis for making a number of comparisons among the beach seine programs.

The effect of using different types of gear was assessed by comparing the means and variances of catches collected from the same beaches by the different programs. In general, the types of gears used for the NYSDEC progrms were found to be more efficient (i.e., had lower variability) than those used for the Utility program.

The effect of the fixed beach design on precision of the estimate was examined by analysis of variance. Variability in catch per haul within beach and river run was found not to differ significantly from variability among beaches (within river run), indicating that the observed among beach variability was no greater than the corresponding within beach variability alone. This is probably the result of random movements among beaches by fish and indicates that the fixed beach design did not improve precision. However, the fixed beach design has the disadvantage of limiting the number of beaches and thereby the area in which sampling is conducted.

Subsets of the Utility data corresponding to the geographic extents of the NYSDEC programs were analyzed to assess the effect of sampling different geographic extents. For striped bass, no difference was found; however, for white perch and American shad, the analysis indicated that sampling a more limited geographic extent could reduce the reliability of estimates.

The programs also were compared to determine which produced the most precise annual estimates of mean catch per unit effort. The NYSDEC programs targeted at striped bass and American shad produced more precise estimates for these species than did the Utility program. For the other species, the precision of the estimates was either unacceptably low for all programs or not consistently higher for any one program.

Analyses of the offshore data in conjunction with the beach seine data provided no indication of the presence of special conditions required for estimating the proportion of the riverwide population that inhabited the area subject to beach seine sampling. The beach seine is an unacceptable means by which to estimate absolute abundance. Furthermore, it must be assumed that this proportion is constant among years in order to make inferences about changes in relative abundance among years from any of the beach seine indices. Factors that could affect this proportion include among year shifts in distribution patterns of juveniles. Consequently, programs that sample larger geographic extents (both longitudinally and latidudinally) are less likely to produce unreliable estimates for these purposes.

For indices of striped bass abundance, the NYSDEC striped bass program has the advantages (due to the 61-m net) of greater precision and greater robustness to possible on-offshore distribution shifts among years, whereas the Utility program has the advantage of being more robust to possible longitudinal shifts in distribution patterns among years. For indices of American shad abundance, the NYSDEC program has the advantage of somewhat greater precision and the Utility program has the advantage of being more robust to (observed) longitudinal shifts in distribution patterns among years. For white perch, the Utility program has the advantage of being more robust to (observed) longitudinal shifts in distribution patterns, whereas the NYSDEC programs have no clear advantages. Finally, none of the programs appear well suited to producing indices of relative abundance for bay anchovies or Atlantic tomcod.

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I. INTRODUCTION

Beach seine sampling programs are frequently used for the purpose of measuring yearly differences in relative abundance of juvenile fish in east coast estuaries. Examples include programs conducted in the Delaware estuary (Himchak and George 1986), Chesapeake Bay (Boone 1980), the York and James rivers (Loesch and Kriete 1984), and the Altamaha River (North Carolina Division of Marine Fisheries 1982). The inexpensiveness of the sampling equipment, along with its relative ease of deployment, makes it a popular method for monitoring fish populations.

In the Hudson River, three beach seine sampling programs are presently being conducted. Since 1974, the New York Utilities have been conducting a beach seine sampling program for several key fish species. During this time, the New York State Department of Environmental Conservation (NYSDEC) has conducted two independent seining programs, one directed towards American shad and a second towards striped bass. Data from all three programs have been used to produce annual indices of relative abundance.

Despite the popularity of beach seine monitoring programs, the methods used in these programs have undergone surprisingly little scrutiny. Goodyear (1985) has documented a relationship between the Maryland index of striped bass spawning success and recruitment of adults to the commercial fishery at a later date, but no such validation has been documented for other species or for monitoring programs in other estuarine systems. A few studies have attempted to measure gear efficiency of a beach seine by use of a block net or by repeated hauls (Lyons 1986; Frankiewicz et al. 1986; Penczak and O'Hara 1983; Wiley and Tsai 1983; Weinstein and Davis 1980; Texas Instruments 1979; Lotrich 1973), but none of these have been conducted to optmize a monitoring program by comparing gears or study designs. In the Hudson River, where multiple seine programs have been conducted using different methods (e.g., a 61-m net vs. a 31-m net, a stratified random sampling design vs. a fixed beach design), no study has examined which methods provide the most precise and statistically reliable results.

This report evaluates the relative merits and statistical adequacy of the three beach seine programs being conducted in the Hudson River based on data collected in each program from 1981-1985. The evaluation focuses primarily on the reliability of each program for producing indices of relative and absolute abundance for among year comparisons of year class strength for five fish species: striped bass, white perch, American shad, bay anchovy, and Atlantic tomcod. We conducted the evaluation by identifying the characteristics of a "prototype estimator" of abundance and then determining how well the Utility and NYSDEC beach seine programs compare to the prototype. This approach allows identification of strengths and weaknesses of the respective programs, thereby providing a basis for recommendations for design changes to improve all the programs.

During 1981-1985, both the Utilities and the NYSDEC have maintained an offshore program in the Hudson River. In order to evaluate representativeness of beach seine data on the river as a whole, it was necessary to examine onshore-offshore distribution patterns. Thus, the NYSDEC and Utility offshore data were also used to evaluate the beach seine programs.

The remainder of this report is divided into four chapters. Chapter II presents detailed descriptions of methods used for the various studies. This includes specific information on sampling schedules and locations, site selection protocols, sampling gears, etc. This chapter describes both the nominal and actual methods that were used in the study design and collection of the data. Chapter III describes the characteristics of the prototype estimator for calculating relative abundance. It lists the properties that such an estimator should have in order to ensure a successful program. Chapter IV compares the Utility and NYSDEC beach seine programs, using the criteria of the prototype estimator, as defined in Chapter III. Literature cited is presented in Chapter V.

II. PROGRAM METHODOLOGIES

This chapter describes methods used in three beach seine and two offshore programs conducted by the Utilities and NYSDEC from 1981-1985. For each method we discuss:

- Sample allocation (the frequency of sampling, geographic range of sampling, and methods used for selecting sample site locations)
- Sampling procedures (the type of gear and methods used to collect the data).

We developed these descriptions by reviewing written procedures provided by the study group and by inspecting actual data records. When these two sources were in disagreement, the description of methods was based on inspection of data records, and the discrepancies were noted.

Sections A-C of this chapter describe the methods used for each of the three beach seine programs. Sections D and E describe methods used in the Utility and NYSDEC offshore programs, respectively. Section F presents a comparison of the number and size of fish collected by each of the five programs.

A. UTILITY BEACH SEINE PROGRAM

Sample Allocation

The Utility beach seine program is conducted biweekly (i.e., every two weeks) from as early as mid-July (week 28, with week based on number of Sundays since the first of the year) to mid-November (week 46) for the 1981-1985 period (Fig. II-1). Approximately 100 samples were taken per sampling period; deviations from this number rarely varied by more than one or two samples per sampling period.

Sampled beaches are selected each week on a stratified random basis from 285 beaches that the Utilities have identified as constituting all sampleable beaches between river miles 12-152. Two hundred and eighty-one of these beaches were sampled between 1981 and 1985. Strata are based on the 12 regions shown in Fig. II-2, with the greatest number of samples collected in the downstream regions, where striped bass are most abundant (Table II-1).

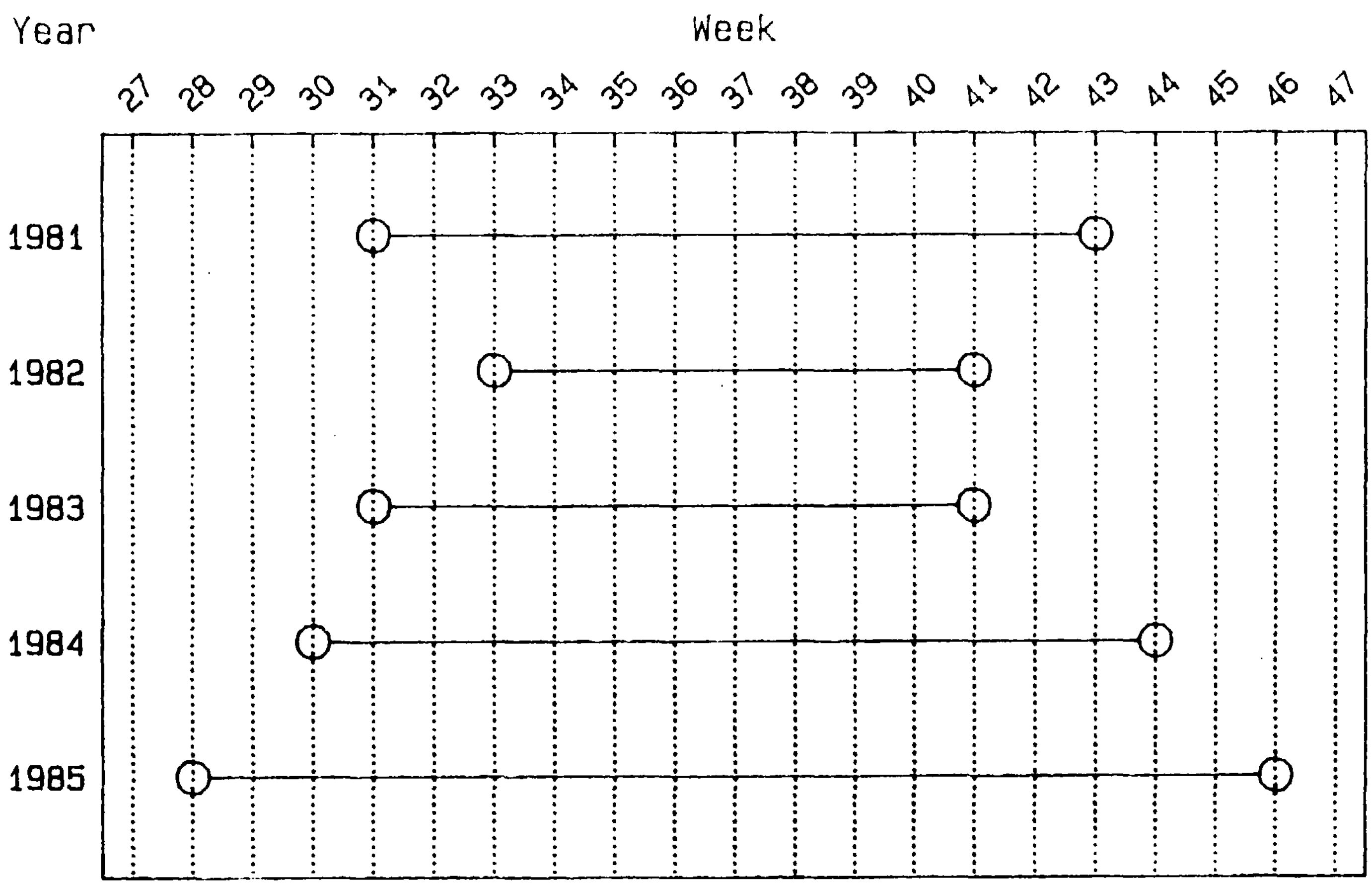

Figure II-1. Weeks during which the Utility beach seine program has been conducted from 1981-1985

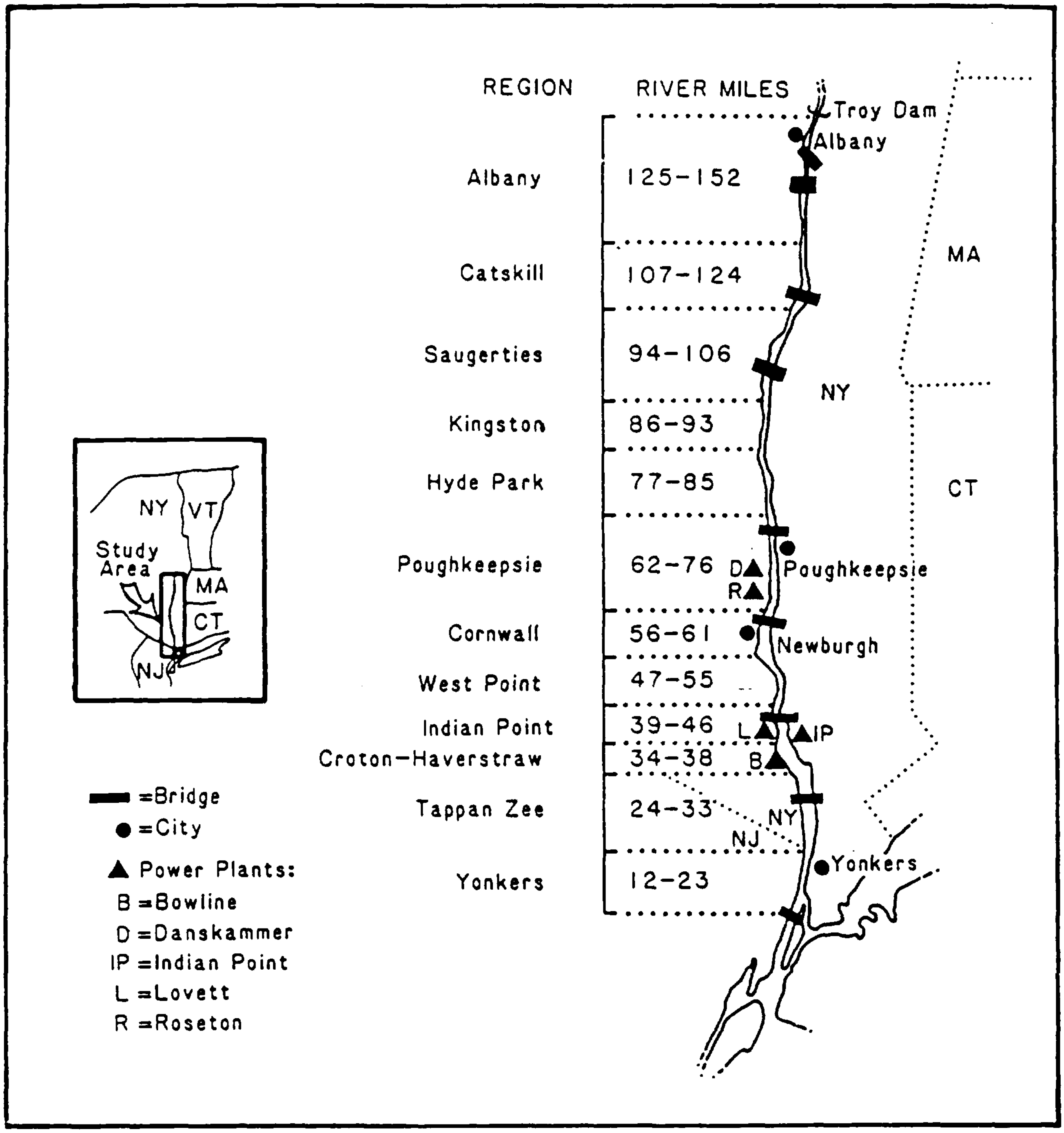

Figure II-2. Location of 12 geographic regions (with river mile boundaries) sampled during 1985 field sampling programs in the Hudson River estuary

Table II-1. Regional sample allocation for the Utility beach seine program and the number of beaches that the Utilities have identified as sampleable in each region

Region	Number of Beaches Sampled During a Weekly Sample Period	Number of Sampleable Beaches within the Region
Yonkers	5	15
Tappan Zee	24	26
Croton-Haverstraw	14	25
Indian Point	5	22
West Point	5	9
Cornwall	6	15
Poughkeepsie	5	30
Hyde Park	5	17
Kingston	5	11
Saugerties	9	20
Catskill	10	41
Albany	7	54
TOTAL	100	285

Nominally, beaches are sampled only once per sampling period (river run), but in the Tappan Zee region 24 samples are allocated to only 26 beaches. As some beaches are unavailable at certain times (swimming activity, tidal stage, etc.), beaches may be sampled twice during a river run to meet the required sampling effort. Under such circumstances, repeated sampling occurs only after a 24-hr waiting period. The Utilities also impose a 24-hr waiting period if they are aware that the NYSDEC has recently sampled one of their beaches, although data indicate that the Utilities and NYSDEC sampled the same beaches on the same day 152 times. On 30 of these occasions, the Utilities sampled beaches later in the day than did NYSDEC, while the reverse was true 74 times. In 1985, there were 48 occurrences of a beach being sampled on the same date, but sampling times were not available for the NYSDEC striped bass program.

Sampling Procedures

Sampling is conducted using a 30.5-m bag beach seine. The two wings of the seine are each 2.4 m deep and 12.2 m long, and are constructed of 2.0-cm stretch mesh. The 6.1-m bag is 3.0 m deep with 9.5-mm stretch mesh. The net is deployed by holding one end on shore and towing the other end perpendicular to the shore by boat. The seine is then hauled toward shore into the current in an arc of decreasing radius.

All Utility beach seine sampling takes place during daylight hours. Sampling for the week has most often been completed in four days, but has taken as long as six days.

All fish are identified to species and age class (i.e., young-of-year, yearling, older) and are counted. Total length is measured for 12 species of fish (Table II-2). Up to 10 young-of-year fish are measured from each of the Yonkers, Indian Point, West Point, Cornwall, and Poughkeepsie regions. For all other regions, up to five fish per species per sample are measured. When more specimens of a species are collected than are needed for length measurements, the fish used to fill the quota are randomly selected. Table II-3 gives the fraction of target species that were measured for length from 1981-1985.

Table II-2. Fish species for which length measurements (TL) are taken in the Utility beach seine and offshore programs

Alewife	Shortnose sturgeon
American shad	Spottail shiner
Atlantic sturgeon	Striped bass
Atlantic tomcod	Weakfish
Bay anchovy	White catfish
Blueback herring	White perch

Table II-3. Percent of catch for each of five species sampled during the period 1981-1985 that were measured for length. Length information for the NYSDEC striped bass beach seine program was based on data provided in summary form.

	Utility Beach Seine Program	NYSDEC Shad Beach Seine Program	NYSDEC Striped Bass Beach Seine Program	Utility Offshore Program	NYSDEC Offshore Program
Striped bass	23.6	59.8	77.0	51.0	64.7
White perch	22.0	0	0	44.9	0.7
American shad	14.0	27.2	0	36.2	62.9
Atlantic tomcod	67.0	0	0	24.8	0.1
Bay anchovy	3.7	0	0	1.5	0

B. NYSDEC STRIPED BASS BEACH SEINE PROGRAM

Sample Allocation

The NYSDEC striped bass beach seine program has been conducted biweekly from as early as mid-July (week 28) to as late as mid-November (week 46) (Fig. II-3). From 20 to 25 samples have been collected each week, with 25 samples collected in most weeks.

Sampling in the NYSDEC striped bass program occurs from river miles 23-41. Sampling nominally occurs at a set of 25 standard beaches that are used each year. However, a total of 38 beaches were sampled between 1981 and 1985; only five beaches were sampled in all weeks in all years. In no case has a beach been sampled more than once in a week.

Sampling Procedures

Sampling is conducted using a 61-m x 3.1-m deep, 12-mm stretch mesh net. The net is deployed using a boat starting on the right side of the beach (as faced from the water). Unlike the Utility program, once the net is set, it is pulled to shore by hand.

Beaches used for the NYSDEC striped bass program were selected independently of the beaches selected by the Utilities. However, many of these beaches are held in common between these programs. Appendix B provides a listing of NYSDEC beaches using the numbering system developed by the Utilities.

All sampling takes place during daylight hours. Sampling is most often completed in two days, but has occasionally taken three days.

All fish collected are identified and enumerated. For striped bass, all fish are counted individually. Other species of fish are counted individually unless they are too numerous (~ 500 fish). In this case, they are sampled either volumetrically or (since 1983) by weight. For striped bass and white perch, young-of-year are counted separately from older fish. For other species, the count consists of all size categories combined. Most striped bass are measured for length; these length data were unavailable to Versar.

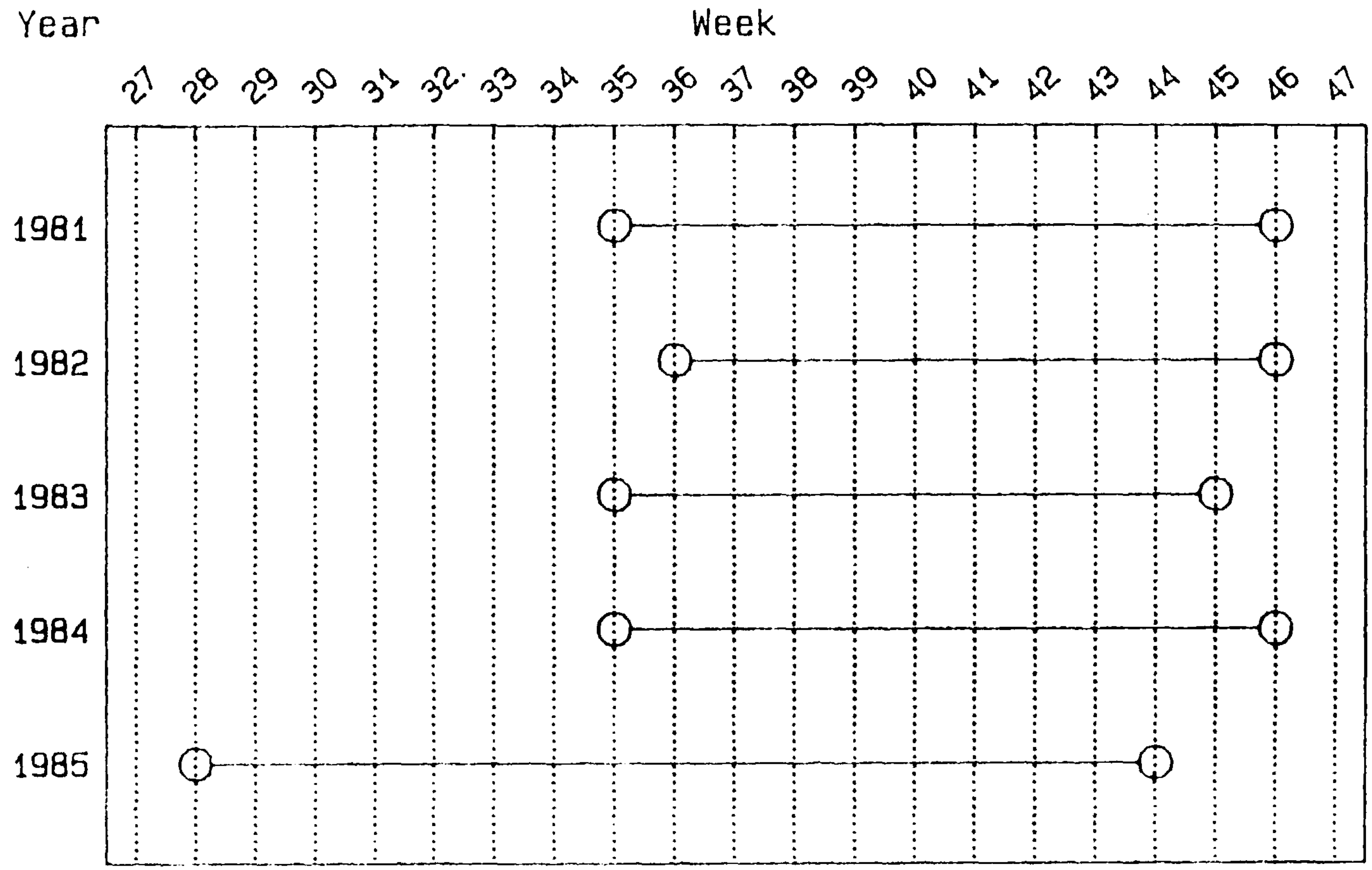

Figure II-3. Weeks during which the NYSDEC striped bass beach seine program has been conducted from 1981-1985

C. NYSDEC SHAD BEACH SEINE PROGRAM

Sample Allocation

The NYSDEC shad beach seine program has been conducted biweekly from as early as mid-June (week 24) to as late as mid-November (week 45) (Fig. II-4). Approximately 35-40 samples are collected in most weeks, although the number of samples has been as low as 21 in some weeks.

The sampling protocol for this program was modified in 1983. In 1981 and 1982, sampling was conducted from river miles 24-152, with beaches selected in a randomized manner from the 285 beaches established by the Utility program. In 1983, the geographic extent was reduced to river miles 55-64, 69-79, 121-130, 134-140. Within these ranges of river miles, a set of 40 standard beach sites was established for sampling. A few sites have been added to or deleted from this list in subsequent years. A total of 48 beaches have been sampled since 1983. For the most part, the standard beach design has been carried out, but because of changes to the list of standard beaches and to missing samples within a river run, only three beaches have been sampled in all river runs in all three years. Discounting river runs in which less than 30 beaches were sampled, 14 beaches have been sampled in all river runs. In no case has a beach been sampled more than once within a river run.

Sampling Procedures

Sampling is conducted using a 30.5-m bag beach seine. The two wings of the net are 12.2 m x 3.1 m, the bag measures 6.1 m x 3.7 m, and the entire net is constructed of 6.4-mm mesh. The net is deployed using a boat in the same manner as in the Utility program. Also, as in the other programs, all beach seine sampling is conducted during daylight hours. Sampling for a river run is typically accomplished in four days, though five days is often required.

All individuals are identified to species as young-of-year or older, and enumerated. However, in 11 hauls, fish of individual species were simply recorded as "too numerous to count." A maximum of 30 individuals per seine haul of each of four species (American shad, alewife, blueback herring, and striped bass) are measured to the nearest mm for total and fork lengths. Table II-3 gives the fractions of total catch of American shad and striped bass that have actually been measured.

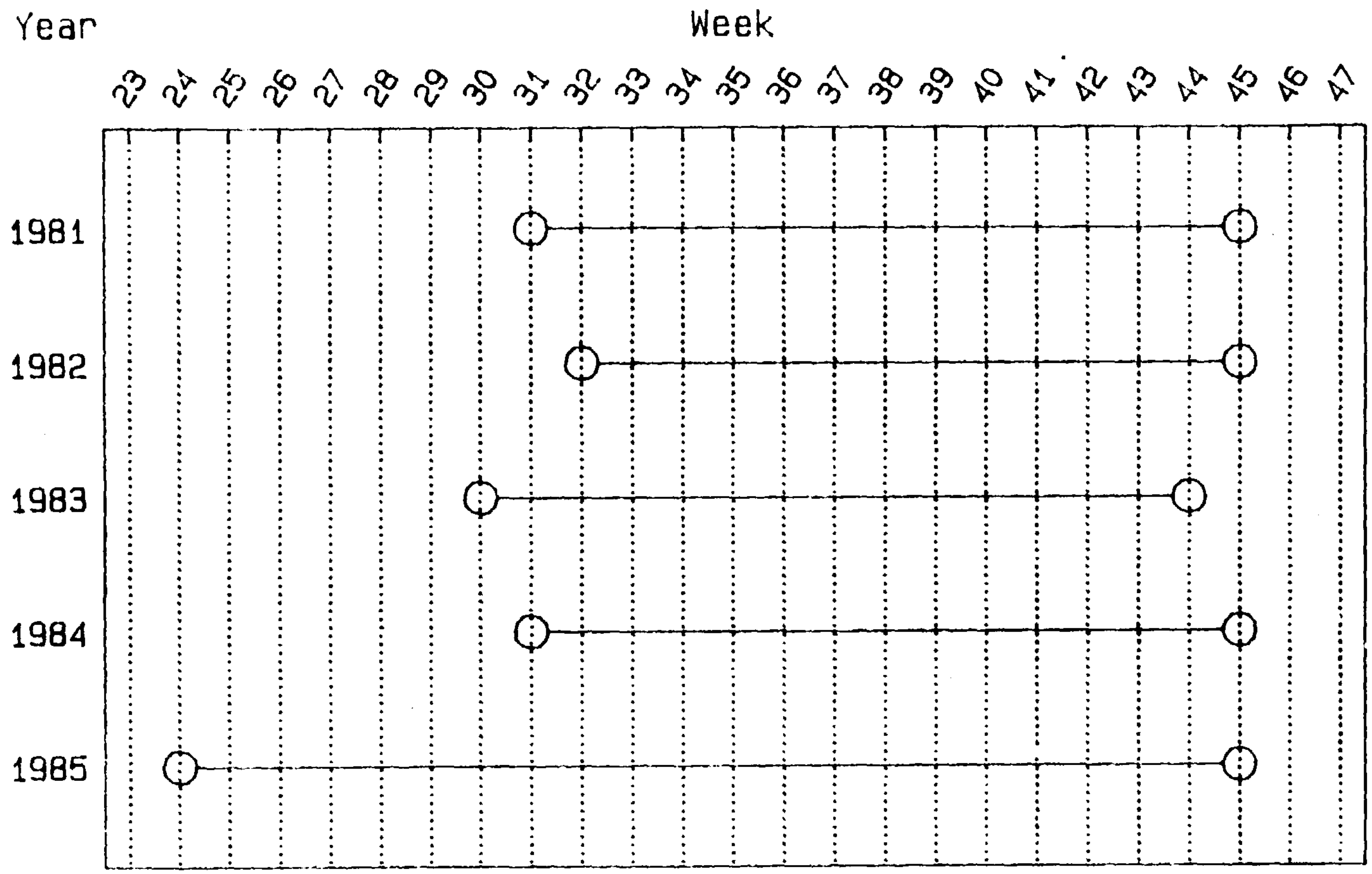

Figure II-4. Weeks during which the NYSDEC American shad beach seine program has been conducted from 1981-1985

D. UTILITY OFFSHORE PROGRAM

Sample Allocation

The Utility offshore program has been conducted biweekly from as early as late July (week 29) to as late as mid-November (week 45) (Fig. II-5). Collections are made on alternate weeks as those taken for the Utility beach seine program. Approximately 200 samples are collected each week, with only minor deviations in number of samples collected.

Offshore sampling in the Utility program is conducted according to a stratified random design in which the river is divided into 12 regions (Fig. II-2). Each region is further divided into "strata" on the basis of river depth. These strata include:

- Shoal -- that portion of the river extending from the 2-6 m depth at mean low tide
- Bottom -- that portion of the river extending from the bottom to 3 m above the bottom where river depth is greater than 6 m at mean low tide
- Channel -- that portion of the river not considered bottom where river depth is greater than 6 m at mean low tide.

However, not all strata are sampled in each region. The shoal is sampled only from river miles 24-46 and 56-61. The channel is sampled from river miles 12-124, and the bottom is sampled from river miles 24-152.

Table II-4 provides the allocation schedule of sampling effort within each region and strata used in 1985. Sampling locations within each region/strata are selected on a random basis.

Sampling Procedures

Three types of gear have been used to collect juvenile fish in the Utility offshore program. A 1 m^2 Tucker trawl with 3,000-μm mesh has been used to collect fish in the channel habitat. The same device, mounted on an epibenthic sled, was used to collect fish in the shoal and bottom habitat prior to 1985. In 1985, the gear used in these two strata was changed to a 3-m beam trawl with a 3.8-cm mesh and 1.3-cm mesh cod end

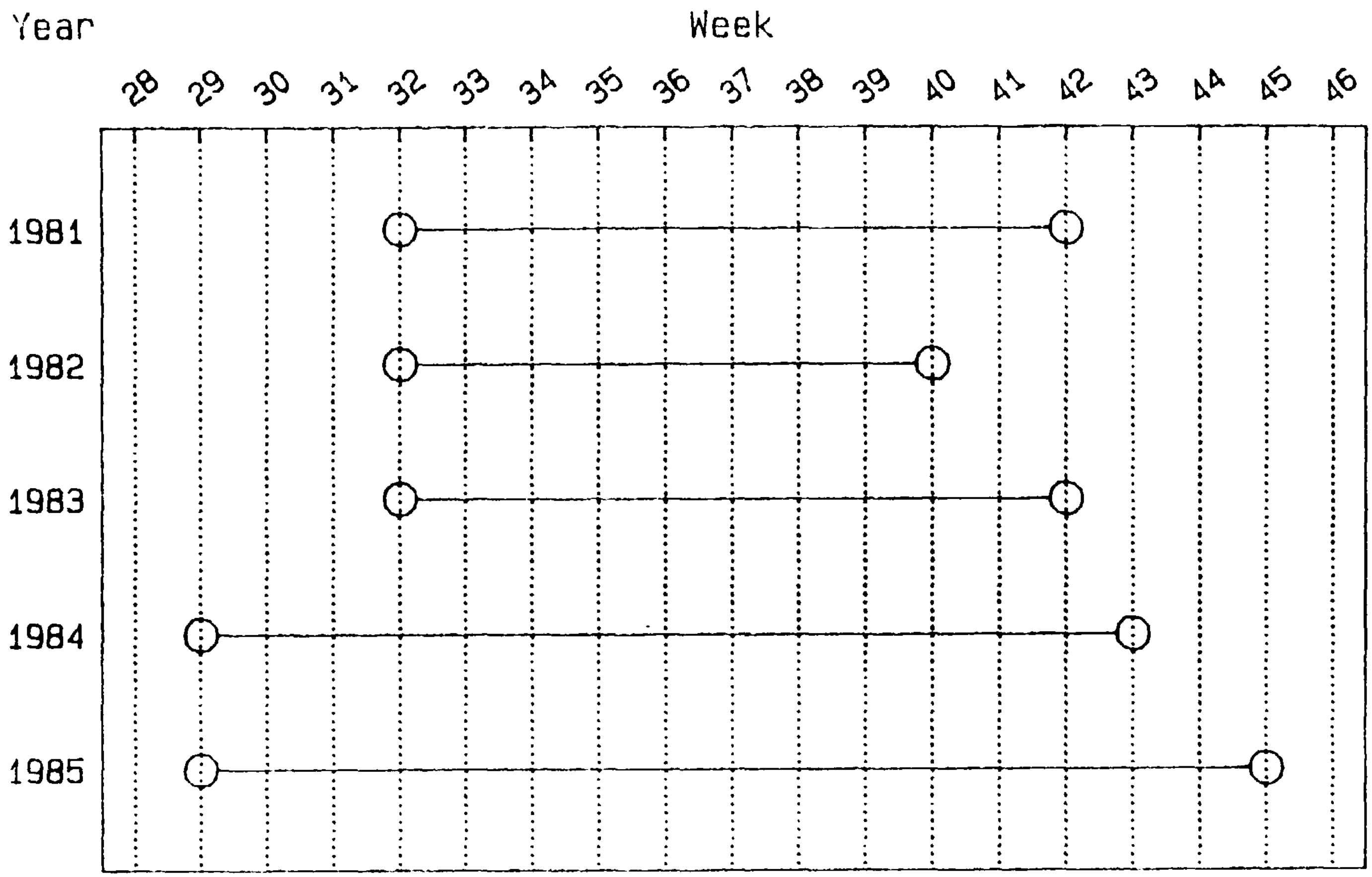

Figure II-5. Range of weeks during which the Utility offshore program has been conducted from 1981-1985

Table II-4. Biweekly sample allocations for the 1985 Utility offshore sampling program

Region	Strata			Total
	Shoal	Bottom	Channel	
Yonkers	7	-	5	12
Tappan Zee	30	8	8	46
Croton-Haverstraw	16	8	3	27
Indian Point	6	5	3	14
West Point	-	5	3	8
Cornwall	5	5	3	13
Poughkeepsie	-	5	3	8
Hyde Park	-	6	4	10
Kingston	-	9	6	15
Saugerties	-	12	6	18
Catskill	-	15	6	21
Albany	-	8	-	8
TOTAL	64	86	50	200

liner. All gears are towed against the current for approximately 5 min, and the tow speed used for each gear is approximately 1.5 m/s (maintained by use of electronic flowmeters deployed alongside the sampling vessel). Volume sampled is determined from digital flowmeters mounted in the mouth of the nets.

All sampling for the Utility offshore program takes place at night. Sampling is generally conducted with two boats sampling different regions of the river over a period of 4 days.

All fish are identified to species and age class (young-of-year, yearling, older), and counted. Total length is measured for 12 species of fish (Table II-2). Up to 10 young-of-year fish are measured from each of the West Point and Poughkeepsie regions. For all other regions, up to five fish per species per sample are measured. When more specimens of a species are collected than are needed for length measurements, the fish used to fill the quota are randomly selected. Table II-3 indicates the fraction of target species that was actually measured for length.

E. NYSDEC OFFSHORE PROGRAM

Sample Allocation

The NYSDEC offshore program has been conducted biweekly from as early as early July (week 26) to as late as mid-November (week 46) (Fig. II-6). Sampling effort varies considerably among weeks, with as few as eight and as many as 20 samples collected within a week.

Collections in the NYSDEC program are made between river miles 24-62 and only in depths from 2.0-9.1 m. The written procedures for this program indicate that sampling takes place at standard stations. However, the data indicate substantial differences in sample location and in number of samples among river runs.

Sampling Procedures

Collections are made with a 7.9-m headrope Carolina wing bottom trawl. The trawl body, cod end, and cod end liner are constructed of 3.8-cm, 3.2-cm, and 1.3-cm stretch mesh, respectively. Trawling is conducted for 5 min against the

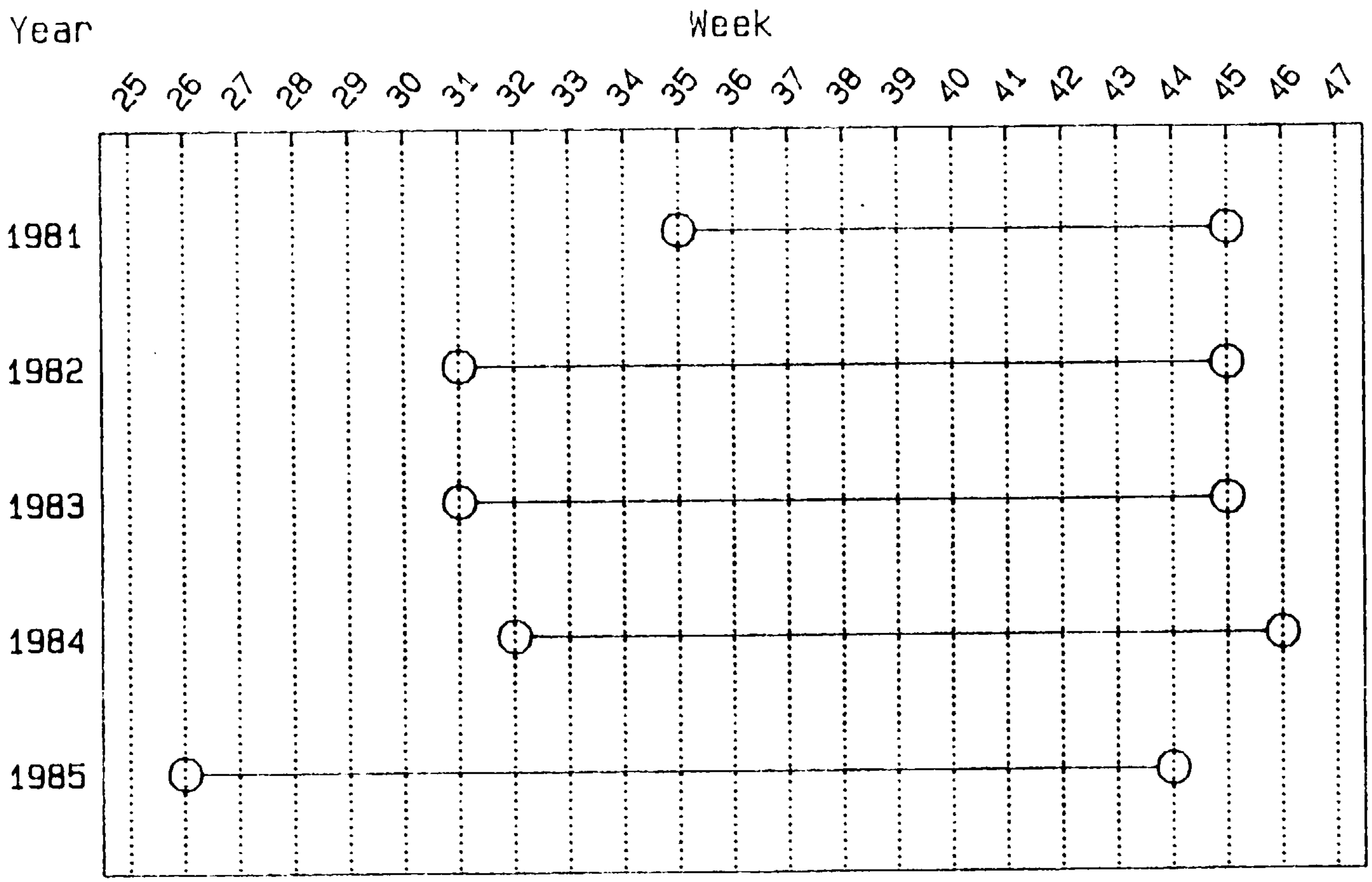

Figure II-6. Range of weeks during which the NYSDEC offshore program has been conducted from 1981-1985 prevailing current at a tow speed of about 1.2 m/s. Tow speed is measured by boat speed rather than by a net-mounted flow meter.

All offshore sampling has been conducted during daylight hours and has been scheduled to be conducted in the same week of sampling as the NYSDEC striped bass beach seine program. Sampling has normally been completed in two days, but has taken one or three days in some weeks.

Fish captured by trawl are sorted by species and counted. NYSDEC methods specify that up to 30 young-of-year striped bass, bluefish, and weakfish from each station are measured to the nearest mm fork length. The data indicate that many more species have actually been measured for length, and that both total and fork length are recorded. Table II-3 shows that, in particular, a substantial portion of the American shad that are collected are measured for length.

F. COMPARISON OF CATCH DATA

Section F acquaints the reader with data collected in each of the five programs so that analyses presented in later chapters are more easily interpreted. In this section, we have presented only data collected from mid-August to mid-October (weeks 34-41), a period sampled in common among all programs in all years (with the exception of the 1981 and 1984 NYSDEC striped bass program, which began in week 36). Limiting data to a common time period, makes for easier comparison among programs.

The Utility beach seine program captured more fish than either of the NYSDEC beach seine programs, though catch per unit effort was greater for the NYSDEC programs (Table II-5). When examined by species, the NYSDEC beach seine programs were more effective (higher catch per haul, fewer incidences of zero catch) for the species they were targeted for, but the Utility program was equally or more effective for the remaining species. For the targeted species, the lower percentage of zero catch by the NYSDEC programs probably reflects the limitation of their sampling area to areas of highest abundance for those taxa.

Total catch and catch per haul were generally higher for the beach seine programs than for either of the trawl programs (Table II-5). However, for bay anchovy the trawl programs were both more effective, with over one-half million collected in the Utility offshore program. No other species were collected in more than 50% of the trawl samples, with the exception of striped bass collected by the NYSDEC program.

Table II-5. Number of samples, total catch, and percent of samples with zero catch of selected species for each of the five sampling programs from 1981-1985

		Striped Bass		White Perch		American Shad		Atlantic Tomcod		Bay Anchovy	
	Number of Samples	Total Catch	Percent Zero Catch	Total Catch	Percent Zero Catch	Total Catch	Percent Zero Catch	Total Catch	Percent Zero Catch	Total Catch	Percent Zero Catch
Utility Beach Seine	2,003	12,356	46	15,392	51	19,215	37	415	93	19,942	90
Utility Off-shore	3,998	1,348	88	2,296	84	4,675	71	4,502	79	520,781	28
NYSDEC Striped Bass Beach Seine	431	17,298	8	28,850	27	3,892	40	289	67	5,732	73
NYSDEC American Shad Beach Seine	752	4,122	43	7,063	48	17,225	13	0	100	1,266	96
NYSDEC Trawl	316	4,215	28	3,883	75	1,280	62	1,176	78	19,281	51

Figure II-7 provides a means for portraying weekly and yearly variability in the catch data, using striped bass as an example. Sampling variability from week to week was often large, but not so large as to mask yearly differences or differences in mean catch among programs.

Length-frequency distributions were similar for the NYSDEC shad beach seine program and the two utility programs for the two taxa that were measured in both programs (Figs. II-8 and II-9). The NYSDEC program had a higher percentage of large fish, but many of these appear to have been yearlings which were not measured in the utility programs. However, for both of these taxa, the NYSDEC trawl program collected more large fish. The difference in size-frequency between the NYSDEC trawl program was even more pronounced in later weeks when more large fish were available to be captured. Data from the NYSDEC striped bass beach seine program were unavailable for comparison at the time this document was prepared.

The remaining taxa were only measured by the two utility programs. Size-frequency distributions for these taxa were generally similar (Figs. II-10 through II-12).

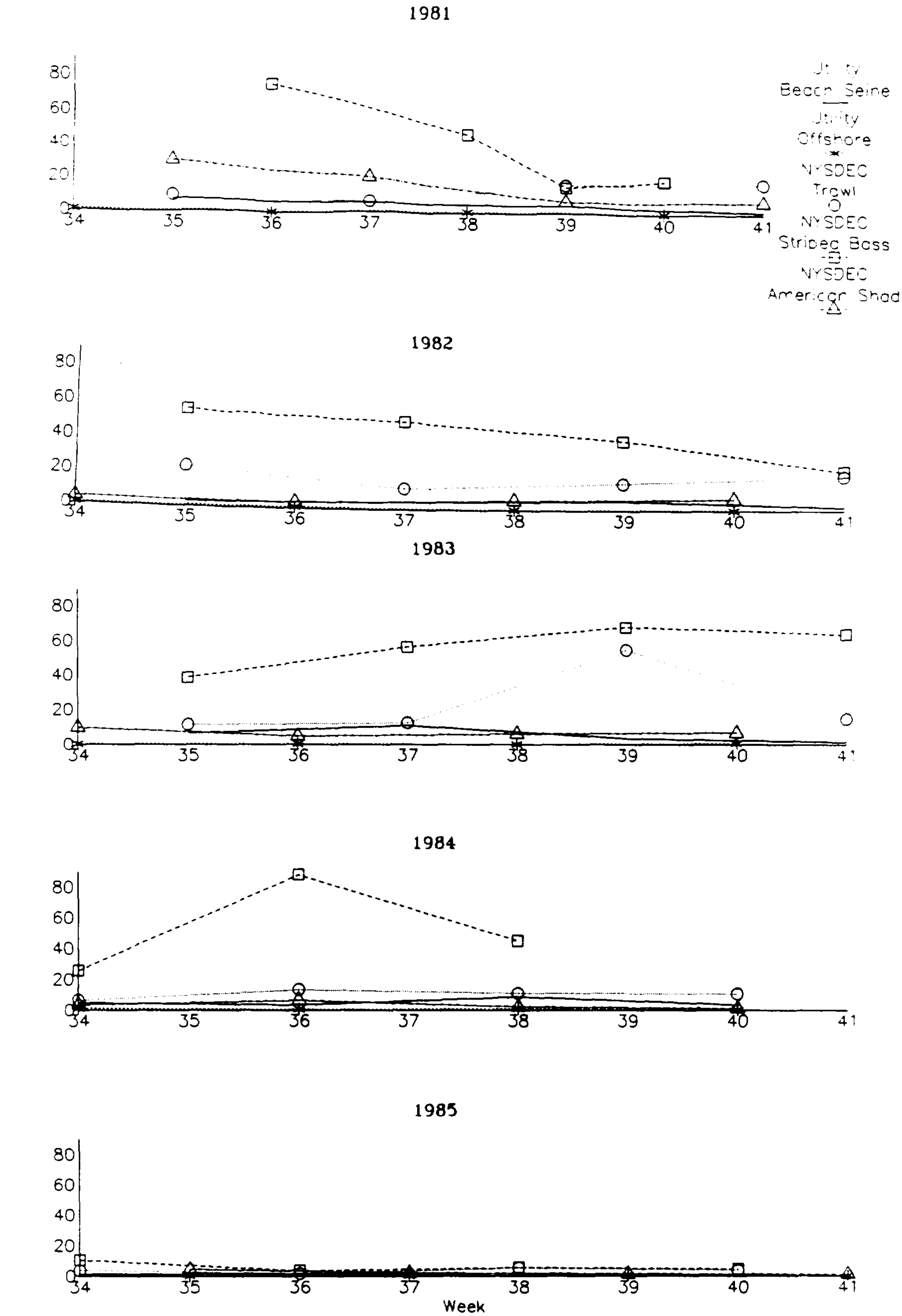

Figure II-7. Average weekly catch per unit effort for striped bass in each of five programs between 1981 and 1985

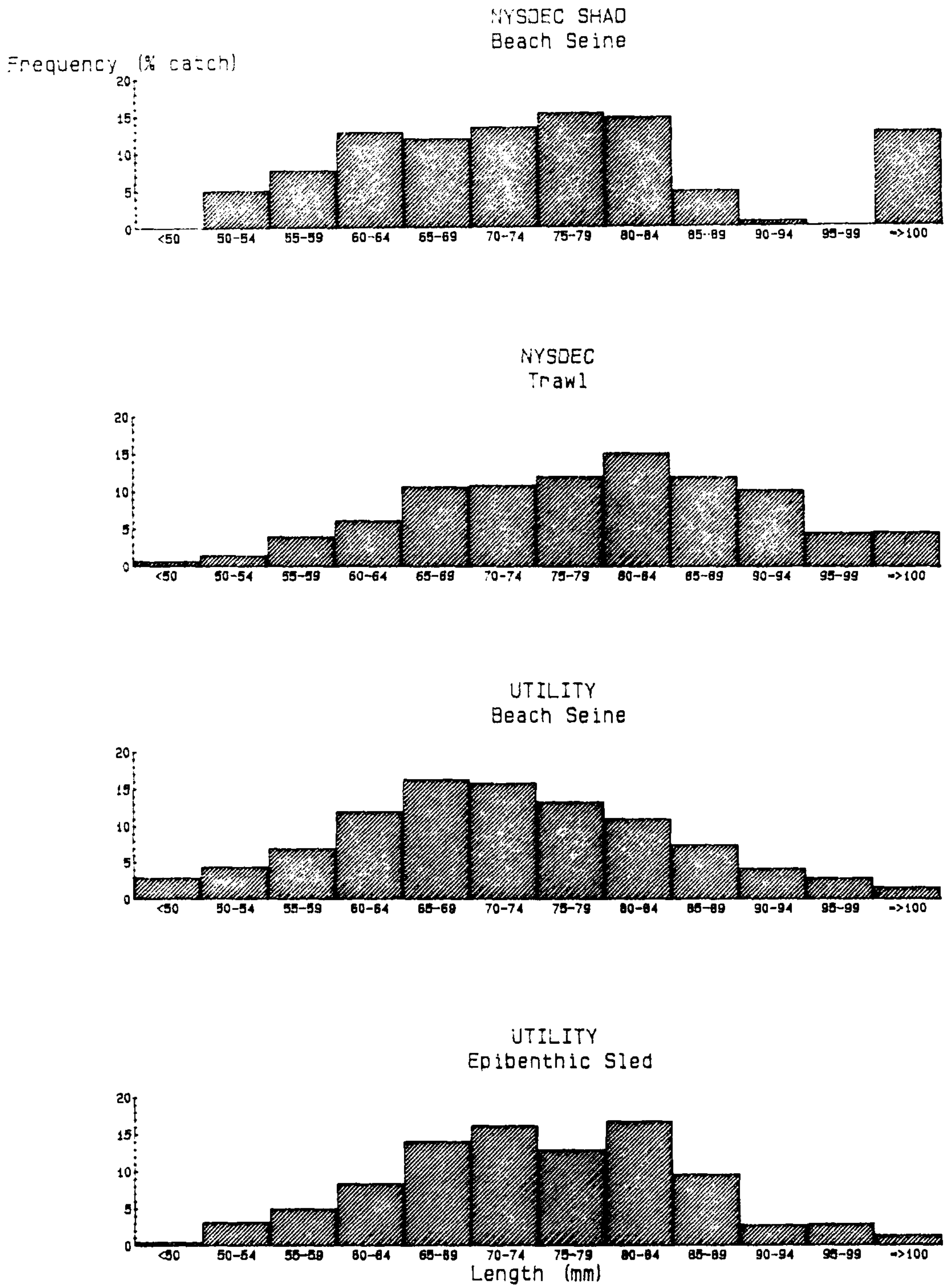

Figure II-8. Length-frequency distributions for striped bass collected in the NYSDEC shad beach seine, NYSDEC trawl, Utility beach seine and Utility offshore program between mid-August and mid-October, 1984

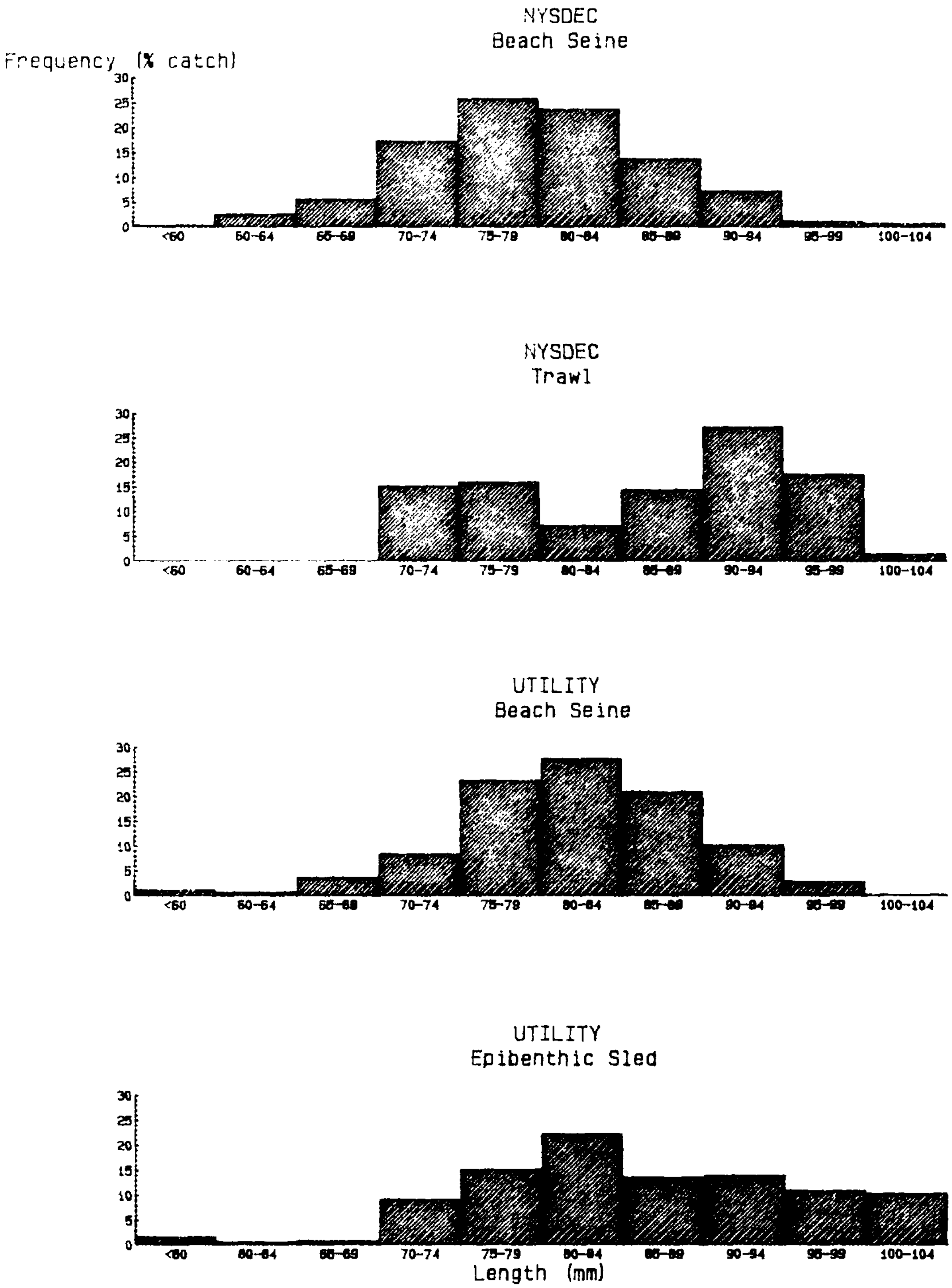

Figure II-9. Length-frequency distributions for American shad collected in the NYSDEC shad beach seine, NYSDEC trawl, Utility beach seine and Utility offshore program between mid-August and mid-October, 1984

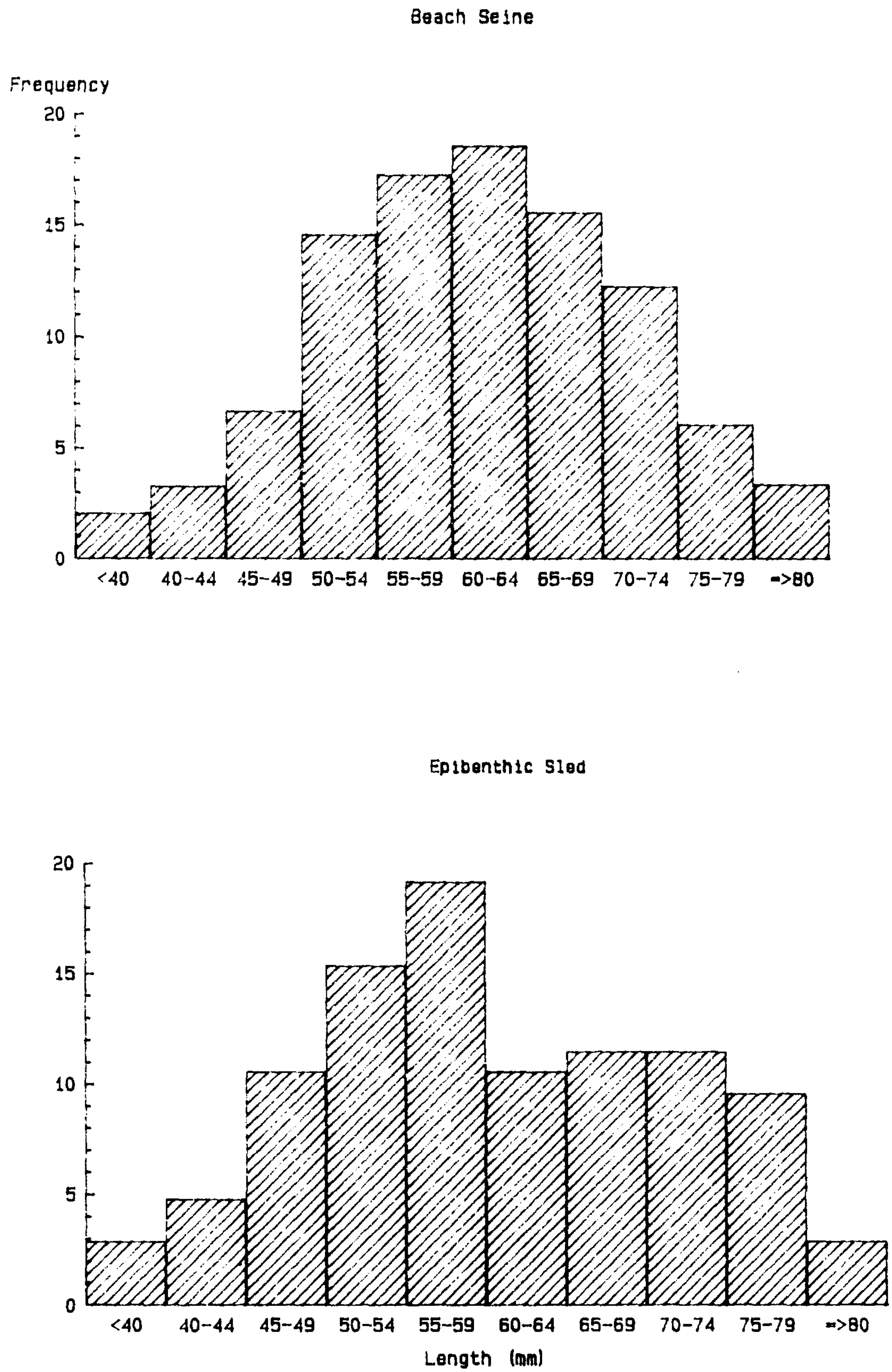

Figure II-10. Length-frequency distributions for white perch collected in the Utility beach seine and Utility offshore program between mid-August and mid-October, 1984

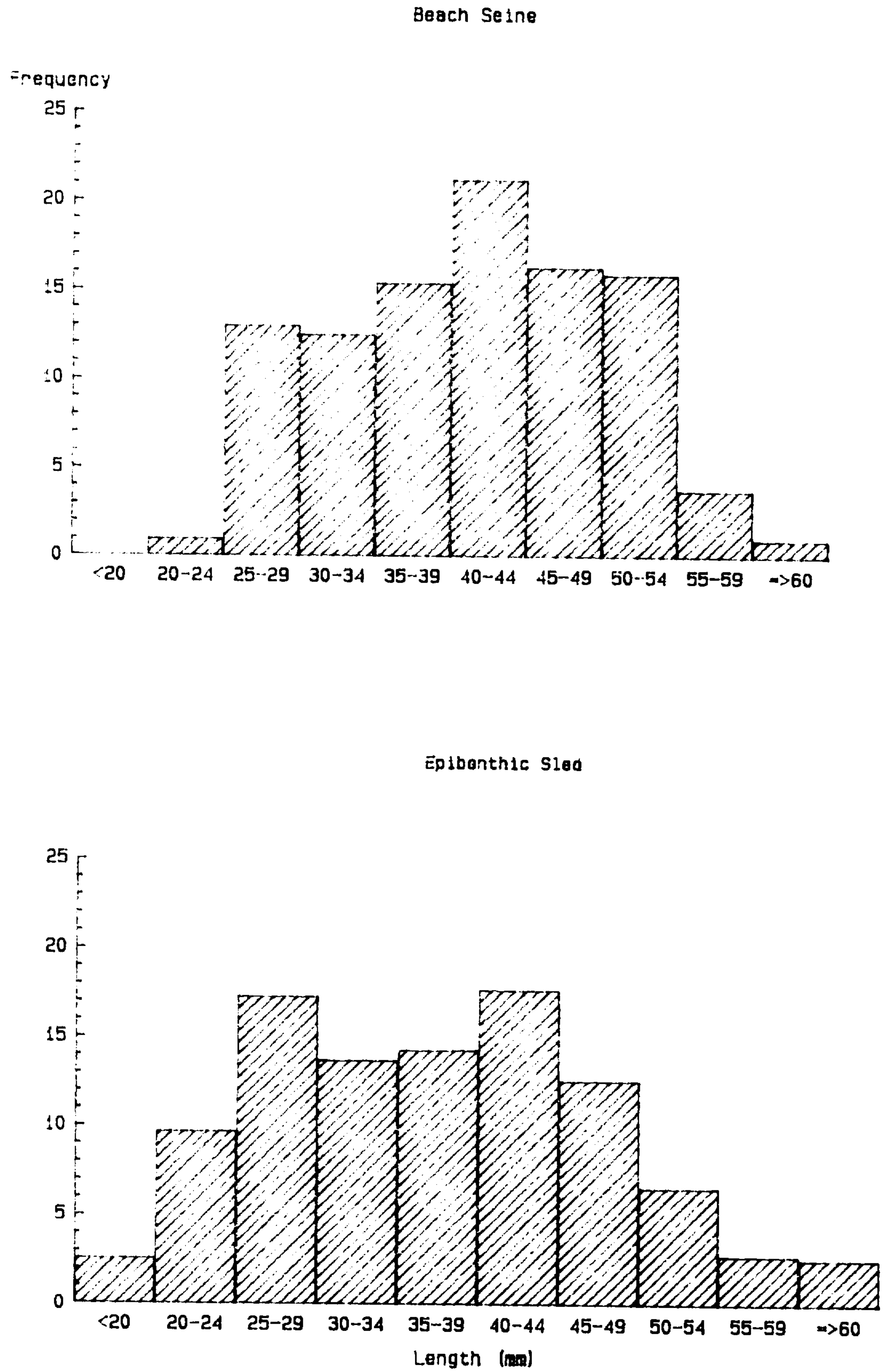

Figure II-11. Length-frequency distributions for bay anchovy collected in the Utility beach seine and Utility offshore program between mid-August and mid-October, 1984

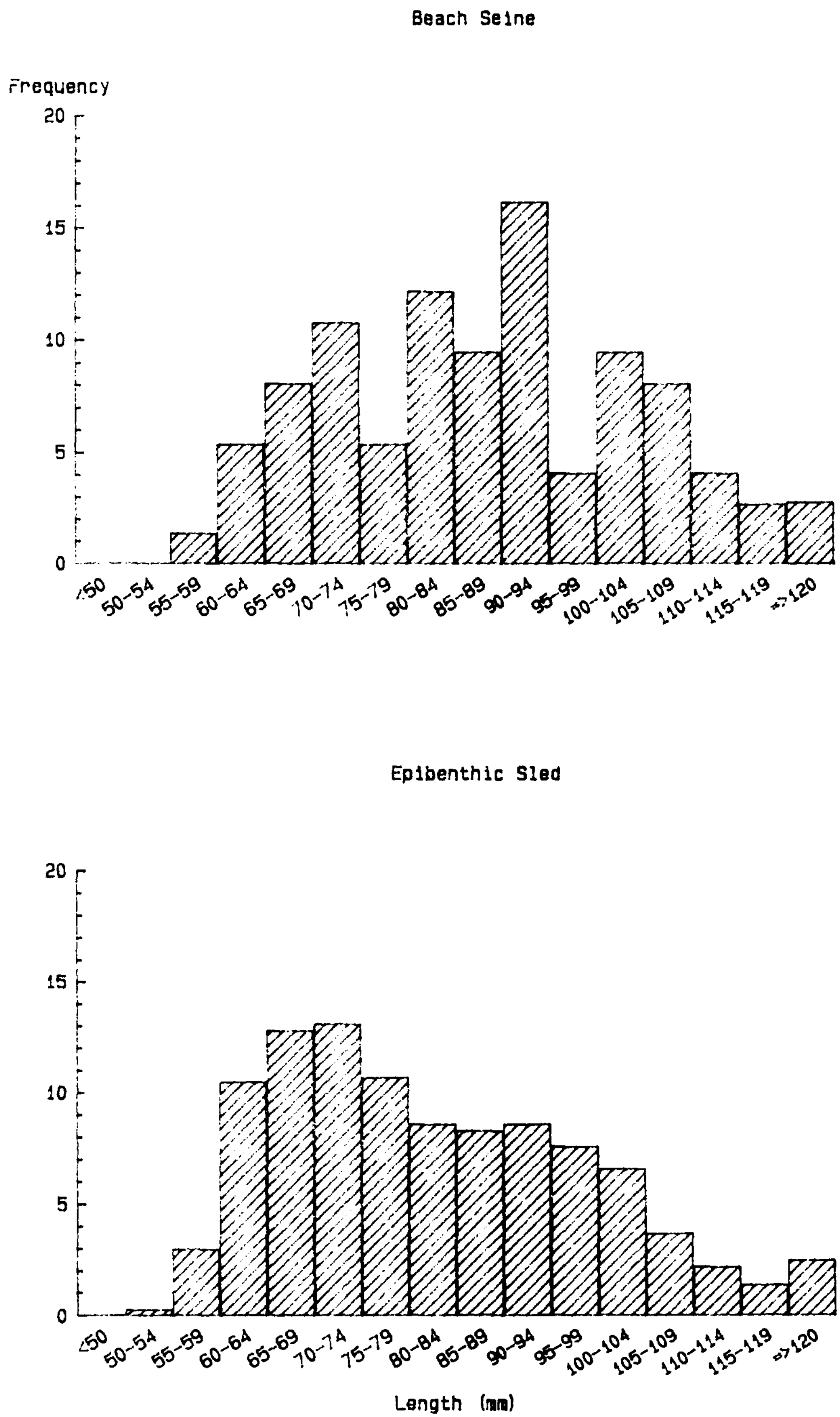

Figure II-12. Length-frequency distributions for Atlantic tomcod collected in the Utility beach seine and Utility offshore program between mid-August and mid-October, 1984

III. PROTOTYPE ESTIMATOR FOR RELATIVE ABUNDANCE

This chapter describes the experimental design requirements and associated statistical considerations that must be satisfied in order to use beach seine data for producing reliable abundance indices for the river-wide population of juvenile finfish. For this report, a reliable index of relative abundance is defined as a statistic computed from beach seine catch data with the following properties:

1) An expected value in any year equal to the riverwide abundance of juveniles in the year multiplied by a constant which is invariant over years, and

2) A variance that can be estimated from the catch data to assess the precision of the index.

The first property simply states that the index must be consistently related to the abundance of juveniles so that an increase in the index can be interpreted as indicating an increase in abundance. Thus, if gear efficiency varied among years, a difference in expected mean catch could be caused by changes in gear efficiency rather than changes in fish abundance. Additionally, if the proportion of the population occurring outside of the sampled area (e.g., offshore, unsampled shore zone, downstream of the study area) varied among years, differences in expected mean catch could reflect changes in distribution, rather than changes in abundance.

The second property provides the means for assessing how well the index will detect differences in abundance among years. The ultimate goal for the prototype estimator is to identify differences in fish abundance should they occur. Ideally, the index will be one in which variance components within year are small (precise) and measurable, to allow for maximum power in detecting among year differences.

The two properties can be satisfied conceptually with a simple index based on mean catch per unit effort over space (the series of beaches where sampling takes place) and time (weeks of the year in which sampling takes place). Because an estimator of mean catch per unit effort can satisfy both required properties of a reliable index, and because this type of index is both simple and intuitively understandable, we have selected it as the prototype against which to evaluate and compare the beach seine programs.

Conceptually, the period of time used for calculating the index should be an optimum derived from several parameters. The period should:

- Occur as late in the year as possible, since year class strength is defined as abundance on December 31

- Occur when abundance remains relatively constant (i.e., a period of low mortality and prior to migration) to minimize among-river run variance

- Be one in which relative probability of capture is constant from year-to-year. Without specific data, this criteria can be most easily approximated by selecting a common time period in each year and thereby minimizing the effects of fish size and water temperature on gear efficiency and fish distribution.

- Contain as many sampling runs as possible without violating the previous two criteria. Sampling runs are replicates used to compare abundance among years and a greater number of runs increases precision

Section A of this chapter discusses the specific requirements of a consistent index of annual abundance. The subsequent section describes a single sampling design model (and associated variance formulae) that can be used to represent each of the programs being evaluated. This model includes variance components that provide the basis for making comparisons among programs. Section C briefly describes how the prototype can be used as a framework for comparing the programs and the last section lists the additional information/assumptions required to extend the prototype from an index of relative abundance to one of absolute abundance.

In Chapter IV, the three beach seine programs are evaluated in terms of these considerations. Specifically each is evaluated to determine whether it produces data that could provide a consistent indicator of juvenile abundance. Also, the relative precision of the indices from the programs are compared to identify the program most capable of assessing differences in abundances among years.

A. FRACTION OF THE RIVERWIDE POPULATION THAT IS SUBJECT TO SAMPLING

The sampling unit of this prototype estimator is defined by location (beach) and time, where the variate of interest is the number caught in the seine haul. The number caught can be described as a random variable that is related to the actual number of juveniles present at the location and time the sample was collected as follows:

$$E_r(Y^B_{ity}) = q^B_{ity} N^B_{ity} \quad (1)$$

where

Y^B_{ity} = the number caught at beach location i at time t in year y

$E_r(Y^B_{ity})$ = expectation of Y_{ity} under identical conditions at location i at time t in year y

N^B_{ity} = the number of juveniles actually present at beach location i at time t in year y

q^B_{ity} = gear efficiency of the seine fished at location i at time t in year y.

The expected catch per unit effort (over all locations and times t) can be expressed as,

$$E_t\left[E_i\left[E_r\ (Y^B_{ity})\right]\right] = K^B_y N_y \quad (2)$$

where

E_t = the expectation over all times t

E_i = the expectation over all locations (beaches) i

K^B_y = a constant

N_y = the riverwide abundance of juveniles in year y

The constant K^B_y can be interpreted assuming that the gear efficiency (q^B_{ity}) and (N^B_{ity}) are independent and assuming the gear efficiency is constant among years. The constant K^B_y is proportional to the average fraction of the riverwide population inhabiting a beach subject to sampling. This interpretation is based on the following algebraic relationships:

$$E_i\left[E_r\ (Y^B_{ity})\right] = q^B_{ty}\ b_{ty}\ N_{ty}\ f^B_y \quad (3)$$

and

$$E_t\left[E_i\left[E_r\ (Y^B_{ity})\right]\right] = q^B_y\ b_y\ N_y\ f^B_y \quad (4)$$

where

$$q_y^B = E_t\left[E_i\ (q_{ity}^B)\right]$$

$$f_y^B\ b_y\ N_y = E_t\left[E_i\ (N_{ity}^B)\right]$$

b_y = average proportion of the riverwide juvenile population inhabiting the area subject to sampling in year y

and

f_y^B = the fraction of the area subject to sampling by beach seine that is sampled with a single seine haul.

In general, the proportion of the riverwide population that inhabits the area subject to sampling at time t in year y can be represented as b_{ty}, and the proportion not subject to sampling as $1-b_{ty}$ (Fig. III-1). For fixed beach designs, the area subject to sampling consists of the beaches actually sampled. For sampling designs in which the beaches sampled are selected randomly from a larger set of defined beaches, the area subject to sampling consists of the full set of beaches and not only those actually sampled. In either case, catch data from the beach seine alone provides no information on the magnitude of b_{ty} (or $b_y = E_t\ (b_{ty})$) nor does it provide a basis for assessing whether b_y is invariant over years.

However, under special circumstances, ancillary data collected on the proportion not subject to sampling by the beach seine (the $1-b_{ty}$ proportion), together with data from the beach seine, do provide a basis for assessing b_{ty}. Data from offshore (e.g., bottom trawl, epibenthic sled, beam trawl and/or Tucker trawl) sampling are examples of data collected on the proportion of the population not subject to beach seine sampling. The special condition that must be met for this ancillary data to be useful for these purposes is that a constant fraction of the population not subject to beach seine sampling is subject to offshore sampling. Algebraically, the proportion of the riverwide population subject to offshore sampling, in this case, can be expressed as:

$$(1-b_{ty})\ e_{ty}$$

where

e_{ty} = the fraction of the population not subject to beach seine sampling that is subject to offshore sampling at time t in year y

and

$$e_{ty} = e_y \text{ for all t.}$$

The Venn diagram for this condition is depicted in Fig. III-2.

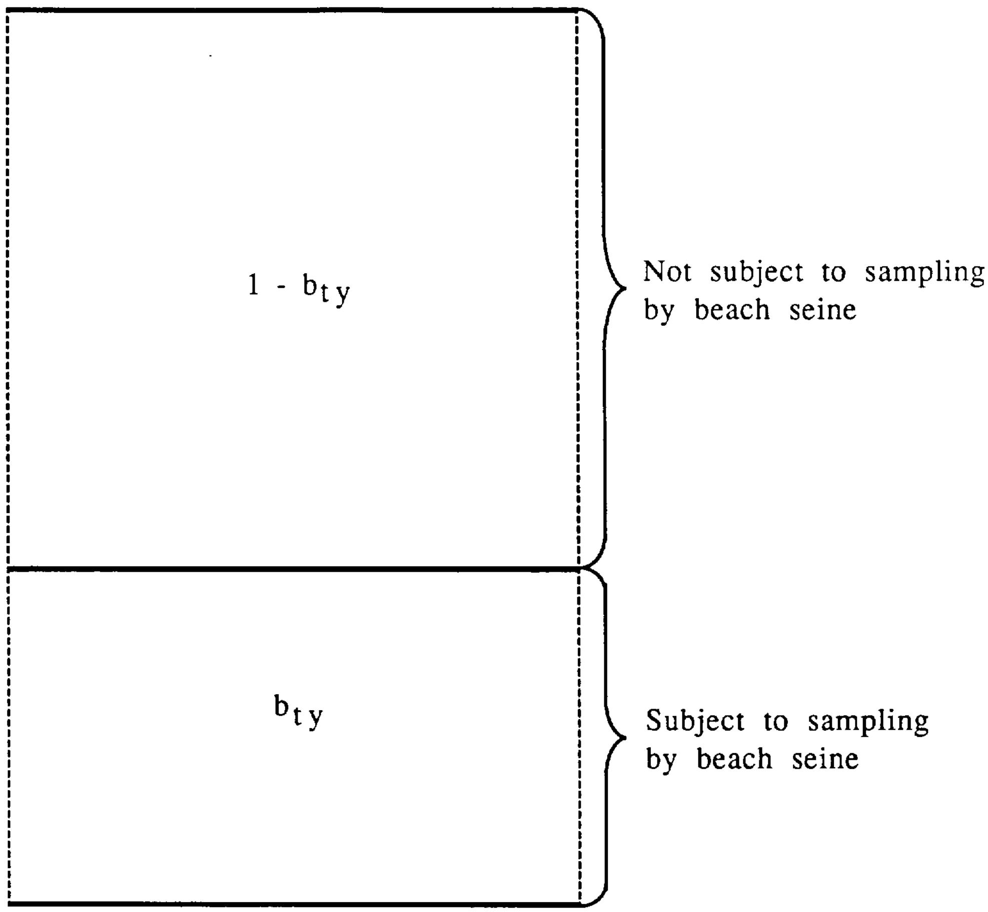

Figure III-1. Simple Venn diagram depicting the proportion of the riverwide population of juveniles subject to sampling by beach seine

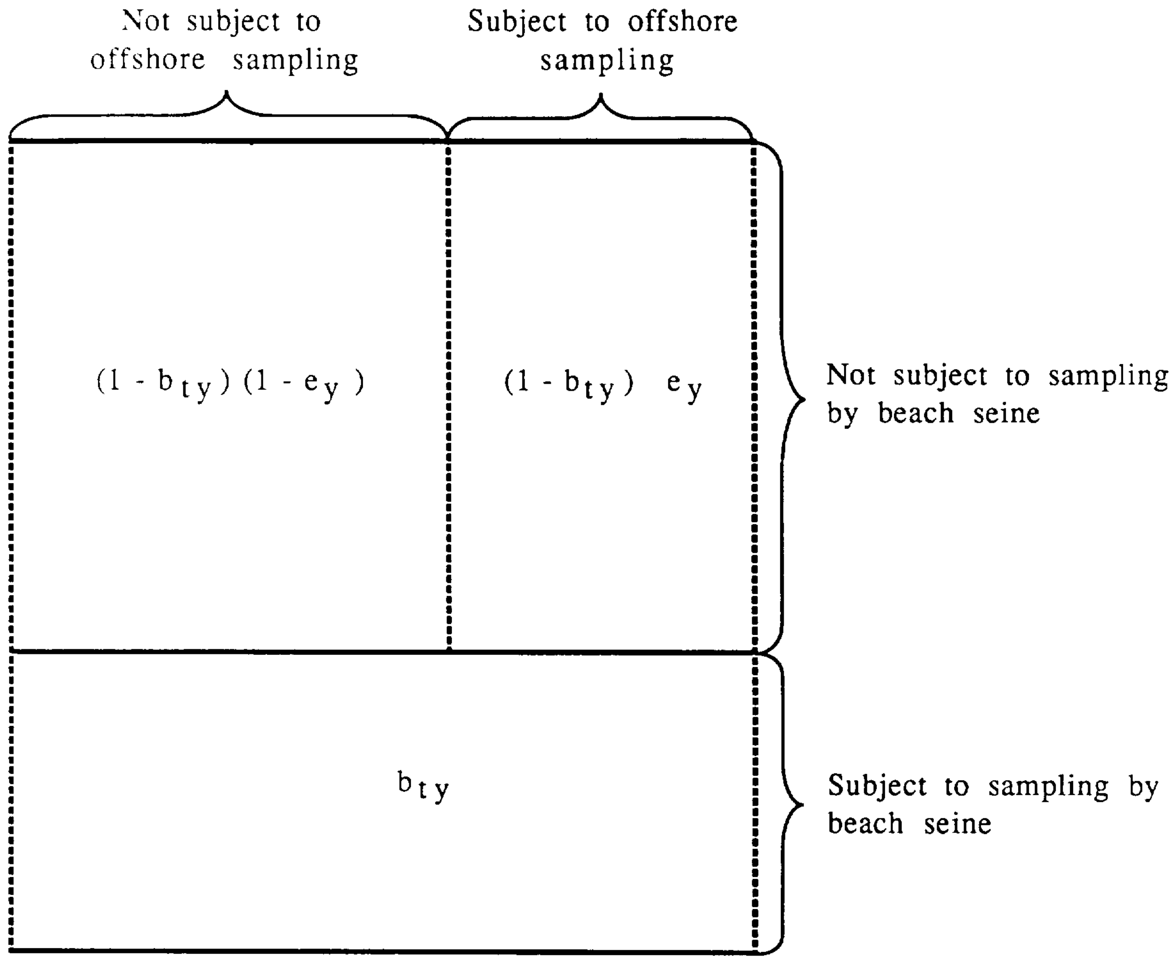

Figure III-2. Venn diagram depicting the proportion of the riverwide population subject to two types of sampling under the special condition required for assessing b_{ty}.

Assuming this condition (and one other) exists, b_{ty} can be expressed in terms of the expected catch per unit effort from the offshore sampling and the expected catch per unit effort from the beach seine sampling. The expected catch per unit effort for offshore sampling can be represented algebraically in a manner similar to that used for beach seine samping as follows:

$$E_r\ (Y^T_{ity}) \ = \ q^T_{ity}\ N^T_{ity}$$

and

$$E_i\left[E_r\ (Y^T_{ity})\right] \ = \ q^T\ (1-b_{ty})\ e_y\ N_{ty}\ f^T_y \qquad (5)$$

where

q^T_{ity} = gear efficiency of the offshore gear at location i at time t in year y,

N^T_{ity} = the number of juveniles actually present at sample location i at time t in year y,

f^T_y = the fraction of the area (volume) subject to sampling by offshore gear that is sampled in a single haul,

and assuming,

q^T_{ity} and N^T_{ity} are independent,

$e_{ty} = e_y$ for all times t, and

$E_i\ [q^T_{ity}] = q^T$ for all times t and years y.

The following equations illustrate how data collected on the proportion of the population not subject to beach seine sampling can be used to provide information for assessing the proportion of the population subject to beach seine sampling (b_{ty}). Substituting equation 3 (assuming $q^B_{ty} = q^B$) into equation (5) gives

$$E_i\left[E_r\ (Y^T_{ity})\right] \ = \ q^T\ e_y\ N_{ty}\ f^T_y - e_y\ \frac{f^T_y}{f^B_y}\ \frac{q^T}{q^B}\ E_i\left[E_r\ (Y^B_{ity})\right] \qquad (6)$$

Equation (6) can be rewritten in a simple regression model as

$$E_i \left[E_r \left(Y^T_{ity} \right) \right] = \beta_{0y} - \beta_{1y} \cdot E_i \left[E_r \left(Y^B_{ity} \right) \right] \qquad (7)$$

where

$$\beta_{0y} = q^T e_y N_y f^T_y$$

and

$$\beta_{1y} = e_y \frac{f^T_y}{f^B_y} \frac{q^T}{q^B}$$

assuming that $N_{ty} = N_y$ for all t. Alternatively, equation (6) can be expressed as

$$E_i \left[E_r \left(Y^T_{ity} \right) \right] = \alpha_{0y} - \alpha_{1y} \cdot t - \alpha_{zy} \cdot E_i \left[E_r \left(Y^B_{ity} \right) \right] \qquad (8)$$

where

$$\alpha_{0y} = q^T f^t_y e_y N_{0y}$$

$$\alpha_{1y} = q^T f^T_y e_y (\Delta N_y)$$

and

$$\alpha 2y = \beta 1y$$

assuming $N_{ty} = N_{0t} - (\Delta N_y) \cdot t$, i.e., assuming a linear reduction in abundance over time

where

ΔN_y = the rate of change in the riverwide population size in a unit of time (t to t+1)

Estimates of the β's for equation (7) or the α's for equation (8) can be obtained if b_{ty} varies over times t, and if all of the foregoing assumptions are satisfied. In this case, sample means could be substituted for expectations producing the following two (alternative) systems of equations:

$$\overline{Y}^T_{ty} = \beta_{0y} - \beta_{1y} \overline{Y}^B_{ty} \qquad (9$$

$$\overline{Y}^T_{ty} = \alpha_{0y} - \alpha_{1y} \cdot t - \alpha_{2y} \overline{Y}^B_{ty} \qquad (1($$

Estimates of the β's or α's then could be computed using least squares techniques (assuming that paired offshore and beach seine data are available). Subsequently, b_{ty} could be estimated as:

$$\frac{\beta_{1y} \cdot \bar{Y}^B_{ty}}{\beta_{0y}} = b_{ty} ,$$

if $N_{ty} = N_y$ for all t

or as:

$$\frac{\alpha_{0y} \cdot \bar{Y}^B_{ty}}{\alpha_{0y} - \alpha_{1y} \cdot t} = b_{ty}$$

if abundance linearly decreased over time.

A necessary condition of both of these models (equations (7) and (8)) is that the average catch per unit effort for the offshore sampling decreases as the catch per unit effort for beach seine sampling increases. Whether or not this condition is satisfied can be ascertained from observed catch data. This provides a straightforward method for determining whether b_{ty} can be estimated from the data using this approach.

In summary, the fraction of the riverwide population that is subject to sampling can be assessed if certain conditions exist. If the required conditions exist, the mean catch per unit effort from offshore sampling (after adjusting the data for declines in abundance, if present) will decrease as the mean catch per unit effort from beach seine sampling increases. Failure to establish that this relationship exists means that without a census of the previously unsampled area, the supposition that the proportion of the population within the sampled area remains constant among years cannot be tested and must be assumed if the beach seine mean catch per unit effort is to be used as an index of abundance.

B. SAMPLING DESIGN MODEL FOR ESTIMATING MEAN CATCH PER UNIT EFFORT

The sampling design of each of the three beach seine programs of interest (Utility beach seine program, NYSDEC striped bass beach seine program, NYSDEC shad beach seine program) can be described as three-stage sampling (Cochran 1977) as shown in Figure III-3. Each of these programs selectes and samples a set of beaches periodically (e.g., every two weeks) during the fall. Sampling all of the beaches that were selected generally

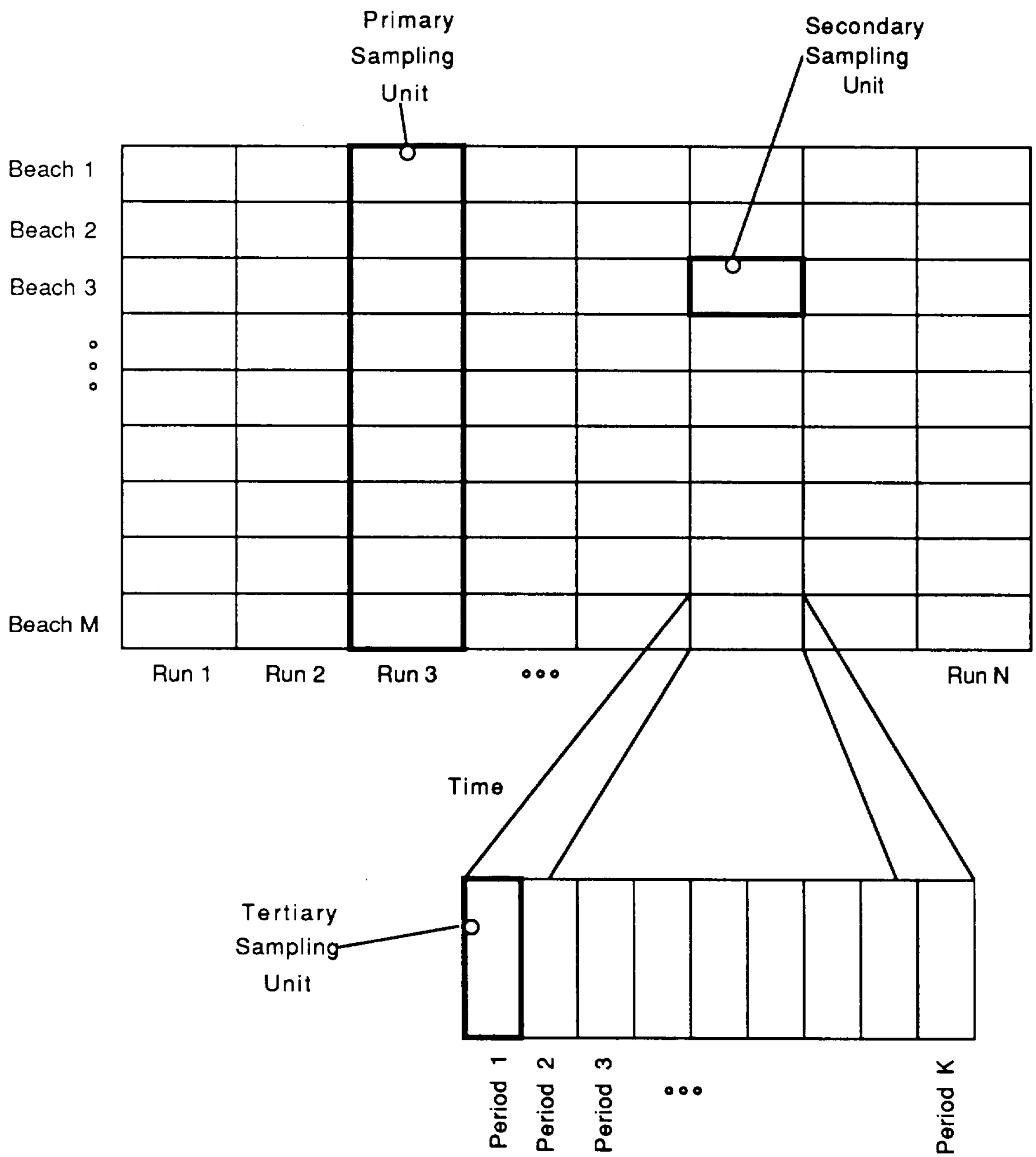

Figure III-3. Graphic representation of the three stages of sampling units for the prototype estimator requires 3 to 4 days, and individual beaches typically requires 30 minutes to sample. Accordingly the three stages can be defined in terms of:

1) River runs (the 3-4 day period typically required to complete sampling all selected beaches once) -- primary sampling units

2) Beaches within a river run -- secondary sampling units

3) 30 minute time periods within the 3-4 day river run (at individual beaches) -- tertiary sampling units.

For all of the programs under consideration, the methods for selecting sampling units at each of the three stages can be construed as follows:

Stage 1 (river runs)	--	simple random sampling without replacement
Stage 2 (beaches)	--	stratified random sampling without replacement
Stage 3 (sampling time periods)	--	simple random sampling with replacement (in fact the sampling is without replacement, but can be treated as stated because of the small time period required for sampling).

The NYSDEC programs did not have defined strata within primary sampling units (i.e., beaches were not grouped into strata), nevertheless, each of the NYSDEC programs can be thought of as a stratified random design (at Stage 2) with only one stratum in order to facilitate comparisons among programs. Also, the NYSDEC programs were nominally fixed beach designs without random selection. Again, in order to facilitate comparisons, the NYSDEC programs can be thought of as stratified random designs (at Stage 2) with all secondary sampling units in the (statistical) population being selected. The third stage of sampling is viewed as sampling with replacement because the sampling fraction (i.e., the ratio of the time it takes to actually complete a seine haul at a beach to the time it takes to complete a river run) is very small.

This sampling design, which can represent each of the three programs as special cases, corresponds to the following estimator for mean catch per unit effort:

$$\overline{\overline{\overline{y}}} = \frac{1}{n} \sum_{i=1}^{n} \overline{\overline{y}}_i \qquad (11)$$

$$\overline{\overline{y}}_i = \sum_{l=1}^{L} \frac{M_l}{M} \overline{\overline{y}}_{il} \qquad (12)$$

$$\overline{\overline{y}}_{il} = \frac{1}{m_i} \sum_{j=1}^{m_l} \overline{y}_{ilj} \qquad (13)$$

$$\overline{y}_{ilj} = \frac{1}{k} \sum_{h=1}^{k} y_{iljh} \qquad (14)$$

where

$\overline{\overline{\overline{y}}}$ = sample mean catch per unit effort

n = number of river runs sampled

M_l = number of beaches (in the population subject to sampling) in stratum l

L = number of strata

M = total number of beaches subject to sampling

m_l = number of beaches sampled in stratum l

k = number of times a beach is sampled within a river run

y_{iljh} = number caught at time h at beach j in stratum l and river run i.

The variance of $\bar{\bar{y}}$ is

$$V(\bar{\bar{y}}) = \frac{1-f_1}{n} S_1^2 + \frac{1}{n} \bar{\sigma}_2^2 \qquad (15)$$

where

f_1 = sampling fraction of primary units (n/N where N is the total number of possible, non-overlapping, river runs)

S_1^2 = variance among primary unit means

$\bar{\sigma}_2^2$ = average variance of estimates of primary unit means

and,

$$S_1^2 = \frac{\sum_{i=1}^{N} \left(\bar{\bar{Y}}_i - \bar{\bar{Y}}\right)^2}{N-1} \qquad (16)$$

$$\bar{\sigma}_2^2 = \frac{1}{N} \sum_{i=1}^{N} \sum_{l=1}^{L} \left[\frac{M_l}{M}\right]^2 V\left(\bar{\bar{y}}_{il}\right) \qquad (17)$$

where

$\bar{\bar{Y}}_i$ = population mean catch per unit effort for river run i

$\bar{\bar{Y}}$ = overall population mean catch per unit effort

$V\left(\bar{\bar{y}}_{il}\right)$ = variance of the sample mean catch per unit effort within river run i and stratum l,

and

$$V(\bar{\bar{y}}_{il}) = \frac{1-f_{2l}}{m_l} S_{2il}^2 + \frac{1}{m_l} \bar{\sigma}_{3il}^2 \qquad (18)$$

where

f_{2l} = sampling fraction of secondary units (m_l/M_l) within stratum l

s^2_{2il} = variance among secondary unit means within river run i and stratum l

$\bar{\sigma}^2_{3il}$ = average variance of estimates of secondary unit means within river run i and stratum l

and

$$s^2_{2il} = \frac{\sum_{j=1}^{M_l}\left(\bar{Y}_{ilj} - \bar{\bar{Y}}_{il}\right)^2}{M_l - 1} \tag{19}$$

$$\bar{\sigma}^2_{3il} = \frac{1}{M_l}\sum_{j=1}^{M_l} \frac{1}{k}\, s^2_{3ilj} \tag{20}$$

where

s^2_{3ilj} = variance among tertiary unit samples

$$= \frac{\sum_{h=1}^{K} (Y_{iljh} - \bar{Y}_{ilj})^2}{K-1}$$

The unbiased estimator for the variance of the overall sample mean ($\bar{\bar{y}}$) is

$$v(\bar{\bar{y}}) = \frac{1-f_l}{n}\, s_1^2 + \frac{f_l}{n}\, \hat{\sigma}_2^2 \tag{21}$$

where

$$s_1^2 = \frac{\sum_{i=1}^{n} (\bar{\bar{y}}_i - \bar{\bar{y}})^2}{n-1} \qquad (22)$$

$$\hat{\sigma}_2^2 = \frac{1}{n} \sum_{i=1}^{n} \sum_{l=1}^{L} \left(\frac{M_l}{M}\right)^2 v\,(\bar{\bar{y}}_{il}) \qquad (23)$$

and

$$v\,(\bar{\bar{y}}_{il}) = \frac{1-f_{21}}{m_l}\, s_{2il}^2 + \frac{f_{21}}{m_l}\, \hat{\sigma}_{3il}^2 \qquad (24)$$

where

$$s_{2il}^2 = \frac{\sum_{j=1}^{M_l} (\bar{y}_{ilj} - \bar{\bar{y}}_{il})^2}{m_l - 1} \qquad (25)$$

$$\hat{\sigma}_{3il}^2 = \frac{1}{m_l} \sum_{j=1}^{m_l} \frac{1}{k}\, s_{3ilj}^2 \qquad (26)$$

$$s_{3ilj}^2 = \frac{\sum_{h=1}^{k} (y_{iljh} - \bar{y}_{ilj})^2}{k - 1} \quad . \qquad (27)$$

The components of the population variance (S_1^2, S_{2il}^2 and S_{3ilj}^2) are directly interpretable in terms of the definitions of the three stages of sampling. Furthermore, each of these parameters can be estimated from the components of sample variance (s_1^2, s_{2il}^2, and s_{3ilj}^2). Consequently, estimates of the components of the population variance (S_1^2, S_{2il}^2, and S_{3ilj}^2) provide a basis for comparing the three beach seine programs.

C. APPLICATION OF THE PROTOTYPE MODEL

Application of the prototype estimator to each of three beach seine sampling programs allows for comparison among the programs using a common framework. Specifically, the prototypic estimator allows the effects of major methodological differences among programs to be examined based on the estimates of variance components:

- Effectiveness of sampling a larger geographic extent for reducing among river run variability
  - compare s_1^2 among programs
  - compare s_1^2 for full versus partial geographic extent of a single program
- Effect of fixed versus random sampling of beaches within river runs
  - assess relative contribution of s_{2il}^2 to the total variance
  - compare f_{21} among programs
- Precision of different gear types
  - compare s_{3ilj}^2 among programs

These specific comparisons are accomplished in Chapter IV. However, direct comparisons of the variance of one program with that of another may not be the most meaningful tests that can be made. This is because all programs do not use the same gear type, and do not have the same population subject to sampling (i.e., due to different beaches comprising the population of interest). Consequently the magnitude of mean catch per unit effort may differ among programs. Since mean catch per unit effort is a relative measure of abundance, the magnitude of the variance relative to the magnitude of its expected value is more meaningful than the magnitude of the variance. Therefore, each estimate of variance should be standardized to the magnitude of the corresponding mean catch per unit effort prior to making comparisons among programs.

The coefficient of variation ($\sqrt{\text{variance}}$/mean) is an appropriate descriptive statistic for direct comparisons among programs for the foregoing reasons. It represents the magnitude of variability relative to the magnitude of the mean and it is dimensionless. Therefore, the comparisons among programs are made in terms of the coefficients of variation of the relevant components of variance.

For example, the comparisons between programs of among river run variances (s_1^2) are made in terms of the coefficients of variation for s_1^2, i.e.,

$$CV\ (s_1^2) = \frac{\sqrt{s_1^2}}{\bar{\bar{y}}} .$$

However, the comparisons between programs of within river run variances (s_2^2) are made in terms of the coefficients of variation for s_2^2, i.e.,

$$CV\ (s_2^2) = \frac{\sqrt{s_2^2}}{\bar{\bar{y}}}$$

The term inside the parentheses that follow the symbol, CV, simply indicates the component of variance that is being described.

D. ADDITIONAL CONSIDERATIONS FOR ESTIMATING ABSOLUTE ABUNDANCE

Absolute abundance can be estimated as an extension of the prototype estimator of relative abundance described in this chapter. Estimating absolute abundance requires data from offshore sampling, plus additional information beyond that needed for an index of relative abundance.

If an estimate of the fraction of the riverwide population that is subject to beach seine sampling (b_{ty}) can be obtained (e.g., using equation (9) or (10), then the riverwide abundance, N_{ty}, can be estimated as:

$$\hat{N}_{ty} = E_i \left[\hat{E}_r \ (Y^B_{ity}) \right] \cdot \frac{1}{\hat{b}_{ty}} \cdot \frac{1}{f^B_y \ \hat{q}^B_{ty}} \qquad (28)$$

This method for estimating absolute abundance requires only an estimate of the gear efficiency of the beach seines, q^B_{ty}, and the sampling fraction, f^B_y, in addition to the information that would be required for estimating relative abundance.

However, if the fraction, b_{ty}, cannot be estimated, then the requirements for additional information increase substantially. In this case the following additional information would be required:

- An estimate of the gear efficiency of the beach seine
- Estimates of the gear efficiency of the offshore gears
- The sampling fractions for sampling with beach seine and offshore gears
- An estimate of the fraction of the riverwide population that is not subject to sampling (by the beach seine or by the offshore gear).

Satisfying these additional requirements, especially the last one, may not be feasible. Consequently, if b_{ty} cannot be estimated, producing valid estimates of absolute abundance from beach seine data may not be a realistic objective.

IV. COMPARISON OF PROGRAMS

This chapter describes analyses that were conducted to evaluate the relative usefulness of the three beach seine programs for providing indices of relative abundance for the five species of interest:

- Bay anchovy
- American shad
- Striped bass
- Atlantic tomcod
- White perch.

Comparisons were performed at two levels. The first was to assess the relative precision of each program, and to assess specific features of each program's sampling design with regard to their contribution to estimation error. Comparisons made at this level correspond to property #2 of the prototype estimator. The second level of comparison addresses property #1 of the prototype estimator. In these comparisons, associated data collected offshore were analyzed together with data from the beach seine programs. These evaluations were intended to assess whether the proportion of the riverwide population that inhabited the areas subject to beach seine sampling could be estimated.

For the Utility beach seine program and the NYSDEC striped bass beach seine program, data collected from 1981 through 1985 were analyzed for these purposes. For the NYSDEC American shad beach seine program, only data from 1983 through 1985 were analyzed because of the change in program design that was implemented in 1983.

In order to implement the comparison among programs, a convention defining the time period to be included in the estimates of mean catch per unit effort was adopted. Specifically, an eight-week period from mid-August to mid-October (weeks 34-41, with weeks based on number of Sundays since January 1) was selected. This was the longest period of time within which sampling was conducted by all programs in all years of the study (with the exception of the 1981 and 1984 NYSDEC striped bass program which began in week 36). Analyses were conducted on this common subset of weeks in order to avoid confounding the results with the possible effects of extraneous factors related to week of sampling. In addition, using a common set of weeks allows estimation of average abundance at a fixed number of days prior to establishment of year class strength without requiring an adjustment for mortality. All data were log transformed (ln (count +1)) prior to analysis with the intention of stabilizing variance.

The following section describes the analyses that were performed to assess the relative precision of the programs, and the results of these analyses. Section B describes the tests that were performed to ascertain whether the assumptions needed for estimating the proportion of the population that inhabited the areas subject to beach seine sampling were satisfied. Section C of this chapter summarizes the findings, particularly as they relate to major methodological differences among the programs. Section D discusses implications of these results to the relative usefulness of each program for producing reliable indices of relative abundance. The last section provides a set of recommendations for improvements to the programs based on results of this study.

A. RELATIVE PRECISION OF THE PROGRAMS AND SOURCES OF ERROR

As described in Chapter III, the relative precision (coefficient of variation) of each annual estimate of mean catch per unit effort includes variability from each of the three stages of the sampling design:

- Stage 1 -- Among river runs
- Stage 2 -- Among beaches, within river run (and stratum)
- Stage 3 -- Among possible 30 minute sampling periods within beach and river run.

Estimates of the contribution to the overall estimation error from each of these sources of error, and estimates of the annual estimation error are discussed below. Included in these discussions are descriptions of the estimation procedures and comparisons among programs.

Stage 3

Variance of the mean catch per unit effort among tertiary sampling units could not be computed directly for all years of each study. Except for samples at a few beaches in 1981, 1984 and 1985, replicate samples were not collected at the same beach within river runs as part of the Utility program. Furthermore, replicate samples were not reported in any year for either of the NYSDEC programs. Consequently, direct estimates of the variance among tertiary unit means for each program were limited in number.

Without estimates of the stage-3 variance components, variance for the stage-2 and stage-1 components, as well as for the annual index values, cannot be computed. Therefore, an alternative approach was implemented that did not require direct estimates of variability within a beach on an individual river run.

Tests of equality of variance between the estimates of the average stage-3 variance ($\bar{\sigma}^2_{3il}$) for the limited number of beaches at which replicate samples within a river run were available and the sample variance at stage-2 (s^2_{2il}) indicated that the stage-2 variance in general was not significantly greater than zero. This meant that the variability among beaches (within a stratum (i.e., river region) as defined for the Utility program) was no greater than the average variability at a single beach over the course of a river run. Therefore, the stage-3 variance could be estimated by treating beaches within river run and stratum (i.e., region) as replicates.

The tests for equality of variance were based on the following relationship:

$$E\left[s^2_{2il}\right] = S^2_{2il} + \bar{\sigma}^2_{3il} \ . \qquad (28)$$

Therefore, if the stage-2 variance (S^2_{2il}) was zero, the expected value of the sample variance, $E[s^2_{2il}]$, would equal the average stage-3 variance, $\bar{\sigma}^2_{3il}$.

The equality of $E[s^2_{2il}]$ and $\bar{\sigma}^2_{3il}$ was tested using the following F-statistic:

$$F_{df_2,\ df_3} = \frac{s^2_{2il}}{\hat{\bar{\sigma}}^2_{3il}} \qquad (29)$$

where

df_2 = the degrees of freedom for s^2_{2il}, i.e., m_1-1

df_3 = the degrees of freedom for $\hat{\bar{\sigma}}^2_{3il}$, i.e., $m_1\ (k-1)$.

This analysis was performed on data from the Utility programs in 1981, 1984 and 1985, as these were the only years in which a beach was resampled within a river run. Results of these F-tests are presented in Table IV-1. No significant differences ($\alpha = 0.05$) between stage 2 and stage 3 variances were detected in 10 out of 12 river runs (for which tests could be conducted) for bay anchovy, 8 out of 11 for American shad, 10 out of 11 for striped bass, 8 out of 8 for Atlantic tomcod and 7 out of 10 for white perch.

Because of a large number of zero counts, a variance to mean relationship still remained for the data in this analysis, even after logarithmic transformation. To examine whether the outcome was a function of this relationship, the analyses was repeated using the nonparametric Kruskal-Wallis test. Results of this test were consistent with that of the parametric test, with no significant differences between the stage-2 and stage-3 variance (Appendix A).

To supplement these analyses, the Utility beach seine data were merged with the NYSDEC American shad beach seine data to produce an additional data set with replicates at stage-3 (i.e., occasions on which the NYSDEC and the Utilities happened to sample the same beach in the same week). These samples were viewed as replicates because the two programs used similar sampling gear (30.5-m seine). These data were only available for 1981, since after 1981 sampling schedules were revised so that the Utility and NYSDEC shad programs sampled in alternate weeks. The F-test procedure described above was applied to the merged data set which included 5 week by stratum sampling events that contained replicates. Results from these tests are presented in Table IV-2. No significant differences ($\alpha = 0.05$) were detected in 5 out of 5 tests for American shad, 3 out of 4 for striped bass, and 3 out of 5 for white perch.

Stage 2

Based on results from these analyses (i.e., the observed variability at stage-2, s^2_{2il}, was no greater than what would be expected from the average stage-3 variability, $\bar{\sigma}^2_{3il}$) and because stage-3 replicates were not included in the sampling design in any of the three programs, the prototype sampling design model was modified to a two-stage model. The second and third stages (of the initial model) were combined into a revised stage-2 with sampling units defined by beach and sampling period within a river run and stratum (Fig. IV-1).

As before, the second stage units are construed as having been selected according to a stratified random sampling procedure. However, for this modified model both NYSDEC programs as well as the Utility program were viewed as having multiple strata defined by the sampling regions of the Utility program.

Table IV-1. PR > F for F-tests of between beach vs. within beach variance for beach seine data collected within a river run by the Utility program. Within beach variance was estimated from 2 hauls per beach (N = total number of samples, i.e., 2 x number of beaches).

Year	River Run	N	Species				
			Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
81	35	6	0.72	0.25	0.97	--	0.27
	37	10	0.49	0.08	<0.01	--	0.07
	39	12	<0.01	0.04	0.22	0.49	0.04
	41	12	0.49	0.03	0.97	--	0.02
84	34	18	0.50	0.03	0.14	0.11	<0.01
	36	12	0.67	0.89	0.67	0.63	0.94
	38	14	0.54	0.38	0.43	0.58	0.58
	40	14	0.58	0.08	0.08	0.49	0.07
85	34	8	0.48	0.61	0.25	0.23	0.08
	36	6	0.08	--	--	--	--
	38	8	<0.01	0.48	0.09	0.62	--
	40	10	0.49	0.49	0.73	0.49	0.71

Table IV-2. PR > F for F-tests of between beach vs. within beach variance for beach seine data collected by the Utility program and the NYSDEC American shad program at the same beach with a river run. Within beach variance was estimated from 2 hauls per beach (N = total number of samples, i.e., 2 x number of beaches).

Year	River Run	Region	N	Species				
				Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
81	35	5	4	--	0.21	0.09	--	0.19
	35	11	4	--	0.17	--	--	<0.01
	37	5	6	--	0.47	0.87	--	0.03
	37	7	4	--	0.67	0.42	--	0.77
	39	5	4	--	0.82	0.03	--	0.29

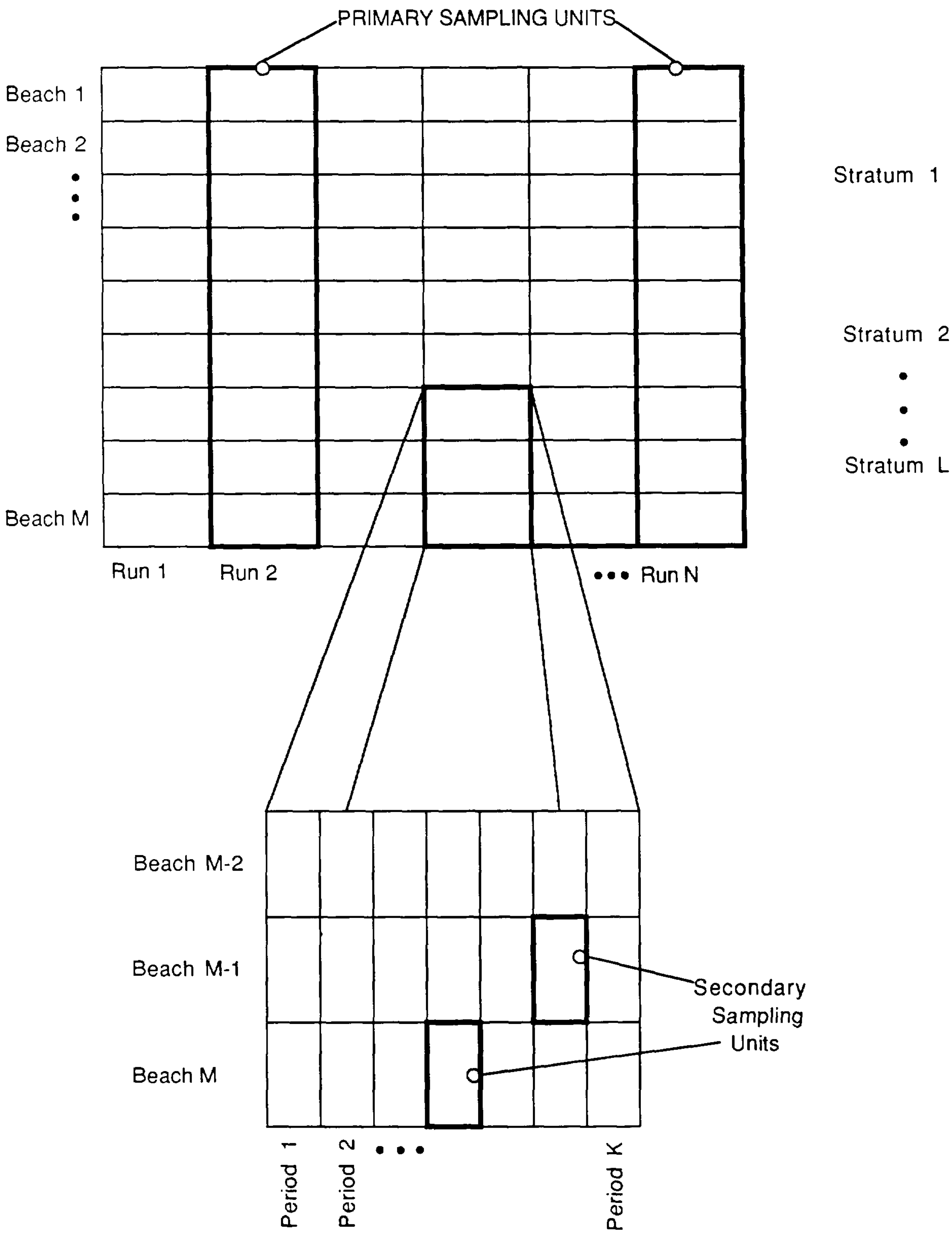

Figure IV-1. Graphic representation of the modified prototype sampling design with two stages

This was because the tests for equality of variance were conducted on sets of data from within strata. Also, preliminary analyses indicated that substantial differences in mean catch per unit effort existed geographically. Consequently, the variance estimates of the NYSDEC programs would be artifically inflated if the data were not post-stratified.

This modified construct simplifies the variance formulae described in the previous chapter and requires a slight modification to the estimator of the index of relative abundance. The following changes to the index (estimator of mean catch per unit effort) are required:

$$\bar{\bar{y}}'_{i1} \text{ replaces } \bar{\bar{y}}_{i1} \text{ in equation (12)}$$

where

$$\bar{\bar{y}}'_{i1} = \frac{1}{m_1 k} \sum_{j=1}^{m_1} \sum_{h=1}^{k} y_{i1jh} \qquad (30).$$

The variance of $\bar{\bar{y}}$ is simplified by replacing $V(\bar{\bar{y}}_{i1})$ by the following term:

$$V(\bar{\bar{y}}'_{i1}) = \frac{1}{m_1 k} S^{2\prime}_{2i1} \qquad (31)$$

where

$$S^2_{2i1} = \frac{\sum_{j=1}^{M_1} \sum_{h=1}^{K} \left(Y_{i1jh} - \bar{\bar{Y}}_{i1} \right)^2}{M_1 K - 1} \qquad (32).$$

and

$$\bar{\bar{Y}}_{i1} = \frac{1}{M_1 K} \sum_{j=1}^{M_1} \sum_{h=1}^{K} Y_{i1jh} .$$

Lastly, the estimate of the variance is simplified by replacing $v(\bar{\bar{y}}_{i1})$ by the following term:

$$V(\bar{y}'_{i1}) = \frac{1}{m_1 k} s^{2\prime}_{2i1} \qquad (33)$$

where

$$s^{2\prime}_{2i1} = \frac{\sum_{j=1}^{m_1} \sum_{h=1}^{k} (y_{ij1h} - \bar{\bar{y}}_{i1})^2}{m_1 k - 1} \qquad (34).$$

Estimates of the average within river run estimation error ($\hat{\bar{\sigma}}^2_2$) were computed using equation (23) with $V(\bar{\bar{y}}'_{i1})$ replacing $V(\bar{\bar{y}}_{i1})$. Associated coefficients of variation were computed as

$$\hat{CV}(\hat{\bar{\sigma}}^2_2) = \sqrt{\bar{\sigma}^2_2} \,/\, \bar{\bar{y}} \,. \qquad (35)$$

This descriptive statistic for each year, program, and species is presented in Table IV-3.

In the absence of among river run (stage-1) variability, the relative error of the annual index of relative abundance for the Utility program was reasonably small (e.g., about 0.1) for American shad and striped bass in all years. Also, relative error of the index based on the NYSDEC shad beach seine program was reasonably small for American shad in all years, and the relative error of the index for striped bass from the NYSDEC striped bass program was reasonably small in all years. However, the relative errors for bay anchovy, Atlantic tomcod and (to a lesser degree) white perch were generally quite large in all programs.

These results reflect the overall precision of estimates of mean catch per unit effort within river runs. As such, they include the effects of gear type, geographic extent of sampling, and sample size. Consequently, comparisons between programs based on these statistics, although meaningful, do not provide insights into the effects of specific program elements. Of particular interest, is the effect of gear type (30.5 m vs 61 m seine) on relative error.

The effect of the gear type was isolated by subsetting the Utility data to include only beaches sampled by the NYSDEC striped bass program. Also, the computation of the coefficient of variation was based on the sampling error (e.g., standard deviation) rather than on the estimation error (e.g., standard

Table IV-3. Coefficients of variation for average within river run standard errors (estimation error) $\hat{CV}(\hat{\sigma}_2^2) = \sqrt{\hat{\sigma}_2^2} / \bar{\bar{y}}$.

Year	Program	Average Number of Beaches Sampled Within River Run	Species				
			Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities	100	0.38	0.08	0.10	0.96	0.14
	DEC S.B.	13.25	1.05	0.22	0.09	0.82	0.16
	DEC Shad	--	--	--	--	--	--
1982	Utilities	100	0.33	0.01	0.09	0.33	0.12
	DEC S.B.	21.75	0.39	0.21	0.08	0.26	0.14
	DEC Shad	--	--	--	--	--	--
1983	Utilities	100	0.43	0.08	0.12	0.68	0.12
	DEC S.B.	22.75	0.45	0.21	0.07	0.38	0.15
	DEC Shad	36	1.31	0.06	0.15	--(1)	0.19
1984	Utilities	100	0.35	0.07	0.10	0.42	0.15
	DEC S.B.	23.33	0.45	0.16	0.07	0.31	0.17
	DEC Shad	34.25	1.79	0.08	0.17	--(1)	0.22
1985	Utilities	100	0.35	0.09	0.16	0.32	0.15
	DEC S.B.	21.75	0.55	0.27	0.17	0.46	0.28
	DEC Shad	31.5	0.48	0.05	0.19	--(1)	0.21

(1) $\bar{\bar{y}} = 0$

error). Specifically, the following formulae were used for these computations:

$$\hat{CV}(\bar{s}_2^2) = \sqrt{\bar{s}_2^2} / \bar{\bar{y}} \quad (36)$$

where

$$\bar{s}_2^2 = \hat{\bar{\sigma}}_2^2 \cdot \bar{m} \quad (37)$$

and

$\bar{m}$ = average number of beaches sampled during one river run

$$= \frac{1}{n} \sum_{i=1}^{n} \sum_{l=1}^{4} m_{l}\ k$$

where

strata 1 through 4 correspond to the geographic extent sampled by the NYSDEC striped bass beach seine program.

Results from these computations are presented in Table IV-4. They indicate that the relative error of the 61 m seine was consistently less than that of the 30.5 m seine. For striped bass and white perch this was the case in all five years. For bay anchovy, American shad, and Atlantic tomcod, the relative error was smaller for the 61 m seine in 4 of the 5 years.

Although both the NYSDEC American shad and the Utility programs used 30.5-m nets, the NYSDEC net was 0.6 m deeper than the Utility net. Also, the sampling protocols for the two programs may have differed in ways that could have affected precision. Therefore, a similar analysis was conducted for regions 5-12 which compared the NYSDEC shad sampling to the Utility sampling. The Utility data were subsetted to include only beaches sampled by the NYSDEC shad program. Results from these analyses are presented in Table IV-4. They indicate that for American shad, the NYSDEC sampling was more precise than the Utility sampling.

Stage 1

Estimates of the among river run variance were based on the following relationship:

$$E(s_1^2) = S_1^2 + \bar{\sigma}_2^2 \quad (38)$$

Table IV-4. Coefficients of variation for within river run standard deviations (sampling error per haul), $CV(s_2^2) = \sqrt{s_2^2} / \bar{\bar{y}}$. Utility data have been subset to include only those beaches sampled in common with the NYSDEC data to which it is being compared.

Year	Program	Species: Bay Anchovy	Species: American Shad	Species: Striped Bass	Species: Atlantic Tomcod	Species: White Perch	Average Number of Beaches Sampled Within River Run
1981	Utilities (1-4)	2.74	1.30	0.58	6.92	1.30	52
	DEC S.B.	3.82	0.80	0.33	2.98	0.58	13.25
1982	Utilities (1-4)	2.24	1.87	0.72	2.38	1.08	52
	DEC S.B.	1.82	0.98	0.37	1.21	0.65	21.75(2)
1983	Utilities (1-4)	3.33	2.83	0.94	4.93	2.17	52.5
	DEC S.B.	2.15	1.00	0.33	1.81	0.72	22.75(3)
1984	Utilities (1-4)	3.39	1.23	0.72	3.10	1.44	52
	DEC S.B.	2.17	0.77	0.34	1.50	0.82	23.33(4)
1985	Utilities (1-4)	2.74	2.45	1.30	2.38	1.66	52
	DEC S.B.	2.57	1.26	0.79	2.15	1.31	21.75(5)
1983	Utilities (5-12)	9.31	0.08	1.55	—(1)	1.09	60.25
	DEC Shad	7.86	0.36	0.90	—(1)	1.14	36
1984	Utilities (5-12)	4.18	0.62	1.70	15.49	1.63	60
	DEC Shad	10.48	0.47	0.99	—(1)	1.29	34.25
1985	Utilities (5-12)	6.82	0.70	2.48	15.49	1.47	60
	DEC Shad	2.69	0.28	1.07	—(1)	1.18	31.5

(1) $\bar{\bar{y}} = 0.0$

Accordingly, the estimate of among river run variance was computed as

$$\hat{S}_1^2 = s_1^2 - \hat{\sigma}_2^2 \,. \qquad (39)$$

Each estimate was tested to determine whether it was significantly different from zero based on the following F-statistic:

$$F_{df_1,df_2} = \frac{s_1^2}{\hat{\sigma}_2^2} \qquad (40)$$

where

df_1 = number of degrees of freedom for s_1^2, i.e., n-1

df_2 = number of degrees of freedom for $\bar{\sigma}_2^2$, i.e.,

$$n \sum_{l=1}^{L} (m_l\, k - 1).$$

Prior to application of this F-test, Hartley's test was conducted to determine if the log transformation had created homogeneity of variance.

Results from these tests indicate that the among river run variation in mean catch per unit effort was not significantly different ($\alpha = 0.05$) from zero for bay anchovy and Atlantic tomcod. This was the case, in general, for all three programs (Table IV-5). However, it should be noted that the power of these tests for bay anchovy and Atlantic tomcod was likely to have been quite low as indicated by the poor precision of the within river run estimates (Table IV-3).

Significant differences ($\alpha = 0.05$) among river run means were found for American shad in all programs (Table IV-5). The Utility program and the NYSDEC striped bass program produced very different results for striped bass and (to a lesser degree) white perch. Significant differences ($\alpha = 0.05$) in among river run means for striped bass were found in 4 out of 5 years of the Utility program but in only 1 out of 5 years of the NYSDEC striped bass program (Table IV-5). Similarly, significant differences for white perch were detected in 3 out of 5 years of the Utility program but in only 1 out of 5 of the NYSDEC striped bass program. The NYSDEC American shad beach seine program produced significant among river run differences in 3 out of 3 years for American shad and in 2 out of 3 years for white perch. Homogeneity of variance was found to exist in all these tests.

Table IV-5. F-statistics for between river run vs. within river run variance $s_1^2/\hat{\sigma}_2^2$.

Year	Program	Among River Run DF	Within River Run DF	Species: Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities	3	400	4.43*	3.42*	9.49*	0.67	5.85*
	DEC S.B.	3	43	0.48	3.48*	7.41*	0.63	3.36*
	DEC Shad	—	—	—	—	—	—	—
1982	Utilities	3	400	0.61	4.79*	3.37*	0.43	1.58
	DEC S.B.	3	75	0.21	3.09*	2.24	2.71*	1.52
	DEC Shad	—	—	—	—	—	—	—
1983	Utilities	3	403	3.79*	12.70*	14.55*	0.69	3.50*
	DEC S.B.	3	79	1.27	3.53*	0.48	0.23	1.34
	DEC Shad	3	128	2.34	4.38*	0.56	—(1)	3.95*
1984	Utilities	3	400	2.39	15.75*	0.85	0.32	1.16
	DEC S.B.	2	61	3.06*	4.07*	0.49	2.14	0.11
	DEC Shad	3	121	0.92	4.70*	4.56*	—(1)	3.02*
1985	Utilities	3	400	2.15	4.53*	8.02*	0.79	4.32*
	DEC S.B.	3	75	0.67	1.07	0.67	0.41	1.97
	DEC Shad	3	110	1.30	11.68*	6.11*	—(1)	1.77

* s_i^2 significantly different from zero at $\alpha = 0.05$

(1) $s_1^2 = 0.0$

The relative magnitude of among week variability observed in mean catch per unit effort reflects losses due to mortality in the population, and movement of juveniles into, and out of, the areas subject to sampling (i.e., within year variability in b_{yt}). This variability can be represented (for the purposes of comparisons between programs) by the following coefficient of variation:

$$\hat{CV}(\hat{S}_1^2) = \sqrt{\hat{S}_1^2} / \bar{\bar{y}}. \tag{41}$$

Values for this descriptive statistic for all years, programs and species for which S_1^2 was significantly non-zero are presented in Table IV-6.

These comparisons of stage-1 variability reflect differences in the geographic extent of the programs as well as differences in gear types. Therefore, interpretation of differences between programs is difficult. For example, the fact that the Utilities' program consistently detected among river run differences in the mean catch per unit effort for striped bass, and the NYSDEC striped bass program consistently found no significant difference may have been due to:

- Shifts in the longitudinal distribution of striped bass relative to the areas subject to sampling in the two programs

- On-offshore movements to areas beyond the reach of the 30.5-m seine, but not beyond the reach of the 61-m seine.

In order to better interpret the comparisons, the F-tests and computations of $CV(S_1^2)$ were repeated on 2 subsets of the Utility data. The first subset included only data collected in sampling regions (strata) 1 through 4, which roughly correspond to the geographic extent of sampling by the NYSDEC striped bass program. The second subset included only data collected in sampling regions (strata) 5-12, which roughly correspond to the geographic extent of sampling by the NYSDEC shad program.

Results from these analyses were very similar to the results based on data from the full geographic extent of the Utility program. This suggests that the observed differences among programs for striped bass were due to gear differences rather than differences in the geographic extent of the study areas. Results from the F-tests are presented in Table IV-7, and values for the coefficients of variation are presented in Table IV-8.

Table IV-6. Coefficients of variation for among river run variance, $\hat{CV}(\hat{S}_1^2) = \sqrt{\hat{S}_1^2} / \bar{\bar{y}}$.

NS indicates that S_1^2 was not significantly different from zero.

Year	Program	Species: Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities	0.70	0.12	0.28	NS	0.31
	DEC S.B.	NS	0.34	0.22	NS	0.14
	DEC Shad	--	--	--	--	--
1982	Utilities	NS	0.16	0.14	NS	NS
	DEC S.B.	NS	0.30	NS	0.34	NS
	DEC Shad	--	--	--	--	--
1983	Utilities	0.71	0.27	0.43	NS	0.20
	DEC S.B.	NS	0.34	NS	NS	NS
	DEC Shad	NS	0.12	NS	--(1)	0.32
1984	Utilities	NS	0.29	NS	NS	NS
	DEC S.B.	0.64	0.29	NS	NS	NS
	DEC Shad	NS	0.16	0.32	--(1)	0.31
1985	Utilities	NS	0.17	0.43	NS	0.27
	DEC S.B.	NS	NS	NS	NS	NS
	DEC Shad	NS	0.17	0.44	--(1)	NS

(1) $\bar{\bar{y}} = 0.0$

Table IV-7. F-statistics between river run vs. within river run variance, $\hat{S}_1^2/\hat{\sigma}_2^2$, for subsets of data from the Utilities' program.

Year	Program (Regions)	Among River Run DF	Within River Run DF	Species: Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities (1-4)	3	192	4.39*	11.28*	20.94*	0.67	4.19*
	DEC S.B.	3	43	0.48	3.48*	7.41*	0.63	3.36*
1982	Utilities (1-4)	3	192	0.97	3.50*	4.05*	0.43	0.55
	DEC S.B.	3	75	0.21	3.09*	2.24	2.71*	1.52
1983	Utilities (1-4)	3	194	3.29*	10.74*	14.68*	0.69	0.70
	DEC S.B.	3	79	2.34	3.53*	0.48	0.23	1.34
1984	Utilities (1-4)	3	192	0.46	3.21*	1.27	0.38	0.87
	DEC S.B.	2	61	3.06*	4.07*	0.49	2.14	0.11
1985	Utilities (1-4)	3	192	2.61*	4.16*	6.05*	0.79	3.35*
	DEC S.B.	3	75	0.67	1.07	0.67	0.41	1.97
1983	Utilities (5-12)	3	209	0.93	12.76*	5.15*	—(1)	4.21*
	DEC Shad	3	128	2.34	4.38*	0.56	—(1)	3.95*
1984	Utilities (5-12)	3	208	4.81*	13.18*	4.90*	1.00	3.31*
	DEC Shad	3	121	0.92	4.70*	4.56*	—(1)	3.02*
1985	Utilities (5-12)	3	208	1.25	2.93*	2.79*	1.00	1.92
	DEC Shad	3	110	1.35	11.68*	6.11*	—(1)	1.77

*S_1^2 significantly different from zero at $\alpha = 0.05$.

(1) $s_1^2 = 0.0$

Table IV-8. Coefficients of variation for among river run variance, $\hat{CV}(\hat{S}_I^2) = \sqrt{\hat{S}_I^2} / \overset{\equiv}{y}$.
NS indicates that S_I^2 was not significantly different from zero.

Year	Program (Regions)	Species: Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities (1-4)	0.70	0.58	0.34	NS	0.32
	DEC S.B.	NS	0.34	0.22	NS	0.14
1982	Utilities (1-4)	NS	0.41	0.17	NS	NS
	DEC S.B.	NS	0.30	NS	0.34	NS
1983	Utilities (1-4)	0.69	NS	0.47	NS	NS
	DEC S.B.	NS	0.34	NS	NS	NS
1984	Utilities (1-4)	NS	0.26	NS	NS	NS
	DEC S.B.	0.64	0.29	NS	NS	NS
1985	Utilities (1-4)	0.49	0.61	0.40	NS	0.36
	DEC S.B.	NS	NS	NS	NS	NS
1983	Utilities (5-12)	NS	0.27	0.41	--(1)	0.24
	DEC Shad	NS	0.12	NS	--(1)	0.32
1984	Utilities (5-12)	1.06	0.29	0.44	NS	0.32
	DEC Shad	NS	0.16	0.32	--(1)	0.31
1985	Utilities (5-12	NS	0.13	0.42	NS	NS
	DEC Shad	NS	0.17	0.44	--(1)	NS

(1) $\overset{\equiv}{y} = 0.0$

Standard Errors of Annual Index Values

In order to assess the overall relative precision of each of the programs, the coefficient of variation for the estimated variances of the annual means was computed:

$$\hat{CV}\,(V(\bar{\bar{y}})) = \sqrt{V(\bar{\bar{y}})}\ /\ \bar{\bar{y}} \quad .$$

Results from these computations are presented in Table IV-9.

For striped bass, the coefficient of variation from the NYSDEC striped bass beach seine program was smaller than that from the Utility beach seine program in all years. Similarly, the coefficient of variation for American shad from the NYSDEC American shad beach seine program was smaller than that from the Utility program in all years. However, the coefficients of variation for bay anchovy and white perch were larger from the NYSDEC shad program than from the other programs.

B. FRACTION OF THE RIVERWIDE POPULATION THAT INHABITED THE AREAS SUBJECT TO SAMPLING

As discussed in the previous chapter, two necessary conditions for estimating the proportion of the riverwide population that inhabited the areas subject to sampling are that:

- The proportion subject to sampling, b_{ty}, varied over time within the year, and
- A negative relationship existed between the mean catch per unit effort for beach seine sampling and the mean catch per unit effort for offshore sampling.

In the preceding section, the species, programs, and years for which the first of these conditions was satisfied were identified. This section describes analyses conducted to determine whether the second condition was satisfied by any of the programs.

The first step in this assessment was to subject the offshore data to the same type of analysis conducted on the beach seine data in order to:

- Estimate mean catch per unit effort for each river run within each year
- Determine whether the mean catch per unit effort was significantly different among river runs.

Table IV-9. Coefficients of variation for annual estimates of the mean (estimation error),

$$CV(\nu(\bar{\bar{y}})) = \nu(\bar{\bar{y}}) / \bar{\bar{y}}.$$

Year	Program	Species				
		Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities	0.35	0.07	0.13	0.42	0.15
	DEC S.B.	0.40	0.18	0.11	0.35	0.14
	DEC A.S.	--	--	--	--	--
1982	Utilities	0.14	0.08	0.08	0.13	0.07
	DEC S.B.	0.12	0.17	0.06	0.20	0.08
	DEC A.S.	--	--	--	--	--
1983	Utilities	0.37	0.12	0.19	0.30	0.10
	DEC S.B.	0.25	0.18	0.03	0.12	0.08
	DEC A.S.	0.91	0.06	0.06	--(1)	0.32
1984	Utilities	0.25	0.13	0.05	0.15	0.08
	DEC S.B.	0.43	0.18	0.03	0.25	0.05
	DEC A.S.	0.87	0.08	0.16	--(1)	0.31
1985	Utilities	0.24	0.09	0.20	0.15	0.14
	DEC S.B.	0.24	0.14	0.07	0.17	0.18
	DEC A.S.	0.26	0.07	0.21	--(1)	0.19

(1) $\bar{\bar{y}} = 0.0$

Only species and years with significant among river run differences in mean catch per unit effort from the offshore programs were included in the assessment. This was done to avoid observing spurious relationships between the offshore and beach seine means that were due solely to estimation error.

Data from two offshore programs were analyzed:

- NYSDEC trawl program
- Utility Fall Shoals epibenthic sled (beam trawl in 1985) and Tucker trawl program.

For white perch and striped bass from the Utility program, only data from epibenthic sled sampling (and beam trawl sampling in 1985) were used to compute the means. This was because previous analyses (Versar 1987) have indicated that the catches of juveniles of these species in the Tucker trawl were too low to provide any useful information on relative abundance. For the other species, data collected with the Tucker trawl and epibenthic sled (beam trawl) were treated as having come from different sampling strata.

The sampling design for both of these programs was construed to have been two-stage stratified random sampling (although the NYSDEC program was implemented as a fixed station design). As was the case for the beach seine programs, this provided a definition of replicates based on time within river run and station location within stratum (strata defined by the Utility sampling regions). All formulae for estimating means and the components of variance, and the F-tests as described in the preceding section, were thus directly applicable to the NYSDEC trawl and Utility Fall Shoals data.

Results from F-tests for among river run differences in mean catch per unit effort from the NYSDEC trawl program included only four cases of significant differences ($\alpha = 0.05$) -- bay anchovy in 1983 and 1984, American shad in 1981, and Atlantic tomcod in 1981 (see Table IV-10). However, for the Utility Fall Shoals program, significant differences ($\alpha = 0.05$) were detected in at least two years for each of the five species (Table IV-10). The difference in the results of the two programs can be attributed largely to the differences in sample sizes. The Utility program collects about 200 samples per river run, whereas the NYSDEC program generally had about 15 samples per river run.

Based on these results, and the results from tests for significant differences in beach seine means among river runs (from the preceding section), only ten cases were found with significant differences in both the offshore means and the beach seine means. The species, programs, and years in which these conditions were met are summarized in Table IV-11.

Table IV-10. F-statistics for between river run vs within river run variance, S_I^2/σ_I^2.

Year	Program	Among River Run DF	Within River Run DF	Species: Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
1981	Utilities	3	691	13.15*	5.47*	5.09*	7.34*	1.84
	DEC	3	41	1.31	6.78*	0.40	3.53*	2.43
1982	Utilities	3	691	0.52	0.98	7.72*	1.76	2.42
	DEC	3	55	2.68	0.49	0.22	1.06	2.70*
1983	Utilities	3	690	6.61*	36.50*	3.02*	0.85	2.36
	DEC	3	41	6.03*	0.12	2.27	2.84*	1.15
1984	Utilities	3	694	18.88*	0.84	9.29*	2.55*	0.40
	DEC	3	42	1.83	1.38	1.04	0.47	0.71
1985	Utilities(6)	3	692	9.68*	5.28*	1.68	2.81*	3.14*
	DEC	3	45	6.22*	2.49	0.63	1.29	2.29

*S_I^2 significanly different from zero at α =0.05.

Table IV-11. Cases in which both offshore and beach seine sampling programs both showed significant differences in mean catch unit effort among river runs.

Offshore Program	Beach Seine Program	Species	Year
NYSDEC	NYSDEC Striped bass	American shad	1981
Utilities	Utilities	Bay anchovy	1981
Utilities	Utilities	Bay anchovy	1983
Utilities	Utilities	American shad	1981
Utilities	Utilities	American shad	1983
Utilities	Utilities	American shad	1985
Utilities	Utilities	Striped bass	1981
Utilities	Utilities	Striped bass	1982
Utilities	Utilities	Striped bass	1983
Utilities	Utilities	White perch	1985

For each of these cases, the estimated means from the offshore sampling were paired with the estimated means from the corresponding beach seine sampling. In general, offshore and beach seine sampling were not conducted concurrently. Therefore, the paired means may include data from offshore that were collected up to one week before (or after) the corresponding beach seine data were collected.

Plots of the offshore means versus the beach seine means for these ten cases indicate that, in general, negative relationships did not exist (see Figures IV-2 to IV-11). As discussed in Chapter III, if the riverwide abundance was constant during the study period within a year, and if the conditions required for estimating b_{ty} occurred, then the regression of offshore means on beach seine means must have a negative slope. Consequently, it appears that these conditions did not occur. However, due to the very limited number of data available for these purposes, this conclusion should be viewed as tentative. Furthermore, the presence of the alternate situation that would allow estimation of b_{ty} (i.e., riverwide abundance declining linearly during the study period) cannot be assessed due to the limited number of data points (4 per regression).

C. DISCUSSION OF RESULTS

The analyses described in this chapter were intended to provide the basis for comparing the following features of the beach seine programs:

- Fixed versus random selection of beaches for sampling
- 30.5-m versus 61-m beach seines
- Geographic extent of sampling
  - Regions 5-12 versus regions 1-12 for American shad
  - Regions 1-4 versus regions 1-12 for striped bass.

In addition, the analyses were intended to answer the following specific questions:

- Which program is most precise
- Which program(s), if any, can produce reliable estimates of the proportion of the riverwide population that inhabited the area subject to beach seine sampling.

The implications of the analysis results for each of these questions are summarized below.

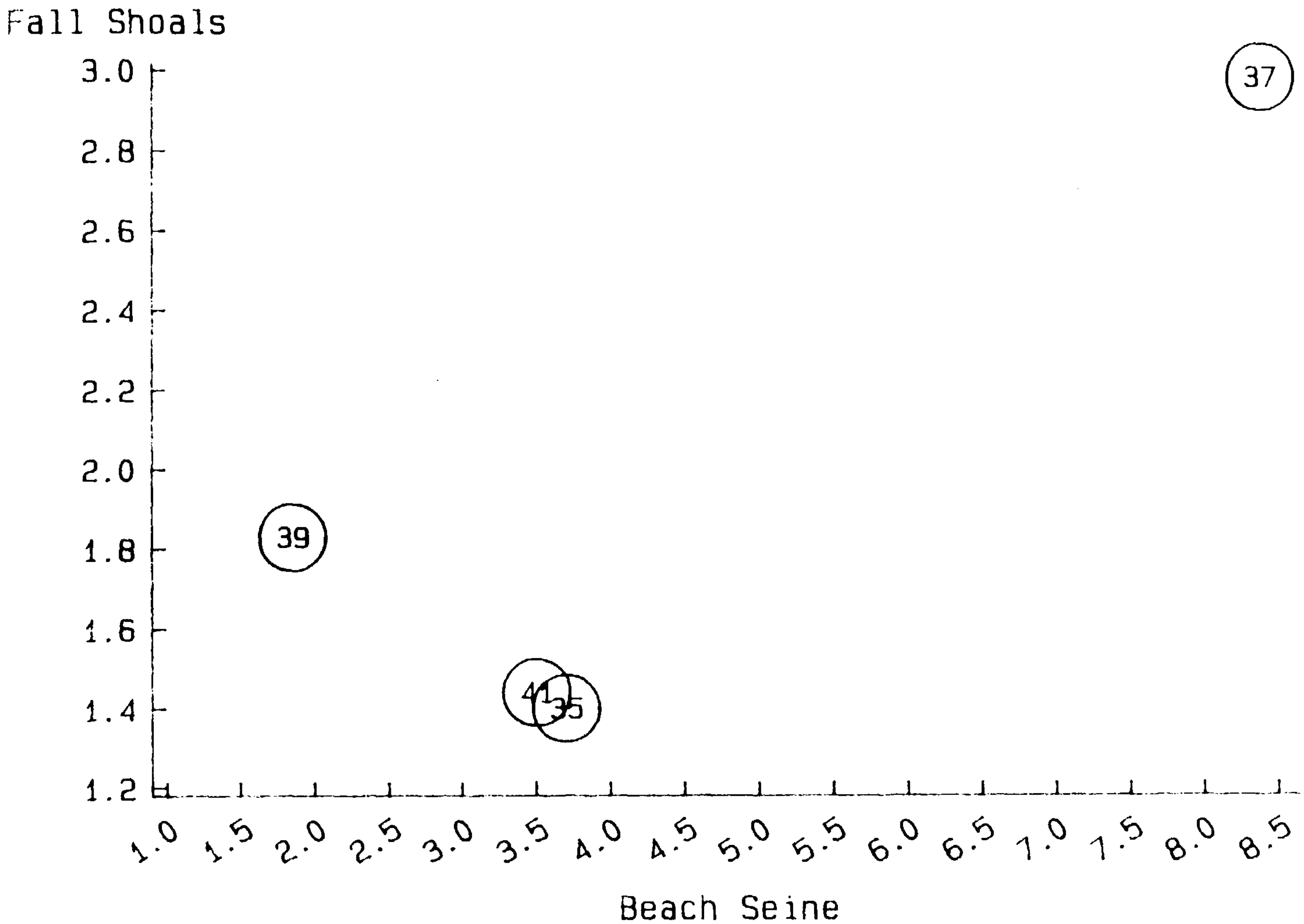

Figure IV-2. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for white perch in 1985. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

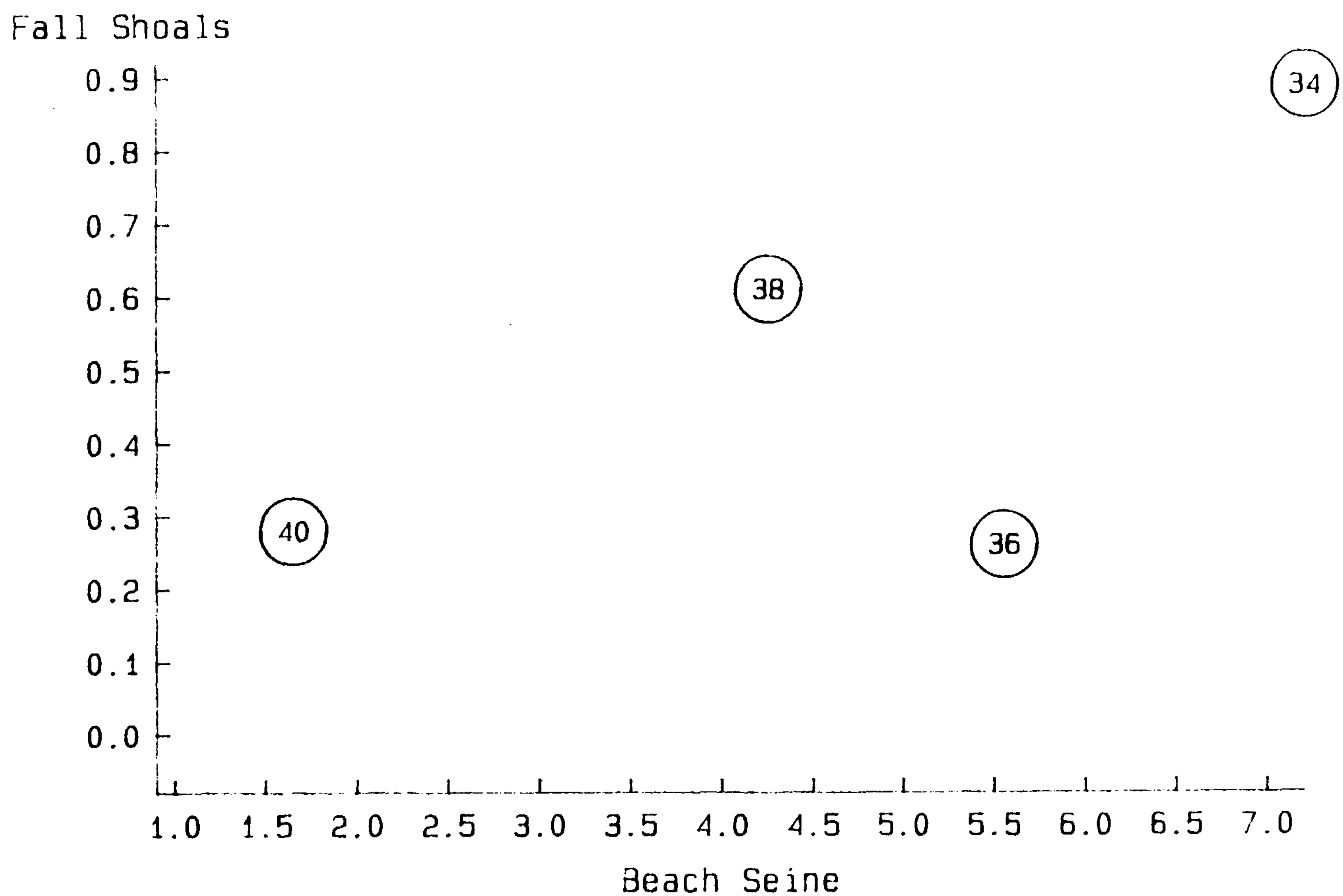

Figure IV-3. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for striped bass in 1981. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

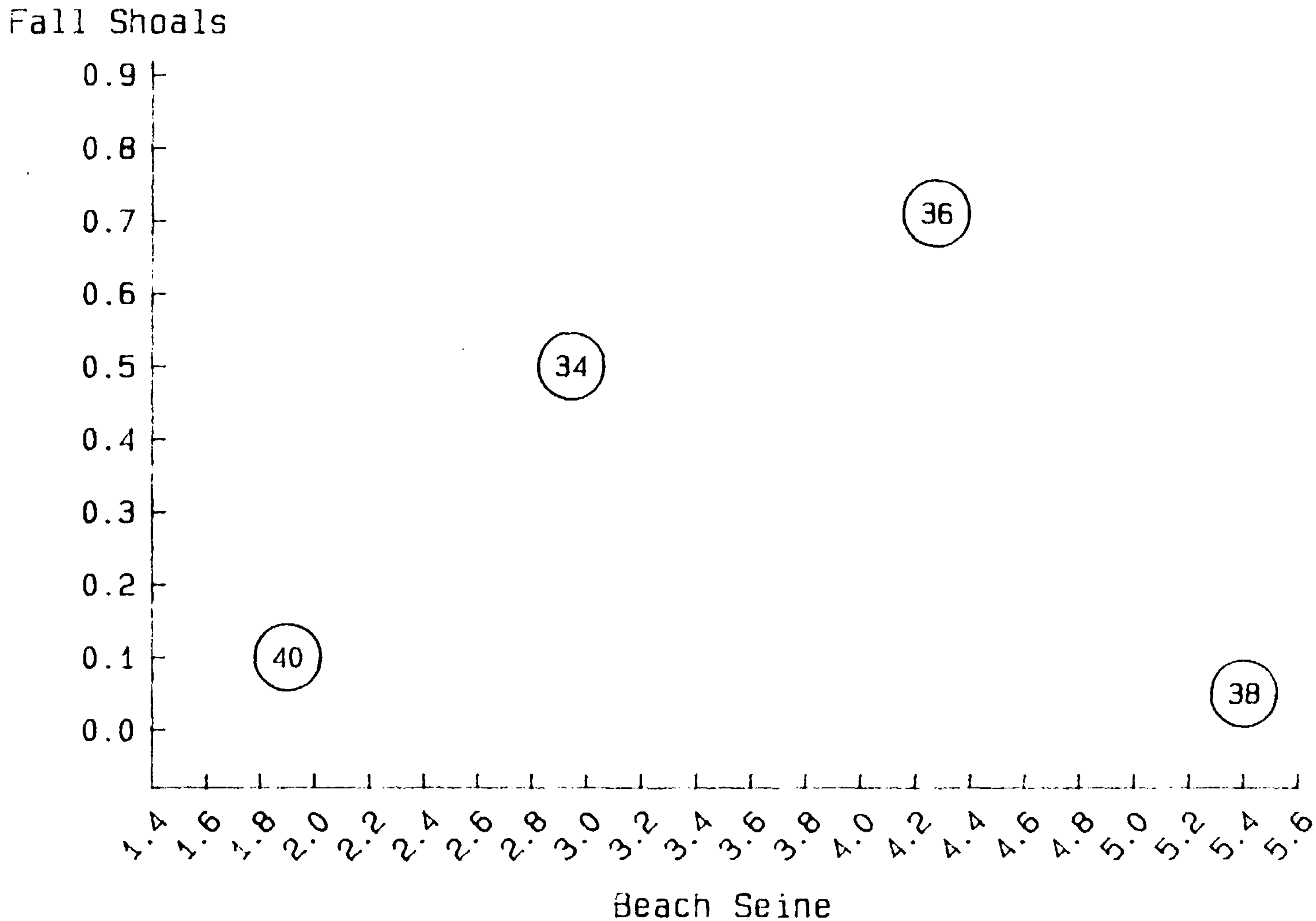

Figure IV-4. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for striped bass in 1982. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

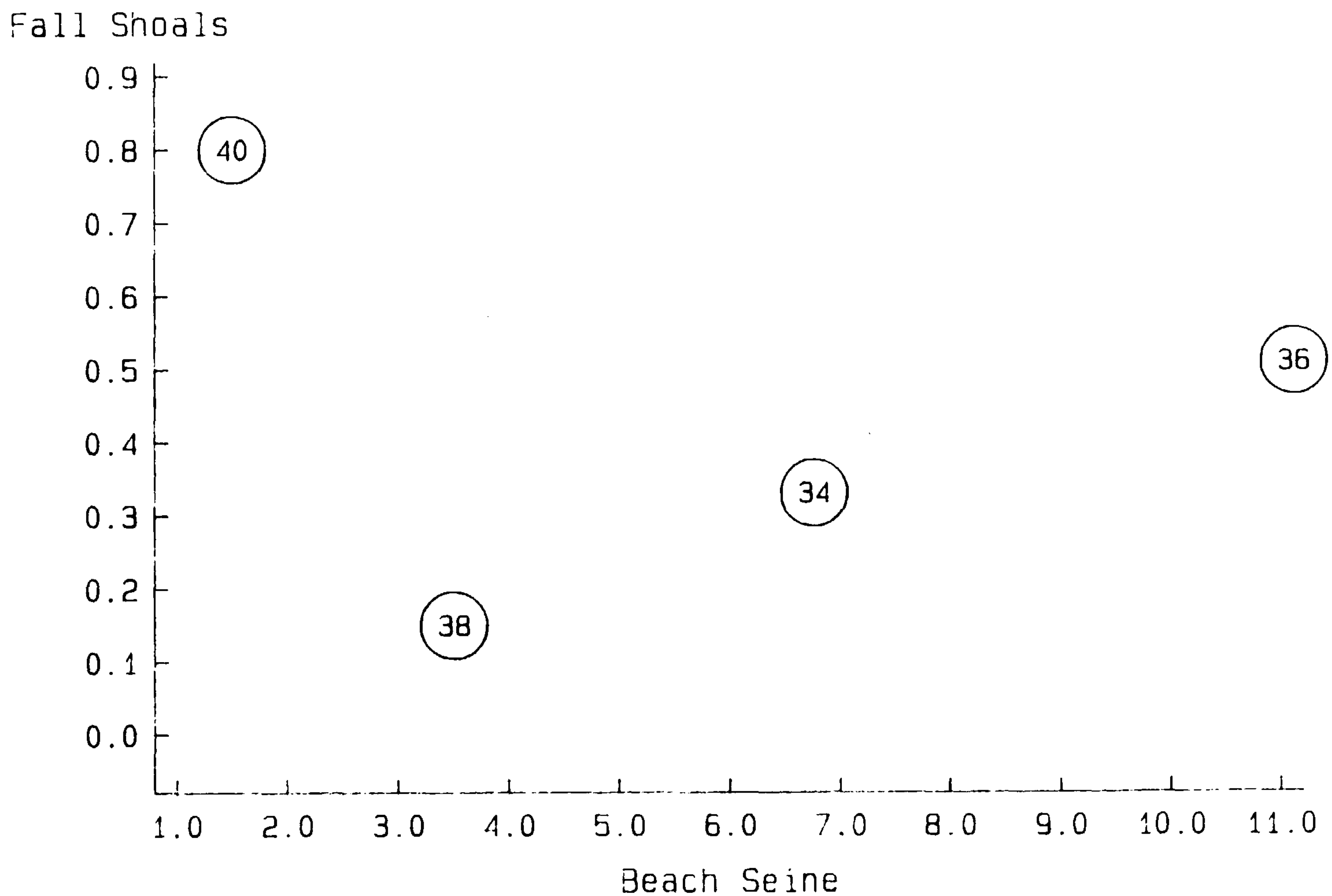

Figure IV-5. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for striped bass in 1983. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

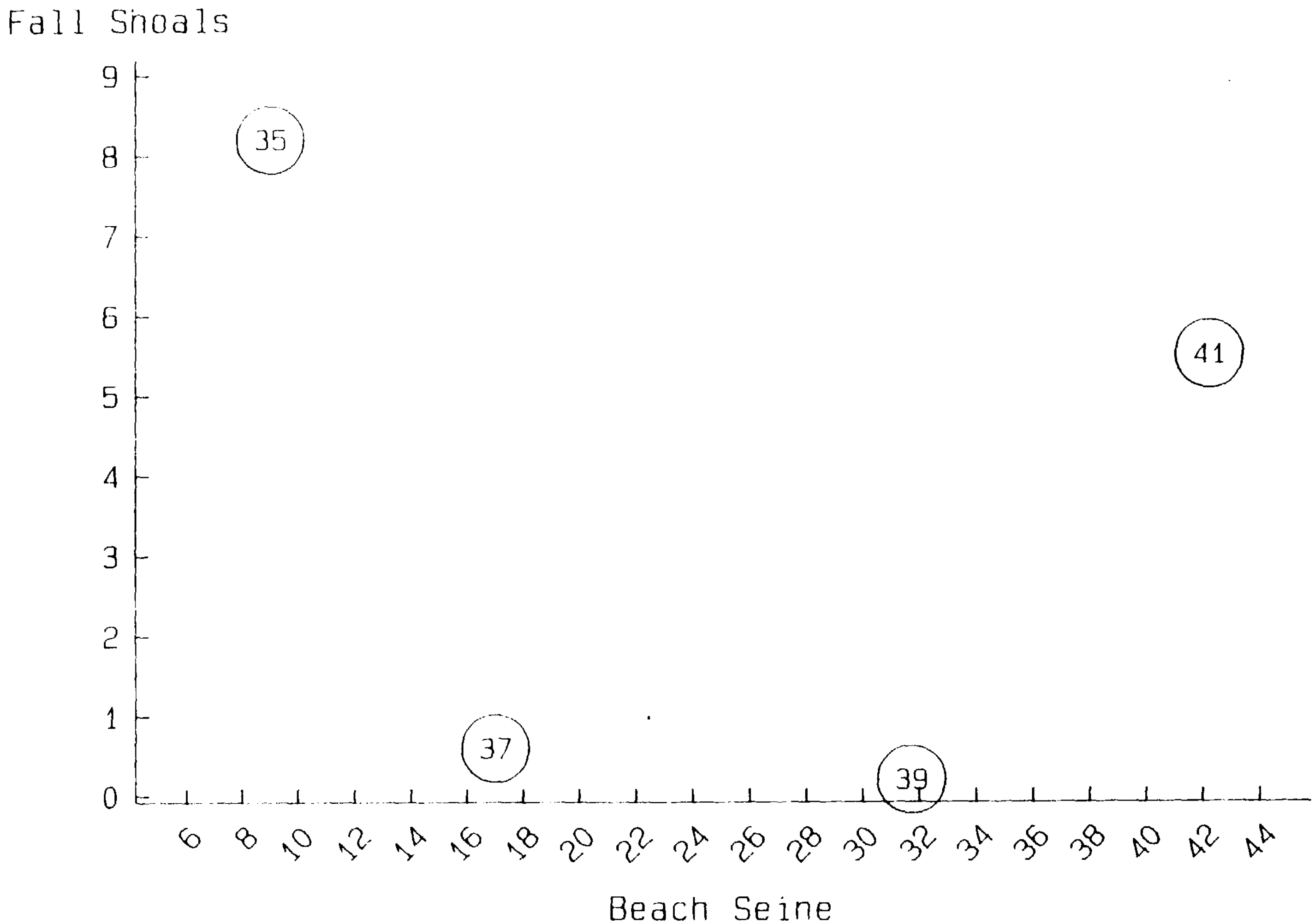

Figure IV-6. Plots of mean catch per unit effort from NYSDEC offshore sampling (y-axis) vs. mean catch per unit effort from NYSDEC beach seine sampling (x-axis) for striped bass in 1981. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

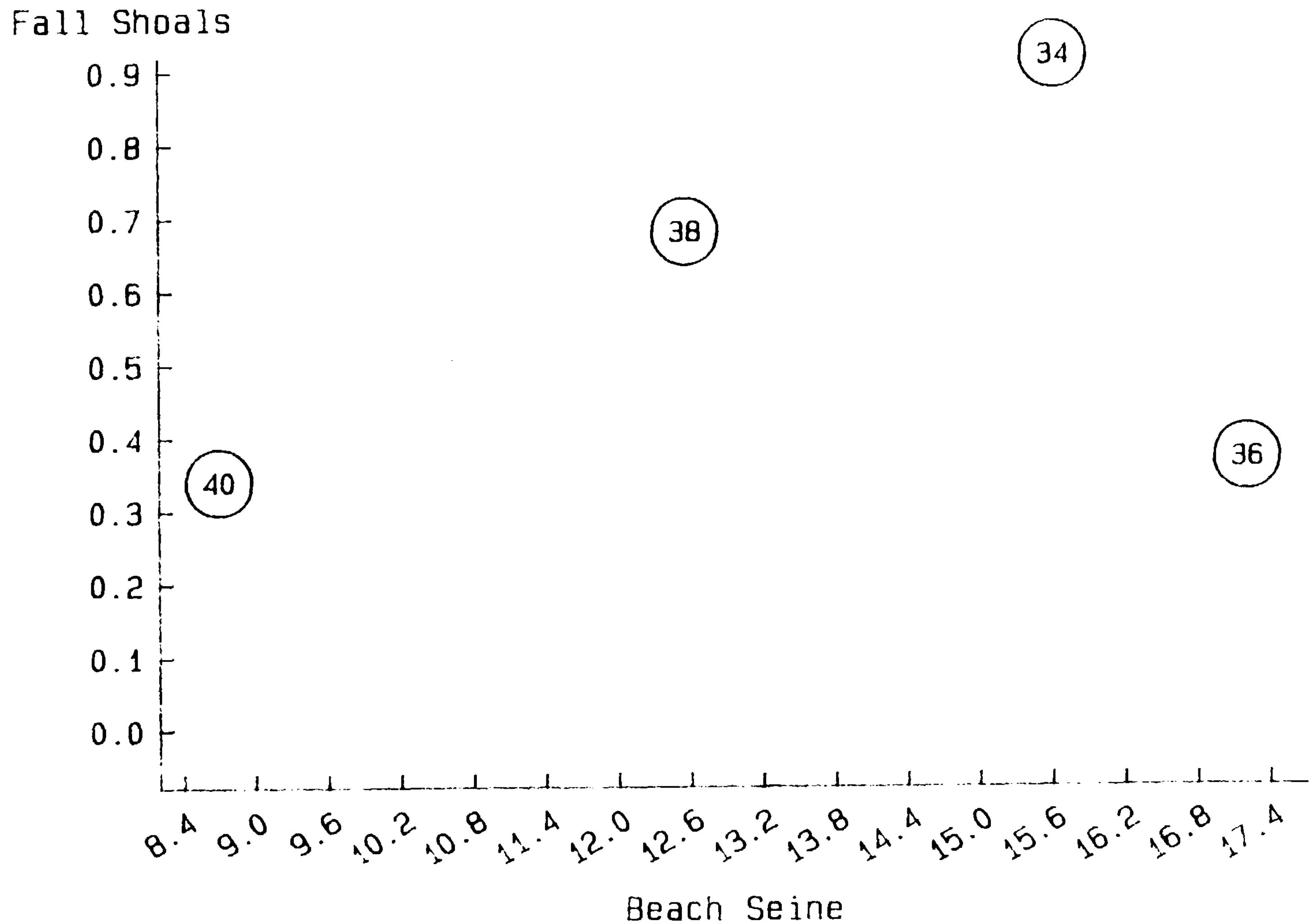

Figure IV-7. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for American shad in 1981. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

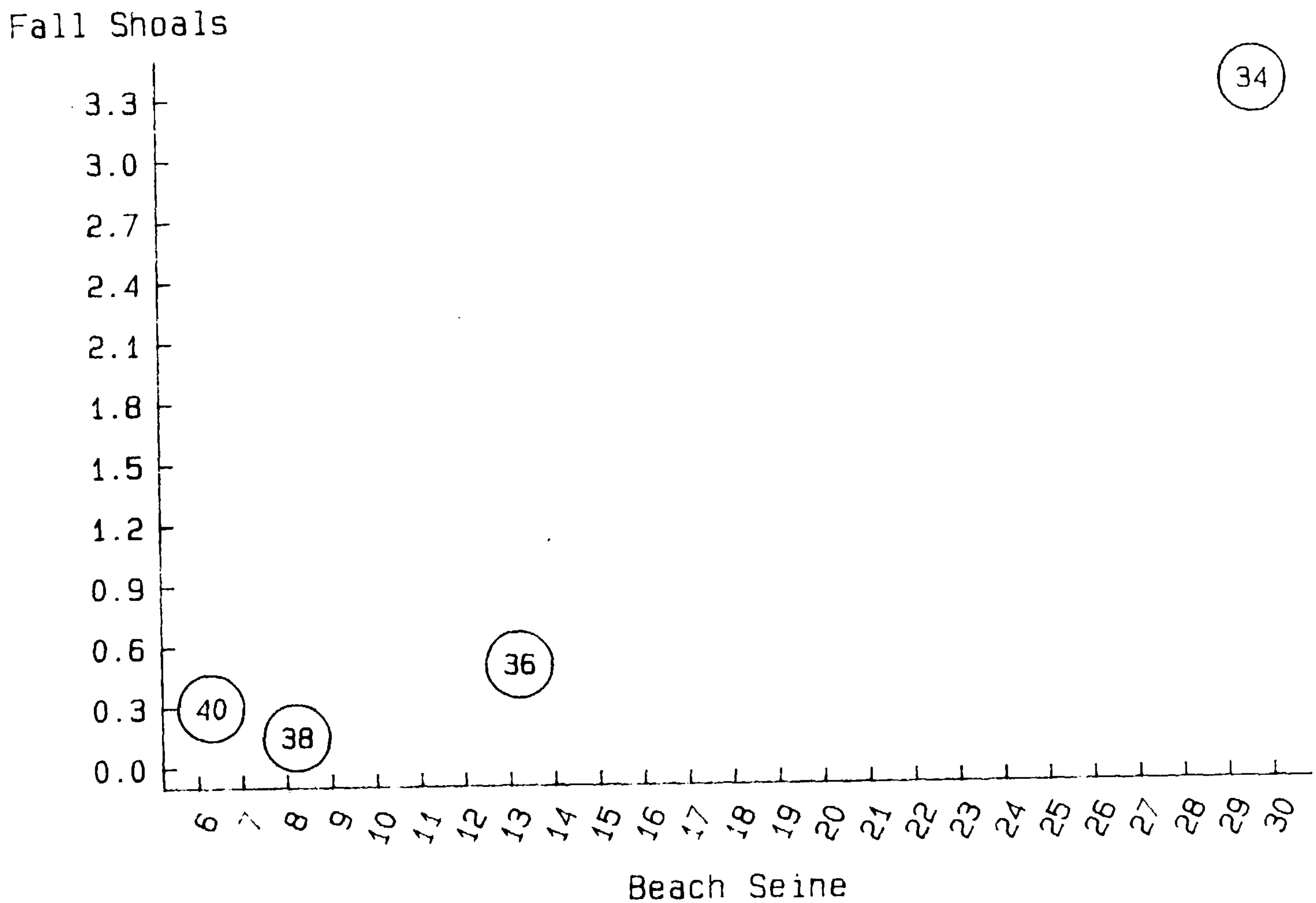

Figure IV-8. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for American shad in 1983. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

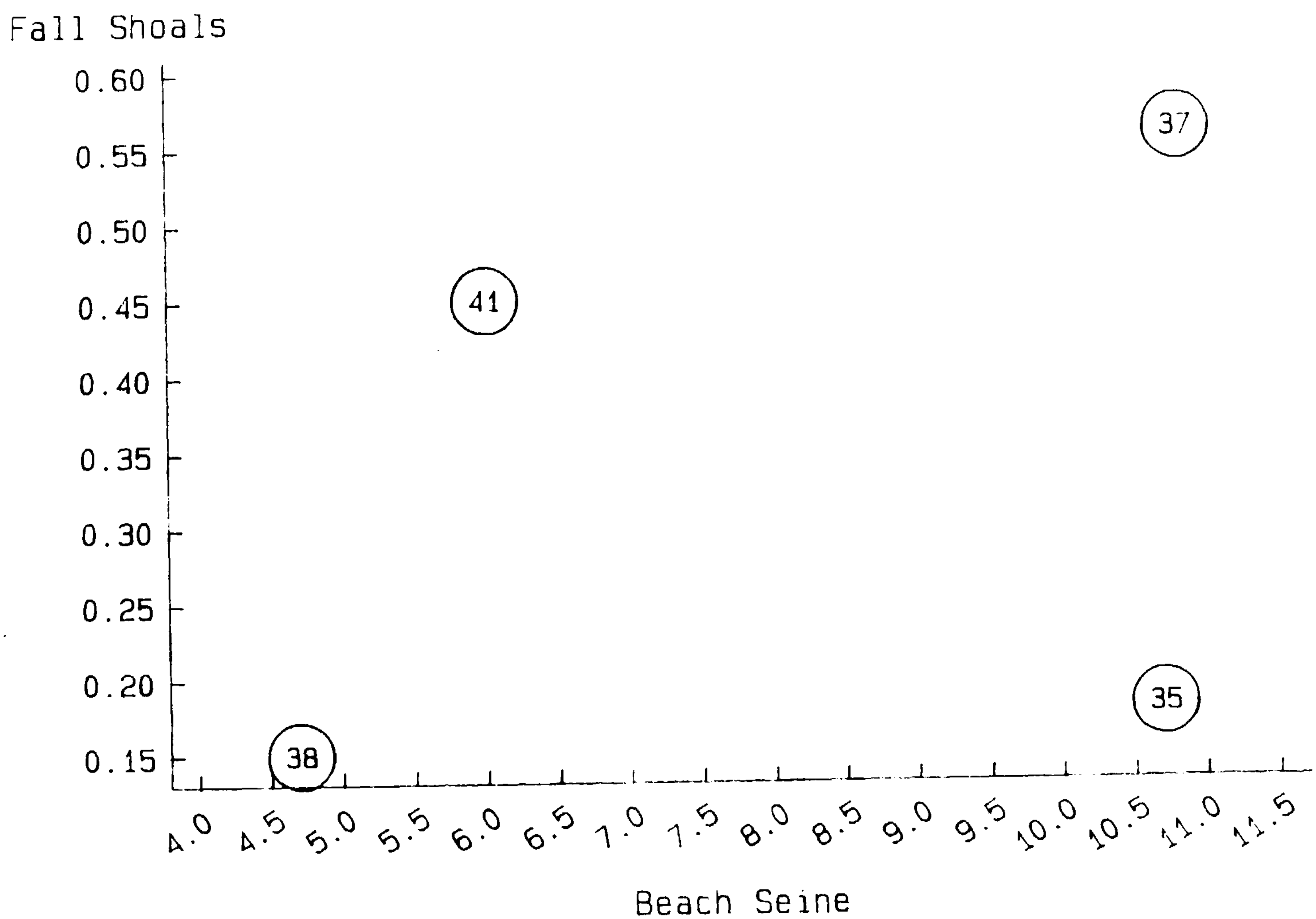

Figure IV-9. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for American shad in 1985. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

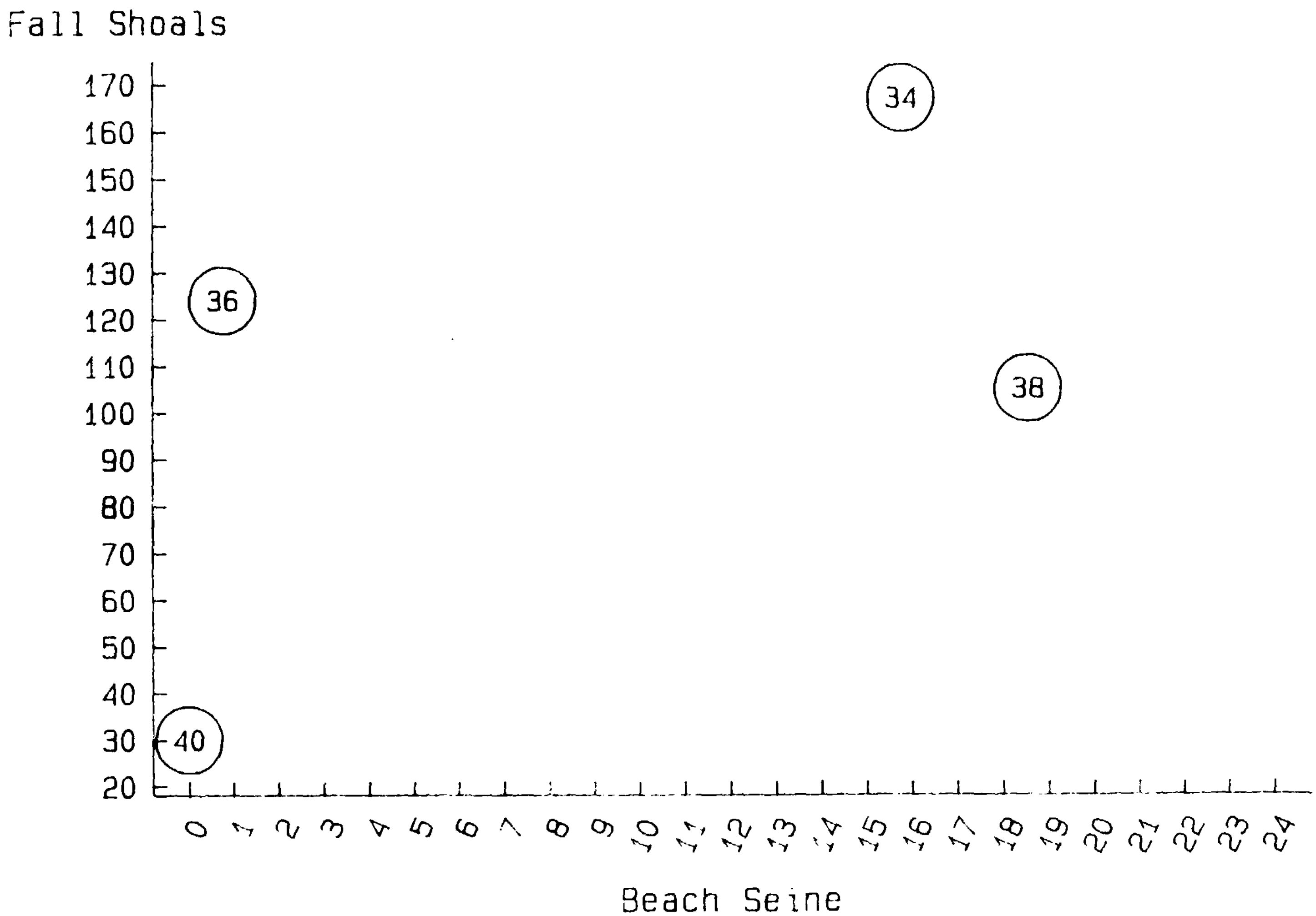

Figure IV-10. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for Bay Anchovy in 1981. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

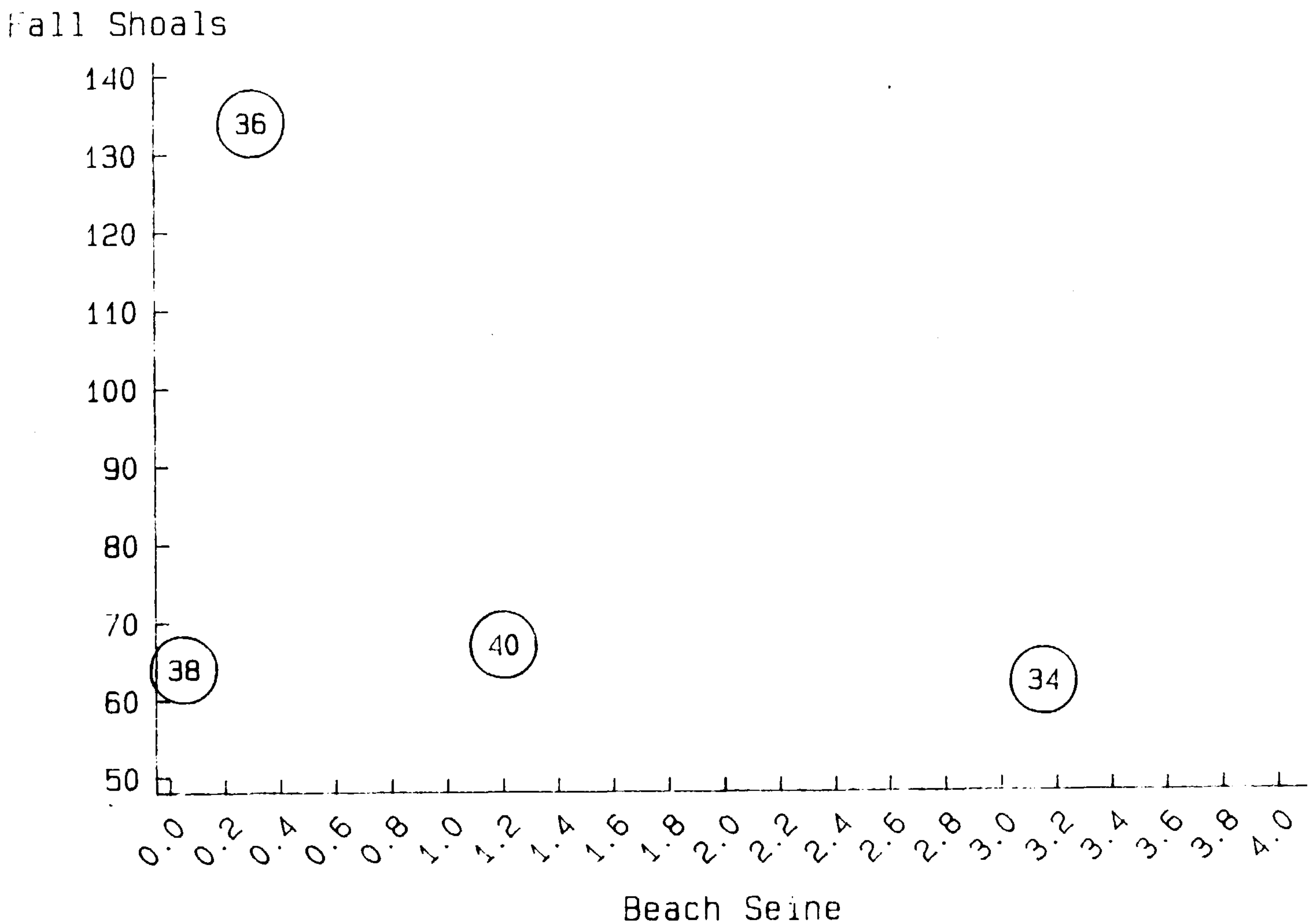

Figure IV-11. Plots of mean catch per unit effort from utility offshore sampling (y-axis) vs. mean catch per unit effort from utility beach seine sampling (x-axis) for Bay Anchovy in 1983. Symbols represent the nominal week of sampling within the 8-week period between week 34 and 41.

The findings (Tables IV-1 and IV-2) that the observed variability among beaches (within river run and region) was no greater than the expected within beach variability (within river run) indicates that the method of selecting beaches to sample (fixed vs. random) made little difference in this study. The variability over time (at a single beach) within a river run was so large relative to the among beach variability that increasing the sampling fraction for beaches to 1 (i.e., $f_2 = 1$ for a fixed beach design) would not improve the overall precision of the estimate of the mean. Thus, the fixed beach design has the disadvantage of limiting the number of beaches subject to sampling while not measurably improving precision; however, this conclusion must be tempered by the small sample size on which the comparisons were made.

The coefficients of variation for sampling error (standard deviations) (Table IV-4) indicated that the 61 m seine was more precise than the 30.5-m seine. Also, the fact that the variance among river run means for striped bass was not significantly different from zero for the 61-m seine, but was significantly different from zero for the 30.5-m seine (sampled in the same regions) (Table IV-8) suggests that the 61-m seine was more effective in catching the nearshore population of striped bass.

The coefficients of variation for among river run variability (Tables IV-6 and IV-8) indicate that the geographic extent of sampling (for the Utility vs. NYSDEC programs) did not affect the degree of movement into and out of the area subject to sampling. Specifically, $CV(S_1^2)$ was roughly the same for American shad whether based on the Utility data from regions 1-12 or only regions 5-12. Similarly, the $CV(S_1^2)$ for striped bass was roughly the same for data from regions 1-4 as it was for data from regions 1-12. These results can be attributed largely to the fact that the relative abundance of striped bass in regions 5-12 is small (Fig. IV-12), as is the relative abundance of American shad in regions 1-4 (Fig. IV-12).

The coefficients of variation for annual estimates of mean catch per unit effort (Table IV-9) indicate that the NYSDEC programs targeted at striped bass and American shad produced more precise estimates of mean catch per unit effort for these species than did the Utility program. This can be attributed to the more precise gear (61-m vs 30.5-m) used in the NYSDEC striped bass program and the more precise gear (3.1-m vs. 2.4-m deep) and possibly different sampling protocols in the NYSDEC shad program. The increased precision resulting from these factors apparently outweighed the benefits conferred upon the Utility program by larger sample size. For the other species, the relative precision of the estimates was either unacceptably low for all programs or not consistently higher for any one program.

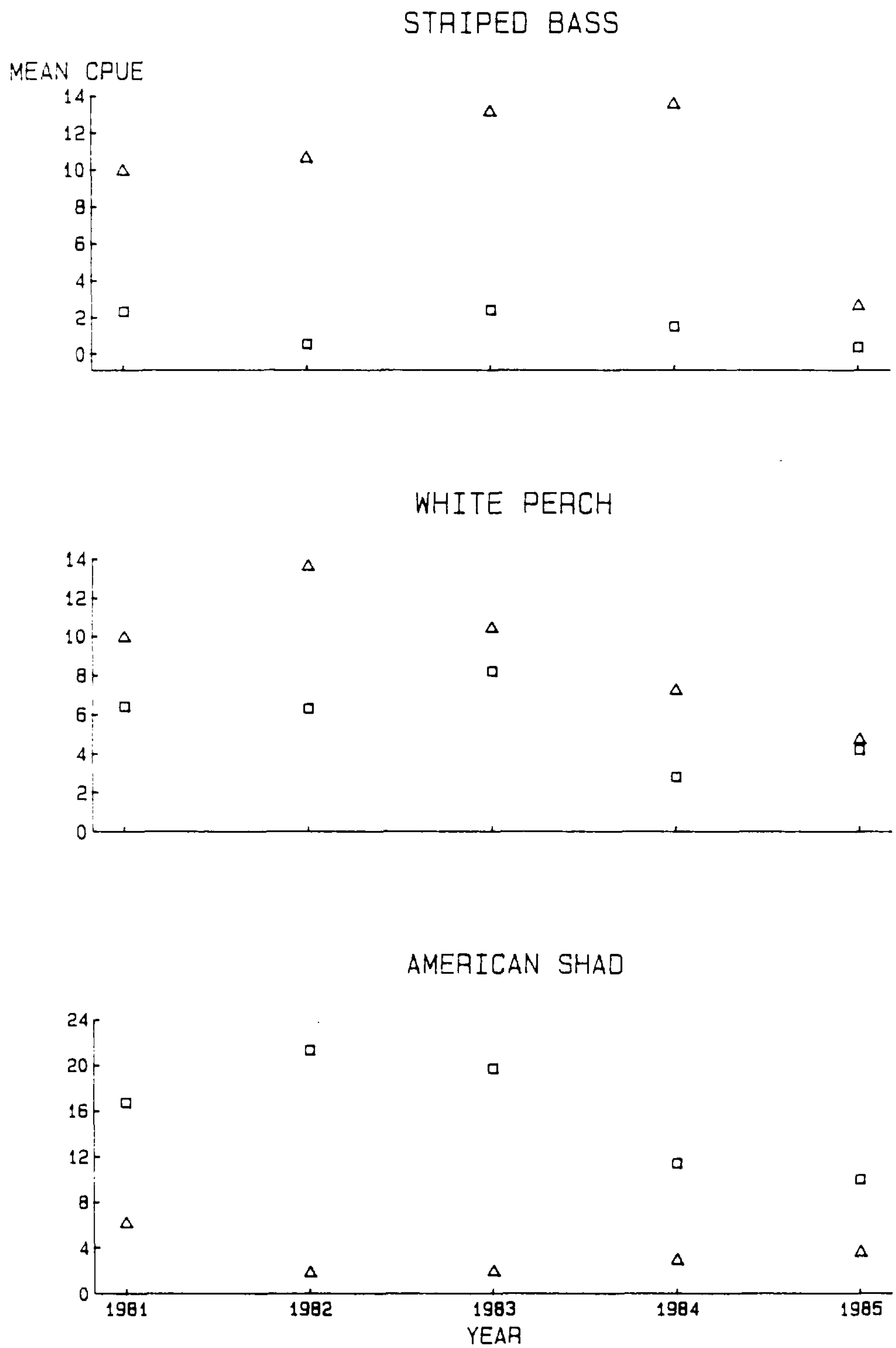

Figure IV-12. Plots of annual mean catch per unit effort from the Utility beach seine program for striped bass, white perch, and American shad in two geographic areas of the Hudson River:

Δ = Regions 1-4
□ = Regions 5-12.

The plots of mean catch per unit effort from offshore sampling to mean catch per unit effort from beach seine sampling (Figures IV-2 to IV-11) failed to show that any of the programs being evaluated could produce reliable estimates of the proportion of the riverwide stock that inhabited the areas subject to sampling. Consequently, since there are no data demonstrating that the proportion of the population inhabiting the areas subject to sampling is invariant over years or within years, this condition must be stated as an assumption if beach seine data are to be used to produce indices of relative abundance. Additional, more untenable, assumptions must be made for the beach seine to be used as an index of absolute abundance.

D. CONCLUSIONS

Overall examination of the relative merits of each of the programs for assessing among gear differences in relative abundance of selected species was based on two general considerations:

- Precision
- Reliability (comparability of index values among years).

The precision of the annual estimates of mean catch per unit effort was quite low for bay anchovy and Atlantic tomcod for all programs. This may have been due to the sporadic catches of Atlantic tomcod and the pelagic behavior of bay anchovy (i.e., the beach environment contained a very small and highly variable fraction of the riverwide population). Consequently, none of the programs were judged to have been well suited to assessing annual differences that may have existed in the abundances of those species.

The NYSDEC shad and striped bass programs were more precise than the Utility program for estimating mean catch per unit effort of American shad and striped bass, respectively. This appears to have been due to the larger seines used in the NYSDEC programs and possibly due to differences in sampling protocols. However, for white perch, no consistent difference in precision between programs was observed.

The conclusions regarding precision of the programs must be balanced against considerations of the reliability of the programs. In order for any of the programs to be useful for their intended purpose, the fraction of the riverwide population in the area subject to sampling must be constant among years. One major factor that could affect the fraction inhabiting the area subject to sampling is shifts in the distribution patterns among years. Such shifts could be longitudinal (upriver-downriver) or lateral (onshore-offshore).

The Utility program samples a larger geographic extent than the NYSDEC programs, and would be less affected by shifts in longitudinal distribution patterns than the NYSDEC programs. In the years examined, no major longitudinal shifts in distribution patterns were observed for striped bass juveniles. Accordingly, the annual estimates of mean catch per unit effort from the Utility and the NYSDEC programs were highly correlated (Fig. IV-13). However, if the longitudinal distribution pattern were to differ in some future year, the NYSDEC programs could produce index values that were inconsistent with the indices from other years. Beyond estimation of relative abundance, the greater geographical extent of the Utility program has the additional advantage of allowing inference about movement patterns and other population parameters that can not be estimated with the more limited NYSDEC sampling program.

For white perch and American shad, the longitudinal distribution patterns did vary substantially among the years examined (Fig. IV-12). Accordingly, the estimated mean catch per unit effort for white perch from the Utility program did not correlate well with the indices from the two NYSDEC programs (Figs. IV-14 and IV-15). Similarly, the estimated mean catch per unit effort for American shad from the Utility program did not correlate well with that from the NYSDEC shad program (Fig. IV-16). This suggests that for white perch and American shad, the Utility program produced a more reliable index of annual abundance.

Whereas the Utility program is more robust to possible longitudinal shifts in distribution patterns, the NYSDEC striped bass program would be less affected by onshore-offshore shifts. This is because the larger seine deployed in this program can sample farther offshore than the Utility seine. As discussed previously in the context of between week variance, the larger seine appears to have been able to collect striped bass that were too far offshore to be collected in the smaller seine.

In summary, the NYSDEC striped bass program has the following advantages (due to the 61-m net) for indices of striped bass abundance:

- greater precision of the estimate

- more robust to possible on-offshore distribution shifts among years.

The Utility program has the advantage of being more robust to possible longitudinal shifts in distribution patterns among years. For indices of American shad abundance, the NYSDEC program has the advantage of greater efficiency from using a deeper net and possibly from different sampling protocols, and the Utility program has the advantage of being more robust

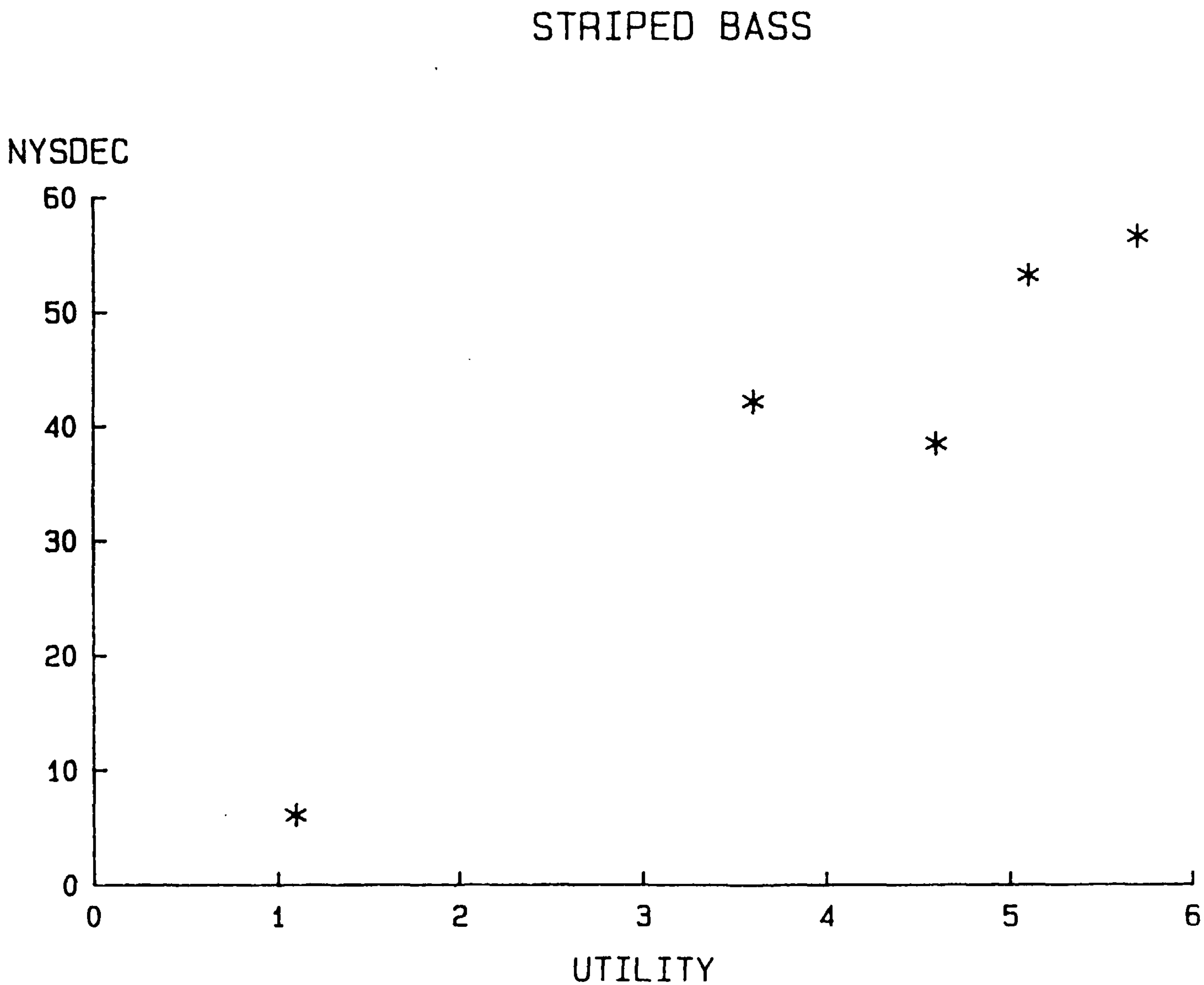

Figure IV-13. Plot of annual estimates of striped bass mean catch per unit effort from the NYSDEC striped bass program vs. those from the Utilities' program.

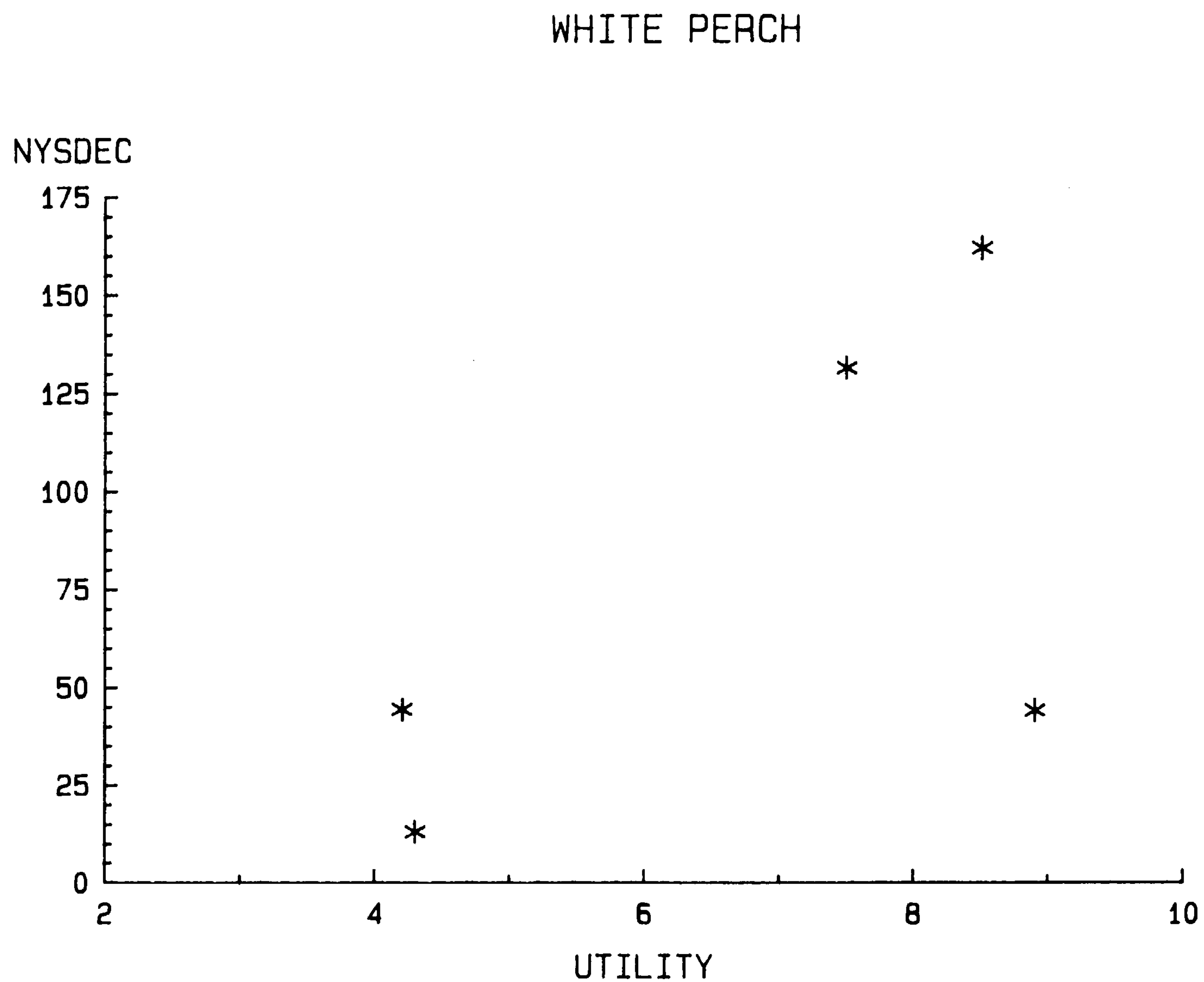

Figure IV-14. Plot of annual estimates of white perch mean catch per unit effort from the NYSDEC striped bass program vs. those from the Utilities' program.

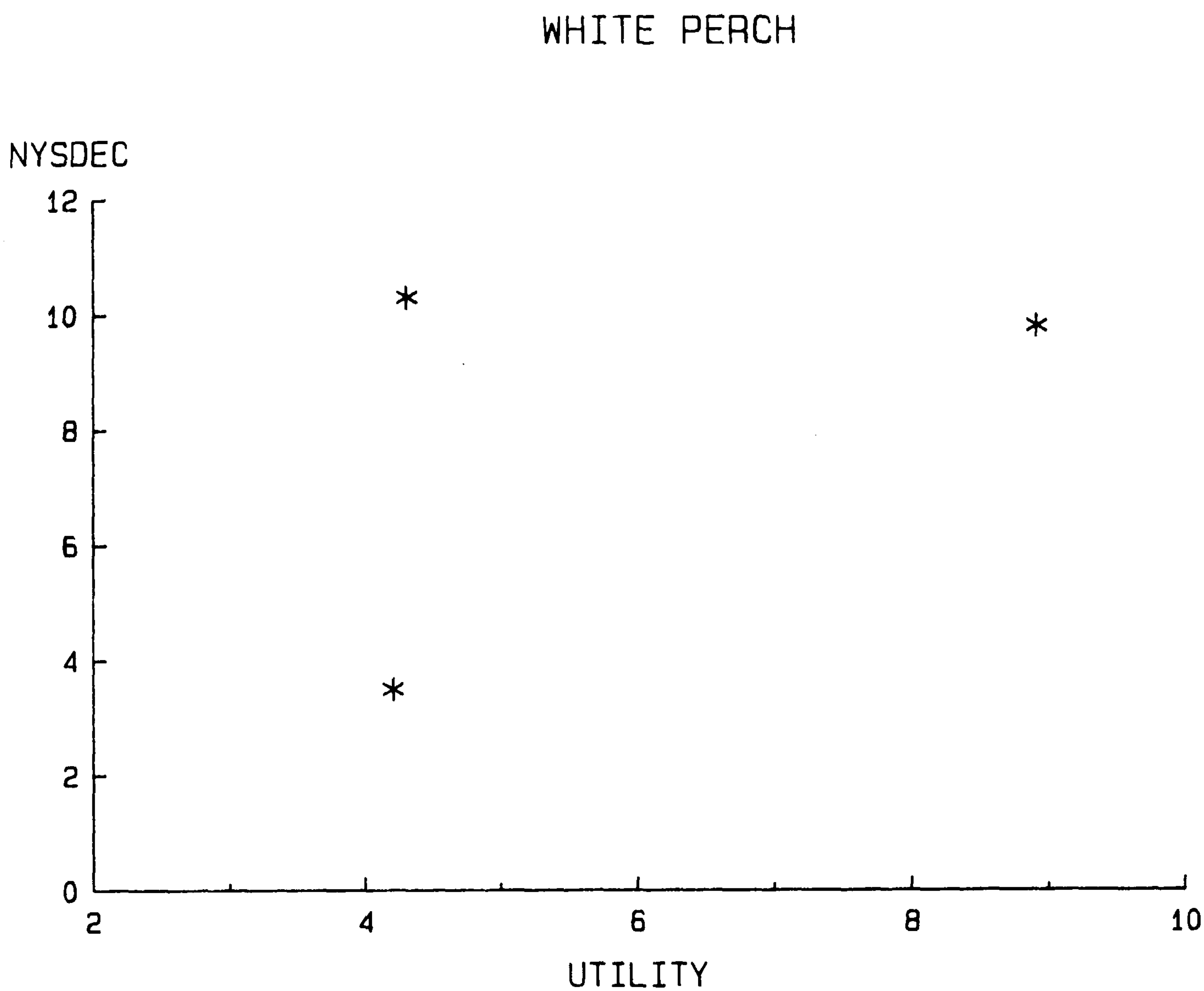

Figure IV-15. Plot of annual estimates of white perch mean catch per unit effort from the NYSDEC American shad program vs. those from the Utilities' programs.

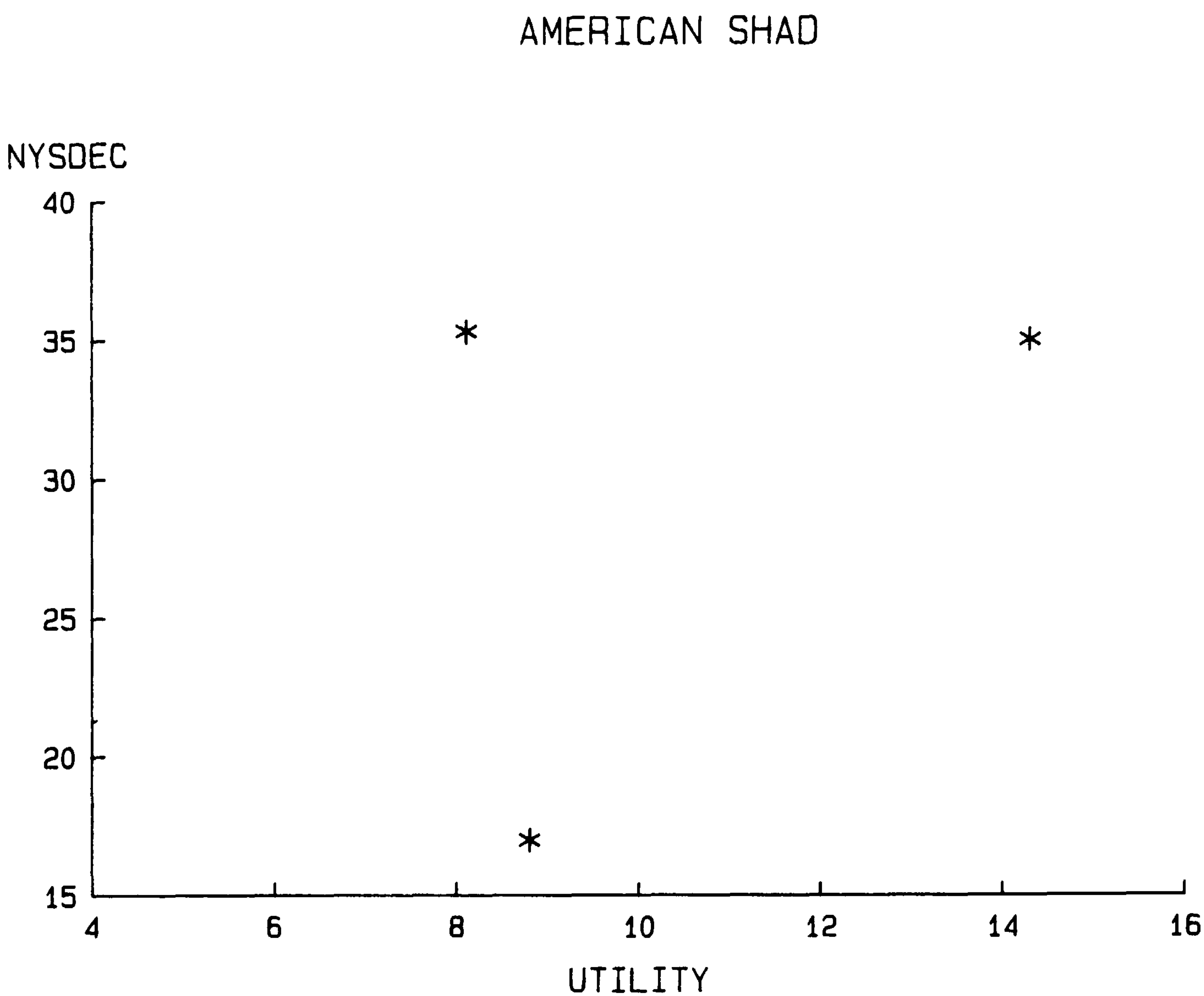

Figure IV-16. Plot of annual estimates of American shad mean catch per unit effort from the NYSDEC American shad program vs. those from the Utilities' program.

to observed longitudinal shifts in distribution patterns among years. For white perch, the Utility program has the advantage of being more robust to observed longitudinal shifts in distribution patterns, whereas the NYSDEC programs have no clear advantages. Finally, none of the programs appear well suited to producing indices of relative abundance for bay anchovies or Atlantic tomcod.

E. RECOMMENDATIONS

Several recommendations that should be considered in developing new monitoring programs or improving existing programs can be derived from results of this study. However, most of the recommendations include either logistical or economic tradeoffs. Other tradeoffs need to be considered since the recommendations were based solely on improving estimation of abundance. Some of the programs, particularly those of the utilities, have multiple objectives including estimation of life history parameters.

Throughout this report, the evaluation has been conducted by examining both reliability and precision; the recommendations are also presented according to this division. Within these divisions are included recommendations to alter sampling effort based on existing information, and recommendation of studies to resolve the substantive unanswered questions, which would lead to future refinements of the monitoring programs.

Reliability

- Conduct monitoring programs on a river-wide basis. This is more important for monitoring white perch and American shad than for striped bass. However, even for striped bass, increasing the total amount of area subject to sampling is suggested since we were unable to verify that a consistent percentage of the population remains in the sampled area among years.

- Continue to conduct a trawl program coincident with the beach seine monitoring programs since we were unable to establish that a constant proportion of the population remains within the sampled beach area among years. Versar (1987) established that, particularly for striped bass, the index from offshore gear and the beach seine are not well correlated (Figure IV-17). Without some means for establishing the relative probability of capture among these programs, it is wisest to continue both.

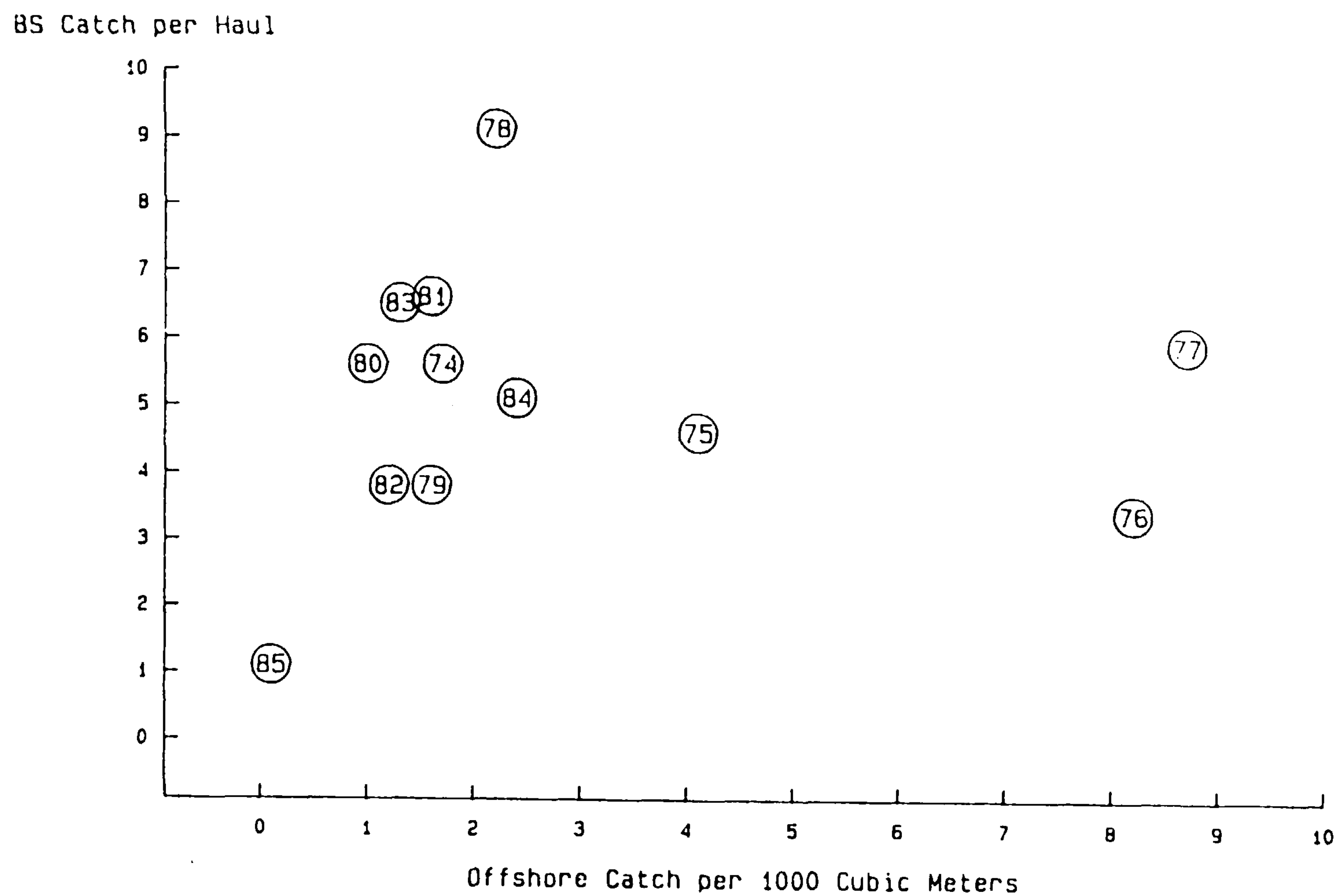

Figure IV-17. Average striped bass from the Utility programs weekly offshore density estimate and beach seine catch per unit effort in the Hudson River, 1974-1985 (Versar 1987)

- Conduct a radiotagging study to examine onshore-offshore movement patterns for species of interest. This data will allow selection of the most relevant weeks for conducting a beach seine program and will provide some basis for determining whether the beach seine or offshore program is the more appropriate method for estimating abundance.

Precision

- If increased precision is desired, increase the number of river runs rather than increasing the number of samples within a river run. Comparison of Tables IV-3 and IV-6 shows that among river run variability is generally greater than within river run variability.

- All of the programs have sampled an inconsistent set of weeks among year. Both reliability and precision can be maximized by reallocating effort so that it is focused on more extensive sampling within a shorter time period that is sampled by that program in all years.

- Conduct a study to more specifically examine whether within-beach and among-beach variability are significantly different. If they are not, as was found with limited data in this study, place the fixed beach design with one that randomly samples from a larger set of beaches.

- Use the 61-m net preferentially over the 30.5-m net. The 61 m net collects more fish with a lesser degree of variability than the smaller net. However, replacing the 30.5-m net used in the two ongoing programs may not be appropriate. First, a gear correction factor to relate the historical database to all future sampling would have to be developed. Second, many of the beaches sampled by the 30.5-m net are small and may be unsampleable by the larger net, further reducing comparability with the historic database.

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APPENDIX A

KRUSKAL-WALLIS TEST FOR EQUALITY OF STAGE 2 AND STAGE 3 VARIANCE

Table A-1. PR > F for the Kruskal-Wallis test of between beach vs. within beach variance for beach seine data collected within a river run by the Utilities' programs. Within beach variance was estimated from 2 hauls per beach (N = total number of samples, i.e., 2 x number of beaches).

Year	River Run	N	Species				
			Bay Anchovy	American Shad	Striped Bass	Atlantic Tomcod	White Perch
81	35	6	0.87	0.28	0.99	--	0.32
	37	10	0.41	0.20	0.07	--	0.16
	39	12	0.10	0.15	0.35	0.42	0.09
	41	12	0.43	0.18	0.98	--	0.09
84	34	18	0.43	0.08	0.18	0.17	0.10
	36	12	0.59	0.89	0.60	0.59	0.93
	38	14	0.28	0.28	0.60	0.49	0.54
	40	14	0.49	0.19	0.18	0.42	0.09
85	34	8	0.39	0.50	0.18	0.27	0.10
	36	6	0.09	--	--	--	--
	38	8	0.08	0.39	0.15	0.51	--
	40	10	0.41	0.41	0.79	0.41	0.62

APPENDIX B

CORRESPONDING NYSDEC STRIPED BASS PROGRAM
AND UTLITY PROGRAM BEACH NUMBERS

Table B-1. Correspondence between beaches sampled in the NYSDEC striped bass beach seine program and the Utilities beach seine program. Table is based on comparison of sampling station maps and conversations with Utility and NYSDEC biologists (NC = no corresponding beach).

NYSDEC Beach Number	Utility Beach Number	Comments
1E	NC	
1W	NC	
2E	217	
3E	218	
3W	216	
4E	219	
4W	221	
5E	NC	
5W	279	
6E	276	NYSDEC beach location was moved. Used to correspond to 228.
7EW	274	
7EE	231	
7W	NC	
8E	232	
8W	NC	Partial overlap with 226 and 277
9E	234	
9W	229	
10E	NC	
10W	230	Beach location is close but not exact
11E	235	
11W	285	
12E	243	
12W	241	
13E	NC	
13W	NC	
14E	244	
14W	242	
15E	NC	
15WN	272	
15WS	NC	NYSDEC also refers to this beach as 15W.
16E	251	
16WN	271	NYSDEC also refers to this beach as 16W.

Table B-1. Continued

NYSDEC Beach Number	Utility Beach Number	Comments
16WS	246	
17E	254	Beach location is close but not exact
17W	209	Beach location is close but not exact
18E	256	Also referred to as 18ES and 18EN
19E	237	
20E	208	

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#458

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OTH 08

DEPTH CONTOURS & CHANNEL BOTTOM

AUTHOR CONFIGURATION FOR THE HUD. RIVER ESTUAY R.M. 12-153.

TITLE

OCT. 12, 1973 (DRAFT)

DATE LOANED	BORROWER'S NAME	DATE RETURNED

11

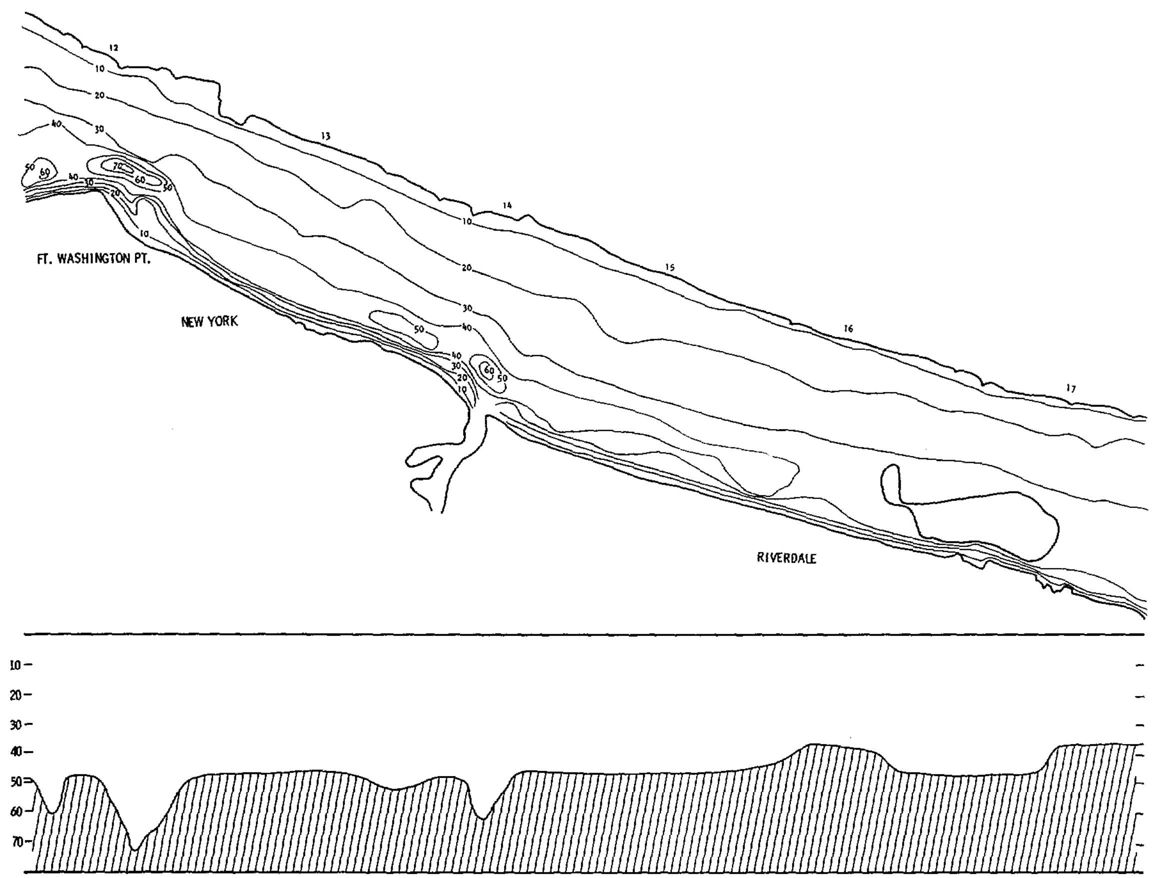
Depth Contours & Channel

bottom Configuration for the Hudson

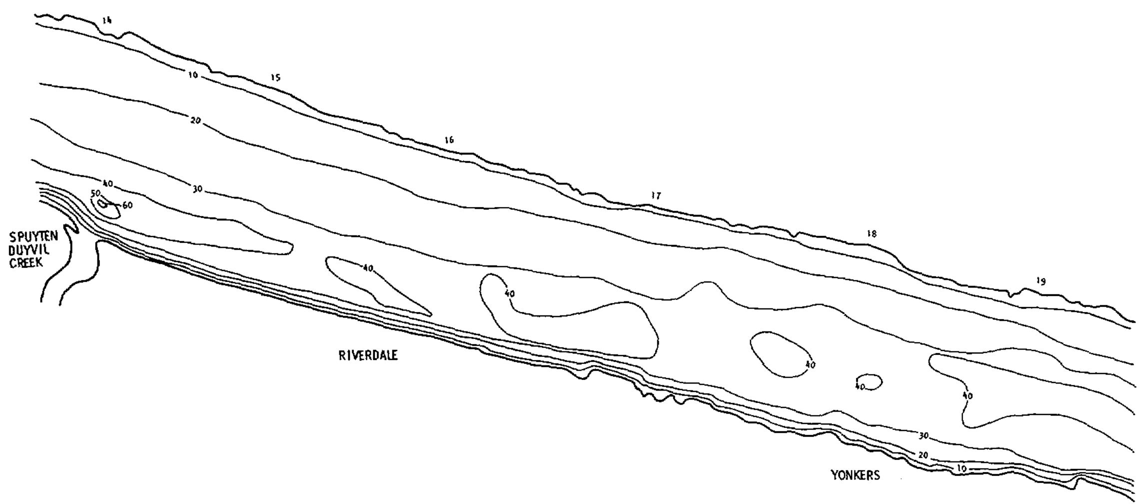
River Esturay R.M. 12-153.

W Q

Jack Chailer
October 12, 1973



FT. WASHINGTON PT.
NEW YORK
RIVERDALE
12
13
14
15
16
17
10
20
30
40
50
60
70



14
15
16
17
18
19
10
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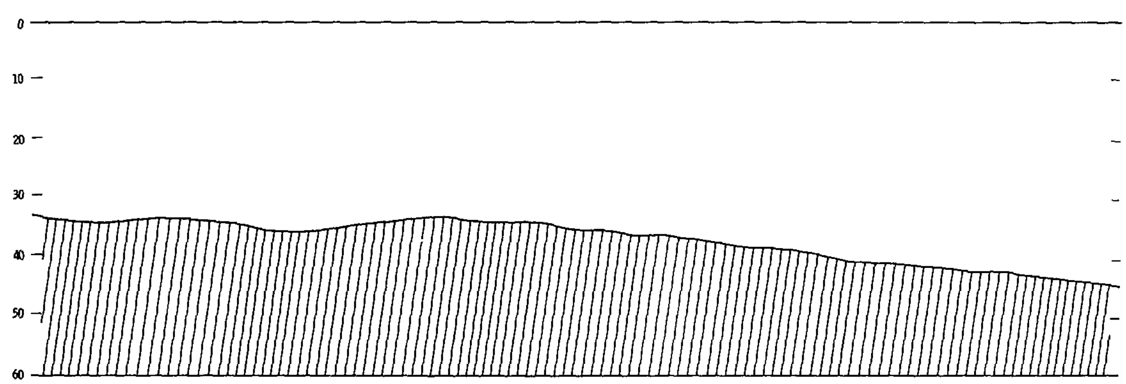
40
50
60
SPUYTEN
DUYVIL
CREEK
RIVERDALE
YONKERS



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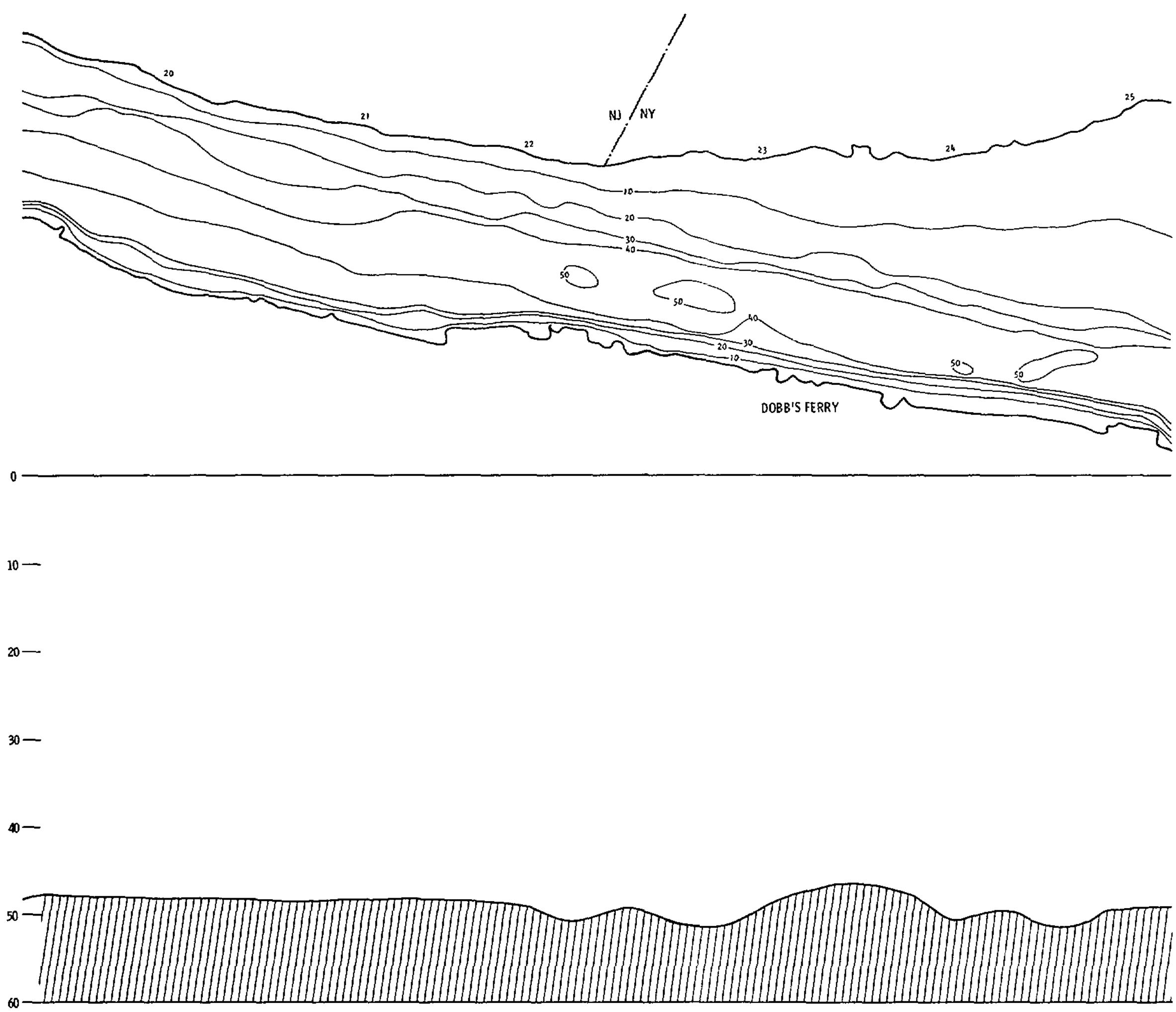
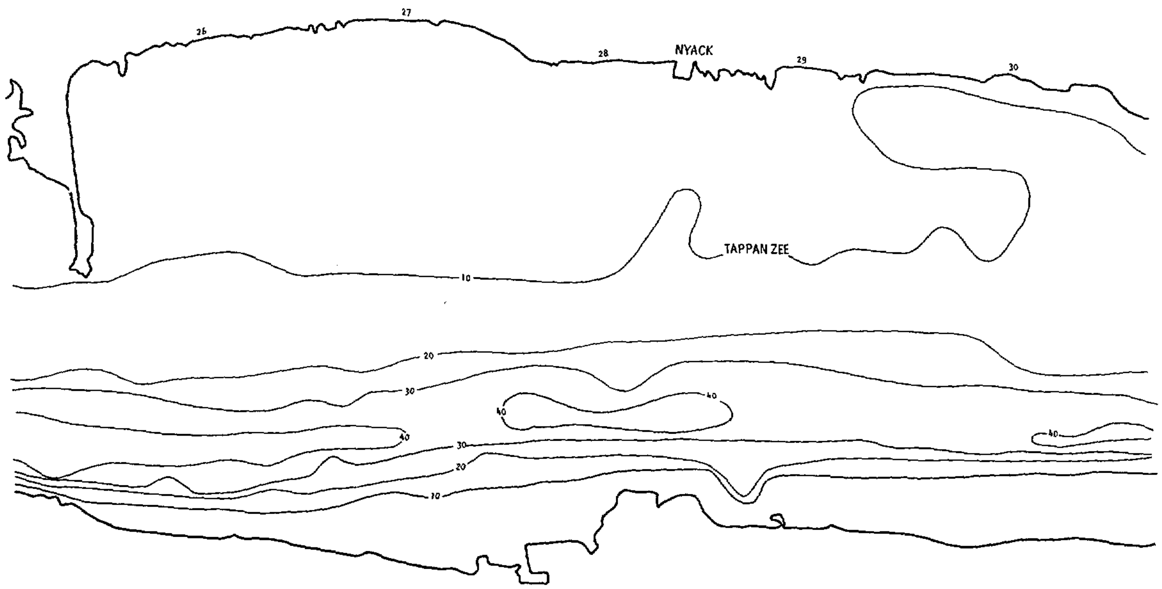
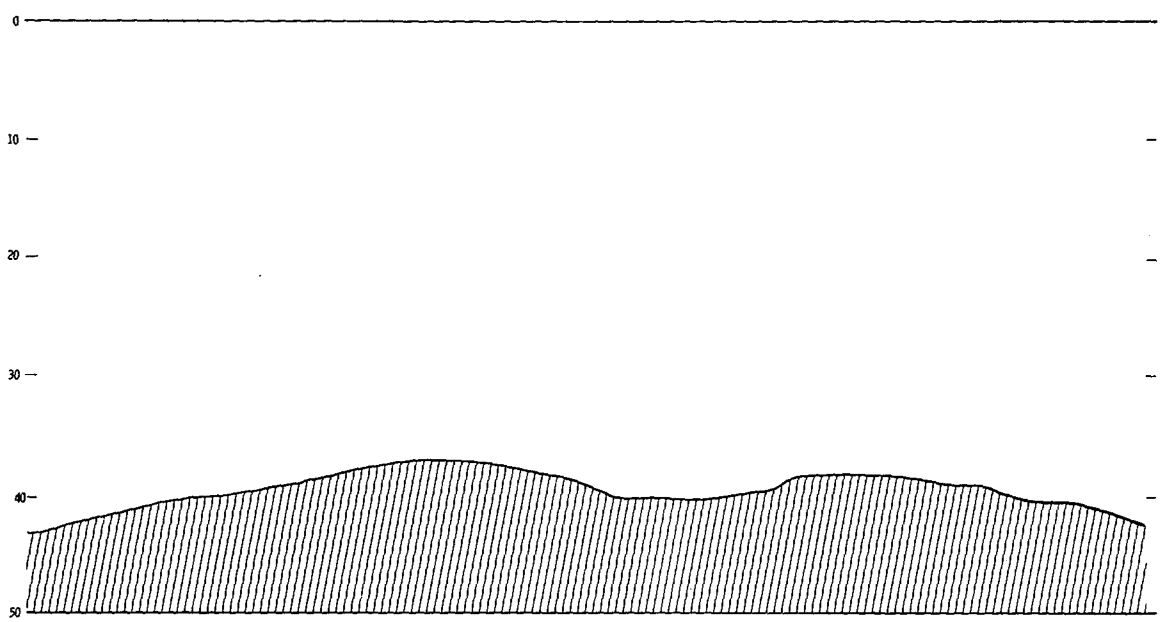

NJ
NY
DOBB'S FERRY
20
21
22
23
24
25
10
20
30
40
50
0
10
20
30
40
50
60


26
27
28
NYACK
29
30
TAPPAN ZEE
10
20
30
40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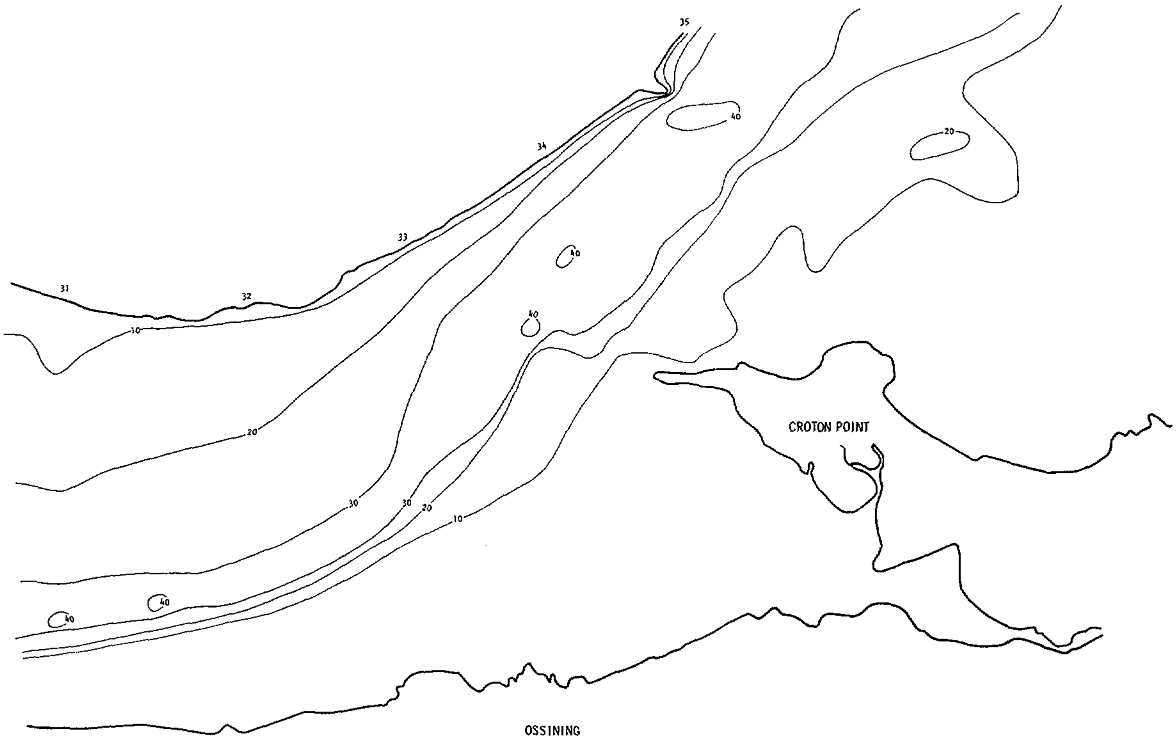
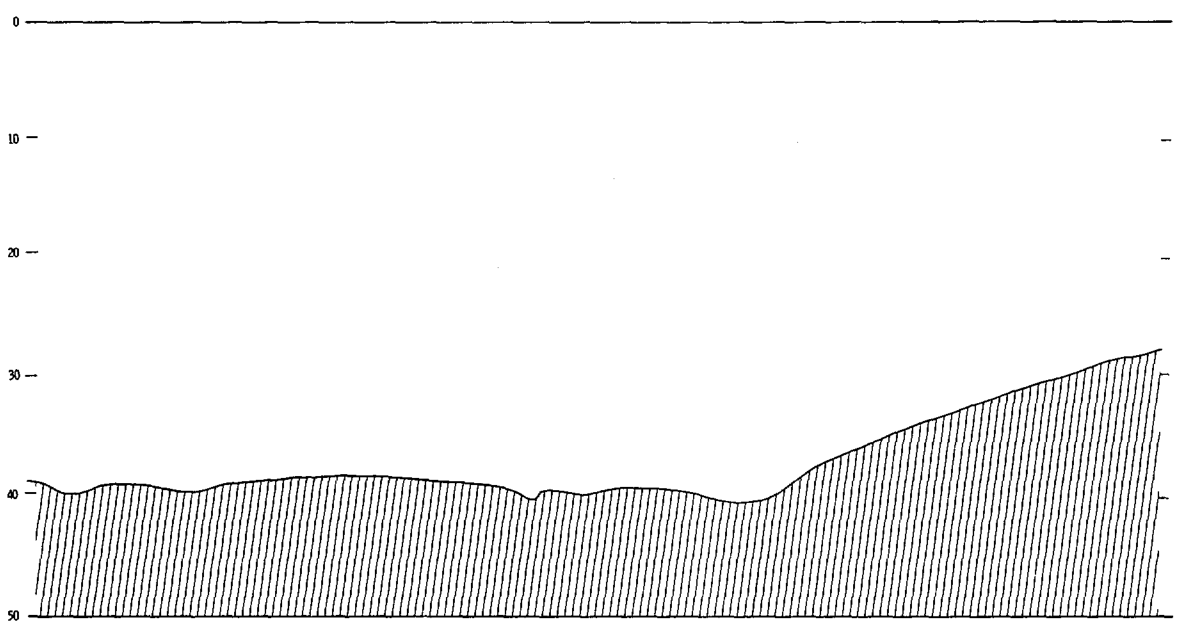
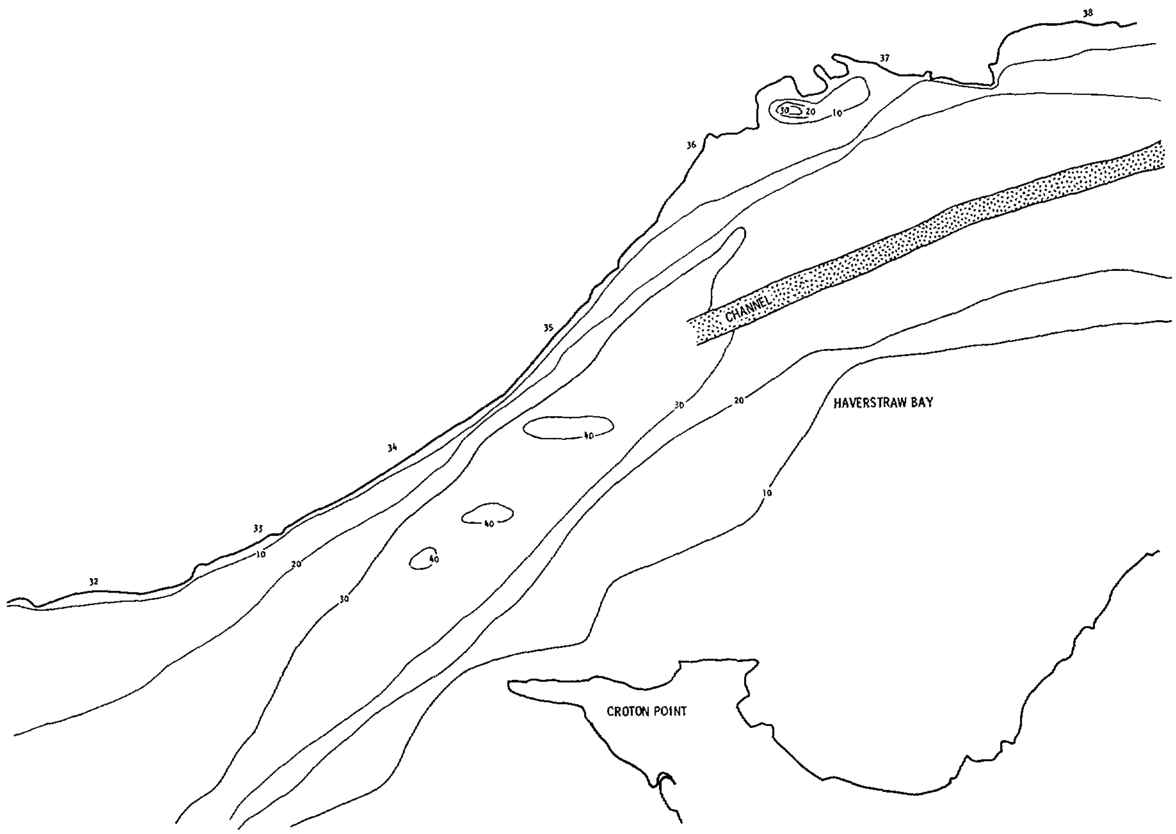
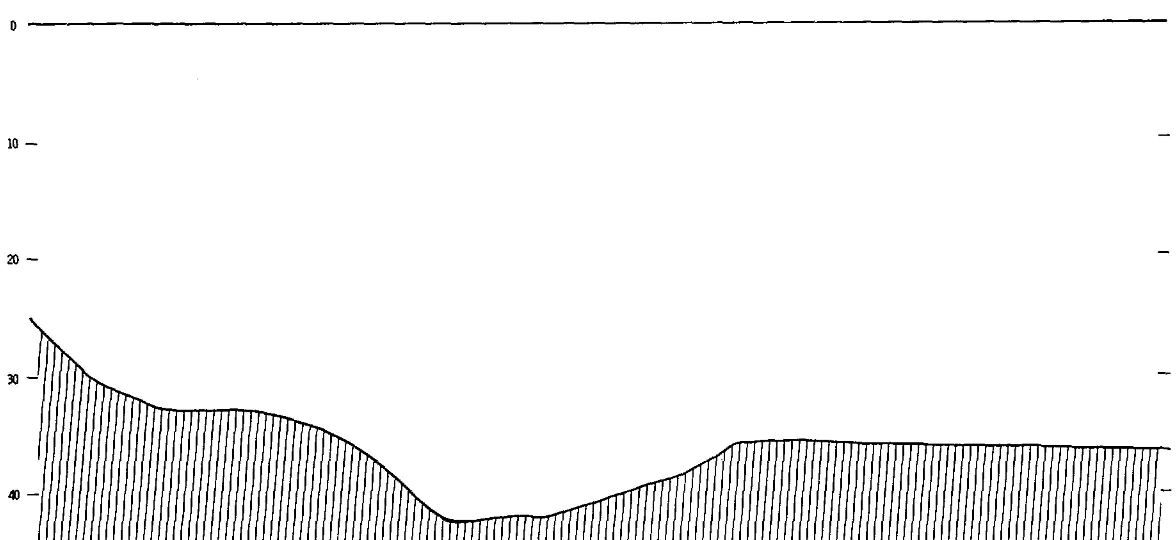
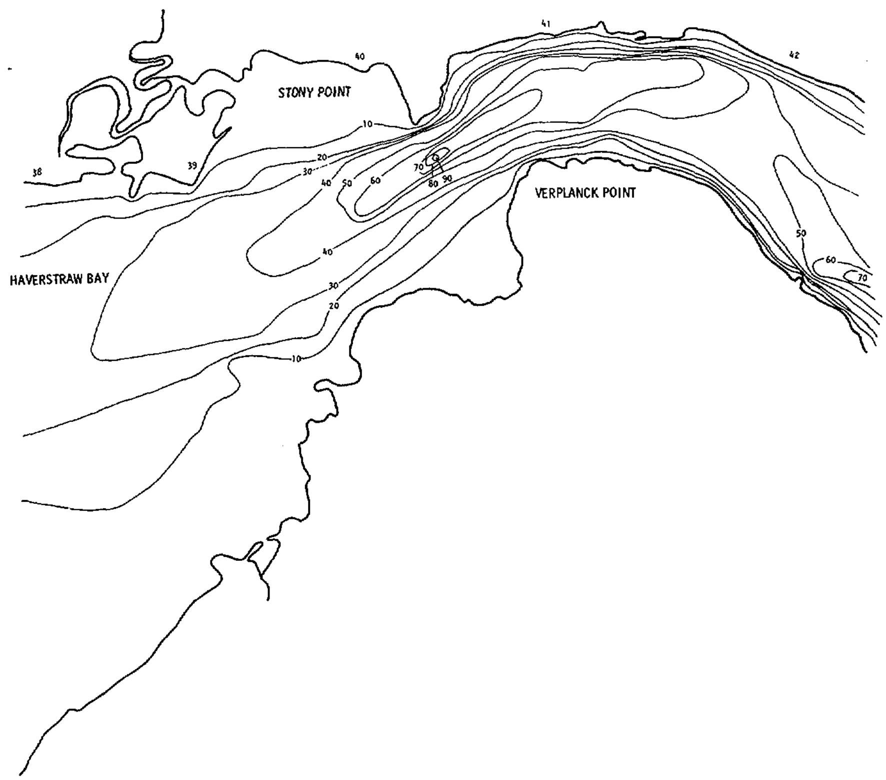
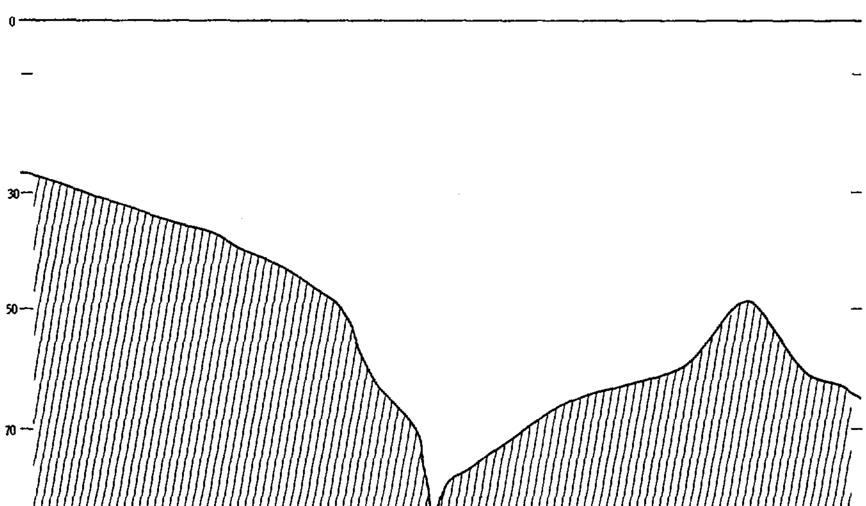

35
40
34
20
33
40
31
32
10
40
20
30
30
20
10
40
40
CROTON POINT
OSSINING

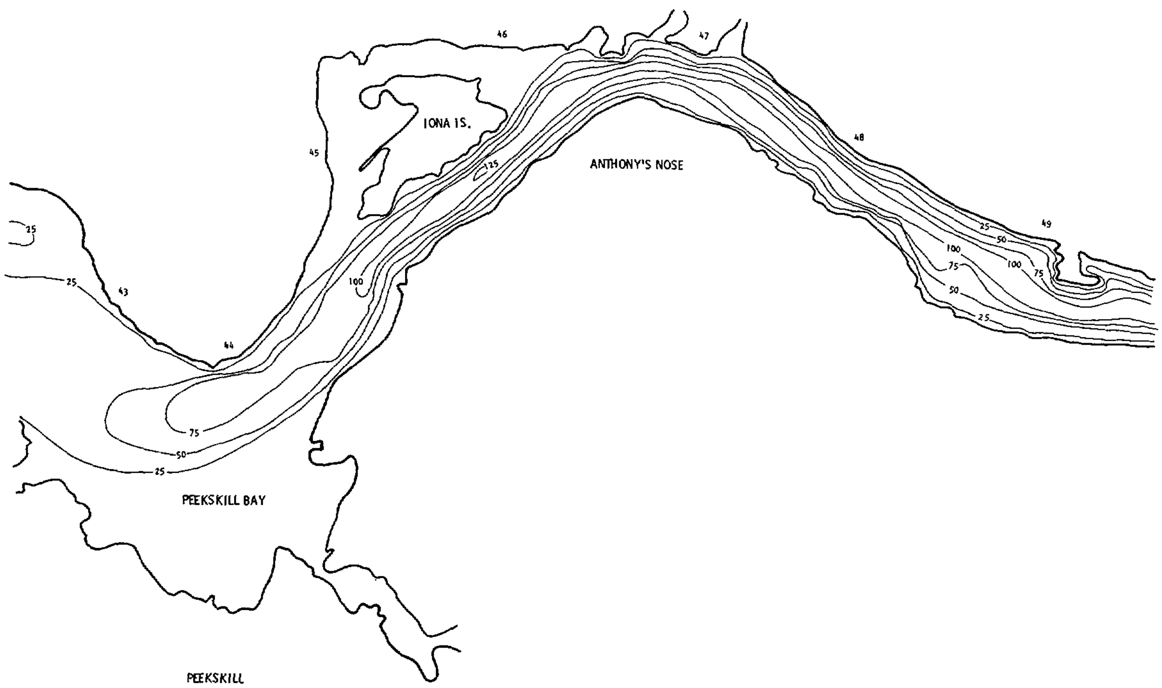

0
10
20
30
40
50

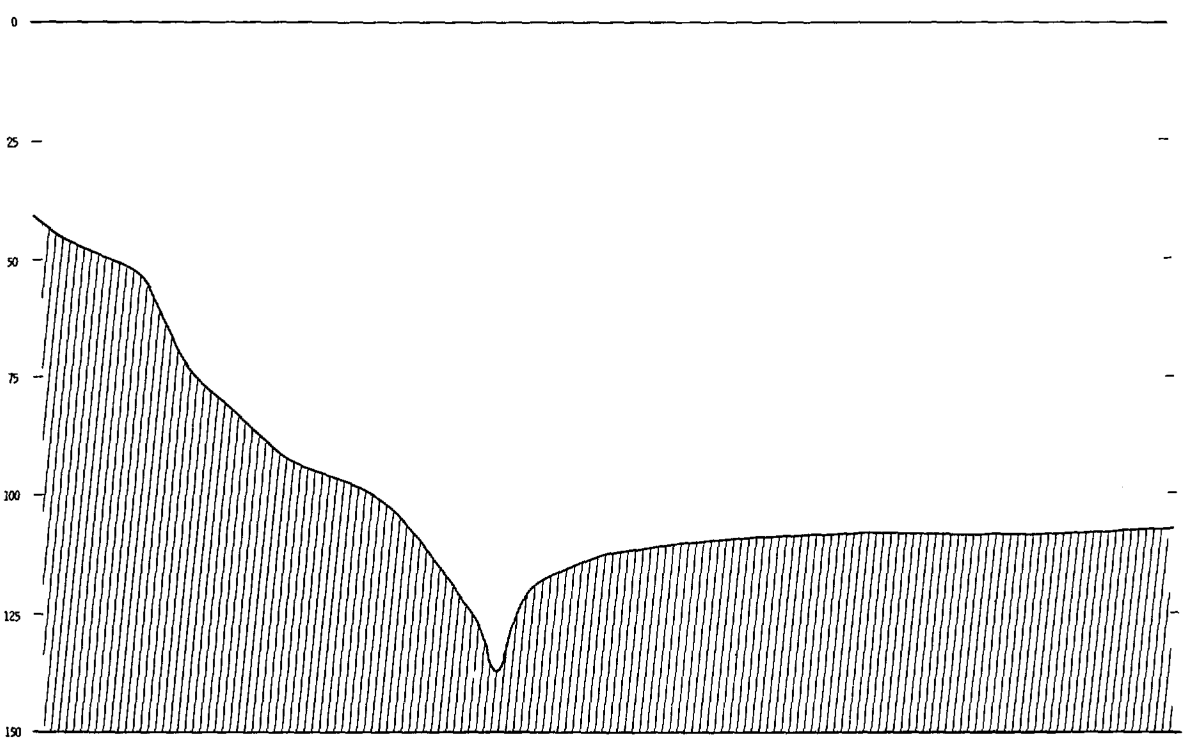

38
37
36
35
34
33
32
10
20
30
40
CHANNEL
HAVERSTRAW BAY
CROTON POINT

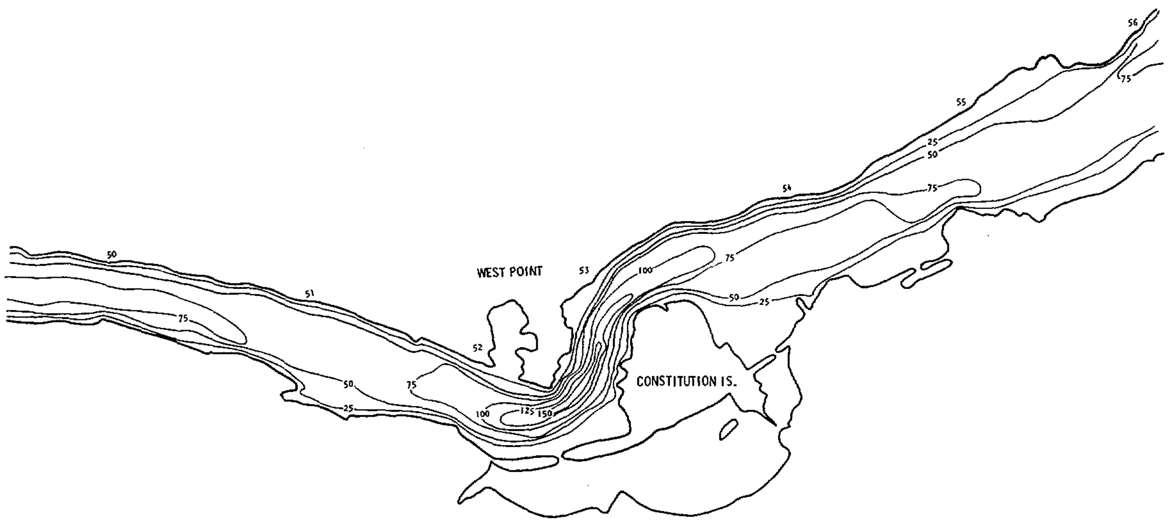

0
10
20
30
40
50

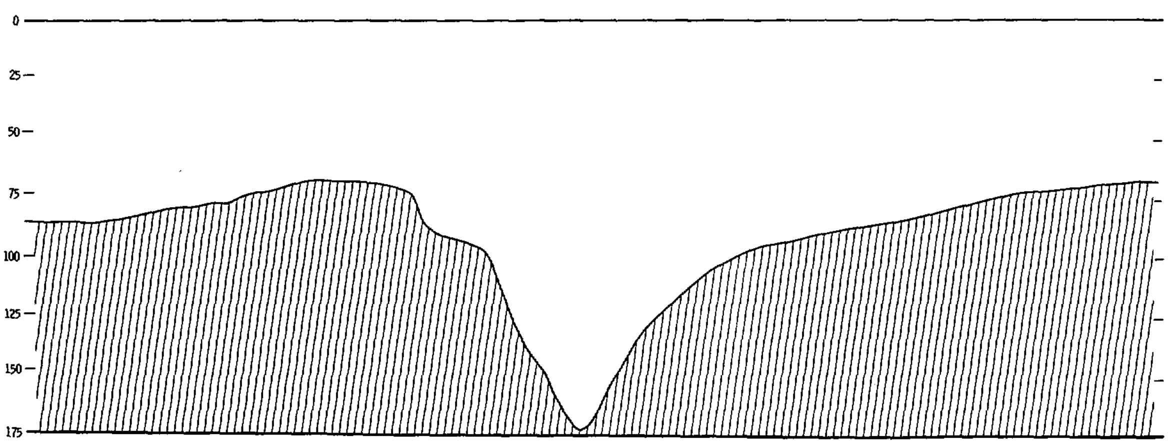

STONY POINT
VERPLANCK POINT
HAVERSTRAW BAY
38
39
40
41
42
10
20
30
40
50
60
70
80
90

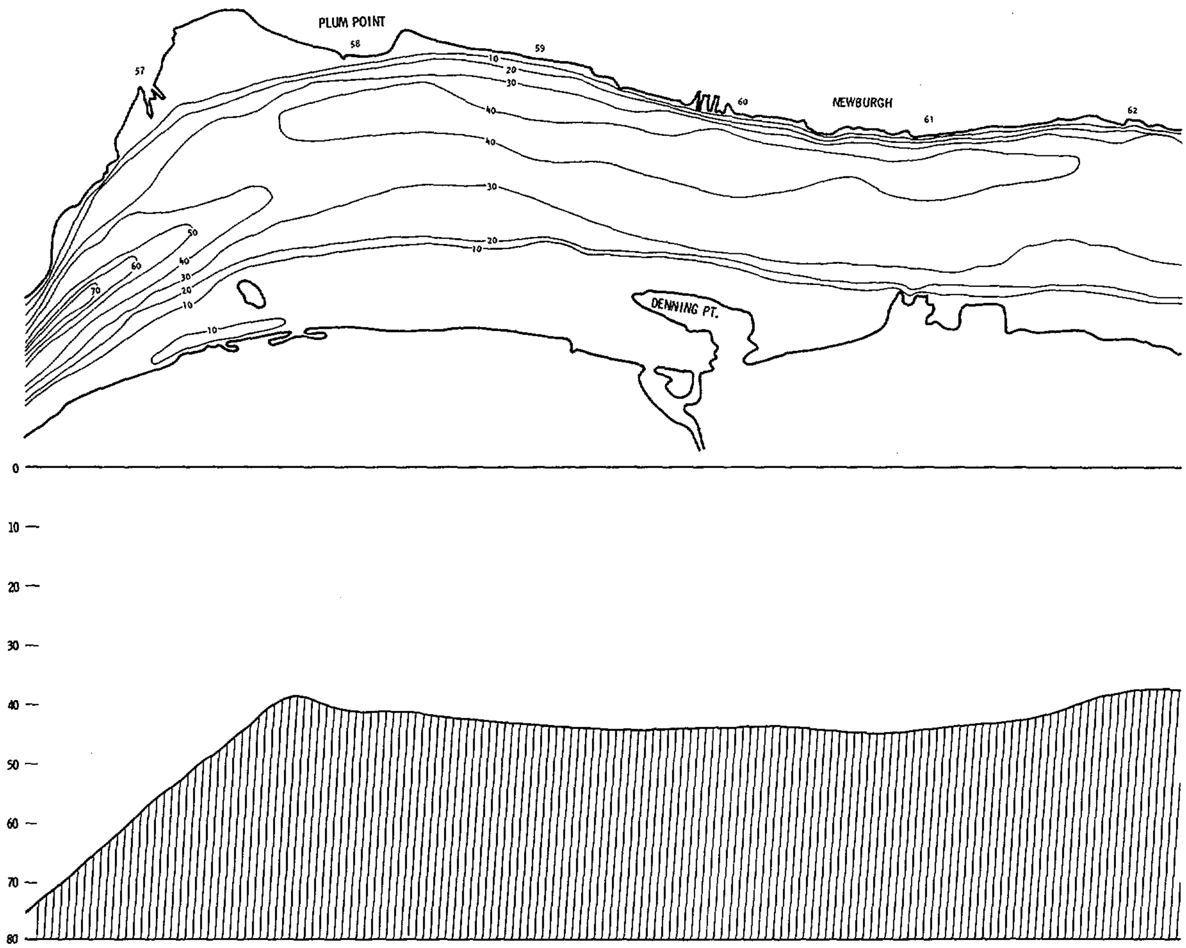

0
30
50
70
90


IONA IS.
ANTHONY'S NOSE
PEEKSKILL BAY
PEEKSKILL
43
44
45
46
47
48
49
25
50
75
100
125

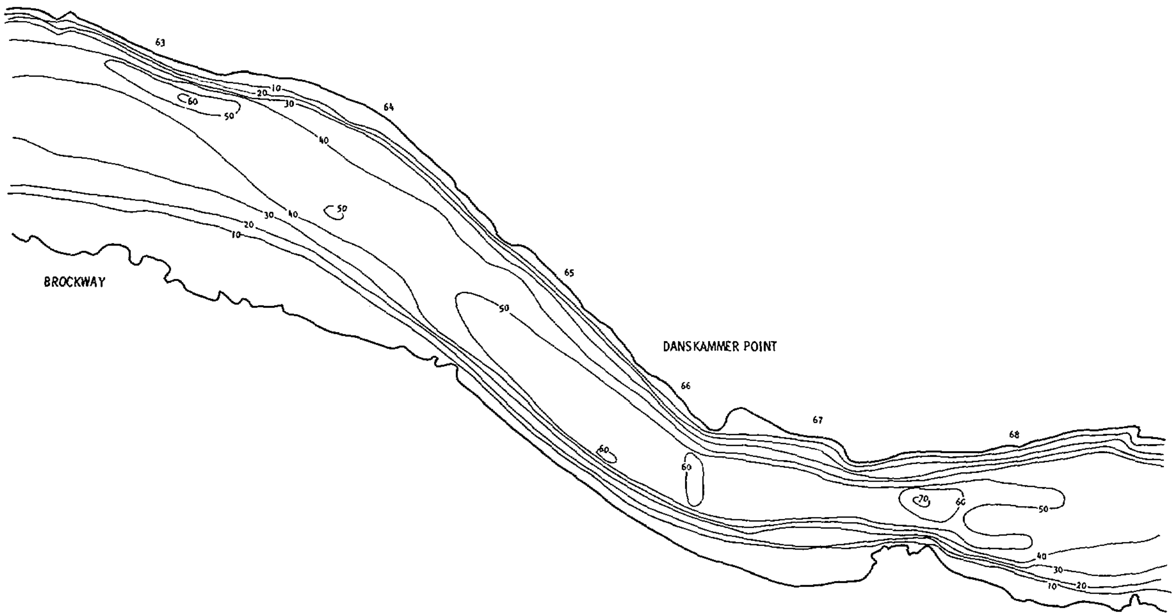

0
25
50
75
100
125
150


WEST POINT
CONSTITUTION IS.
50
51
52
53
54
55
56
25
50
75
100
125
150

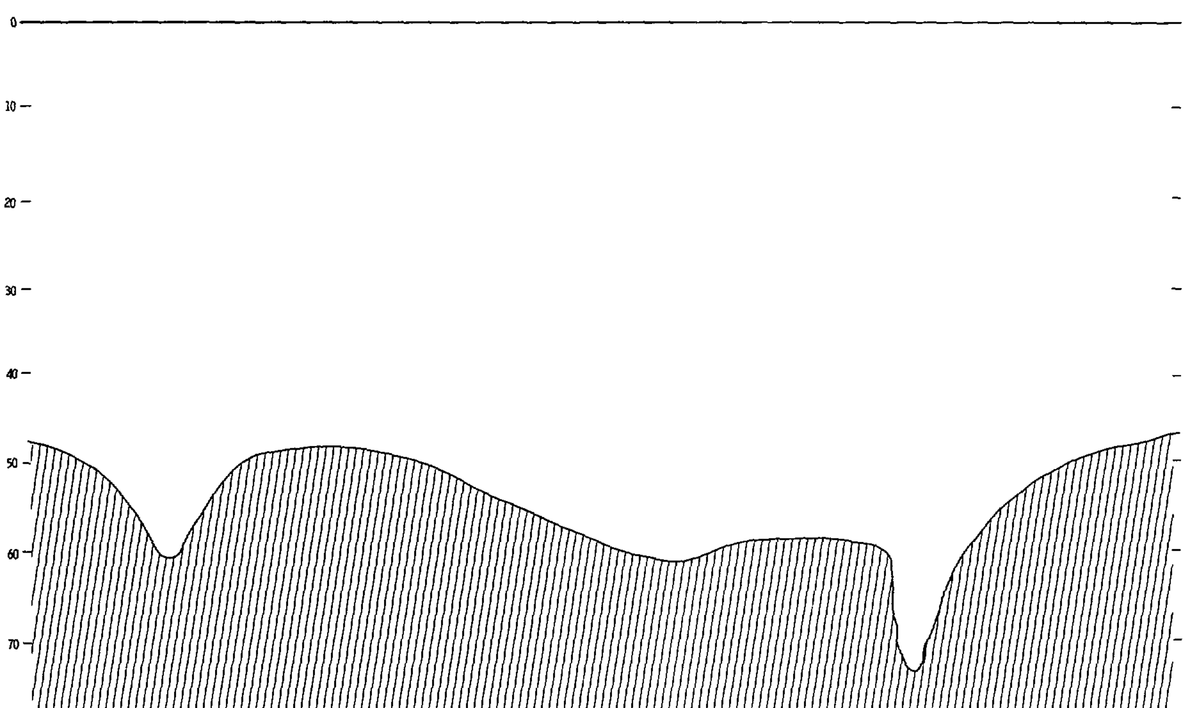

0
25
50
75
100
125
150
175



PLUM POINT
NEWBURGH
DENNING PT.
57
58
59
60
61
62
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80



BROCKWAY
DANSKAMMER POINT
63
64
65
66
67
68



0
10
20
30
40
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70
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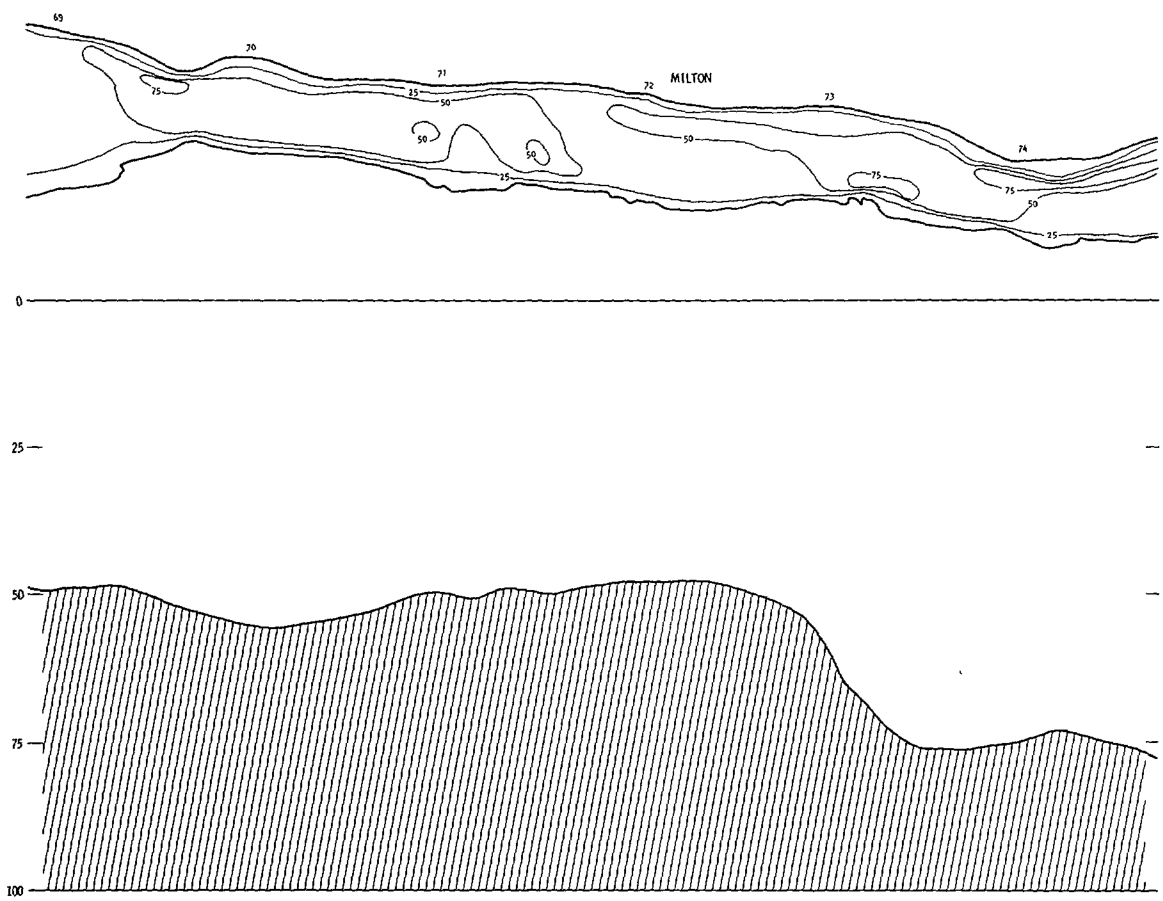
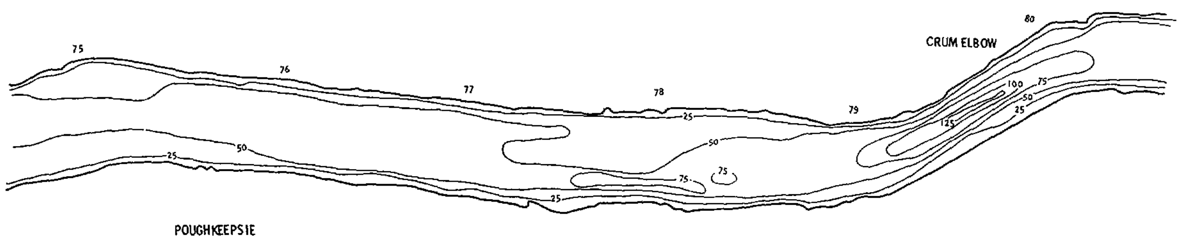
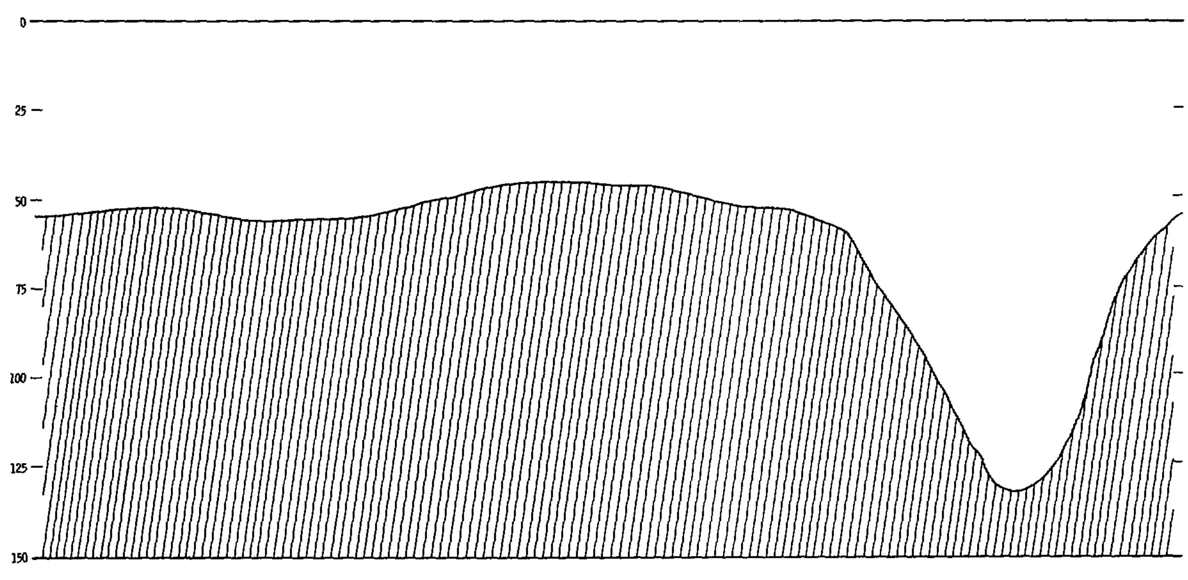


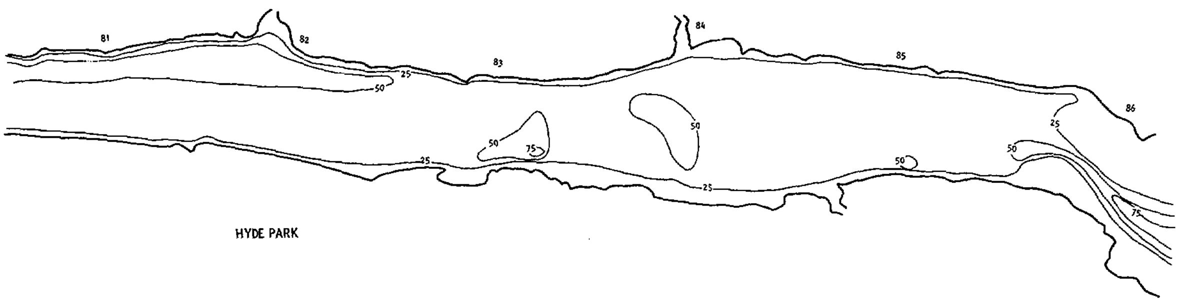
69
70
71
72
MILTON
73
74
25
50
75
0
25
50
75
100



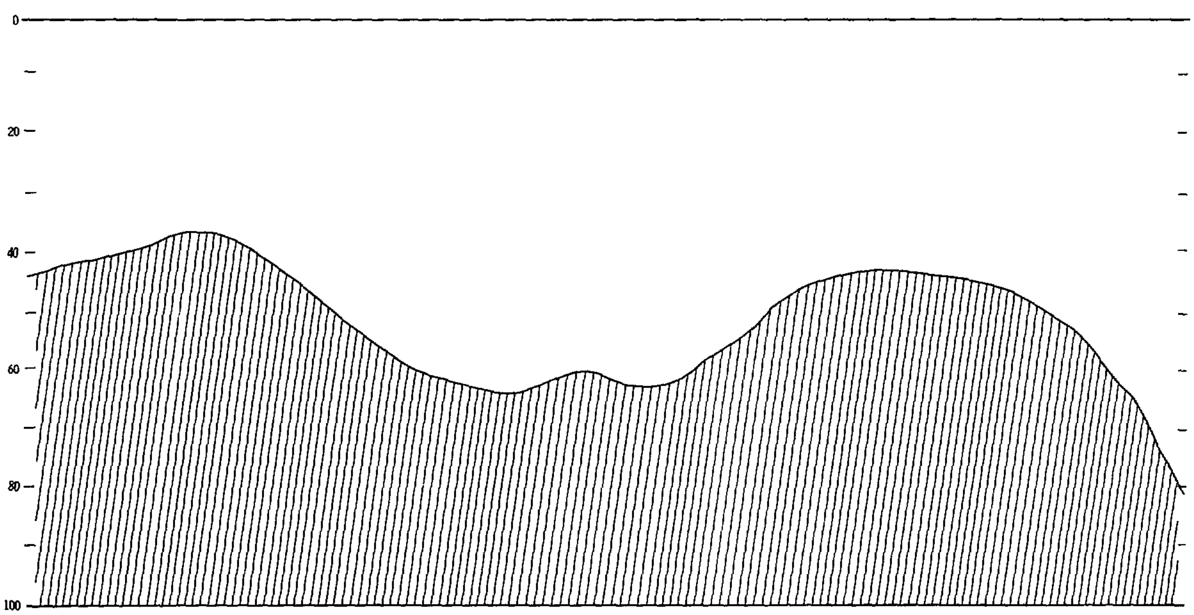
CRUM ELBOW
POUGHKEEPSIE
75
76
77
78
79
80



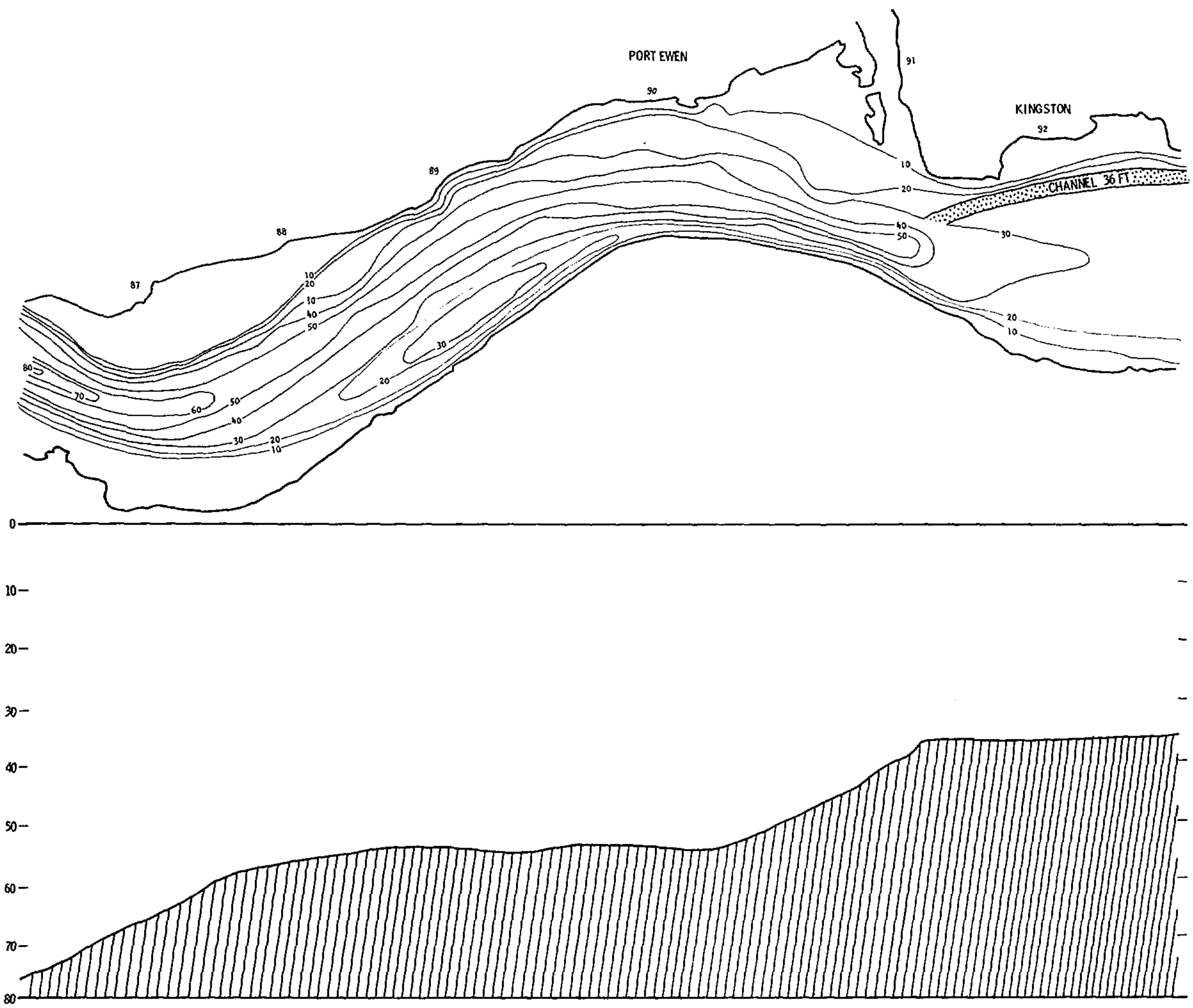
0
25
50
75
100
125
150

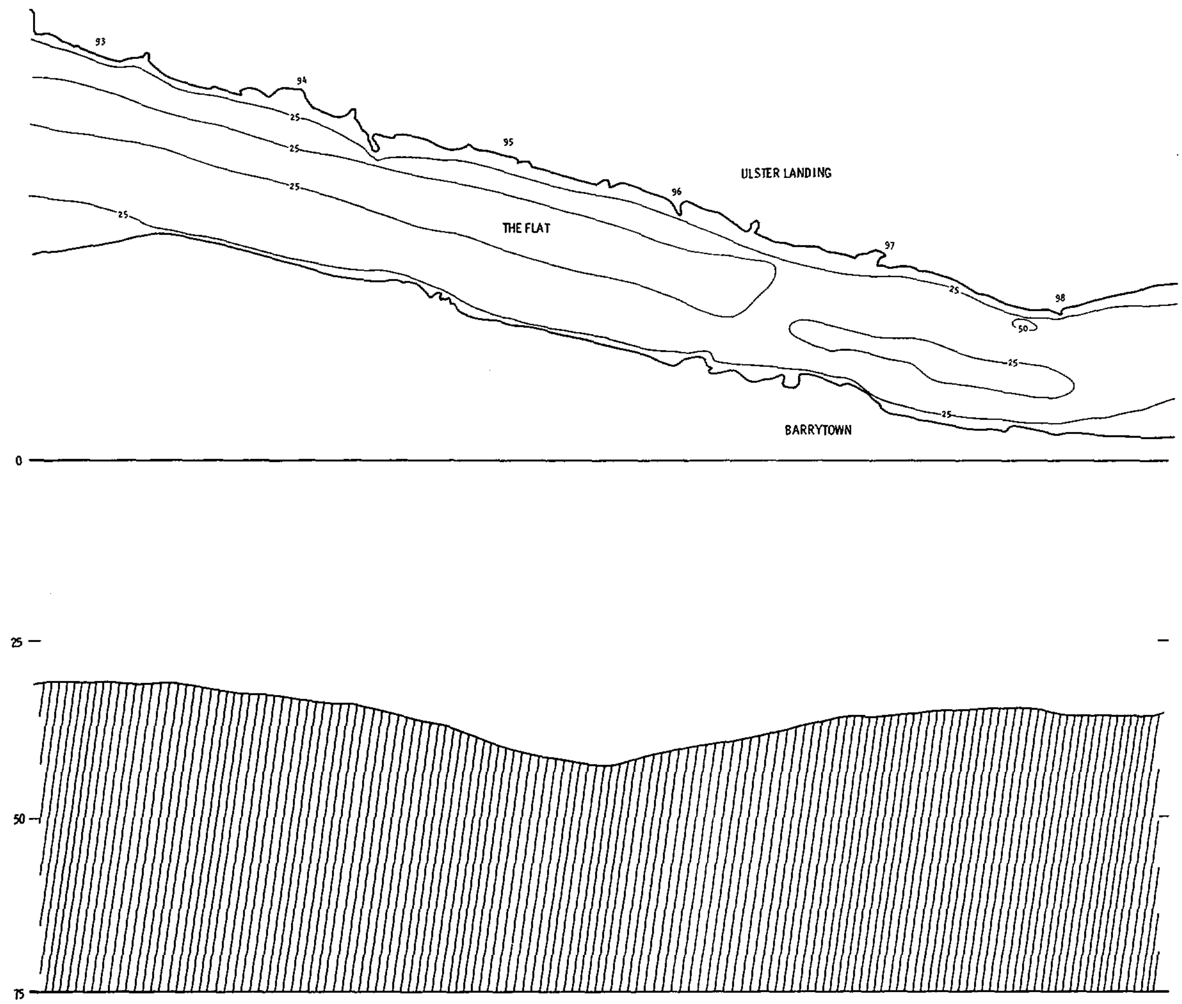


81
82
83
84
85
86
25
50
75
HYDE PARK

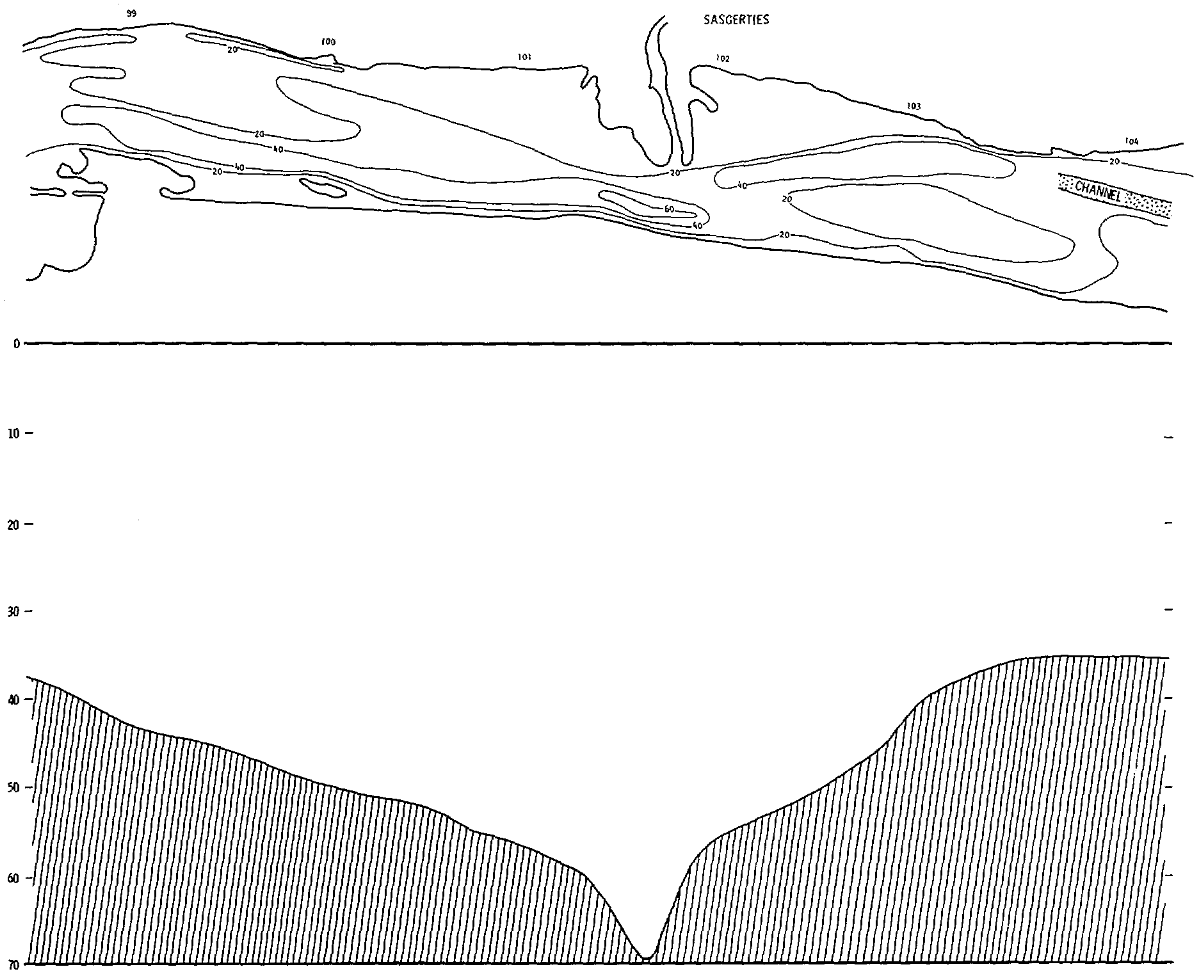


0
20
40
60
80
100


PORT EWEN
KINGSTON
CHANNEL 36 FT
87
88
89
90
91
92
0
10
20
30
40
50
60
70
80

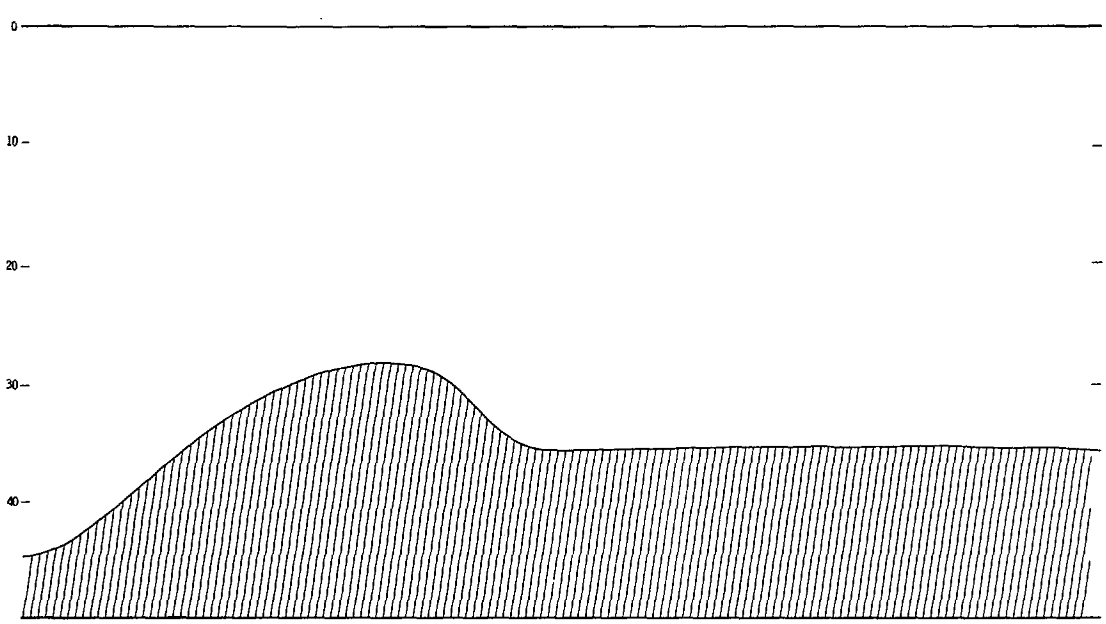


93
94
95
96
97
98
ULSTER LANDING
THE FLAT
BARRYTOWN
25
50
0
25
50
75



99
100
101
SASGERTIES
102
103
104
CHANNEL
20
40
60
0
10
20
30
40
50
60
70


105
106
107
108
109
110
UPPER FLATS
NORTH GERMANTOWN
40
30
20
10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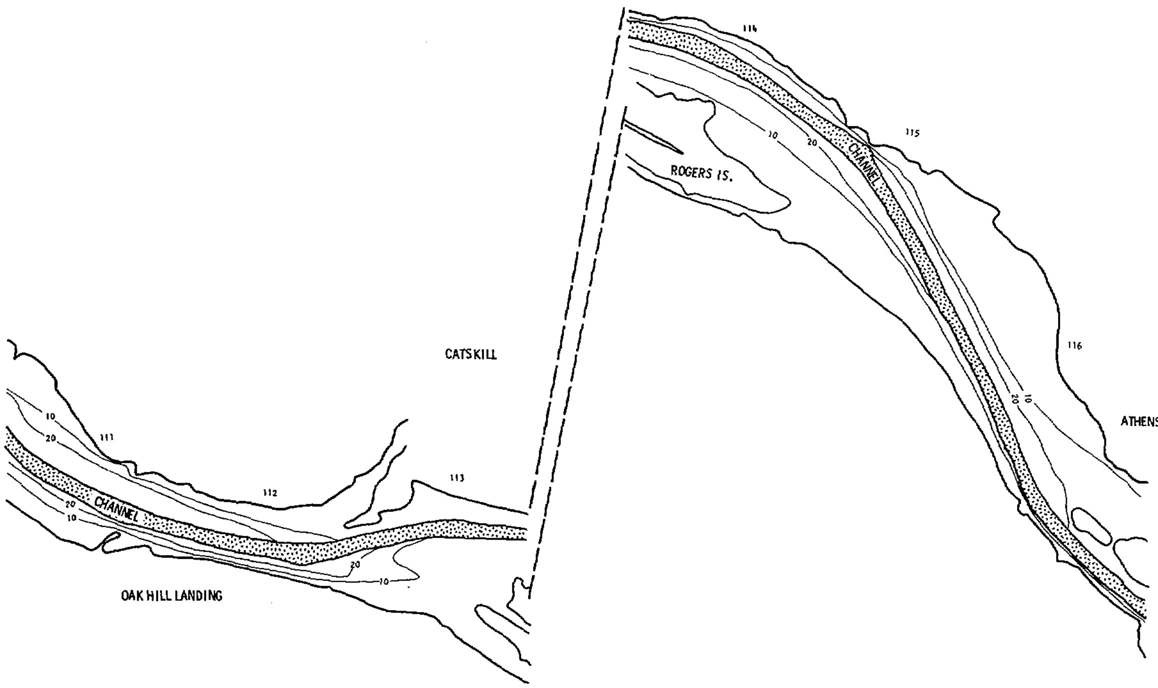
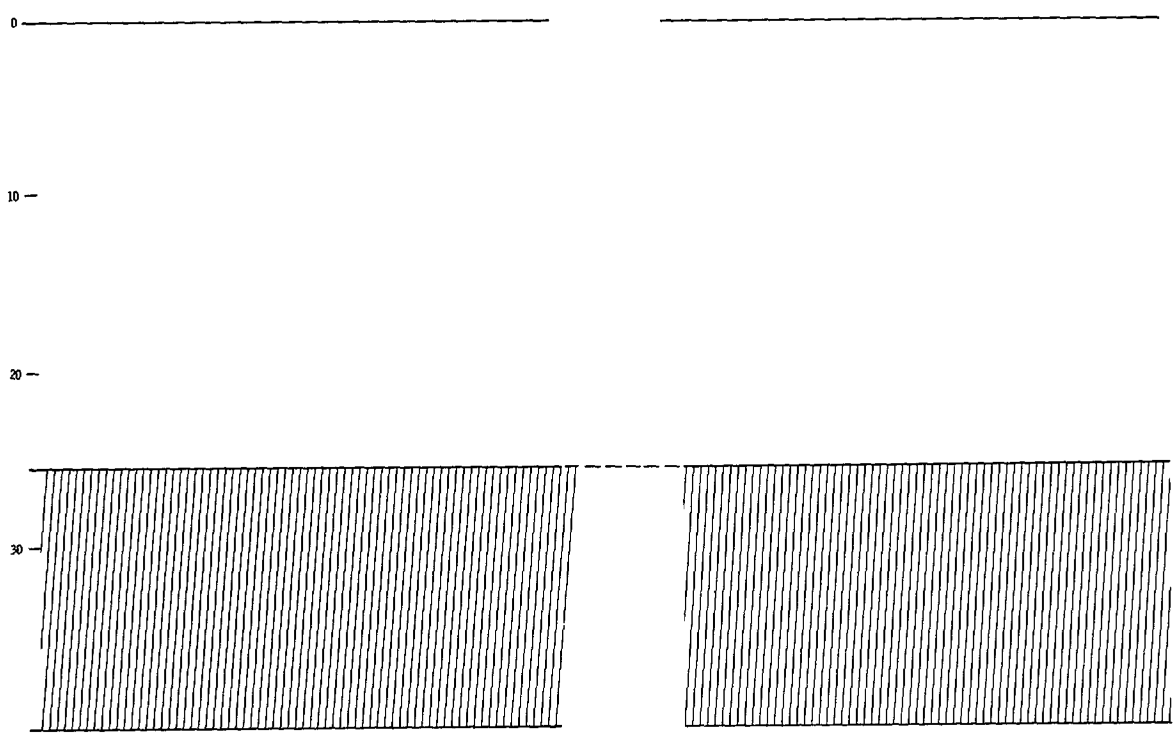
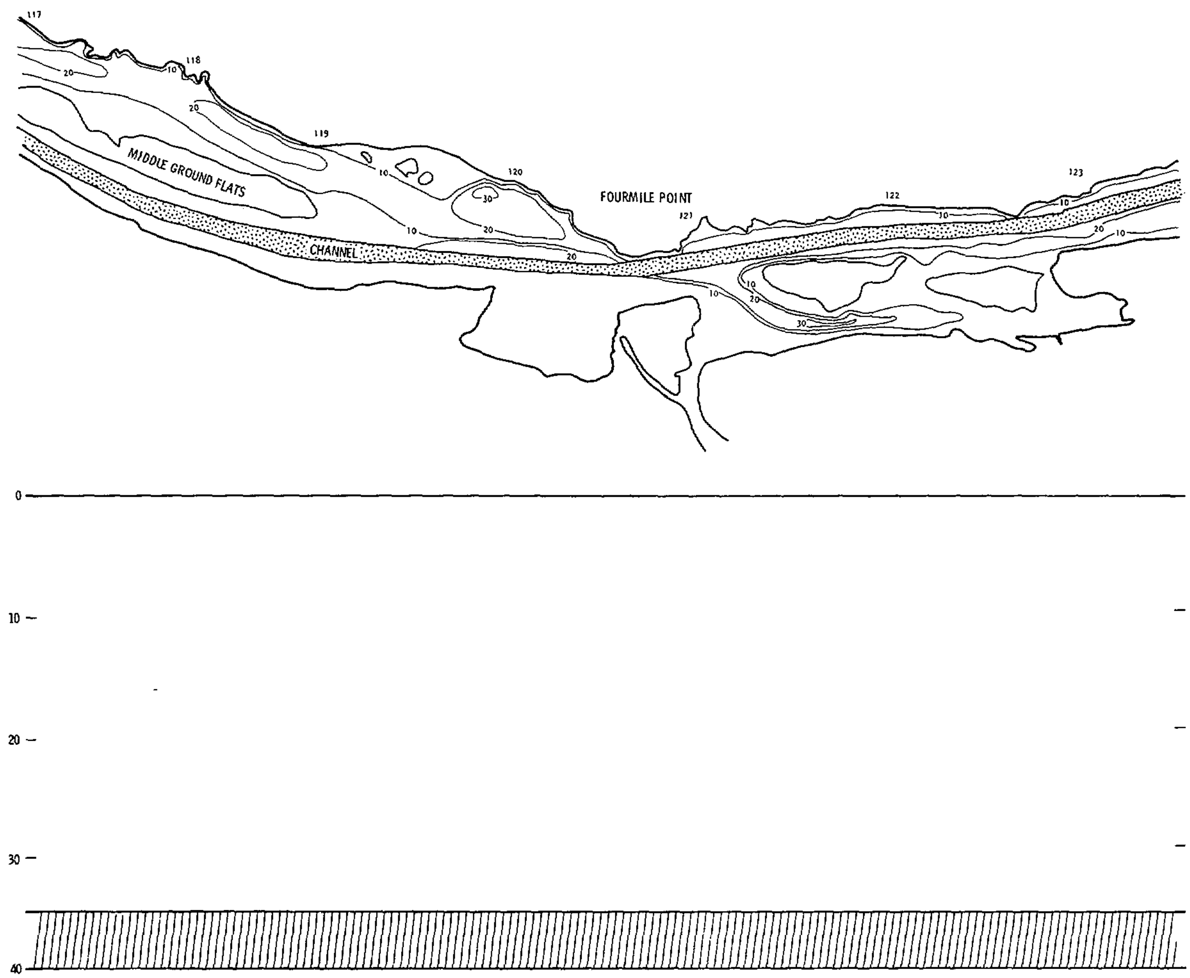
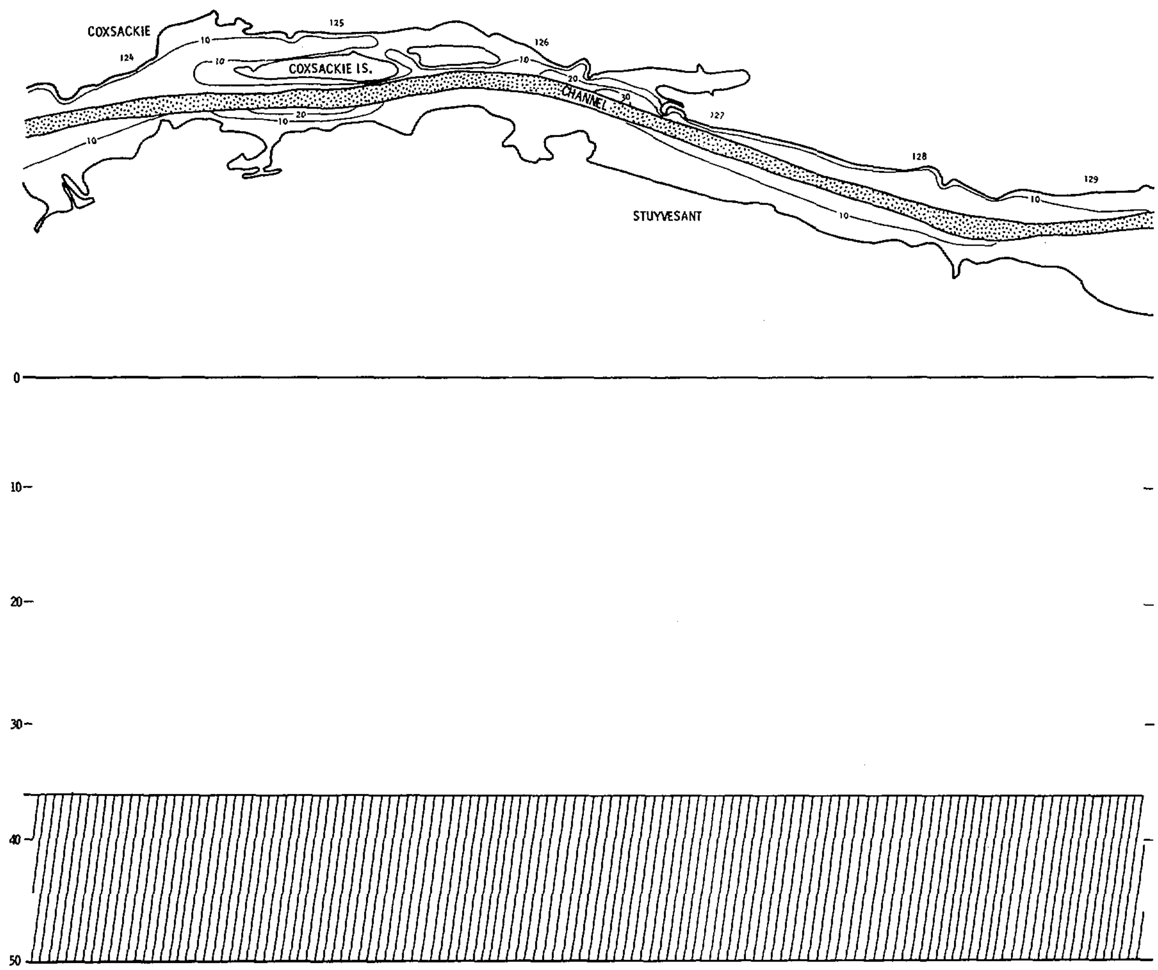
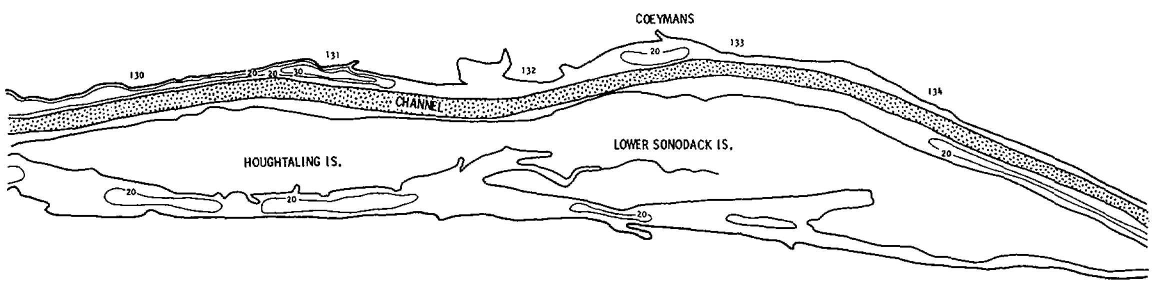
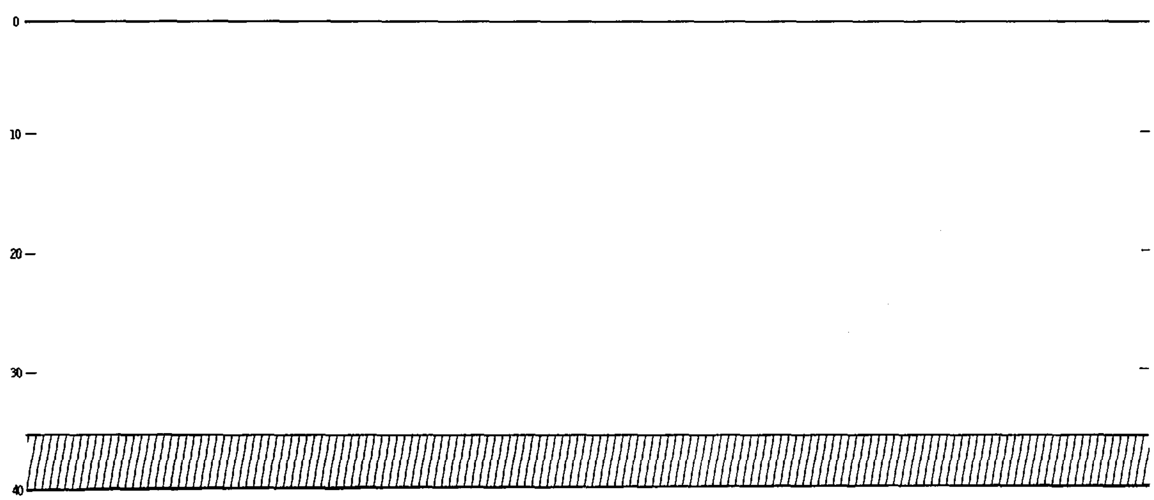

CATSKILL
OAK HILL LANDING
CHANNEL
ROGERS IS.
ATHENS
111
112
113
114
115
116
10
20


0
10
20
30


117
118
119
120
121
122
123
MIDDLE GROUND FLATS
CHANNEL
FOURMILE POINT
0
10
20
30
40


COXSACKIE
124
125
COXSACKIE IS.
126
CHANNEL
127
128
129
STUYVESANT
10
20
30
0
10
20
30
40
50


COEYMANS
130
131
132
133
134
20
30
CHANNEL
HOUGHTALING IS.
LOWER SONODACK IS.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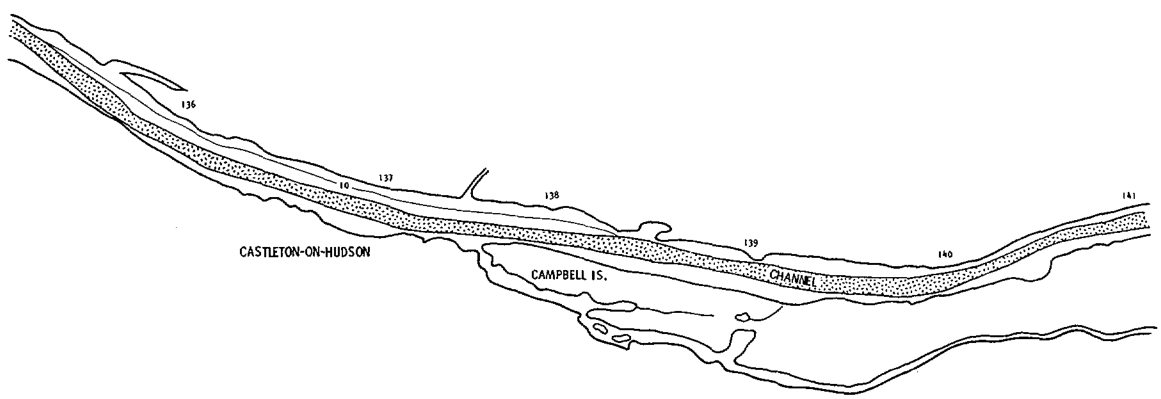
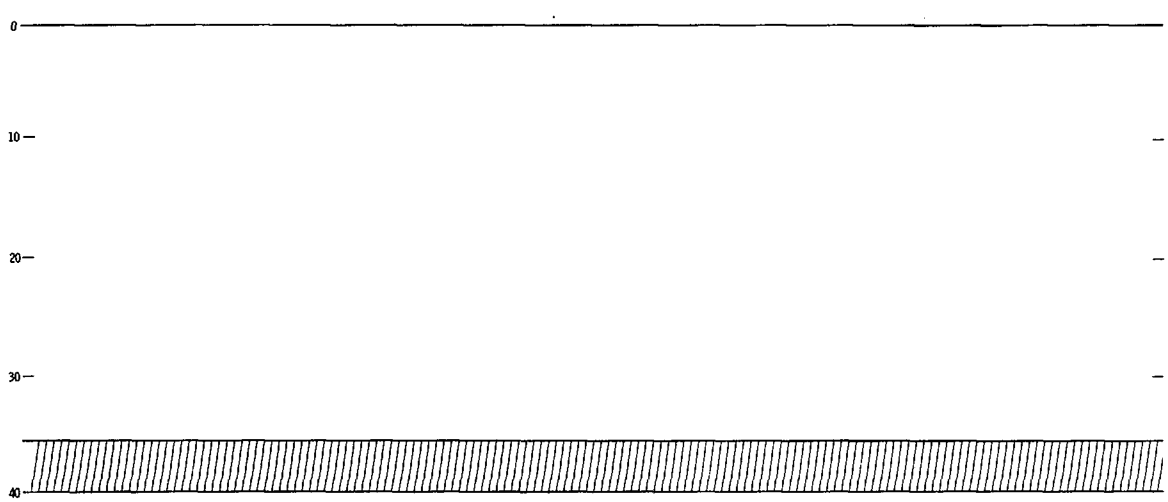

136
137
10
138
139
140
141
CASTLETON-ON-HUDSON
CAMPBELL IS.
CHANNEL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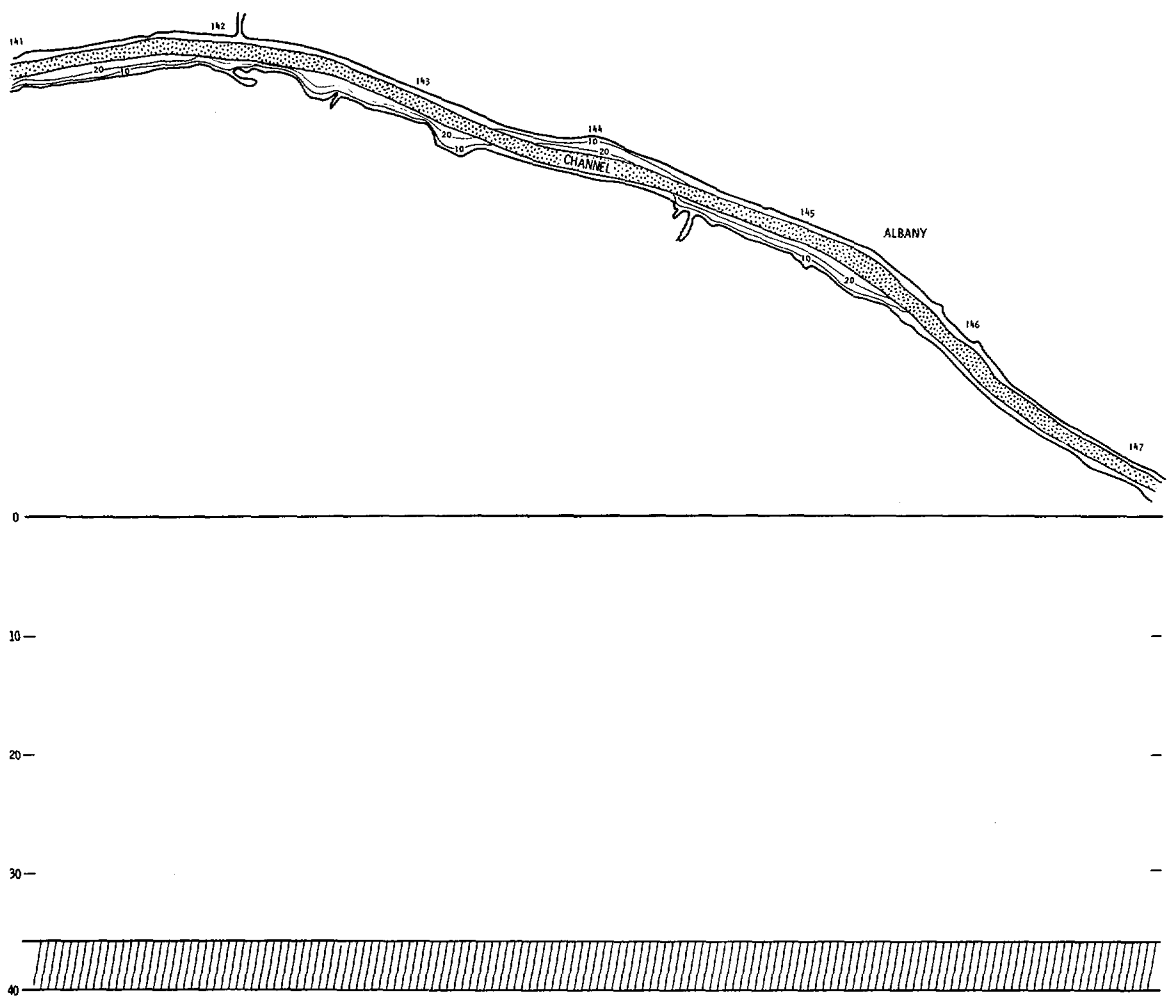
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142
143
144
145
146
147
CHANNEL
ALBANY
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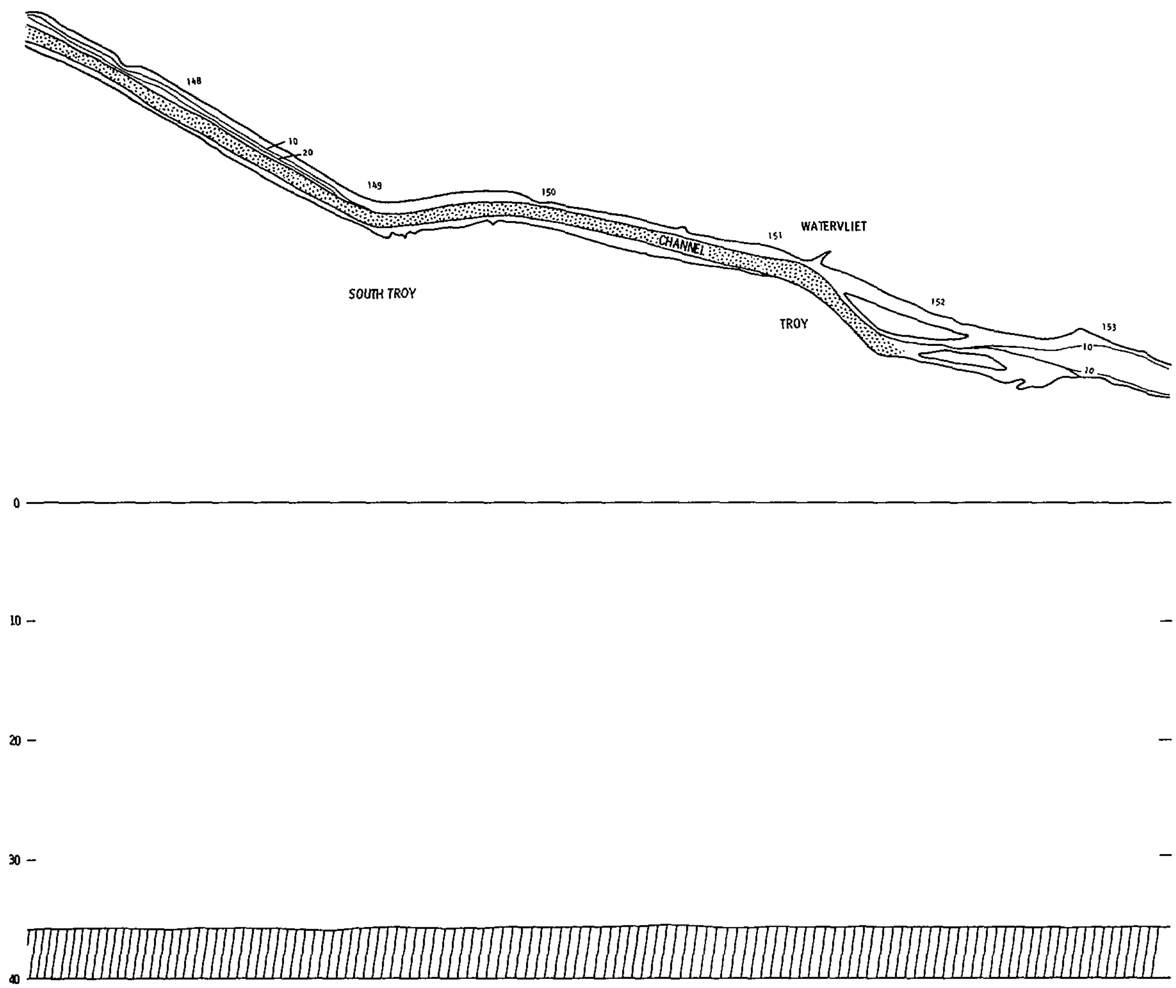
148
10
20
149
150
151
WATERVLIET
CHANNEL
SOUTH TROY
TROY
152
153
10
20
0
10
20
30
40

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NORMANDEAU ASSOCIATES

- HR Library #13010

TEST OF IDENTIFICATION METHODS FOR LARVAL STRIPED BASS AND WHITE PERCH

DATA DOCUMENTATION

Prepared by: Normandeau Associates
25 Nashua Road
Bedford, N.H. 03110-5500

Prepared for: Hudson River Foundation
40 West 20th St., 9th Floor
New York, N.Y. 10011

REFERENCES:

1. Scope of work received by fax from Hudson River Foundation, 22 November 1994 (14 pages including cover page)
2. Contents listing and statistical summary of numerical variables for each of four SAS files (attached)
3. Memo dated 11 April 1995 from Paul Lindsay explaining clarification of procedures for pterygiophore analysis (attached)

ADDITIONAL EXPLANATION:

Lengths coded on the data sheets are standard lengths as labelled on the vials (disregard the label "total length" on some of the data sheets). These lengths were used only for the purpose of assisting in error checking the data. Slight discrepancies between the three biologists in the lengths coded on the data sheets resulted from legibility problems on a few of the vial labels; no attempt was made to resolve these (length is not one of the variables requested in the data files).

The data coding for Task 1 (external characters) was modified from the example in the scope of work to indicate not only which characters were considered to identify a specimen, but also for each character whether that particular character supported identifying that specimen as a striped bass, supported identifying the specimen as a white perch, or whether that character was not useful in making the distinction ("inconclusive"). This will make it possible to evaluate for each character how often it agreed with the ultimate determination. The following codes were used for the Task 1 variables SB_CHAR1, SB_CHAR2, SB_CHAR3, SB_CHAR4, WP_CHAR1, WP_CHAR2, WP_CHAR3, WP_CHAR4, IN_CHAR1, IN_CHAR2, IN_CHAR3, and IN_CHAR4:

1 - presence or absence of oil
2 - degree of gut development
3 - liver development and liver/swim bladder overlap

4 - degree of swim bladder development
5 - prominence and location of mid-ventral melanophore
6 - presence or absence of premaxillary dentition
7 - development of preopercular spines
8 - anal fin ray count
9 - length and thickness of 2nd anal spine

The characters were coded in order of decreasing importance (SB_CHAR1, WP_CHAR1, and IN_CHAR1 being the most important).

For Task 2 (supraneural and pterygiophore counts) there were counts recorded for every specimen. Coding of the counts was modified to provide separate variables for supraneural and pterygiophore counts when both types of elements could occur in the same space (i.e, in interneural space 3) and a numerical count was assigned to the variables for supraneurals instead of the convention shown in the scope of work (S, S+1, S+2, SS, SS+1, SSS). The pattern numbers (variables IN1_6, IN10_13, and IH12_15) were then assigned by computer based on the counts. As explained in the 11 April memo, whenever it appeared that the full complement of elements might not have been attained, or when an element could not be assigned to a particular interneural or interhaemal space ("ambiguous"), no pattern was assigned, <u>even if the existing counts matched one of the patterns listed in the scope of work</u>, on the assumption that assignment of pattern number on the basis of incomplete counts would be misleading. Note that pattern 38 duplicates pattern 37: we did not use the pattern code of 38. By oversight no column was included on the data sheet for recording a supraneural count for interneural space 4, but this situation did not occur in the specimens examined (if it had occurred it would have been noted on the data sheet and a variable S_IN4 would have been added to the data set).

For Task 3 (dentition) whenever the vomerine and premaxillary tooth counts would have resulted in opposite conclusions (one supporting striped bass and the other supporting white perch), the identification was made on the basis of the premaxillary tooth count.

The SAS data sets were subjected to systematic error checking programs to search for invalid codes or out-of-range values for each variable. In addition, bivariate checks were performed to make sure the final data product satisfied certain assumptions about the data, such as no duplication of FISH_NO by one of the taxonomists within a task. A few data errors were corrected on the basis of these checks. Any errors resulting from incorrectly coded data (as opposed to data correctly coded but incorrectly keyed) were corrected on the original data sheets as well, to match the final data files. No original data were changed that represented the judgement of the taxonomist. The only changes made were identifiable coding errors such as recording the FISH_NO incorrectly (which could be resolved by matching lengths). In a few cases a blank COND_1 code in Task 2 was replaced by a code of 1 when the total number of supraneurals was less than three for that specimen. Error checking was not conducted by the original taxonomists, so that they did not have any opportunity to modify the data after completing each task.

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

CONTENTS PROCEDURE

Data Set Name:	MORONE.MTHD1	Observations:	930
Member Type:	DATA	Variables:	16
Engine:	V604	Indexes:	0
Created:	14:17 Thursday, June 1, 1995	Observation Length:	132
Last Modified:	14:17 Thursday, June 1, 1995	Deleted Observations:	0
Protection:		Compressed:	NO
Data Set Type:		Sorted:	NO
Label:			

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Label
2	BIOL_NO	Num	8	12	BIOLOGIST CODE NUMBER
3	FISH_NO	Num	8	20	FISH IDENTIFICATION NUMBER
13	IN_CHAR1	Num	8	100	1ST INCONCLUSIVE CHARACTER
14	IN_CHAR2	Num	8	108	2ND INCONCLUSIVE CHARACTER
15	IN_CHAR3	Num	8	116	3RD INCONCLUSIVE CHARACTER
16	IN_CHAR4	Num	8	124	4TH INCONCLUSIVE CHARACTER
1	METHOD	Num	8	4	IDENTIFICATION METHOD
5	SB_CHAR1	Num	8	36	1ST CHAR. SUPPORTING S. BASS
6	SB_CHAR2	Num	8	44	2ND CHAR. SUPPORTING S. BASS
7	SB_CHAR3	Num	8	52	3RD CHAR. SUPPORTING S. BASS
8	SB_CHAR4	Num	8	60	4TH CHAR. SUPPORTING S. BASS
4	TAXON	Num	8	28	SPECIES OR GENUS
9	WP_CHAR1	Num	8	68	1ST CHAR. SUPPORTING W. PERCH
10	WP_CHAR2	Num	8	76	2ND CHAR. SUPPORTING W. PERCH
11	WP_CHAR3	Num	8	84	3RD CHAR. SUPPORTING W. PERCH
12	WP_CHAR4	Num	8	92	4TH CHAR. SUPPORTING W. PERCH

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

Variable	Label	N	Minimum	Maximum	Nmiss
METHOD	IDENTIFICATION METHOD	930	1.0000000	1.0000000	0
BIOL_NO	BIOLOGIST CODE NUMBER	930	1.0000000	3.0000000	0
FISH_NO	FISH IDENTIFICATION NUMBER	930	1.0000000	310.0000000	0
TAXON	SPECIES OR GENUS	930	30.0000000	60.0000000	0
SB_CHAR1	1ST CHAR. SUPPORTING S. BASS	459	1.0000000	9.0000000	471
SB_CHAR2	2ND CHAR. SUPPORTING S. BASS	417	1.0000000	9.0000000	513
SB_CHAR3	3RD CHAR. SUPPORTING S. BASS	307	1.0000000	9.0000000	623
SB_CHAR4	4TH CHAR. SUPPORTING S. BASS	113	1.0000000	9.0000000	817
WP_CHAR1	1ST CHAR. SUPPORTING W. PERCH	499	1.0000000	9.0000000	431
WP_CHAR2	2ND CHAR. SUPPORTING W. PERCH	490	1.0000000	9.0000000	440
WP_CHAR3	3RD CHAR. SUPPORTING W. PERCH	349	1.0000000	9.0000000	581
WP_CHAR4	4TH CHAR. SUPPORTING W. PERCH	58	1.0000000	9.0000000	872
IN_CHAR1	1ST INCONCLUSIVE CHARACTER	496	1.0000000	9.0000000	434
IN_CHAR2	2ND INCONCLUSIVE CHARACTER	108	2.0000000	9.0000000	822
IN_CHAR3	3RD INCONCLUSIVE CHARACTER	14	3.0000000	9.0000000	916
IN_CHAR4	4TH INCONCLUSIVE CHARACTER	4	2.0000000	9.0000000	926

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

CONTENTS PROCEDURE

Data Set Name:	MORONE.MTHD2	Observations:	912
Member Type:	DATA	Variables:	24
Engine:	V604	Indexes:	0
Created:	14:17 Thursday, June 1, 1995	Observation Length:	196
Last Modified:	14:17 Thursday, June 1, 1995	Deleted Observations:	0
Protection:		Compressed:	NO
Data Set Type:		Sorted:	NO
Label:			

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Label
2	BIOL_NO	Num	8	12	BIOLOGIST CODE NUMBER
19	COND_1	Num	8	148	CONDITION CODE FOR IN 1-6
20	COND_2	Num	8	156	CONDITION CODE FOR IN 10-13
21	COND_3	Num	8	164	CONDITION CODE FOR IH 12-15
3	FISH_NO	Num	8	20	FISH IDENTIFICATION NUMBER
23	IH12_15	Num	8	180	CODE FOR PATTERN OBSERVED FOR IH 12-15
22	IN10_13	Num	8	172	CODE FOR PATTERN OBSERVED FOR IN 10-13
24	IN1_6	Num	8	188	CODE FOR PATTERN OBSERVED FOR IN 1-6
1	METHOD	Num	8	4	IDENTIFICATION METHOD
15	P_IH12	Num	8	116	PTERYGIOPHORE COUNT IN SPACE IH12
16	P_IH13	Num	8	124	PTERYGIOPHORE COUNT IN SPACE IH13
17	P_IH14	Num	8	132	PTERYGIOPHORE COUNT IN SPACE IH14
18	P_IH15	Num	8	140	PTERYGIOPHORE COUNT IN SPACE IH15
7	P_IN3	Num	8	52	PTERYGIOPHORE COUNT IN SPACE IN3
8	P_IN4	Num	8	60	PTERYGIOPHORE COUNT IN SPACE IN4
9	P_IN5	Num	8	68	PTERYGIOPHORE COUNT IN SPACE IN5
10	P_IN6	Num	8	76	PTERYGIOPHORE COUNT IN SPACE IN6
11	P_IN10	Num	8	84	PTERYGIOPHORE COUNT IN SPACE IN10
12	P_IN11	Num	8	92	PTERYGIOPHORE COUNT IN SPACE IN11
13	P_IN12	Num	8	100	PTERYGIOPHORE COUNT IN SPACE IN12
14	P_IN13	Num	8	108	PTERYGIOPHORE COUNT IN SPACE IN13
4	S_IN1	Num	8	28	SUPRANEURAL COUNT IN SPACE IN1
5	S_IN2	Num	8	36	SUPRANEURAL COUNT IN SPACE IN2
6	S_IN3	Num	8	44	SUPRANEURAL COUNT IN SPACE IN3

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

Variable	Label	N	Minimum	Maximum	Nmiss
METHOD	IDENTIFICATION METHOD	912	2.0000000	2.0000000	0
BIOL_NO	BIOLOGIST CODE NUMBER	912	1.0000000	3.0000000	0
FISH_NO	FISH IDENTIFICATION NUMBER	912	1.0000000	310.0000000	0
S_IN1	SUPRANEURAL COUNT IN SPACE IN1	912	0	1.0000000	0
S_IN2	SUPRANEURAL COUNT IN SPACE IN2	912	0	2.0000000	0
S_IN3	SUPRANEURAL COUNT IN SPACE IN3	912	0	2.0000000	0
P_IN3	PTERYGIOPHORE COUNT IN SPACE IN3	912	0	2.0000000	0
P_IN4	PTERYGIOPHORE COUNT IN SPACE IN4	912	0	3.0000000	0
P_IN5	PTERYGIOPHORE COUNT IN SPACE IN5	912	0	3.0000000	0
P_IN6	PTERYGIOPHORE COUNT IN SPACE IN6	912	0	2.0000000	0
P_IN10	PTERYGIOPHORE COUNT IN SPACE IN10	912	0	2.0000000	0
P_IN11	PTERYGIOPHORE COUNT IN SPACE IN11	912	0	2.0000000	0
P_IN12	PTERYGIOPHORE COUNT IN SPACE IN12	912	0	3.0000000	0
P_IN13	PTERYGIOPHORE COUNT IN SPACE IN13	912	0	3.0000000	0
P_IH12	PTERYGIOPHORE COUNT IN SPACE IH12	912	0	2.0000000	0
P_IH13	PTERYGIOPHORE COUNT IN SPACE IH13	912	0	3.0000000	0
P_IH14	PTERYGIOPHORE COUNT IN SPACE IH14	912	0	3.0000000	0
P_IH15	PTERYGIOPHORE COUNT IN SPACE IH15	912	0	3.0000000	0
COND_1	CONDITION CODE FOR IN 1-6	515	1.0000000	3.0000000	397
COND_2	CONDITION CODE FOR IN 10-13	272	1.0000000	1.0000000	640
COND_3	CONDITION CODE FOR IH 12-15	280	1.0000000	1.0000000	632
IN10_13	CODE FOR PATTERN OBSERVED FOR IN 10-13	612	29.0000000	45.0000000	300
IH12_15	CODE FOR PATTERN OBSERVED FOR IH 12-15	628	48.0000000	88.0000000	284
IN1_6	CODE FOR PATTERN OBSERVED FOR IN 1-6	366	8.0000000	26.0000000	546

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

CONTENTS PROCEDURE

Data Set Name:	MORONE.MTHD3	Observations:	912
Member Type:	DATA	Variables:	6
Engine:	V604	Indexes:	0
Created:	14:17 Thursday, June 1, 1995	Observation Length:	52
Last Modified:	14:17 Thursday, June 1, 1995	Deleted Observations:	0
Protection:		Compressed:	NO
Data Set Type:		Sorted:	NO
Label:			

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Label
2	BIOL_NO	Num	8	12	BIOLOGIST CODE NUMBER
3	FISH_NO	Num	8	20	FISH IDENTIFICATION NUMBER
6	JAWTEETH	Num	8	44	COUNT OF TEETH ON PREMAXILLARY
1	METHOD	Num	8	4	IDENTIFICATION METHOD
4	TAXON	Num	8	28	SPECIES OR GENUS
5	VOMTEETH	Num	8	36	COUNT OF TEETH ON VOMER

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

Variable	Label	N	Minimum	Maximum	Nmiss
METHOD	IDENTIFICATION METHOD	912	3.0000000	3.0000000	0
BIOL_NO	BIOLOGIST CODE NUMBER	912	1.0000000	3.0000000	0
FISH_NO	FISH IDENTIFICATION NUMBER	912	1.0000000	310.0000000	0
TAXON	SPECIES OR GENUS	912	30.0000000	60.0000000	0
VOMTEETH	COUNT OF TEETH ON VOMER	912	0	8.0000000	0
JAWTEETH	COUNT OF TEETH ON PREMAXILLARY	912	0	23.0000000	0

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

CONTENTS PROCEDURE

Data Set Name:	MORONE.MTHD4	Observations:	912
Member Type:	DATA	Variables:	5
Engine:	V604	Indexes:	0
Created:	14:17 Thursday, June 1, 1995	Observation Length:	44
Last Modified:	14:17 Thursday, June 1, 1995	Deleted Observations:	0
Protection:		Compressed:	NO
Data Set Type:		Sorted:	NO
Label:			

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Label
2	BIOL_NO	Num	8	12	BIOLOGIST CODE NUMBER
3	FISH_NO	Num	8	20	FISH IDENTIFICATION NUMBER
5	ID_CODE	Num	8	36	CODE OF 1ST PTERYGIOPHORE CHAR. PRESENT
1	METHOD	Num	8	4	IDENTIFICATION METHOD
4	TAXON	Num	8	28	SPECIES OR GENUS

TEST OF IDENTIFICATION METHODS
FOR LARVAL STRIPED BASS AND WHITE PERCH

Variable	Label	N	Minimum	Maximum	Nmiss
METHOD	IDENTIFICATION METHOD	912	4.0000000	4.0000000	0
BIOL_NO	BIOLOGIST CODE NUMBER	912	1.0000000	3.0000000	0
FISH_NO	FISH IDENTIFICATION NUMBER	912	1.0000000	310.0000000	0
TAXON	SPECIES OR GENUS	912	30.0000000	60.0000000	0
ID_CODE	CODE OF 1ST PTERYGIOPHORE CHAR. PRESENT	912	0	6.0000000	0

NORMANDEAU ASSOCIATES

TO: Rich Park, Joe Strube, Mike Mataragas

CC: John Waldman, Mark Mattson, Susan Ward

FROM: Paul Lindsay

RE: Clarification of procedures for pterygiophore analysis

DATE: 11 April 1995

The following clarifications about pterygiophore and dentition data coding are based on a discussion on 7 April with John Waldman.

<u>TASK 2</u>

Record counts for those elements observed, and code zeros in those interneural or interhaemal spaces where none are observed. The pattern number will be generated by computer from the counts.

If it appears that some of the supraneurals or pterygiophores have not yet formed, code counts only for those elements observed (the observer is not responsible for presupposing the final number of elements or their position). Code zeros in all spaces where none are present, even though elements might have developed in some of these spaces if the larva had continued to develop. Three columns for condition codes will be inserted to the right of the counts in the area allocated for comments. These will be for IN1-IN6, IN10-IN13, and IH12-IH15, respectively. Enter a 1 in the appropriate condition column(s) when it appears that not all of the supraneurals and pterygiophores are developed. When a condition code of 1 is present in the IN1-IN6 condition column, the pattern number assigned by computer for IN1-IN6 will be left blank. When a condition code of 1 is present in the IN10-IN13 condition column, the pattern number assigned by computer for IN10-IN13 will be left blank. When a condition code of 1 is present in the IH12-IH15 condition column, the pattern number assigned by computer for IH12-IH15 will be left blank.

If the position for one of the observed elements cannot be determined (is ambiguous), do not include it in the counts. Enter a 2 in the appropriate condition column(s) when one or more supraneurals or pterygiophores are omitted from the counts for this reason. When a condition code of 2 is present in the IN1-IN6 condition column, the pattern number assigned by computer for IN1-IN6 will be left blank. When a condition code of 2 is present in the IN10-IN13 condition column, the pattern number assigned by computer for IN10-IN13 will be left blank. When a condition code of 2 is present in the IH12-IH15 condition column, the pattern number assigned by computer for IH12-IH15 will be left blank. Explain in the comments section which are the possible two spaces that the missing count could have belonged to (e.g. "one ambiguous P not counted from IH11/12").

If both the above situations (undeveloped elements and ambiguous elements) apply to one of the three areas (IN1-IN6, IN10-IN13, or IH12-IH15) then enter a condition code of 3 instead of a 1 or a 2 in the appropriate column(s). When a condition code of 3 is present in the IN1-IN6 condition column, the pattern number assigned by computer for IN1-IN6 will be left blank. When a condition code of 3 is present in the IN10-IN13 condition column, the pattern number assigned by computer for IN10-IN13 will be left blank. When a condition code of 3 is present in the IH12-IH15 condition column, the pattern number assigned by computer for IH12-IH15 will be left blank.

TASK 3

Dentition counts are to be made for all specimens, but identifications based on counts are only to be made for those size ranges for which the decision criteria are given in the tables in the scope of work. Extrapolation of the dentition criteria to larger and smaller sizes can only be made after the data have been analyzed and should not be attempted at the time the counts are made. Code those specimens outside the tabulated sizes as TAXON=60.

000 36

Central Hudson Gas & Electric Corporation

HR Library #6530

TRAWL METHODOLOGY STUDY: CONSTANT DISTANCE VS CONSTANT TIME

September 1981

LMSE-81/015 & 176/191

Lawler Matusky & Skelly Engineers
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River New York 10965

00036

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PATRICK J. LAWLER, P. E.
FRANCIS M. McGOWAN, P. E.

September 8, 1981
File No. 176-191

Dr. Thomas G. Huggins
Manager, Environmental Affairs
CENTRAL HUDSON GAS & ELECTRIC CORPORATION
284 South Avenue
Poughkeepsie, New York 12602

Dear Dr. Huggins:

Attached is the report titled "Trawl Methodology Study: Constant Distance vs. Constant Time," prepared by Lawler, Matusky & Skelly Engineers for Central Hudson Gas & Electric Corporation.

Field work for this study was conducted during the fall of 1980 and compliments a trawl comparison study comparing the Otter trawl to a Yankee trawl done during 1979. Program design and overall program coordination was handled by Mr. Michael Bonomo. Field and laboratory studies were done by the Danskammer Point laboratory staff.

The results of this study will help in the development of future biological sampling programs, as well as assisting in the evaluation of previous work, and we appreciate the opportunity to have worked with the Environmental Affairs Division staff in conducting this study.

Sincerely,

John P. Lawler

attachment

CENTRAL HUDSON GAS & ELECTRIC CORPORATION

Final Report

TRAWL METHODOLOGY STUDY:
CONSTANT DISTANCE VS CONSTANT TIME

September 1981

LMSE-81/0151&176/191

LAWLER, MATUSKY & SKELLY ENGINEERS
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River, New York 10965

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CHAPTER 1.0

INTRODUCTION

1.1 BACKGROUND

Trawls are a common and highly useful method of sampling fish populations in a tidal estuary. There are a variety of trawls and trawling techniques used for quantitative sampling. Marcy (1976) used a 4.9-m semiballoon otter trawl to sample the midwater region of the lower Connecticut River. Clark (1974) used a roller-frame trawl of the type described by Tabb and Kenny (1969) to assess factors contributing to variation in trawl data. Kuipers (1975) studied the efficiency of a 2.0-m beam trawl for collecting juvenile plaice (Pleuronectes platessa). Several other authors (Pereyra 1963; Loesch et al. 1976; Kjelson and Johnson 1978) have used similar trawls for assessing nekton populations.

A study conducted in 1979 by Lawler, Matusky & Skelly Engineers (LMS) for Central Hudson Gas & Electric Corp (CHGE) compared the catches of a 7.92-m otter trawl and an 11.89-m yankee trawl (LMS 1980). In addition to addressing the study objective - comparing the catch efficiency of the two trawls at the upper water stratum - the results showed that there was no correlation ($\alpha = .05$) between total catch and the duration (time) of the trawl when distance towed was constant. That is, because there is a tidal current in the river, equidistant tows conducted at the same boat speed through the water take different times to complete, based on the opposing current velocity (since through-water velocity is kept constant). Therefore, it could not be shown that the duration of the tow had any effect on the number of fish collected. These results were preliminary and further investigations were needed to examine the relationship between time/distance and number of fish collected.

The purpose of the 1980 Bottom Trawl Methodology Study was to determine if there is a correlation (1) between number of fish collected and trawl duration with distance towed constant and (2) between number of fish collected and trawling distance with time of tow constant.

Estuarine studies which have used trawls for quantitative assessments of fish populations were generally conducted by either constant time or constant distance. Roessler (1965) and Texas Instruments (1980 a,b) conducted trawl surveys by constant time, whereas Clark (1974), Marcy (1976), Kjelson (1978), and Lenarz (1980) used trawls over a constant distance. When trawl data are examined, the effect of the duration for constant distance trawls or distance for constant time trawls is an important consideration, because a correlation between number of fish collected and duration and/or distance is an indication of bias. This notion of bias is best explained by a theoretical example. Say that in a tidal estuary there is a perfectly homogeneous population of fish and assume that these fish are oriented to the dynamic water mass. That is, the fish do not orient to the bottom but drift with the current, like plankton. Assume that fish removed from this population are immediately replaced. Say also that we would like to determine the size of the population or to monitor it. For a series of constant time trawls (10 min) we would expect to catch the same number of fish in each trawl since the volume filtered for each trawl would be the same. Since the estuary is tidal, we know that for a constant time we will cover different distances. If the data are determined to be correlated to these distances, then we know that trawling by time does not provide representative samples of the population and perhaps our assumption that fish orient to the water mass is incorrect. If we found no significant correlation, then our assumption may be correct. A similar situation is true for constant distance trawls when the assumption is that fish orient to the bottom or some fixed object. If the catch is found to be correlated to the duration of the tow, then our assumption with respect to fish orientation is false and trawling by constant distance does not provide representative samples. If there is no correlation evidenced, then the assumption about fish orientation may be true and the constant distance trawling technique may be appropriate.

Other types of correlations between distance and/or duration and number of fish collected are possible and may be the result of variables that were not controlled in this study. For example, the "mechanics" of the trawl and the fish population were assumed to be constant for this study. If the fish population is not constant, for example, but varies with flood and ebb tides, this may cause a correlation between number of fish collected and distance towed or trawl duration (since these variables are a function of tide). These considerations will be made upon examining the results.

1.2 OBJECTIVES

The objectives of this study are as follows:

1. To determine if a correlation exists between number of fish collected and distance towed over the bottom when trawl duration is constant.
2. To determine if a correlation exists between number of fish collected and trawl duration when towing distance over the bottom is constant.

CHAPTER 2.0

MATERIALS AND METHODS

2.1 SAMPLING LOCATION

Bottom sampling was conducted in the Hudson River (KM 106-107) using a 7.92-m otter trawl at 10 parallel transects in the vicinity of the Roseton/Danskammer Point plants (Figure 2.0-1). A description of the otter trawl is provided in Table 2.0-1. All stations were located in the river channel, which ranged from approximately 12.1- to 18.3-m in depth. Stations for constant distance trawls were marked by a yellow cable crossing sign to the north and the southern end of the Roseton oil-dock to the south. Constant time trawls were conducted within the same area.

2.2 SAMPLING SCHEDULE

Trawls were conducted on four dates between 19-23 October 1980 during day and night photoperiods. The study was designed to collect constant time trawl samples (first two dates), then constant distance trawl samples (last two dates). Because of sampling problems, i.e., snagging and losing nets, schedule modifications were necessary. Table 2.0-2 presents the sampling dates and number of trawls conducted during the constant time and constant distance phases of this study.

2.3 SAMPLING PROCEDURES

2.3.1 Constant Time Trawls

Constant time trawls were conducted for 15 min at a through-water velocity of 130 cm/sec (as measured at the surface with a General

FIGURE 2.0-1

TRAWL SAMPLING LOCATIONS

Roseton and Danskammer Point Vicinity — 1980

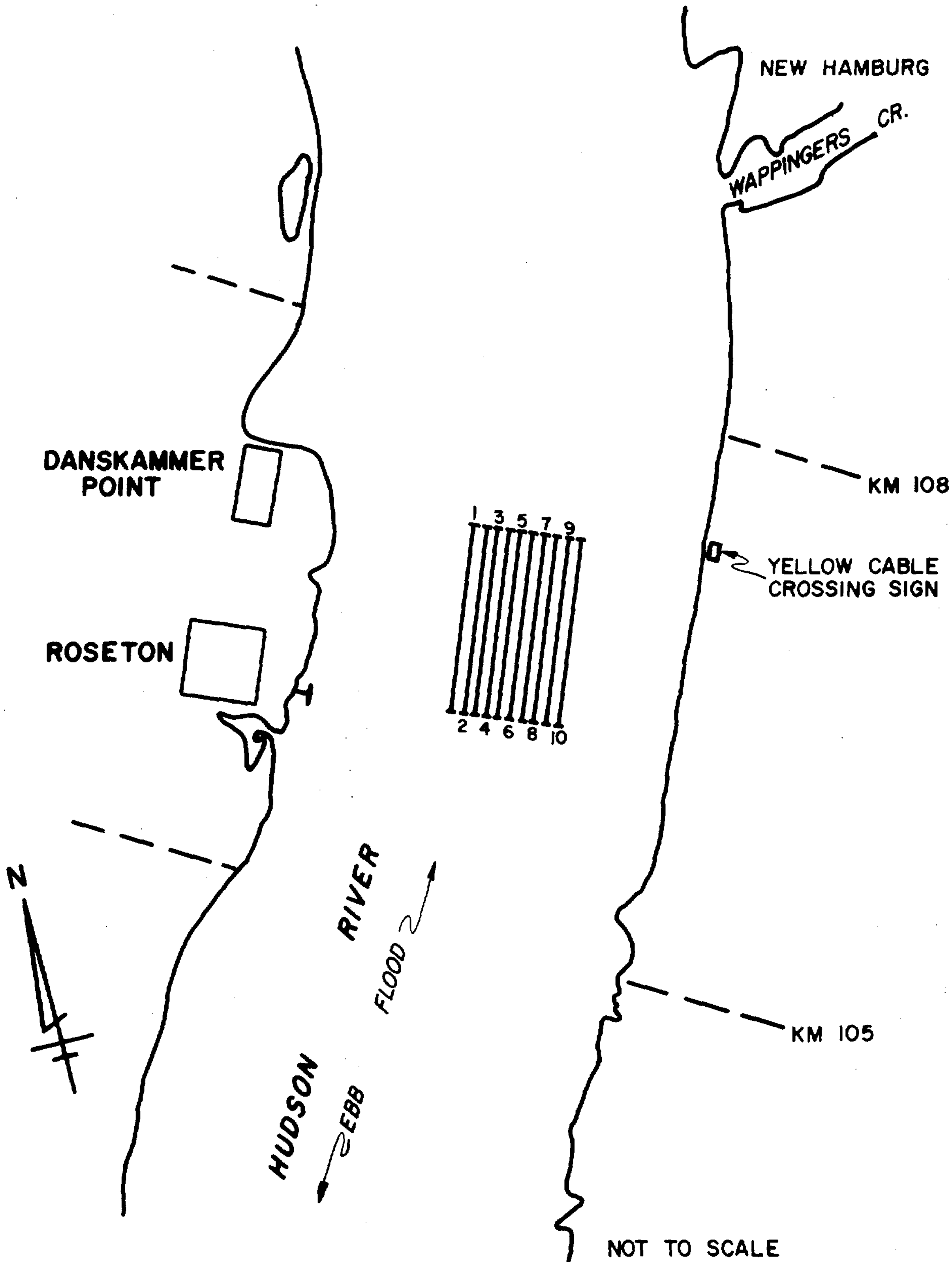


TABLE 2.0-1

OTTER TRAWL DIMENSIONS

PARTS	DIMENSION
Headrope	7.92 m
Footrope	8.53 m
Wing height	1.07 m
Total length	10.67 m
Fishing mouth area	2.14 m^2
Wing mesh (square)	2.54 cm
Body mesh (square)	2.54 cm
Cod end mesh (square)	1.90 cm
Cod end liner mesh (square)	0.64 cm
Trawl doors	81.28 x 40.64 x 2.54 cm oak
Tow line length	61.0 m
Floats	two 18.92 liter jugs

TABLE 2.0-2

SURVEY DATES AND NUMBER OF SAMPLES COLLECTED

Roseton and Danskammer Point Vicinity - 1980

DATE	NUMBER OF SAMPLES TIME TRAWLS	DISTANCE TRAWLS
19-20 Oct	14	0
20-21 Oct	19	0
21-22 Oct	6	12
22-23 Oct	0	23
Totals	39	35

Oceanics velocity meter) against the prevailing current. Sampling was conducted during several tidal stages in order to have a range of distances towed during the constant time.

The distance over the bottom of each trawl was determined as follows: Prior to and immediately following each tow, the boat was anchored and the surface water current velocity measured with a Marsh-McBirney flowmeter. The mean of the two readings was recorded.

Distance Towed = [Boat velocity - mean current velocity] x time

2.3.2 Constant Distance Trawls

The trawl was initiated at a specific starting location and towed for a known distance. The length of the transect (823.9 m) was established from previous (1971-1979) CHGE Aquatic Ecology Studies. All trawls were conducted against the prevailing current and at varying tidal stages to provide a range of trawl durations.

2.4 LABORATORY ANALYSIS

All samples were analyzed fresh or frozen. Nekton were sorted, identified to species, and counted. Secondary analysis consisted of measuring the length of up to 100 fish per species from each sample. If more than 100 fish of a single species were present in a sample, stratified subsampling was performed. A minimum of 60 and a maximum of 150 fish were measured for total length, using the subsampling procedures. The total species biomass was recorded for each sample. Procedures for laboratory analysis are detailed in the 1979 CHGE Workplans.

2.5 DATA ANALYSIS

Data from the constant time and constant distance portions of the study were analyzed separately. Correlation analysis was performed on each part of the study using number of fish and distance towed as variables for the constant time trawls, and number of fish and duration of tow for constant distance trawls.

CHAPTER 3.0

RESULTS

3.1 SPECIES INVENTORY

The species inventory and total number of each species collected for constant time and constant distance trawls are presented in Table 3.0-1. Hogchoker was the dominant species during both phases of the study, comprising 72.5% of the total constant time trawl catch and 71.0% of the total constant distance trawl catch. Blueback herring, bay anchovy, Atlantic tomcod, and white perch were the next most abundant species for constant time trawls; blueback herring, Atlantic tomcod, and white perch were the second, third, and fourth most numerous species for constant distance trawls.

3.2 CONSTANT TIME TRAWLS

The distance towed for a set period of time and boat speed is a function of the opposing tidal current. During slack tidal stages the distance towed is long, while during maximum ebb and flood the distance towed is short. The distance towed, total catch, and number of hogchokers, blueback herring, bay anchovy, Atlantic tomcod, and white perch are presented in Table 3.0-2. In addition, the total catch without hogchokers is presented because the large number of that species had a disproportionate effect on the analysis of the data.

Significant correlations (r) (α = .05) between distance towed and number of fish collected were found for total fish, Atlantic tomcod, hogchoker, and total fish without hogchokers. These correlations were all negative, indicating fewer fish collected with increasing

TABLE 3.0-1

FISH SPECIES INVENTORY AND TOTAL NUMBER COLLECTED IN BOTTOM TRAWLS

Roseton and Danskammer Point Vicinity - 1980

FAMILY	COMMON NAME	SCIENTIFIC NAME	NUMBER COLLECTED CONSTANT TIME[a]	CONSTANT DISTANCE[b]
Acipenseridae	Atlantic sturgeon	Acipenser oxyrhynchus	11	10
	Shortnose sturgeon	Acipenser brevirostrum	2	5
Anguillidae	American eel	Anguilla rostrata	42	29
Centrarchidae	Pumpkinseed	Lepomis gibbosus	7	0
Clupeidae	Alewife	Alosa pseudoharengus	82	9
	American shad	Alosa sapidissima	180	62
	Blueback herring	Alosa aestivalis	2087	851
Cyprinidae	Spottail shiner	Notropis hudsonius	3	3
Cyprinodontidae	Banded killifish	Fundulus diaphanus	0	1
Engraulidae	Bay anchovy	Anchoa mitchilli	1015	90
Gadidae	Atlantic tomcod	Microgadus tomcod	605	610
Gasterosteidae	Fourspine stickleback	Apeltes quadracus	0	1
Ictaluridae	Brown bullhead	Ictalurus nebulosus	11	26
	White catfish	Ictalurus catus	21	20
Osmeridae	Rainbow smelt	Osmerus mordax	8	1
Percichthyidae	Striped bass	Morone saxatilis	10	4
	White perch	Morone americana	399	575
Percidae	Tessellated darter	Etheostoma olmstedi	3	1
Sciaenidae	Weakfish	Cynoscian regalis	6	1
Soleidae	Hogchoker	Trinectes maculatus	11871	5624

[a]Number of timed trawls equals 39.
[b]Number of distance trawls equals 35.

TABLE 3.0-2

TOTAL NUMBER OF FISH AND SELECT SPECIES COLLECTED IN BOTTOM TRAWLS - CONSTANT TIME[a] -

Roseton and Danskammer Point Vicinity - 1980

DATE	DISTANCE (m)	SPECIES: WHITE PERCH	ATLANTIC TOMCOD	HOGCHOKER	BLUEBACK HERRING	BAY ANCHOVY	TOTAL FISH	TOTAL FISH[b]
19 Oct	1033	31	10	156	0	4	210	54
	827	3	13	321	12	0	367	46
	791	15	33	704	0	0	756	52
	1110	9	9	42	0	11	82	40
	909	7	64	818	85	8	992	174
	726	8	23	729	0	1	763	34
	1060	3	6	48	2	0	64	16
	1005	2	13	206	2	2	227	21
	791	2	28	1052	0	0	1082	30
	901	7	22	691	0	1	725	34
	1088	12	21	162	48	10	264	102
	1074	20	55	1481	0	0	1562	81
	929	8	0	151	0	0	160	9
	1005	20	19	455	28	4	531	76
20 Oct	863	2	0	16	0	1	20	4
	978	12	0	8	10	132	197	189
	731	6	7	321	7	3	348	27
	896	42	22	425	0	0	494	69
	923	31	5	24	2	14	89	65
	868	4	3	11	42	174	256	245
	566	3	44	1008	28	13	1106	98
	855	22	47	535	21	0	633	98
	994	1	1	2	29	7	57	55
	759	9	0	5	365	221	646	641
	580	9	5	46	248	118	440	394
	682	18	47	531	2	5	609	78
	1154	3	5	10	5	6	33	23
	1143	0	0	1	1	2	4	3
	800	5	2	33	406	61	520	487
	951	20	4	56	3	4	94	38
	1074	1	1	52	0	3	59	7
	1115	9	1	46	31	16	106	60
	1121	6	3	111	0	2	134	23
21 Oct	731	2	26	148	42	6	241	93
	635	1	27	597	53	18	710	113
	772	4	22	437	153	65	687	250
	937	3	0	71	326	60	469	398
	978	7	3	31	105	29	196	165
	1101	32	14	330	31	17	430	100
r		0.140	-0.328[c]	-0.325[c]	-0.305	-0.245	-0.464[c]	-0.354[c]
slope			-0.035	-0.722	-0.473	-0.776	-1.035	-0.313
y-intercept			47.1	960.8	934.4	928.9	1360.5	399.7

[a]Constant time equals 15 minutes.
[b]Without hogchoker.
[c]Significant at $\alpha = .05$
r - correlation coefficient.

trawl distance. Only white perch had a positive correlation; however, this value was not significant. The significant results indicate that catch size varied inversely with distance towed for the species tested, except for white perch.

The trawl catch/effort for blueback herring and bay anchovy is characterized by several no-catches and a few large catches. This indicates a patchy distribution probably caused by the schooling nature of these species. Because of this, these species are not helpful in evaluating the study objectives. Hogchoker, white perch, and Atlantic tomcod, on the other hand, were captured in relatively consistent numbers that are more useful for addressing the study objectives. These species are graphically presented in Figures 3.0-1 to 3.0-5.

The data were plotted and a least squares regression line was fit for each data set with a significant (α = .05) correlation (Figures 3.0-1 to 3.0-5). The negative slopes on four of the five graphs indicate fewer fish collected with increasing distance when time (duration) and velocity through the water are constant.

3.3 CONSTANT DISTANCE TRAWLS

The tow duration for a fixed distance and boat speed through the water is a function of the opposing tidal current. During slack tidal stages the tow duration is short, while during maximum current stages it is long. The duration of tow, total catch, number of hogchokers, white perch, Atlantic tomcod, and total catch without hogchokers are presented in Table 3.0-3.

Significant correlations (α = .05) between trawl duration and number of fish collected were found for total fish, white perch, and Atlantic tomcod. All correlation values (r) were positive with the

FIGURE 3.0-1

TOTAL NUMBER OF FISH COLLECTED IN BOTTOM TRAWLS -CONSTANT TIME-

Roseton and Danskammer Point Vicinity — 1980

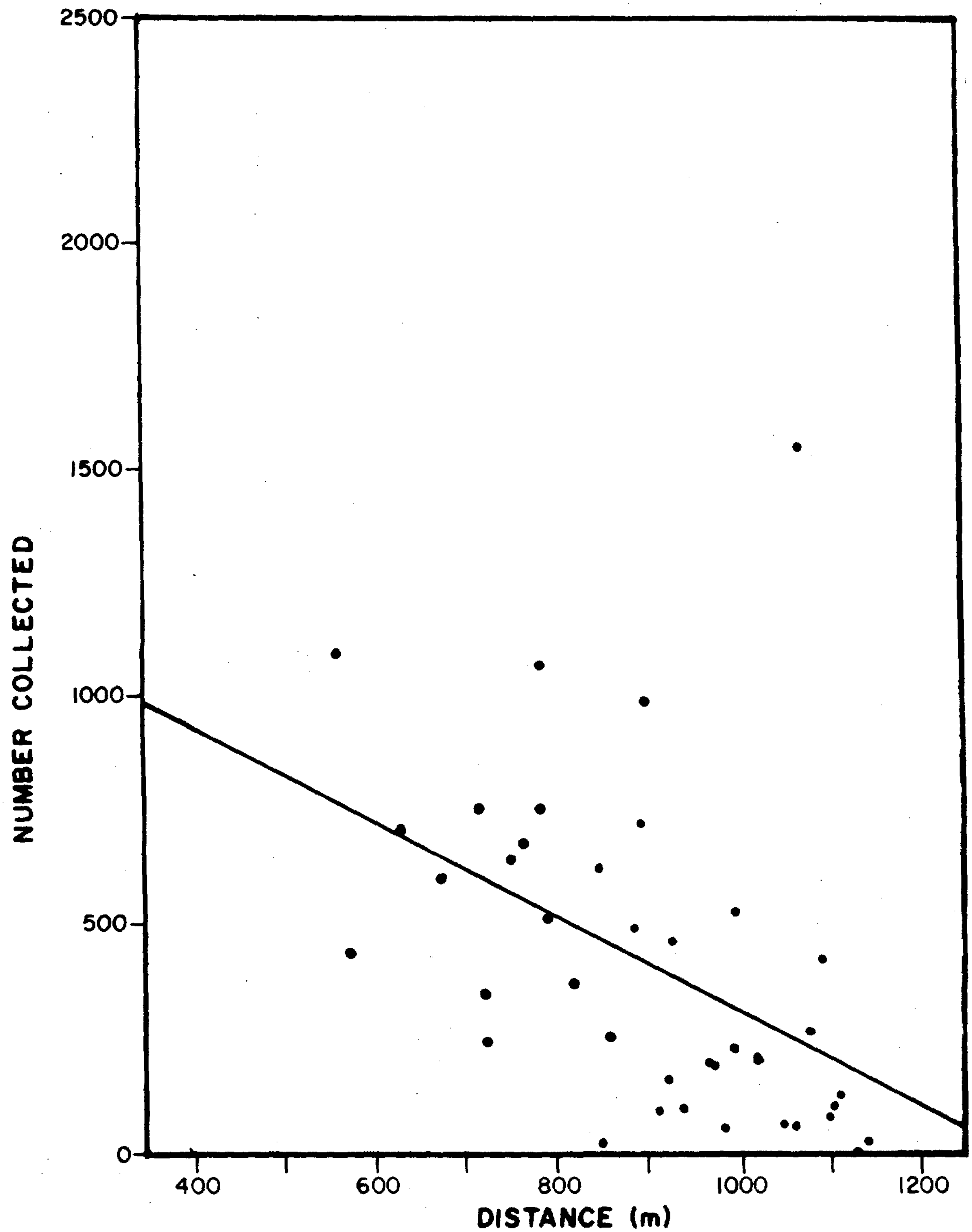


FIGURE 3.0-1

TOTAL NUMBER OF FISH COLLECTED IN BOTTOM TRAWLS - CONSTANT TIME -

Roseton and Danskammer Point Vicinity — 1980

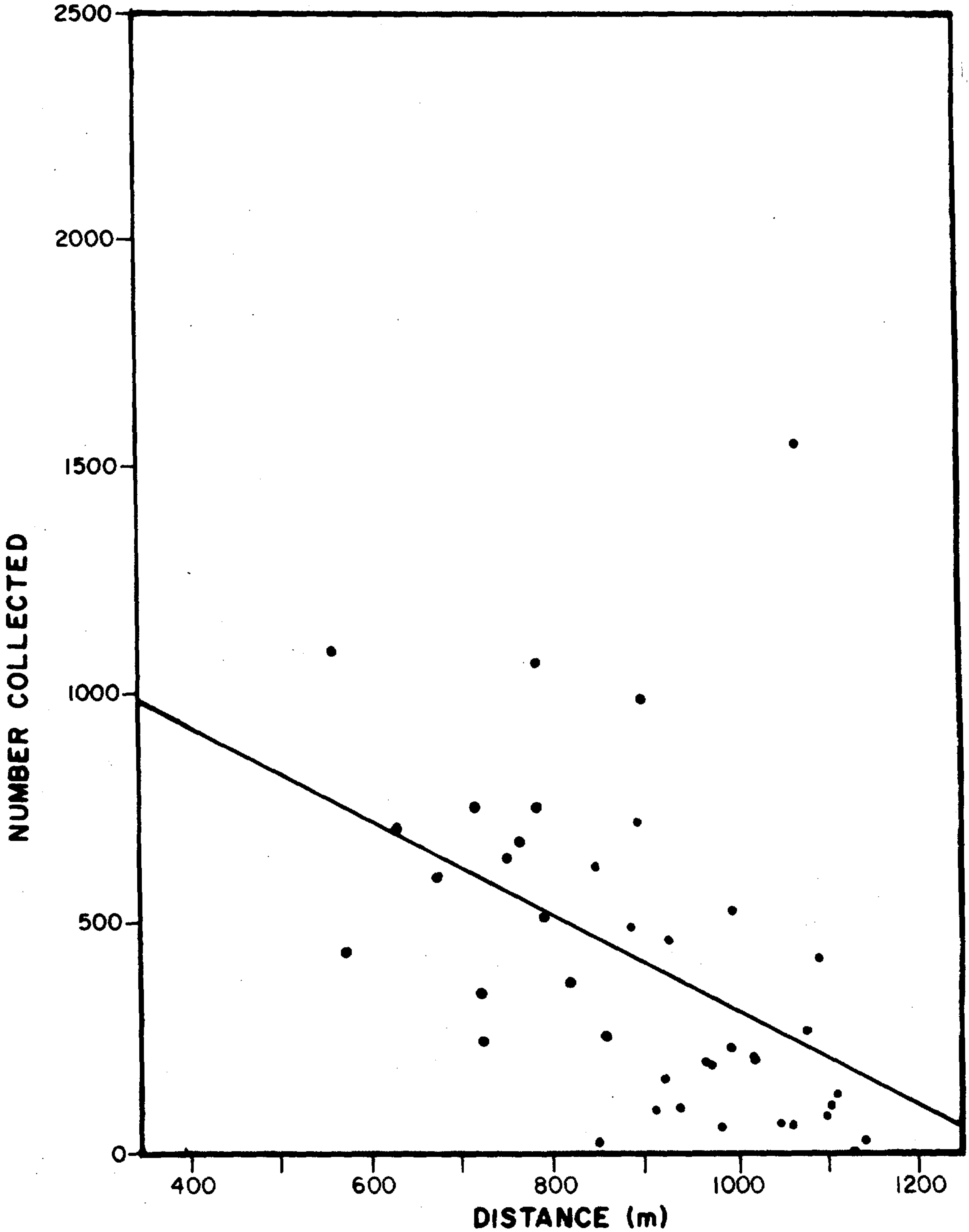


FIGURE 3.0-2

TOTAL NUMBER OF WHITE PERCH COLLECTED IN BOTTOM TRAWLS
— CONSTANT TIME —

Roseton and Danskammer Point Vicinity — 1980

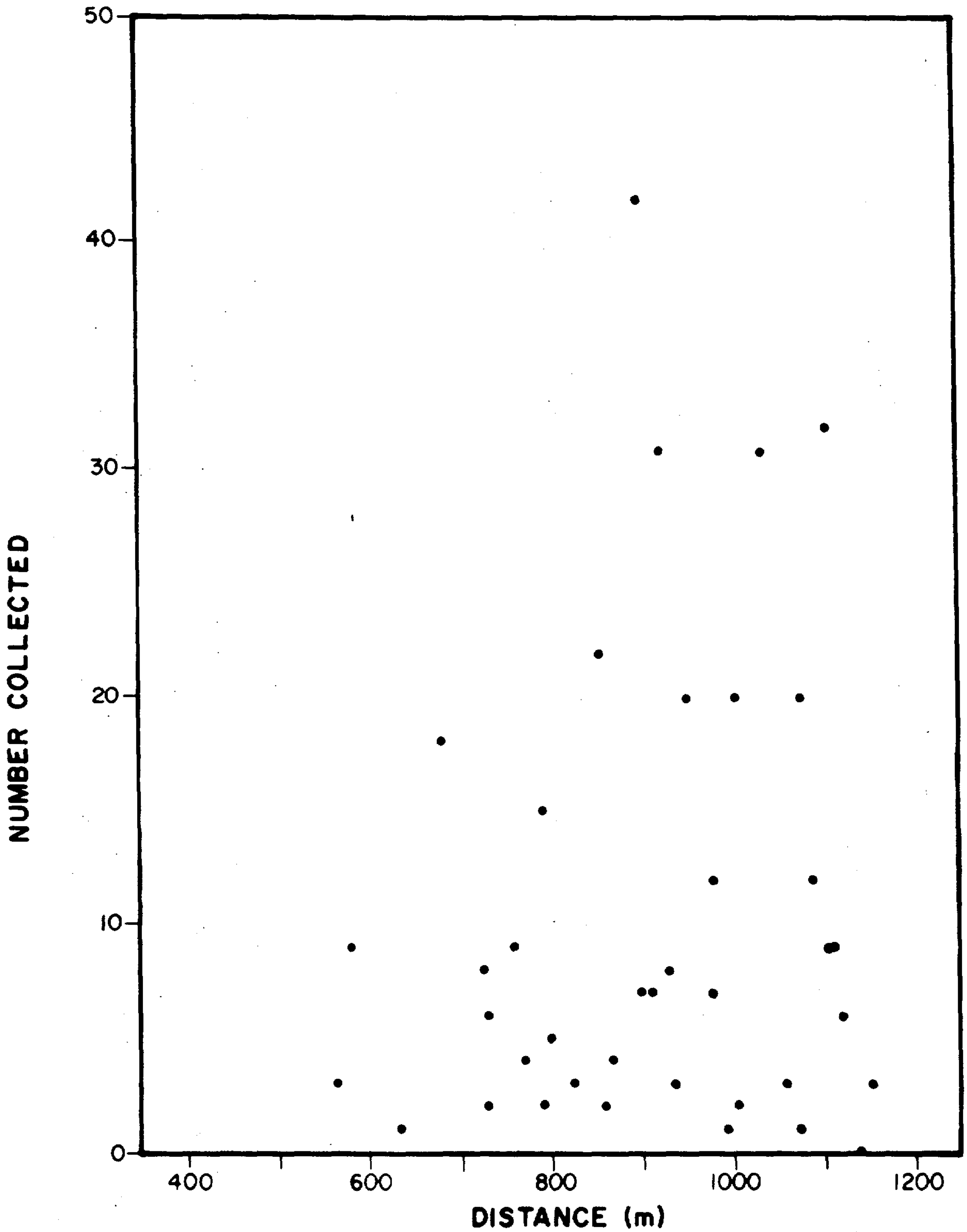


FIGURE 3.0-3

TOTAL NUMBER OF ATLANTIC TOMCOD COLLECTED IN BOTTOM TRAWLS - CONSTANT TIME -

Roseton and Danskammer Point Vicinity — 1980

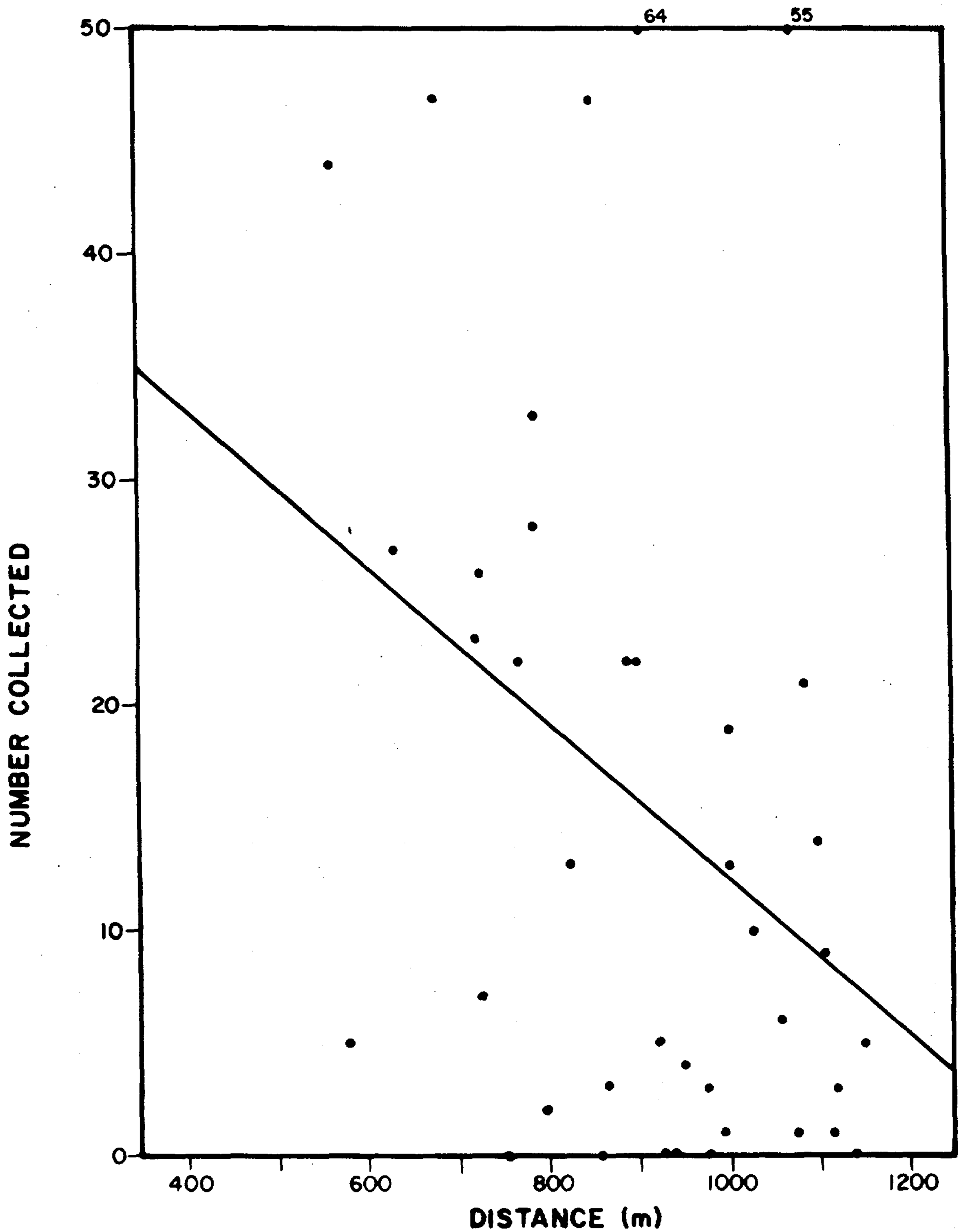


FIGURE 3.0-4

TOTAL NUMBER OF HOGCHOKER COLLECTED IN BOTTOM TRAWLS
- CONSTANT TIME -

Roseton and Danskammer Point Vicinity — 1980

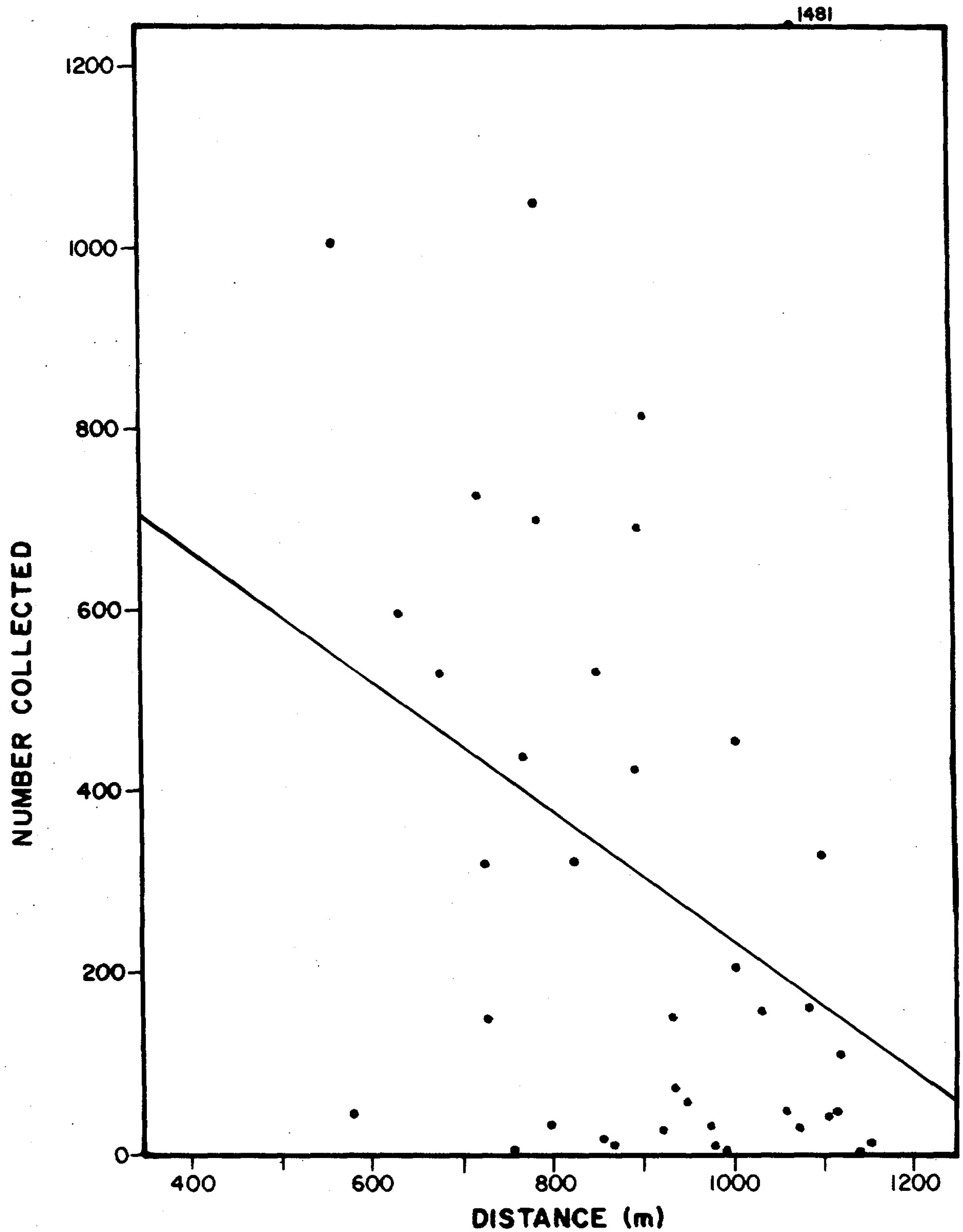
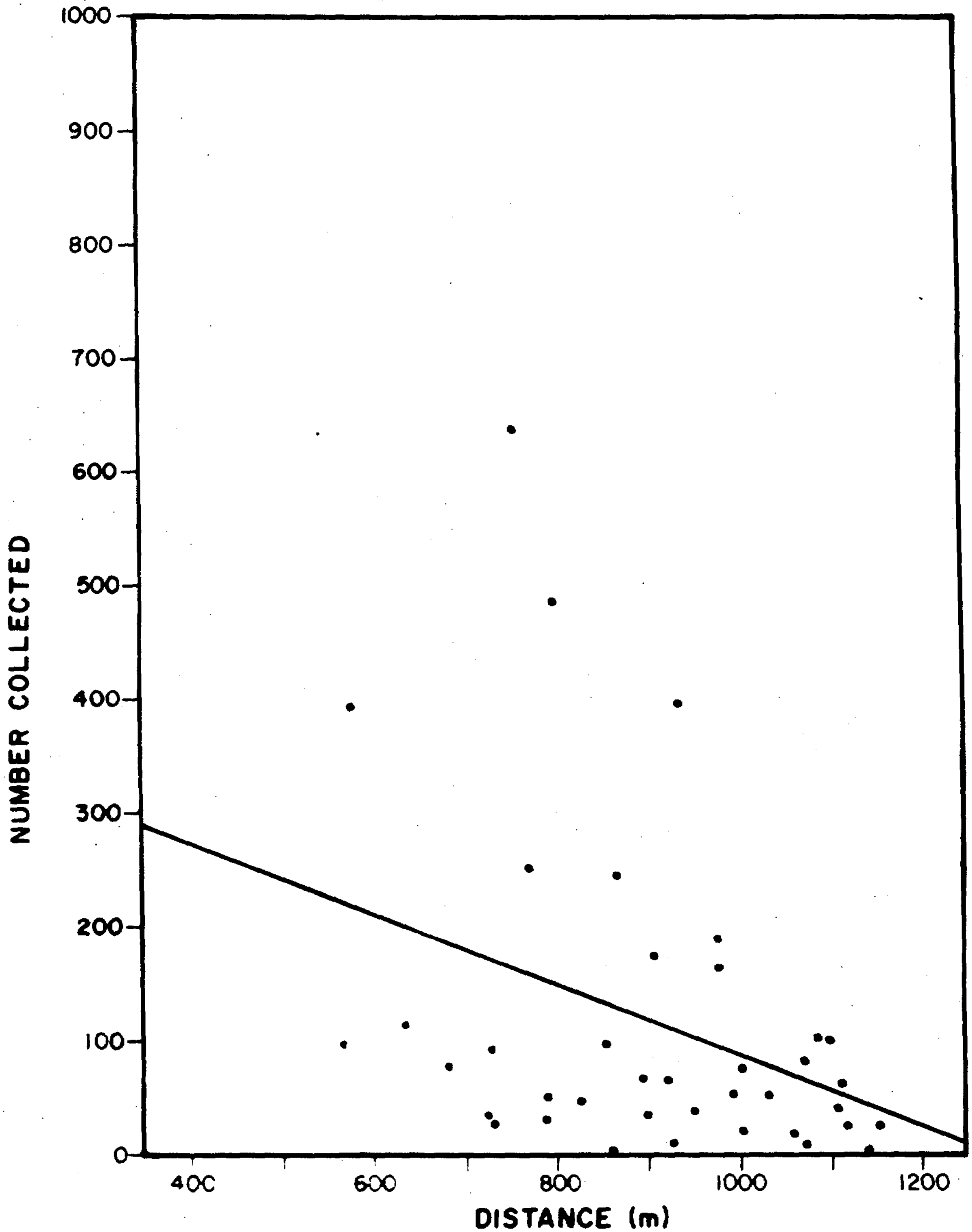


FIGURE 3.0-5

TOTAL NUMBER OF FISH[a] COLLECTED IN BOTTOM TRAWLS - CONSTANT TIME -

Roseton and Danskammer Point Vicinity — 1980



[a]Without hogcoker.

TABLE 3.0-3

TOTAL NUMBER OF FISH AND SELECT SPECIES COLLECTED IN BOTTOM TRAWLS - CONSTANT DISTANCE[a] -

Roseton and Danskammer Point Vicinity - 1980

DATE	DURATION (m)	SPECIES: WHITE PERCH	ATLANTIC TOMCOD	HOGCHOKER	BLUEBACK HERRING	BAY ANCHOVY	TOTAL FISH	TOTAL FISH[b]
21 Oct	18	24	0	198	0	0	226	28
	13	43	0	118	2	0	175	57
	16	27	6	128	0	0	165	37
	18	17	8	142	1	0	174	32
	17	13	16	300	0	1	339	39
	17	1	1	25	47	5	82	57
	21	0	38	446	0	0	489	43
	13	7	5	11	0	5	35	24
	16	0	22	229	2	0	255	26
	22	5	48	476	3	2	536	60
	14	12	9	245	0	1	267	22
	9	1	19	279	8	2	309	30
22 Oct	12	25	5	118	0	0	159	41
	11	26	13	29	89	0	161	132
	10	20	0	27	0	1	48	21
	9	90	8	48	0	0	148	100
	18	34	8	102	0	0	146	44
	21	5	16	110	1	0	137	27
	9	2	15	74	15	0	107	33
	19	5	23	140	12	0	184	44
	13	23	9	85	0	0	119	34
	20	10	19	70	1	3	118	48
	17	9	32	149	35	1	229	80
	21	4	23	207	11	2	254	47
	17	8	65	236	0	5	323	87
	18	7	6	46	0	0	62	16
	17	0	17	577	7	0	602	25
	21	24	14	193	0	7	249	56
	16	24	11	150	0	0	186	36
	23	8	45	154	425	46	690	536
23 Oct	21	10	14	123	0	2	153	30
	11	40	7	73	39	1	163	90
	10	26	18	76	52	4	182	106
	15	21	36	118	75	2	261	143
	28	4	34	122	26	0	190	68
r		-0.444[c]	0.447[c]	0.316[d]	0.178	0.261	0.373[c]	0.173
slope		-1.686	1.466	8.873	0.011	0.154	12.186	
y-intercept		43.9	-6.5	15.9	16.0	15.9	27.6	

[a]Constant distance equals 823.9 meters.
[b]Without hogchoker.
[c]Significant at $\alpha = .05$.
[d]Significant at $\alpha = .10$.
r - correlation coefficient.

exception of white perch, which had a significant negative correlation. The positive correlations indicate larger numbers of fish collected with increasing trawl duration when distance towed and velocity through the water are constant. The negative correlation for white perch indicates fewer fish collected with increasing duration. The correlation, r, between trawl duration and number of hogchokers was not significant at α = .05; however, r was significant at α = .10.

As for constant time trawls, the data for constant distance trawls were plotted and a least squares regression line fit for data with significant correlations (Figures 3.0-6 to 3.0-10). Although blueback herring was the second most numerous species, it was not graphed because of the irregular catches. A regression line was fit for hogchokers since the data were significant at α = .10. The slopes for the total catch, Atlantic tomcod, and hogchoker graphs are positive; white perch data have a negative slope.

FIGURE 3.0-6

TOTAL NUMBER OF FISH COLLECTED IN BOTTOM TRAWLS - CONSTANT DISTANCE -

Roseton and Danskammer Point Vicinity — 1980

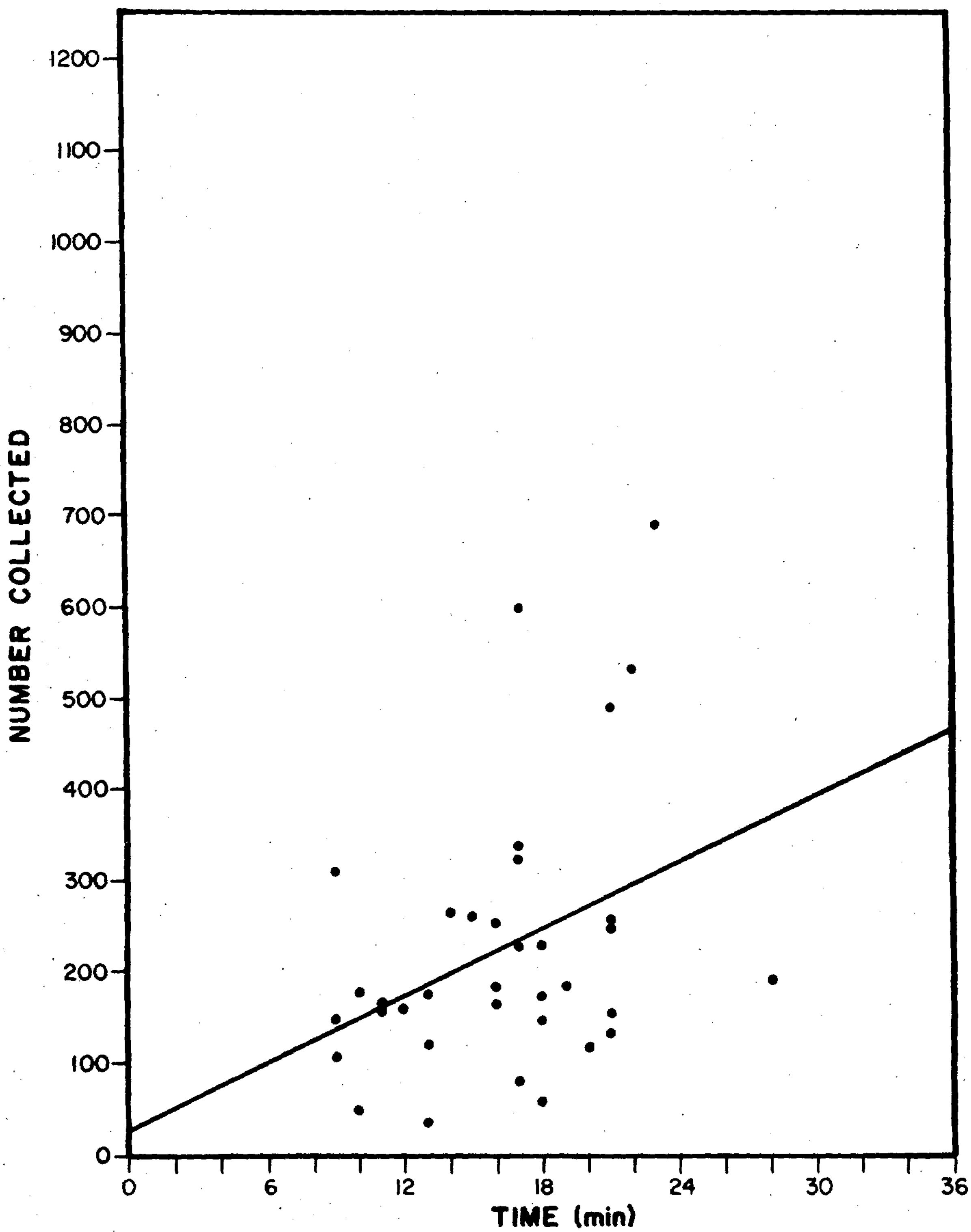


FIGURE 3.0-7

TOTAL NUMBER OF WHITE PERCH COLLECTED IN BOTTOM TRAWLS — CONSTANT DISTANCE —

Roseton and Danskammer Point Vicinity — 1980

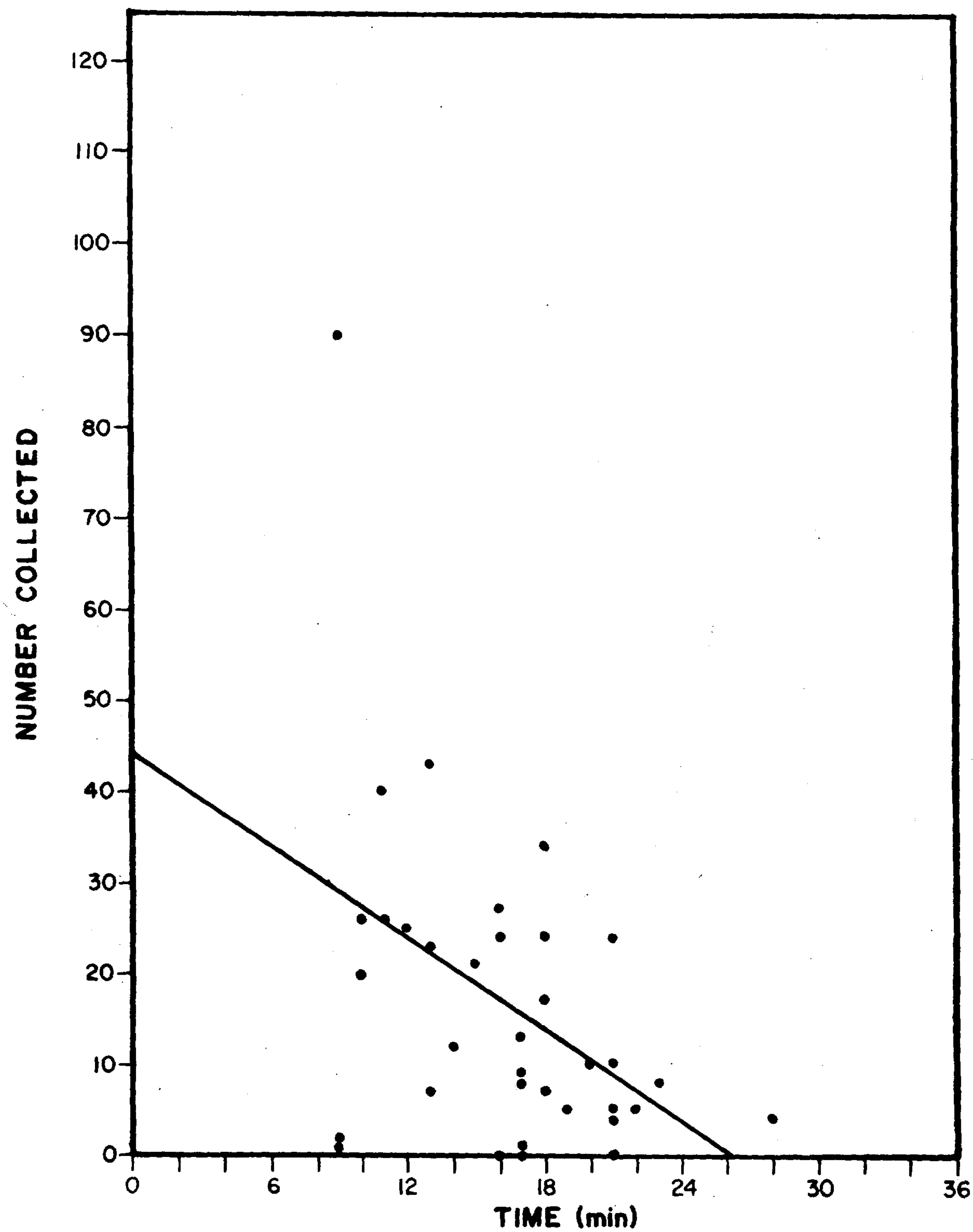


FIGURE 3.0-8

TOTAL NUMBER OF ATLANTIC TOMCOD COLLECTED IN BOTTOM TRAWLS - CONSTANT DISTANCE -

Roseton and Danskammer Point Vicinity — 1980

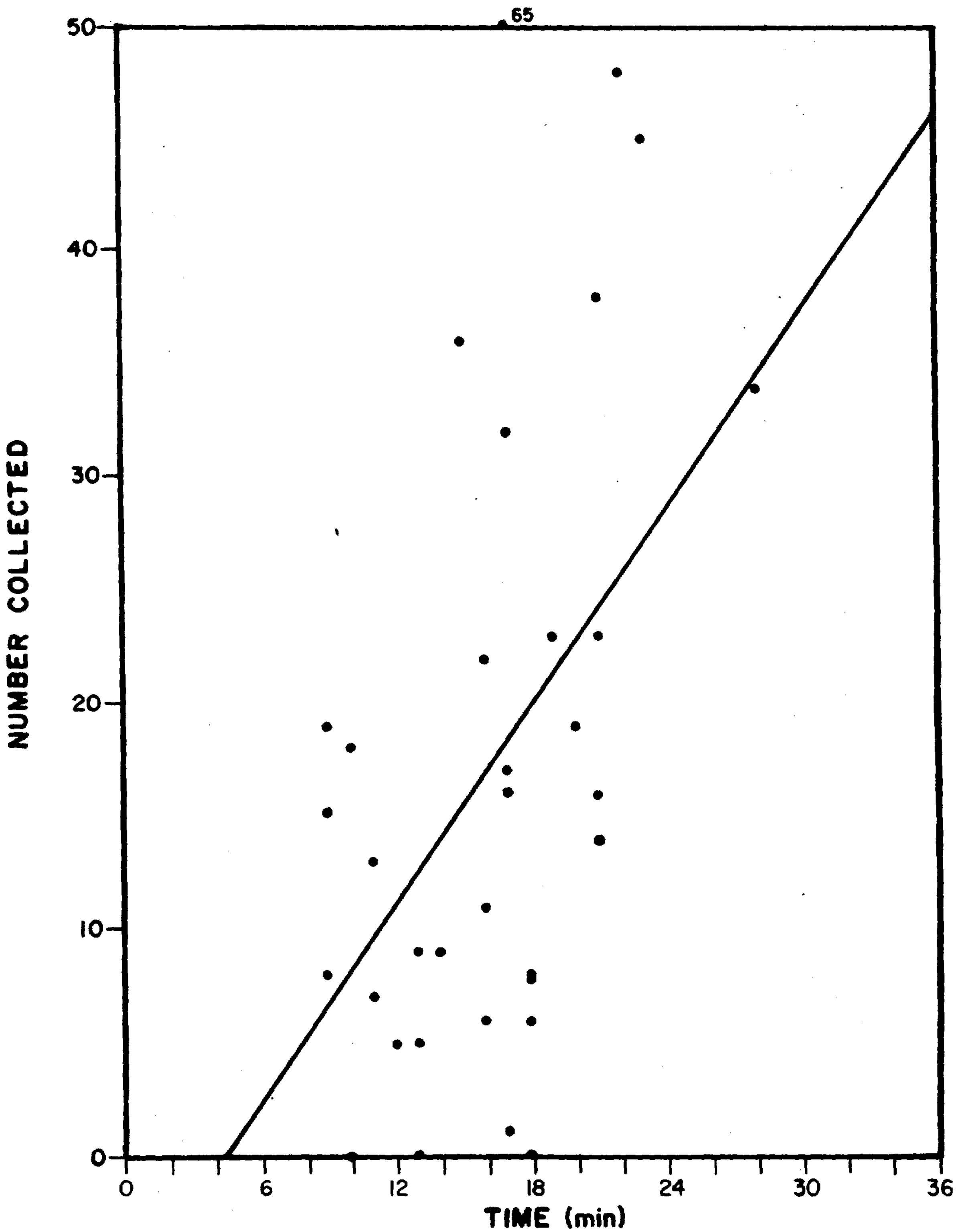


FIGURE 3.0-9

TOTAL NUMBER OF HOGCHOKER COLLECTED IN BOTTOM TRAWLS - CONSTANT DISTANCE -

Roseton and Danskammer Point Vicinity — 1980

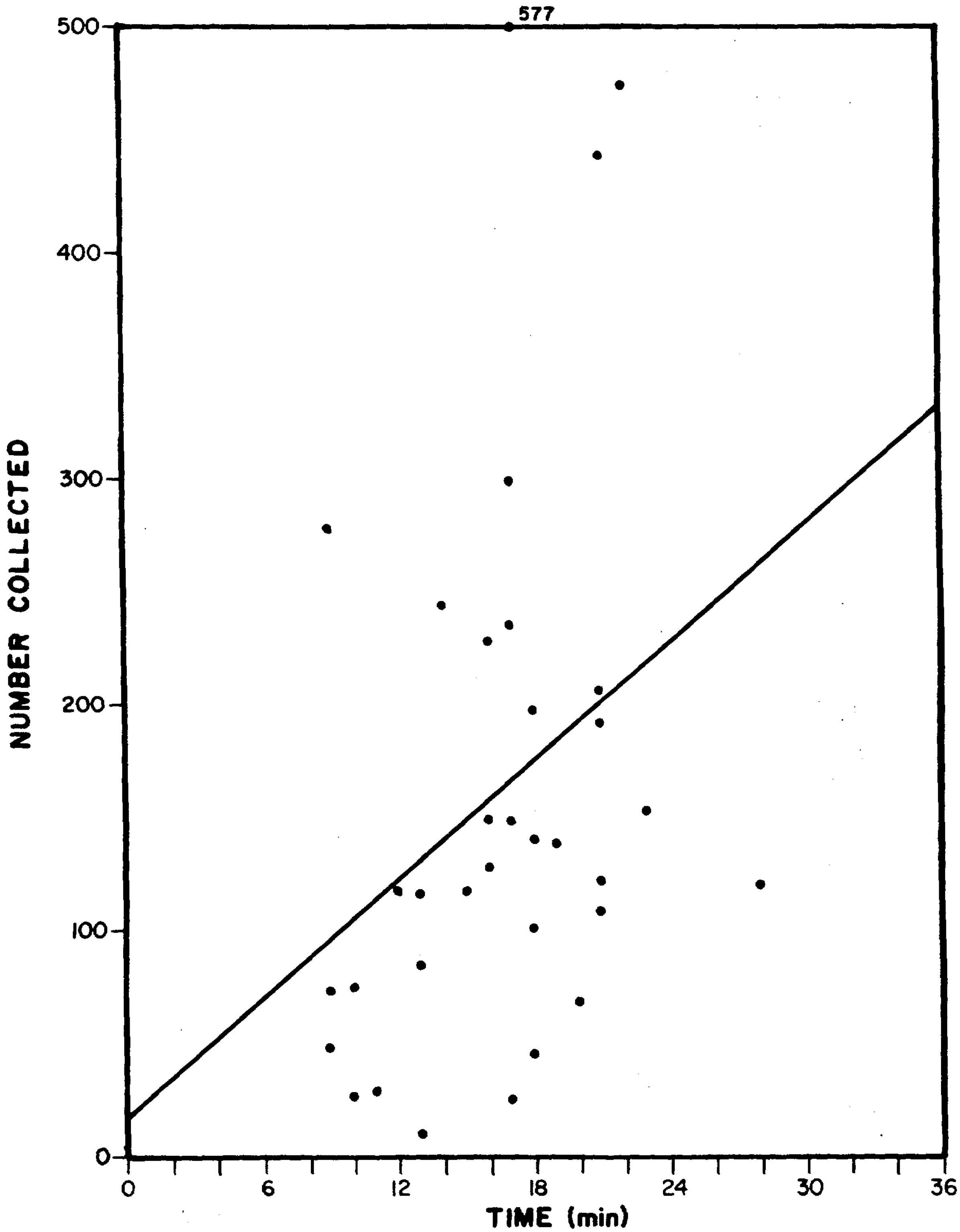
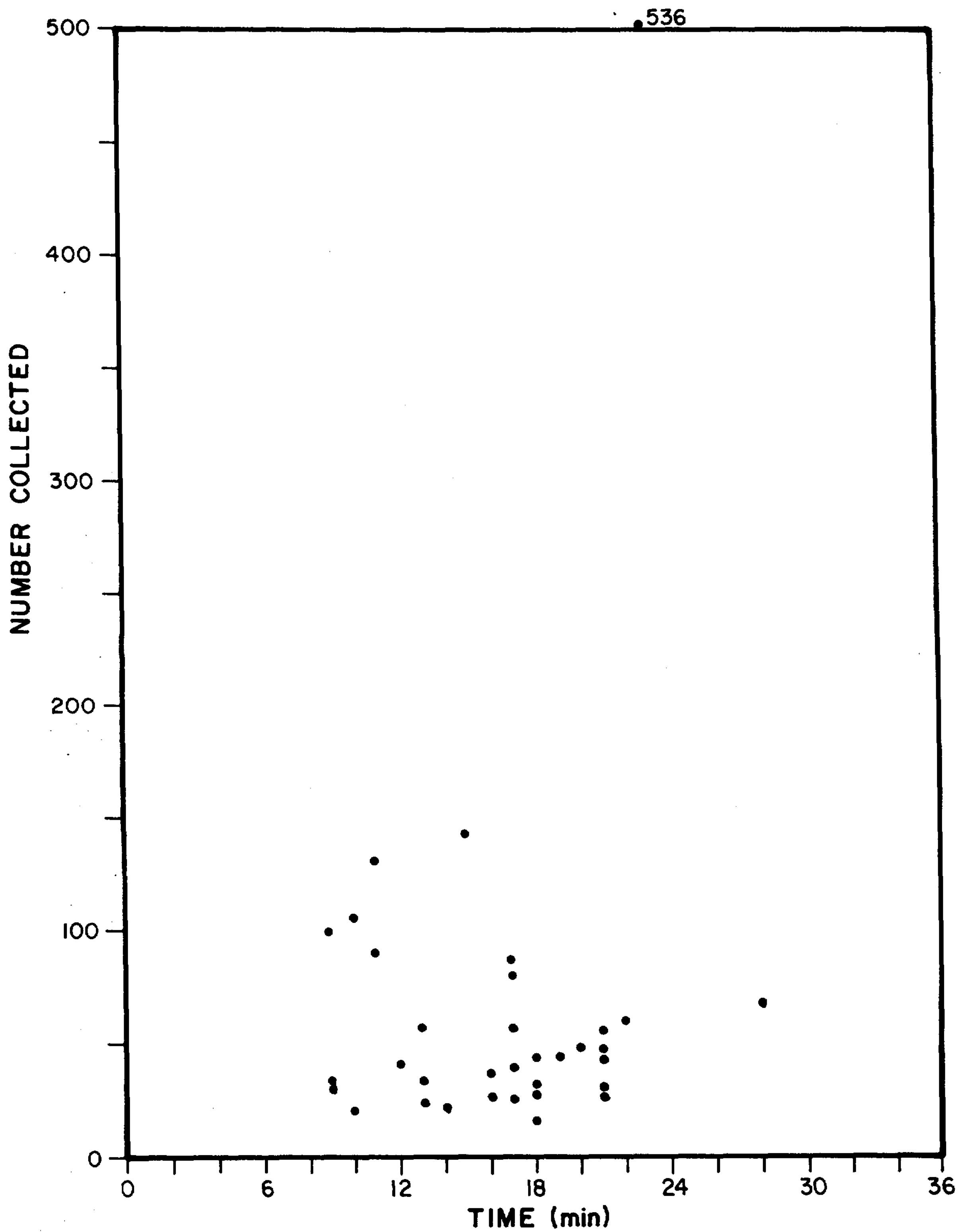


FIGURE 3.0-10

TOTAL NUMBER OF FISH COLLECTED IN BOTTOM TRAWLS - CONSTANT DISTANCE -

Roseton and Danskammer Point Vicinity - 1980



CHAPTER 4.0

DISCUSSION

The significant correlations demonstrate that for constant time trawls, there is a fairly weak negative relationship between the two variables tested, distance and number of fish collected. For constant distance trawls, there is a weak positive relationship between the variables time and number of fish collected.

The constant time trawl data produced significant negative correlations (negative slope) for distance towed and total fish, Atlantic tomcod, and total fish without hogchoker; and a positive, non-significant correlation for white perch. The correlations and slopes for the constant distance trawls were the opposite sign of the time trawls. That is, the negative slopes for the species collected for time trawls had corresponding positive slopes for the distance trawls.

Upon further examination, a similarity between the slopes of the time and distance trawls is apparent. For the constant time trawls, the distance range was achieved by trawling at different stages of the tidal cycle. The longer distances were during slack or close to slack conditions. The shorter distances were during maximum ebb or flood tidal stages. The speed over the bottom during the longest trawls was therefore the fastest, and speed over the bottom during the shorter trawls was the slowest. The negative correlation (or slope) can thus be interpreted as fewer fish collected with increasing speed over the bottom or more fish when opposing current velocities are high.

The constant distance trawls indicate the same pattern. The shortest durations were during the slowest tidal stages; correspondingly, these trawls were the fastest over the bottom. The longest durations were during the maximum velocity of the tidal cycle and were the slowest over the bottom. A positive correlation (or slope) indicates fewer fish collected with increasing speed over the bottom.

For both time and distance trawls, Atlantic tomcod and hogchoker were collected in fewer numbers with increasing speed. This relationship was not evidenced for white perch. Atlantic tomcod and hogchokers are bottom species, the former principally occupying the epibenthic zone, feeding on benthic organisms, the latter living on the bottom substrate, typical of flatfish species. White perch are generally most concentrated at the bottom water strata, but do occupy all regions of the water column and undergo diel vertical migrations (LMS 1980).

The fact that the bottom-dwelling species (hogchoker and Atlantic tomcod) were collected in fewer numbers at higher speeds suggests that the trawl is rising off the substrate with increasing trawl speed over the bottom. Although the boat speed was constant as measured at the surface, this was not necessarily the same through-water velocity as the trawl at the bottom. The water velocity at the bottom is considerably less than at the surface, depending on the type of substrate (Schureman 1934).

This means that even though the boat velocity at the surface was a constant 130 cm/sec, the trawl velocity through the water at the bottom increased as the trawl speed over the bottom increased. The otter trawl doors are designed to maintain the trawl on the bottom; however, at higher speeds, the chain line may have lifted off the substrate, allowing the fish species to pass under the trawl. Nevertheless, white perch were still collected, presumably because they occupy a slightly higher position in the water column.

An alternative explanation for these results is that the bottom fish species (hogchoker, Atlantic tomcod) have greater avoidance capabilities when the net is moving rapidly over the bottom (during low opposing current velocities). The corollary, decreased avoidance capabilities when the net is towed more slowly over the bottom, would also be indicated. This may be because the fish have better perception of the net when it moves rapidly toward them. The slower moving net is not detected as well.

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#8

OPTIMUM DEPLOYMENT AND RELATIVE CATCH EFFICIENCY OF A 3 M BEAM TRAWL FOR QUANTITATIVE FISHERIES SAMPLING IN THE HUDSON RIVER ESTUARY

Prepared under contract with

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OPTIMUM DEPLOYMENT AND RELATIVE CATCH EFFICIENCY OF A 3 M BEAM TRAWL FOR QUANTITATIVE FISHERIES SAMPLING IN THE HUDSON RIVER ESTUARY

ABSTRACT

Analysis of variance models were used to evaluate optimum deployment conditions for a 3-meter beam trawl and compare densities of fish estimated by the beam trawl when optimally deployed with fish densities estimated by a 1.0 m^2 epibenthic sled. Optimum deployment was empirically defined as the fastest towing speed and longest distance towed at which area sampled per tow could be measured with reasonable accuracy and precision. Factors considered in the optimum deployment model included towing speed, distance towed, and tow direction with respect to water currents. Tows were made across fixed distances, and for each tow, measurements were made of distance traveled along the bottom by odometer wheels mounted on both sides of the beam.

Gear performance was significantly affected by all three factors considered in this study. When tows were made against the water current, measurements of distance traveled were reasonably accurate. For tows taken with the water current, the beam trawl lifted off the river bottom and significantly under-estimated the area fished. This underestimate was more pronounced for 900 m tows than for 450 m tows and at a relatively fast towing speed (2.0 m . sec^{-1}) than at slow speeds (1.2 or 1.5 m . sec^{-1}).

Bottom speed was more closely related to gear performance than to towing speed through water. At bottom speeds greater than 1.6 m . sec^{-1}, the beam trawl did not maintain sufficient contact with the substrate to accurately measure the area sampled. Since bottom speeds

greater than 1.6 m . sec^{-1} were generally exceeded towing with the current, optimum deployment was selected as a 900 m tow at a speed through the water of between 1.5 - 2.0 m . sec^{-1} against the current.

Significant differences in densities for selected, abundant fish species (lifestages) were not, however, observed for any of the factors affecting gear performance. Therefore, beam trawl tows at any combination of towing speed, distance, and direction which did not exceed a bottom speed of 1.6 m . sec^{-1} should be equally effective catching fish.

Sampling during September 1980 at night in the Tappan Zee and Croton-Haverstraw regions of the Hudson River estuary, the 3-meter beam trawl (3.8 cm stretch mesh net, 6000 μm mesh liner in the cod end, 10 minute tow at 1.5 m • sec^{-1} against the current) caught more species of fish and more yearling and older fish than the 1.0 m^2 epibenthic sled (3000 μm mesh net, 5 minute tow, 1.5 m • sec^{-1}, against the current). Relative catch efficiency was species specific, however, and may have reflected selectivity of the beam trawl mesh. ANOVA models on densities of selected, abundant fish species by lifestage indicated that, except for bay anchovy young-of-the-year, the beam trawl estimated significantly higher densities than the epibenthic sled. Striped bass (young-of-the year) and white perch (yearling and older) densities were, respectively, 9 and 38 times higher in the beam trawl than in the epibenthic sled. The sled may have caught more bay anchovies than the trawl because these relatively small fish were extruded or escaped through the 3.8 cm (stretch) mesh netting in the body of the beam trawl.

INTRODUCTION

The capture efficiency of a quantitative fishing gear is affected by: 1) the success of gear design and deployment techniques in minimizing avoidance by fish and 2) the probability of the gear encountering fish. Increasing towing speed and mouth size were hypothesized to reduce avoidance and increase catch efficiency (Barkley, 1972; Clutter and Anraku, 1968). Empirical observations by Texas Instruments Incorporated (TI, 1980) supported Barkley's hypothesis and demonstrated that a 1.0 m^2 epibenthic sled was not towed fast enough to show a significant ($p \leq 0.05$) increase in catch efficiency of young-of-the-year (YOY) fish at towing speeds between 0.7 and 2.3 $m \cdot sec^{-1}$. Higher night catches compared to day catches have also been attributed to low light levels reducing the detection/avoidance ability of the fish (Clutter and Anraku, 1968).

The probability that a gear will encounter fish is related primarily to the size of the gear, the length of the tow and the degree of patchiness in the fish population. Long tows with a large gear often catch proportionally more organisms and have lower variance about the mean catch than short tows with small gear (Wiebe, 1971, 1972). One consequence of taking short tows with a small-mouthed gear may be a relatively high frequency of zero catches and an underestimate of population abundance.

The objective of this study was to: 1) empirically determine optimum deployment conditions for a 3-meter beam trawl and 2) compare the beam trawl, when optimally deployed, with a 1.0 m^2 epibenthic sled, deployed as described in TI (1980). Optimum deployment was operationally defined as the fastest towing speed and longest tow which provided the most accurate and precise measure of the sampling unit and of fish density. By comparing fish density from the beam trawl with density estimates from the epibenthic sled, a measure of relative catch efficiency was obtained.

In this study, capture efficiency was considered to encompass both fishing gear design and deployment techniques. If one fishing gear estimated significantly higher fish densities than the other while both sampled the same habitat over the same time period, then the gear estimating the highest density was more efficient. The mechanisms(s) responsible for differences in capture efficiency were not studied, because gear design and deployment techniques were not completely separated in the experimental design.

METHODS

The 3-meter beam trawl (modified from Carey and Heyamoto, 1972) consisted of a trawl net attached to a 3-meter beam with bicycle-like odometer wheels mounted on each end of the beam (Figure 1). Left and right odometer wheels were used to measure the distance the trawl made contact with the substrate and to estimate area sampled. A General Oceanics, Inc. (G.O.) digital flowmeter was also mounted between the head rope and foot rope (sweep, Figure 1) of the beam trawl to estimate sample volume. Stops on the beam trawl (Figure 1) prevented odometer wheels from turning when lifted off the bottom. Since uneven substrate conditions and strong currents could result in odometer differences between the left and right wheels, (Carney and Carey, 1980), the highest odometer reading was used to measure distance and estimate the bottom area (m^2) sampled.

Two phases of sampling were conducted in the last three weeks of September 1980 (Table 1). In Phase 1, optimum deployment of the 3-meter beam trawl was evaluated in daytime sampling on a fixed distance course in the Tappan-Zee region of the Hudson River (Figure 2). In the first part of Phase 1 (8-12 September 1980), towing speed and tow distance were evaluated as two factors affecting optimum deployment. In the second part of Phase 1 (22-26 September 1980), a third factor, tow direction with respect to water currents, was added to the design. In Phase 2 (15-19 September 1980) the beam trawl and a 1.0-m^2 epibenthic sled (Figure 3) were compared in night sampling at randomly selected stations in the Tappan-Zee and Croton-Haverstraw regions of the Hudson

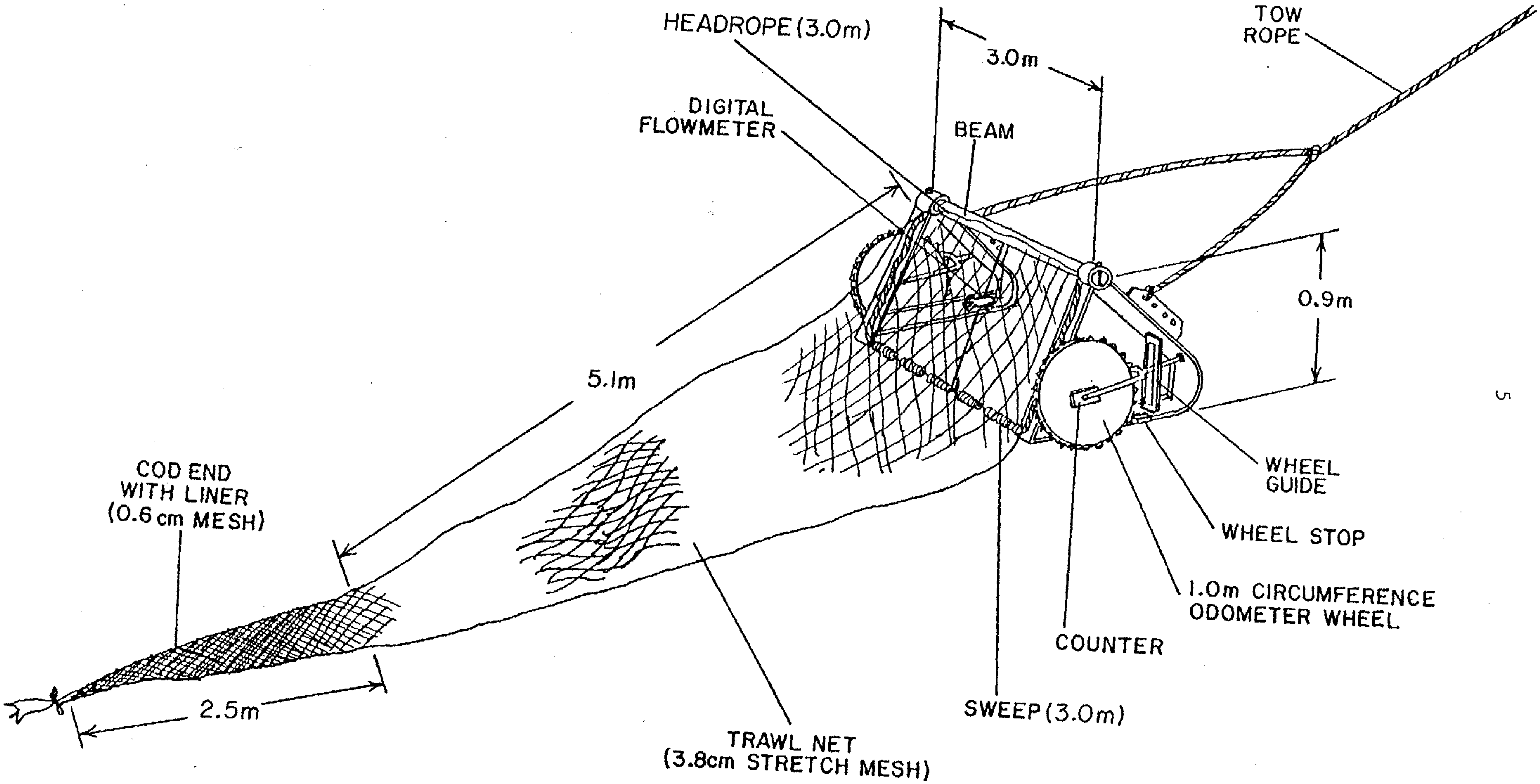

Figure 1. 3-Meter Beam Trawl.

TABLE 1. EXPERIMENTAL DESIGN FOR EVALUATING OPTIMUM DEPLOYMENT OF THE 3-METER BEAM TRAWL (PHASE 1) AND COMPARING THE BEAM TRAWL WITH A 1.0 m^2 EPIBENTHIC SLED (PHASE 2) IN THE HUDSON RIVER ESTUARY, SEPTEMBER 1980.

Phase 1 a) 8-12 September 1980

	Distance Towed (m)	Towing Speed ($m.sec^{-1}$)		
		1.2	1.5	2.0
Daytime Sampling Number of Tows = 36 (2 distances x 3 speeds x 6 replicates)	450	6	6	6
	900	6	6	6

Phase 1 b) 22-26 September 1980

Daytime Sampling
Number of Tows = 35 (1 void)
(2 distances x 3 speeds x 2 directions x 3 replicates)

Distance Towed (m)	Tow Direction	Towing Speed ($m \cdot sec^{-1}$)		
		1.2	1.5	2.0
450	With current	3	3	3
	Against current	3	3	3
900	With current	3	2	3
	Against current	3	3	3

Phase 2 15-19 September 1980

Night Sampling
Number of Tows = 85
(2 gear x 2 river regions)

Gear and Deployment	River Region Sampled	
	Tappan Zee	Croton-Haverstraw
Beam Trawl (10 minute tows at 1.5 $m.sec^{-1}$ towing against river current)	31	9
Epibenthic Sled (5 minute tows at 1.5 $m.sec^{-1}$ towing against river current)	31	14

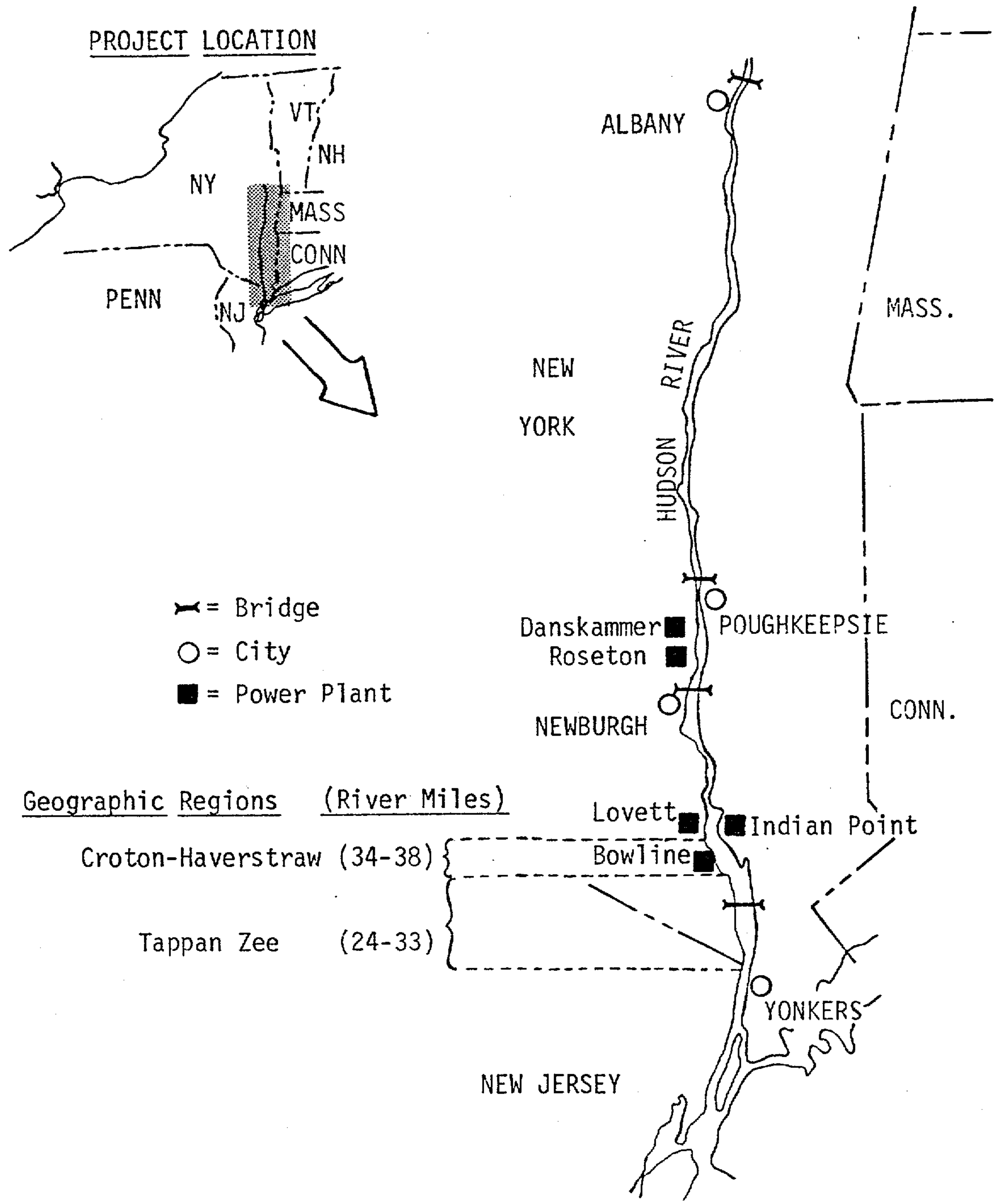

Figure 2. Tappan Zee and Croton-Haverstraw sampling regions in the Hudson River estuary, respectively 24-33 and 34-38 miles up river from the Battery at New York City.

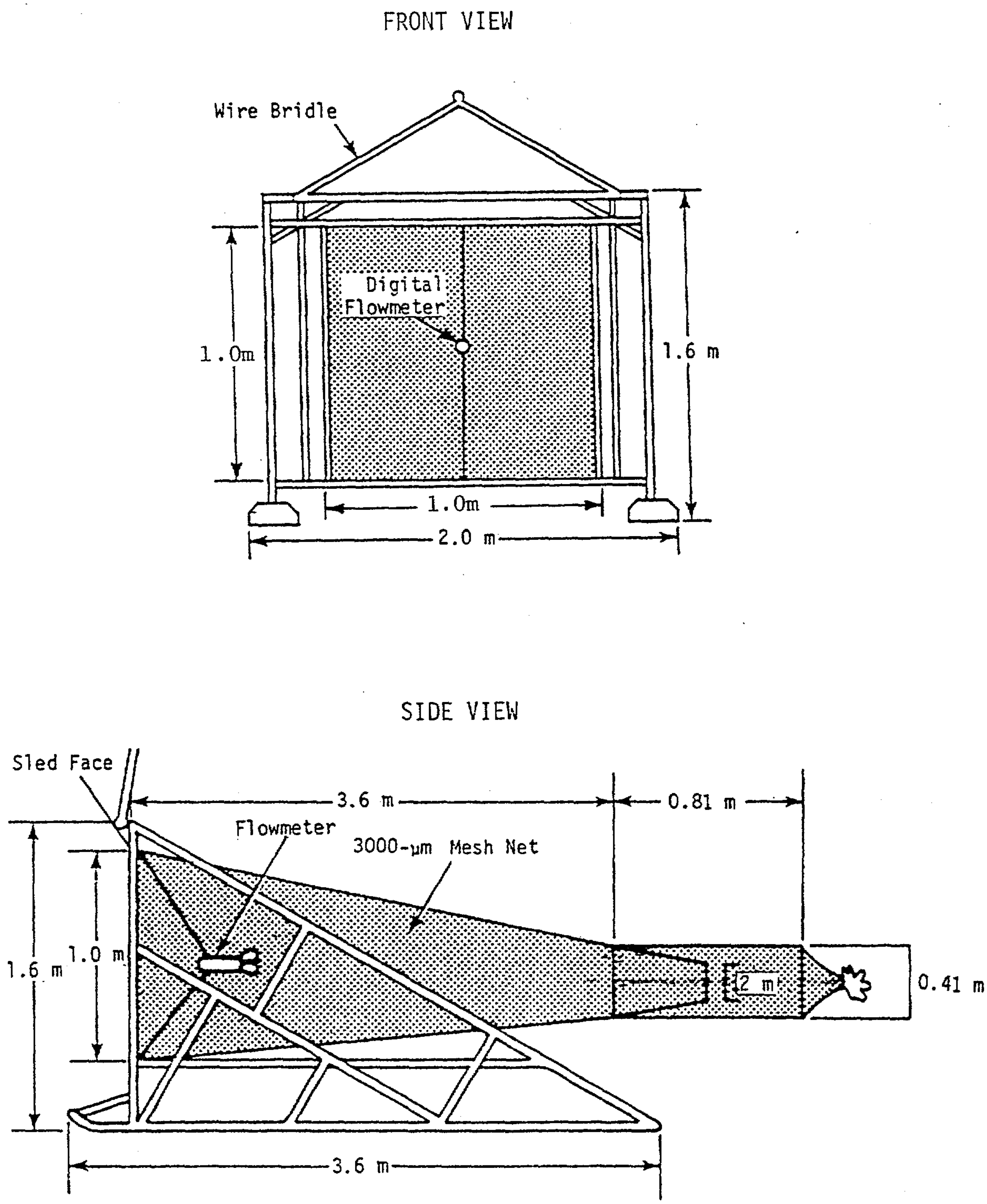

Figure 3. 1.0-m^2 Epibenthic Sled.

River, respectively, 24 through 33 and 34 through 38 miles upriver from the Battery in New York City (Figure 2).

Fish collected were identified and enumerated into length classes. Seasonally adjusted YOY cut-off lengths (Appendix Table 1), empirically determined by TI (1981a), were used to differentiate between YOY, yearling, and older fish. Both the beam trawl and epibenthic sled were relatively small gear and likely to catch primarily YOY fishes; therefore, densities, expressed as N . 1000 m^{-3} (and as N . 1000 m^{-2} for trawl only), were calculated separately for YOY and older fish categories.

In the first part of Phase 1, two distances (450 m and 900 m between fixed buoys) and three towing speeds (measured through the water with a G.O. electronic flowmeter at 1.2, 1.5 and 2.0 m . sec^{-1}) were evaluated. Both distance and towing speed were randomized in a 2 x 3 analysis of variance (ANOVA) model with 6 replicates and a total of 36 tows. The response variable, relative distance sampled, was defined as the distance measured by the highest odometer wheel reading divided by the known distance between buoys. Captured fish were not enumerated since the objective of this part of Phase 1 was to evaluate the response variable (relative distance sampled) for the beam trawl alone, given various combinations of towing distance and speed. Results of the ANOVA (Appendix Table 2) indicated a speed of 1.5 m . sec^{-1} and a distance of 900 m were optimum, but field observations suggested a third factor, tow direction with respect to water currents, would account for additional variation in the model.

In the second part of Phase 1, which was conducted from 22 through 26 September, a three factor ANOVA model evaluated the performance of the beam trawl in daytime sampling over a fixed distance course. In addition to distance and speed, tow direction (with or against water currents) was added as a variable and fish densities were recorded for 35 tows (2 distances x 2 directions x 3 towing speeds x 3 replicates = 36 tows; one tow was void, leaving 2 replicates in the 900 m, with, 1.5 m . sec^{-1} cell). Response variables for this ANOVA model were relative distance, bottom speed (speed of the beam trawl along the river bottom), and density of selected, abundant fish species. Fish densities were transformed as $Log_{10}(X + 1) + 10$ to eliminate variance heterogeneity (as indicated by Taylor's Power Law, Green, 1979; Appendix Table 3).

In Phase 2, 15 through 19 September, the beam trawl and a 1.0 m^2 epibenthic sled (Figure 3) were compared in night sampling at randomly selected stations in the Tappan Zee and Croton-Haverstraw regions of the Hudson River (Figure 2). The beam trawl was towed at 1.5 m . sec^{-1} for 10 minutes (to approximate a 900 m tow) against the current while the epibenthic sled was towed at 1.5 m . sec^{-1} for 5 minutes against the current.

Two boats, the CELIA THAXTER and the WOODY I, were used to deploy the fishing gear in Phase 2. Each gear was randomly assigned to a boat on a particular day of the week, and the boats proceeded to sample a random sequence of shoal sites in the two river regions. Sampling was conducted independently by each boat on each night and no attempt was made to sample sequentially. Pairing of gear and boats at each sampling site was not attempted, since it was not found to be effective in reducing sampling variation in previous studies (TI, 1980). A total of 31 sled and 31 trawl samples were collected in the Tappan Zee region; whereas, 14 sled and 9 trawl samples were collected from the Croton-Haverstraw region.

A two factor ANOVA model (unbalanced) was used in Phase 2 to compare densities of selected, abundant YOY and older fish caught by both gear in the two river regions. The response variable (N . 1000 m^{-3}) was transformed by $Log_{10}(X + 1) + 10$ since a Log_{10} transformation was indicated by Taylor's Power Law (Green, 1979) to satisfy the assumptions of ANOVA (Appendix Table 4).

Data analyses were performed using the SAS (Helwig and Council, 1979) statistical package.

RESULTS

Optimum Deployment of Beam Trawl

Beam trawl performance was significantly affected by all three factors considered in Phase 1b of the study. ANOVA models for optimum deployment of the beam trawl were highly significant ($p \leq 0.0001$). Three way interactions were also significant for both relative distance ($p \leq 0.0006$, Table 2) and bottom speed ($p \leq 0.0282$, Table 3).

Relative distance should equal 1.0 if the beam trawl pacer wheels had made continuous contact with the substrate and accurately estimated the pre-measured distance. Relative distance values less than 1.0 indicate the gear made less contact with the substrate, while values greater than 1.0 indicate the pacer wheels turned in mid-water or when not in contact with the substrate. The significant three-way interaction indicated beam trawl performance was highly dependent on towing direction with respect to water currents, towing speed and distance (Figure 4). For all towing speeds at both distances, the beam trawl made sufficient contact with the substrate to accurately measure tow distance (area) when towed against water currents (relative distance = 1.0; except for 2.0 $m \cdot sec^{-1}$, 900 m, Appendix Table 5). When towed with the direction of water flow, however, accuracy (and precision) of measured distance decreased with increasing towing speed and tow distance (Figure 4, Appendix Table 5). The gear apparently lifted off the river bottom and underestimated sample area as towing speed approached 2.0 $m \cdot sec^{-1}$. The underestimate was more pronounced for 900 m tows than for 450 m tows.

TABLE 2. 2x2x3 ANALYSIS OF VARIANCE (ANOVA) ON RELATIVE DISTANCE* MEASURED BY 3.0 METER BEAM TRAWL PACER WHEEL, 22-26 SEPTEMBER 1980. MAIN FACTORS WERE TOW DIRECTION WITH RESPECT TO RIVER CURRENT, TOW DISTANCE, AND BOAT SPEED THROUGH WATER.

SOURCE	df	SS	MS	F	p>F
Model	11	1.049	0.095	20.03	0.0001
Distance	1	0.047		9.85	0.0046
Speed	2	0.354		37.23	0.0001
Direction	1	0.214		44.89	0.0001
Distance x Speed	2	0.082		8.56	0.0017
Distance x Direction	1	0.032		6.77	0.0160
Speed x Direction	2	0.199		20.92	0.0001
Distance x Speed x Direction	2	0.099		10.35	0.0006
Error	23	0.109	0.005		
Total	34	1.158			

*Relative distance is the ratio of the measured distance by the pacer wheel recording the highest number of revolutions divided by the known distance between two buoys.

df = degrees of freedom
SS = sum of squares
MS = mean square
F = calculated F-ratio
p = probability of obtaining a larger F-ratio
R^2 = coefficient of determination = 0.91

TABLE 3. 2x2x3 ANALYSIS OF VARIANCE (ANOVA) ON ACTUAL BOTTOM SPEED ($m \cdot sec^{-1}$) OF 3.0 METER BEAM TRAWL DEPLOYED IN THE HUDSON RIVER ESTUARY, 22-26 SEPTEMBER 1980. MAIN FACTORS WERE TOW DIRECTION WITH RESPECT TO RIVER CURRENT, TOW DISTANCE, AND BOAT SPEED THROUGH WATER.

SOURCE	df	SS	MS	F	p>F
Model	11	6.283	0.571	26.93	0.0001
Distance	1	0.002		0.01	0.9181
Speed	2	2.537		59.81	0.0001
Direction	1	3.192		150.47	0.0001
Distance x Speed	2	0.155		3.66	0.0418
Distance x Direction	1	0.002		0.08	0.7805
Speed x Direction	2	0.068		1.63	0.2187
Distance x Speed x Direction	2	0.177		4.18	0.0282
Error	23	0.488	0.021		
Total	34	6.770			

df = degrees of freedom
SS = sum of squares
MS = mean square
F = calculated F-ratio
p = probability of obtaining a larger F-ratio
R^2 = coefficient of determination = 0.93

Legend: Solid lines = tow direction against current
Dashed lines = tow direction with current
Circles = 450 meter tow path
Triangles = 900 meter tow path
Each point represents the mean of three observations

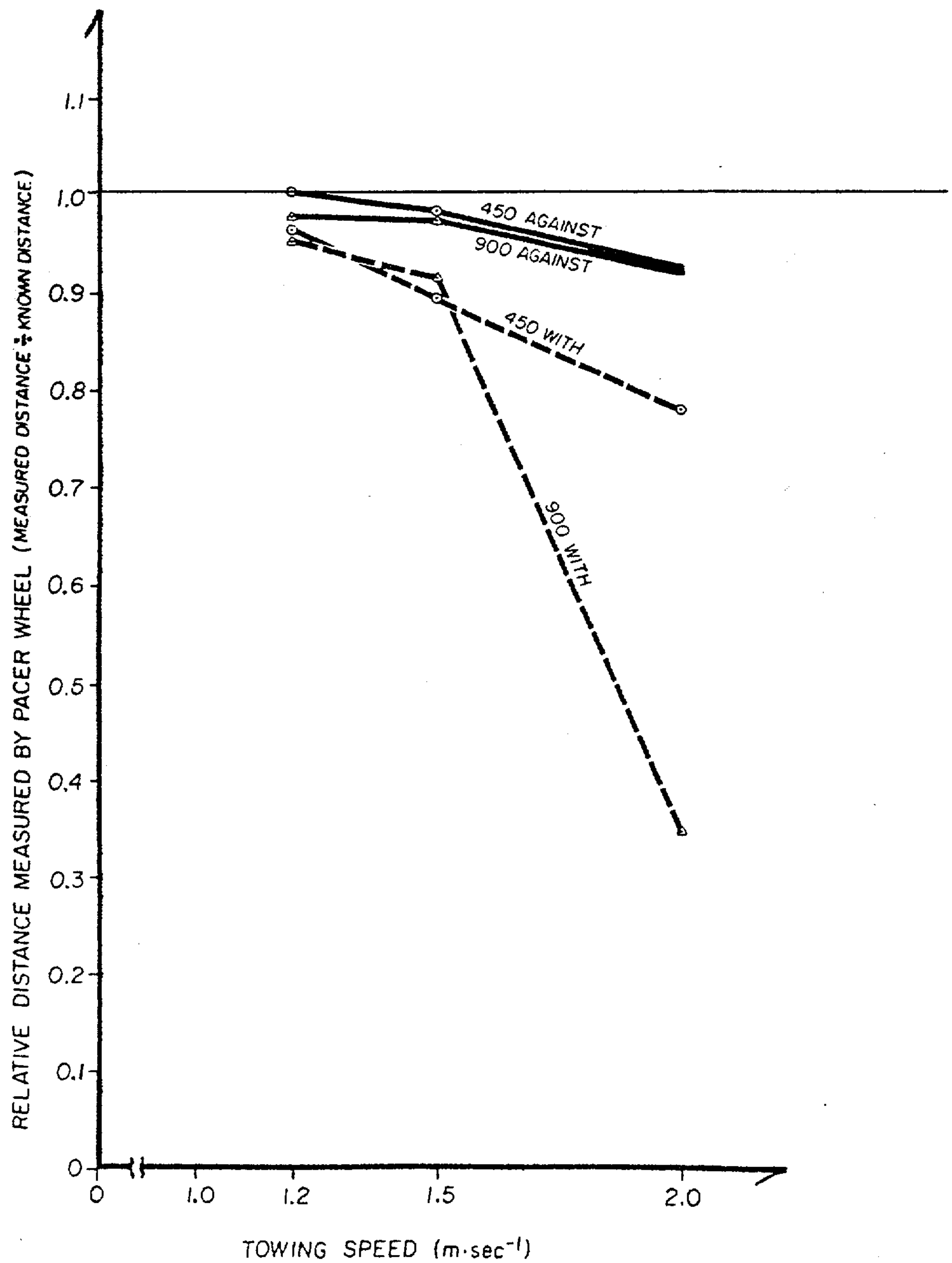

Figure 4. Effects of tow direction with respect to river current, tow distance, and towing speed on relative distance measured by 3.0 m beam trawl pacer wheels, 22-26 September 1980.

The importance of tow direction as a factor in the above ANOVA model suggested boat speed through water less critically affected gear performance than speed of the gear along the river bottom (bottom speed). The actual bottom speed of the trawl would be lowest when towed against the current (at a fixed boat speed through water) and highest when towed with the current. The 2 x 2 x 3 ANOVA model was used to determine the relationship between bottom speed and deployment factors for the beam trawl. When towed against river currents, bottom speed averaged 0.4 m . sec^{-1} less than the speed through water at 1.2 m . sec^{-1}, 0.5 m . sec^{-1} less than the speed through the water at 1.5 m . sec^{-1}, and 0.6 m . sec^{-1} less at 2.0 m . sec^{-1} (Figure 5). The break point in relative distance measurements, above which the counter wheels underestimated sample area, was at 1.5 m . sec^{-1} towing with the current (Figure 4, Appendix Table 5). This corresponded to an average bottom speed of between 1.45 and 1.75 m . sec^{-1} (1.6 m . sec^{-1} is the midpoint). Therefore, at bottom speeds greater than 1.6 m . sec^{-1} the beam trawl did not maintain sufficient contact with the substrate to accurately measure sample area. Since bottom speeds in excess of 1.6 m . sec^{-1} were never reached towing against the current, a speed through water against the current of between 1.5 and 2.0 m . sec^{-1} would optimize bottom speed of the beam trawl.

Bay anchovy YOY, striped bass YOY, and hogchoker (one year and older) were the most abundant fish species caught during daytime sampling in the gear evaluation Phase 1b (Table 4). ANOVA models using Log_{10} (Density + 1) + 10 as the response variable were not signficant ($p>0.05$) for any of the above species categories (Appendix Table 6). This lack of significance was observed for both areal and volumetric densities (Appendix Table 6). The factors identified as important in evaluating gear deployment apparently did not significantly affect density estimates for these species across the range of conditions used. Results of the Phase 1b portion of this study imply that daytime sampling using any combination of beam trawl towing speed and tow direction, which avoids a bottom speed in excess of 1.6 m . sec^{-1}, would

Legend: Solid lines = tow direction against current
Dashed lines = tow direction with current
Circles = 450 meter tow path
Triangles = 900 meter tow path
Each point represents the mean of three observations
45° Line Bottom speed = Speed through water (stationary water mass)

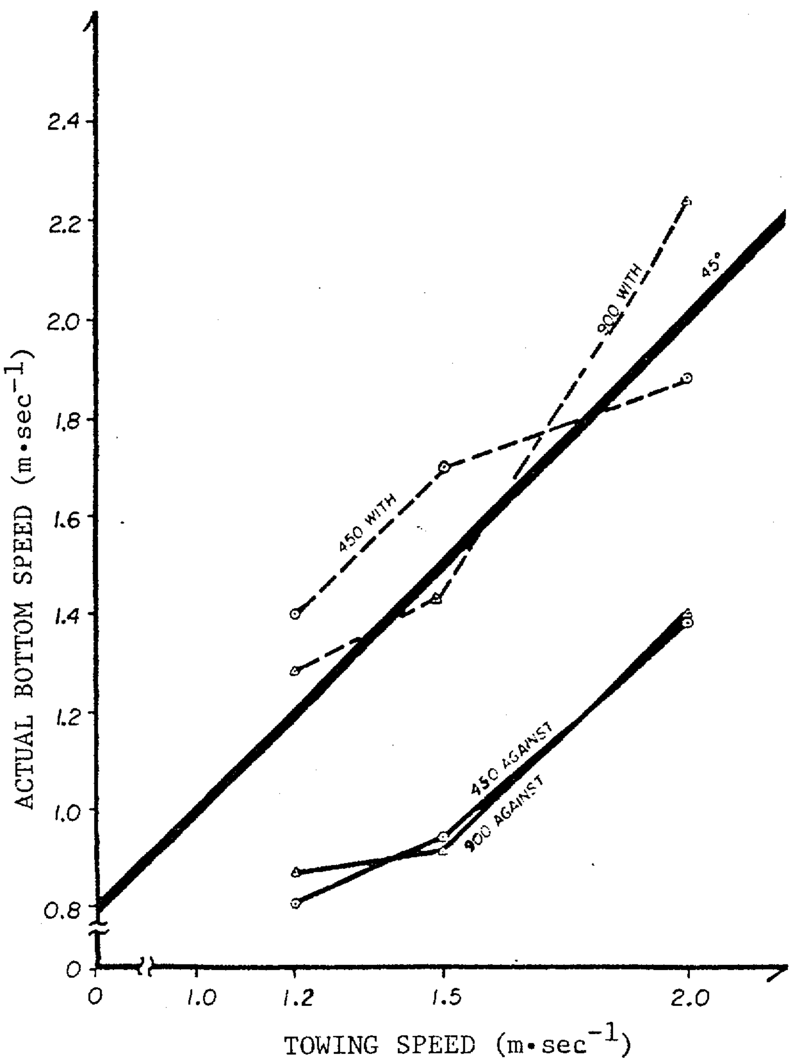

Figure 5. Effects of river current on deployment of 3.0 meter beam trawl, 22-26 September 1980.

TABLE 4. AREAL AND VOLUMETRIC DENSITIES OF SELECTED, ABUNDANT FISH SPECIES COLLECTED BY BEAM TRAWL IN DAYTIME SAMPLING DURING GEAR EVALUATION, HUDSON RIVER ESTUARY, TAPPAN ZEE REGION, 22-26 SEPTEMBER 1980.

DEPLOYMENT CONDITIONS		BAY ANCHOVY, YOY[1]						STRIPED BASS, YOY[1]						HOGCHOKER, OLD[1]					
		AREAL DENSITY			VOLUMETRIC DENSITY			AREAL DENSITY			VOLUMETRIC DENSITY			AREAL DENSITY			VOLUMETRIC DENSITY		
DISTANCE,SPEED,DIRECTION[2]	N	MEAN[3]	S.D.[4]	C.V.[5]	MEAN[3]	S.D.[4]	C.V.[5]	MEAN	S.D.	C.V.	MEAN	S.D.	C.V.	MEAN	S.D.	C.V.	MEAN	S.D.	C.V.
450, 1.2, against	3	1.54	2.66	173.2	1.83	3.16	173.2	0.94	1.07	114.2	3.73	5.02	134.6	24.27	36.84	151.8	102.03	170.42	167.0
450, 1.2, with	3	55.57	46.63	83.9	130.00	153.26	117.9	0.00	0.00	0.0	0.00	0.00	0.0	2.90	4.37	150.8	8.98	14.62	162.8
450, 1.5, against	3	45.80	44.52	97.2	54.96	52.27	95.1	0.74	0.73	98.9	0.88	0.86	97.3	2.51	3.72	148.3	3.11	4.60	148.1
450, 1.5, with	3	0.78	0.76	97.4	1.46	1.35	93.0	2.02	3.50	173.2	3.23	5.60	173.2	46.64	51.17	109.7	78.55	79.01	100.6
450, 2.0, against	3	30.66	16.79	54.8	29.06	16.43	56.5	0.50	0.44	87.3	0.51	0.44	87.3	1.91	1.38	72.0	1.75	1.11	63.4
450, 2.0, with	3	5.99	7.90	131.9	5.46	6.75	123.8	0.00	0.00	0.0	0.00	0.00	0.0	14.67	16.73	114.0	15.27	19.09	125.1
900, 1.2, against	3	22.03	20.94	95.1	77.40	111.29	143.8	0.84	0.90	107.4	3.29	4.26	132.4	7.19	4.69	65.1	13.70	8.05	58.7
900, 1.2, with	3	25.97	23.52	90.6	72.13	91.85	127.3	0.48	0.84	173.2	1.10	1.91	173.2	17.06	28.87	169.2	38.56	65.93	171.0
900, 1.5, against	3	23.44	38.65	164.9	28.67	44.06	153.7	3.44	2.39	69.3	6.35	4.17	65.6	30.96	38.72	125.1	52.18	46.19	88.5
900, 1.5, with	2	0.39	0.55	141.4	0.49	0.69	141.4	0.19	0.27	141.4	0.24	0.35	141.4	8.08	2.82	34.9	9.86	4.01	40.6
900, 2.0, against	3	107.29	93.07	86.8	108.68	94.48	86.9	0.53	0.93	173.2	0.53	0.92	173.2	1.41	1.43	101.1	1.32	1.26	95.6
900, 2.0, with	3	37.92	63.46	167.3	8.50	13.45	158.2	0.00	0.00	0.0	0.00	0.00	0.0	13.56	13.89	102.5	8.13	8.43	104.4

[1] YOY = Young-of-the-Year; Old = yearling and older
[2] Distance in meters; Speed in m . sec^{-1}; Direction with or against river current
[3] Mean areal density as (individuals . 1000 m^{-2}); mean volumetric density as (individuals . 1000 m^{-3})
[4] Standard Deviation
[5] Coefficient of Variation as a percentage by the formula: $\frac{\text{Std. Dev.}}{\text{Mean}} \times 100$

insure the beam trawl was optimally deployed (as defined above) and would be equally effective in catching the above mentioned fish species and lifestages.

Relative Catch Efficiency

The beam trawl caught more species of fish (18 species vs. 10 species) than the epibenthic sled, and more yearling and older fish than the epibenthic sled (Tables 5 and 6). Noticeable differences in the frequency of zero catches between the two gear include:

1) Low frequency of zero catches for bay anchovy (YOY) in the epibenthic sled

2) Low frequency of zero catches for striped bass (YOY) in the beam trawl

3) Low frequency of zero catches for hogchoker (yearling and older) in the beam trawl

4) Low frequency of zero catchaes for white perch (yearling and older) in the beam trawl.

The aforementioned species were also the most abundant fish caught in night sampling by the two gear types (Table 6). The observed differences in frequency of zero catch samples and densities may be associated with both gear characteristics (eg. mesh size and mouth diameter) and deployment practices (eg. tow duration). However, these factors were not completely replciated in the experimental design. Therefore, 2 x 2 ANOVA models on log transformed density estimates, which were used to evaluate relative catch efficiency of the bema trawl (relative to the epibenthic sled), did not identify causal factors for differences between gear.

TABLE 5. FREQUENCY AND PERCENT OF ZERO SAMPLES FOR YOUNG-OF-THE-YEAR AND YEARLING AND OLDER FISH CAUGHT IN NIGHT SAMPLING BY EPIBENTHIC SLED AND BEAM TRAWL, HUDSON RIVER ESTUARY, TAPPAN ZEE AND CROTON-HAVERSTRAW REGIONS, 15-19 SEPTEMBER 1980.

SPECIES	YOUNG-OF-THE-YEAR				YEARLING AND OLDER			
	EPIBENTHIC SLED		BEAM TRAWL		EPIBENTHIC SLED		BEAM TRAWL	
	N=45[a]	%[b]	N=40	%	N=45	%	N=40	%
alewife	42	93.3	39	97.5	45	100.0	40	100.0
bay anchovy	1	2.2	12	30.0	25	55.6	25	62.5
American shad	41	91.1	37	92.5	45	100.0	40	100.0
bluefish	44	97.8	37	92.5	45	100.0	39	97.5
American eel	45	100.0	40	100.0	38	84.4	27	67.5
hogchoker	45	100.0	40	100.0	20	44.4	1	2.5
blueback herring	39	86.7	36	90.0	45	100.0	40	100.0
striped bass	40	88.9	6	15.0	45	100.0	28	70.0
Atlantic tomcod	45	100.0	38	95.0	45	100.0	40	100.0
white catfish	45	100.0	40	100.0	45	100.0	39	97.5
white perch	45	100.0	29	72.5	40	88.9	2	5.0
northern pipefish	45	100.0	40	100.0	45	100.0	39	97.5
weakfish	39	86.7	21	52.5	45	100.0	40	100.0
spot	45	100.0	40	100.0	45	100.0	39	97.5
butterfish	45	100.0	40	100.0	45	100.0	39	97.5
rough silverside	45	100.0	39	97.5	45	100.0	40	100.0
summer flounder	45	100.0	34	85.0	45	100.0	35	87.5
striped searobin	45	100.0	39	97.5	45	100.0	38	95.0
All Species Combined	1	2.2	2	5.0	9	20.0	1	2.5

[a]N = number of samples which did not catch species, lifestage; total N at top of each column.
[b]% = Percent of samples which did not catch species, lifestage.

TABLE 6. MEAN DENSITY (INDIVIDUALS . 1000 m^{-3}) AND STANDARD ERROR OF MEAN DENSITY (S.E.) FOR YOUNG-OF-THE-YEAR AND YEARLING AND OLDER FISH CAUGHT IN NIGHT SAMPLING BY EPIBETHIC SLED AND BEAM TRAWL, HUDSON RIVER ESTUARY, TAPPAN ZEE AND CROTON-HAVERSTRAW REGIONS, 15-19 SEPTEMBER 1980.

SPECIES	YOUNG-OF-THE-YEAR				YEARLING AND OLDER			
	EPIBENTHIC SLED (N=45)		BEAM TRAWL (N=40)		EPIBENTHIC SLED (N=45)		BEAM TRAWL (N=40)	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
alewife	0.13	0.08	0.02	0.02[a]	0.00	0.00	0.00	0.00
bay anchovy	406.67	64.92	10.30	2.76	1.60	0.45	0.68	0.20
american shad	0.26	0.13	0.04	0.02	0.00	0.00	0.00	0.0
bluefish	0.04	0.04[a]	0.05	0.03	0.00	0.00	0.01	0.01[a]
American eel	0.00	0.00	0.00	0.00	1.26	0.56	0.82	0.40
hogchoker	0.00	0.00	0.00	0.00	11.49	4.11	54.76	12.11
blueback herring	0.70	0.46	0.08	0.04	0.00	0.00	0.00	0.00
striped bass	0.81	0.45	7.52	1.26	0.00	0.00	0.61	0.23
Atlántic tomcod	0.00	0.00	0.04	0.03	0.00	0.00	0.00	0.00
white catfish	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01[a]
white perch	0.00	0.00	0.62	0.21	0.51	0.32	19.45	4.81
northern pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02[a]
weakfish	0.63	0.28	0.61	0.14	0.00	0.00	0.00	0.00
spot	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01[a]
butterfish	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01[a]
rough silverside	0.00	0.00	0.03	0.03[a]	0.00	0.00	0.00	0.00
summer flounder	0.00	0.00	0.10	0.04	0.00	0.00	0.55	0.50
striped searobin	0.00	0.00	0.03	0.03[a]	0.00	0.00	0.04	0.03
All species combined	409.26	65.44	19.42	3.12	14.87	5.13	76.97	13.05

[a] Standard error of mean density calculated with only one non-zero density

TABLE 7. ANALYSIS OF VARIANCE FOR SELECTED FISH DENSITIES COMPARING EPIBENTHIC SLED AND BEAM TRAWL NIGHT SAMPLING IN HUDSON RIVER ESTUARY, TAPPAN ZEE AND CROTON-HAVERSTRAW REGIONS, 15-19 SEPTEMBER 1980.

SPECIES	LIFESTAGE	MODEL MSE	MODEL F	MODEL Pr>F	MODEL R^2	FACTOR	F	Pr>F	DUNCAN'S
bay anchovy	YOY	0.29	79.28	0.0001	0.76	Gear	215.06	0.0001	Sled > Trawl
						Region	7.26	0.0086	TZ = CH
						Gear x Region	8.26	0.0052	
hogchoker	Old	0.35	16.30	0.0001	0.38	Gear	15.87	0.0001	Trawl > Sled
						Region	10.86	0.0015	TZ > CH
						Gear x Region	4.22	0.0433	
striped bass	YOY	0.14	21.28	0.0001	0.44	Gear	38.39	0.0001	Trawl > Sled
						Region	4.64	0.0343	TZ > CH
						Gear x Region	0.53	0.4678	
white perch	Old	0.15	41.86	0.0001	0.61	Gear	107.35	0.0001	Trawl > Sled
						Region	0.06	0.8124	TZ = CH
						Gear x Region	1.73	0.1922	

Unbalanced ANOVA Model Log_{10}(Density + 1)+10 = Gear + Region + GearxRegion + Error
Degrees of Freedom: Model = 3; Error = 81; Total = 84

Lifestage: YOY = Young-of-the-year; Old = Yearling and older
MSE = Mean Square Error
F = Calculated F-ratio
Pr>F = probability of obtaining a larger F-ratio
R^2 = coefficient of determination
Duncan's = Duncan's new multiple comparison test for main effects with a significant ($p \leq 0.05$) F-ratio, using the error mean square and associated degrees of freedom as the testing term. Factor levels are arranged with means decreasing from left to right, and are marked equal (=) if no significant ($p \leq 0.05$) differences exist.

Relative catch efficiency of the beam trawl was species specific. Significant ($p \leq 0.0001$) ANOVA models were observed for the above mentioned species (Table 7). Except for bay anchovy YOY, the beam trawl caught significantly more fish than the epibenthic sled. For bay anchovies and hogchokers, significant ($p \leq 0.05$) two-way interactions existed (Table 7, Appendix Figure 1), otherwise only main effects were significant.

Density estimates for striped bass YOY were significantly ($p \leq 0.05$) higher in the beam trawl ($7.52 \cdot 1000\ m^{-3}$) than in the epibenthic sled ($0.81 \cdot 1000\ m^{-3}$) and averaged approximately nine times higher for the trawl. Regional differences were also significant, with the Tappan Zee river region containing an average density of $4.85 \cdot 1000\ m^{-3}$ YOY striped bass while the Croton-Haverstraw River region had an average density of $1.58 \cdot 1000\ m^{-3}$. Regional differences were not apparent for white perch yearling and older life stages; however, density estimates were significantly higher for the beam trawl than the epibenthic sled and averaged approximately 38 times greater in the trawl ($19.45 \cdot 1000\ m^{-3}$) than in the sled ($0.51 \cdot 1000\ m^{-3}$).

The epibenthic sled caught more YOY bay anchovy than the beam trawl, regardless of river region (Appendix Figure 1). For yearling and older hogchokers, the beam trawl caught more fish than the epibenthic sled; proportionally, more hogchokers were caught in the Tappan Zee river region than Croton-Haverstraw. These interactions were probably the result of within-region distributional differences of the two fish species, since field observations indicated substrate (hard mud) and river currents were similar.

DISCUSSION

The 3 m beam trawl equipped with odometer wheels accurately and precisely measured distance (area) fished when bottom speed was below 1.6 m . sec^{-1}. This observation was contrary to Carney and Carey (1980) who expressed reservations about using pacer wheel readings to calculate sample area when the gear was towed at a bottom speed of approximately 1.0 m . sec^{-1}. However, they towed over a variety of substrates, for longer durations, at greater depths and with a different beam design than was used in the present study. Relatively uniform substrate conditions (hard mud) in the Tappan Zee and Croton-Haverstraw regions probably favored accurate and precise area measurement.

Areal and volumetric expressions of species density did not substantially differ in precision, as indicated by the coefficient of variation for daytime (Table 4; Appendix Table 6) and nighttime (Table 8) beam trawl samples. Substantial differences were anticipated, with benthic species (e.g. hogchoker) densities expected to be more precise when calculated per unit area and pelagic species densities (e.g. bay anchovy) more precise when expressed per unit volume. Absence of substantial differences in precision between areal and volumetric densities suggests that either expression of density is appropriate for the range of deployment conditions experienced in this study. Apparently the fish species collected did not have a position preference regarding either the river bottom or the water column, or any preference was masked by variation in the sample unit (Appendix Tables 8 and 9).

The mean area sampled by the beam trawl was 2113 m^2, with a relatively low coefficient of variation (C.V. = 18.0%) and little difference between left and right odometer wheels (Appendix Table 9). However, the beam trawl sampled proportionally less water volume than would be expected based on a comparison of deployment conditions relative to the epibenthic sled. The epibenthic sled mean sample unit was 425 m^3 with a C.V. of 11.8% (Appendix Table 9). The corresponding volu-

TABLE 8. AREAL AND VOLUMETRIC DENSITIES OF SELECTED, ABUNDANT FISH SPECIES COLLECTED BY BEAM TRAWL IN NIGHT SAMPLING, HUDSON RIVER ESTUARY, TAPPAN ZEE AND CROTON-HAVERSTRAW REGIONS, 15-19 SEPTEMBER 1980.

SPECIES	LIFESTAGE[a]	AREAL DENSITY MEAN[b]	AREAL DENSITY STD. DEV.[c]	AREAL DENSITY C.V.[d]	VOLUMETRIC DENSITY MEAN[b]	VOLUMETRIC DENSITY STD. DEV.[c]	VOLUMETRIC DENSITY C.V.[d]
bay anchovy	YOY	7.17	15.91	222.1	10.30	17.43	169.2
hogchoker	Old	46.24	78.13	169.0	54.76	76.57	139.8
striped bass	YOY	4.34	4.54	104.5	7.52	7.98	106.1
	Old	0.28	0.58	210.1	0.61	1.44	235.5
white perch	YOY	0.37	0.85	232.7	0.62	1.34	217.6
	Old	7.39	6.29	85.1	19.45	30.41	156.3
weakfish	YOY	0.51	0.85	166.0	0.61	0.89	147.6
All Species Combined	YOY	12.69	17.22	135.7	19.42	19.75	101.7
	Old	54.96	78.31	142.5	76.97	82.51	107.2

[a] YOY = Young-of-the-year; Old = yearling and older
[b] Mean areal density as (individuals . 1000 m^{-2}); mean volumetric density as (individuals . 1000 m^{-3})
[c] Standard Deviation
[d] Coefficient of Variation as a percentage by the formula: $\frac{\text{Std. Dev.}}{\text{Mean}} \times 100$

metric unit for the beam trawl was more than three times larger than the sled and averaged 1389 m^3 with a C.V. of 46.3%. If filtration efficiency were equal between the two gear, the beam trawl should have sampled approximately 5.4 times the volume of the sled or approximately 2300 m^3, based on a mouth opening for the beam trawl of 0.9 m * 3.0 m = 2.7 m^2 * 2 = 5.4 m^2 (since the sled had a mouth opening of 1.0 m^2 and was towed for half the duration at the same speed as the beam trawl). The reduction in sample volume for the beam trawl cannot be explained by lower filtration efficiency since the relatively large mesh size in the trawl (relative to the epibenthic sled) should have increased filtration efficiency and sample volume (Tranter and Smith, 1968). Field observations from void samples (use code 5, TI 1981a) and examination of Figure 1 suggest the digital flowmeter may have occasionally become fouled in the beam trawl net; thus, sample volume was underestimated and had a relatively high coefficient of variation. During future sampling requiring a volumetric sample unit, the flowmeter should be attached directly to the beam, or held in place by some means other than a tether line running between the head-rope and foot-rope of the beam trawl.

The beam trawl had a higher catch efficiency for dominant fish species than the epibenthic sled except for bay anchovy YOY (Table 7). Mesh selectivity of the beam trawl may have been an important factor explaining this exception. The 3000 μm mesh netting in the epibenthic sled and 6000 μm netting in the cod-end of the beam trawl probably retained 100% of the YOY bay anchovies ($\geq$60 mm total length), since mesh selectivity was not considered significant for several pelagic species $\geq$40 mm (standard length) with a relatively coarse, 12,000 μm mesh net (Aron and Collard, 1969). The relatively fragile YOY bay anchovies may have passed, or were forced, through the 3.8 cm (stretch) mesh netting in the body of the beam trawl and their density was underestimated due to this loss. Mesh selectivity of the beam trawl was not apparent for other dominant fish species.

In this study, the beam trawl was particularly effective in estimating densities of YOY striped bass and yearling and older white perch (Table 6 and Table 7). The increase in catch efficiency of the beam trawl vs. the epibenthic sled may relate to either the larger sample unit size or larger mesh and gear size of the beam trawl. Unfortunately, these factors were not separated in the experimental design and we can only speculate on the causal mechanism for the differences between the gear. Since tow length was not a significant factor influencing density differences in Phase 1b of the beam trawl evaluation, and both the sled and the beam trawl were towed against the current at the same towing speed, perhaps the larger mouth opening and mesh size of the beam trawl increased the capture probability by: 1) reducing detection distance (shorter pressure cone for coarse mesh), and 2) increasing escape distance (wider mouth opening). Additional evaluation with complete balancing of causal factors including: tow duration, net mesh size and mouth diameter, and sample unit size, would be required to explain observed differences in density estimates between the 3-meter beam trawl and the 1.0 m^2 epibenthic sled.

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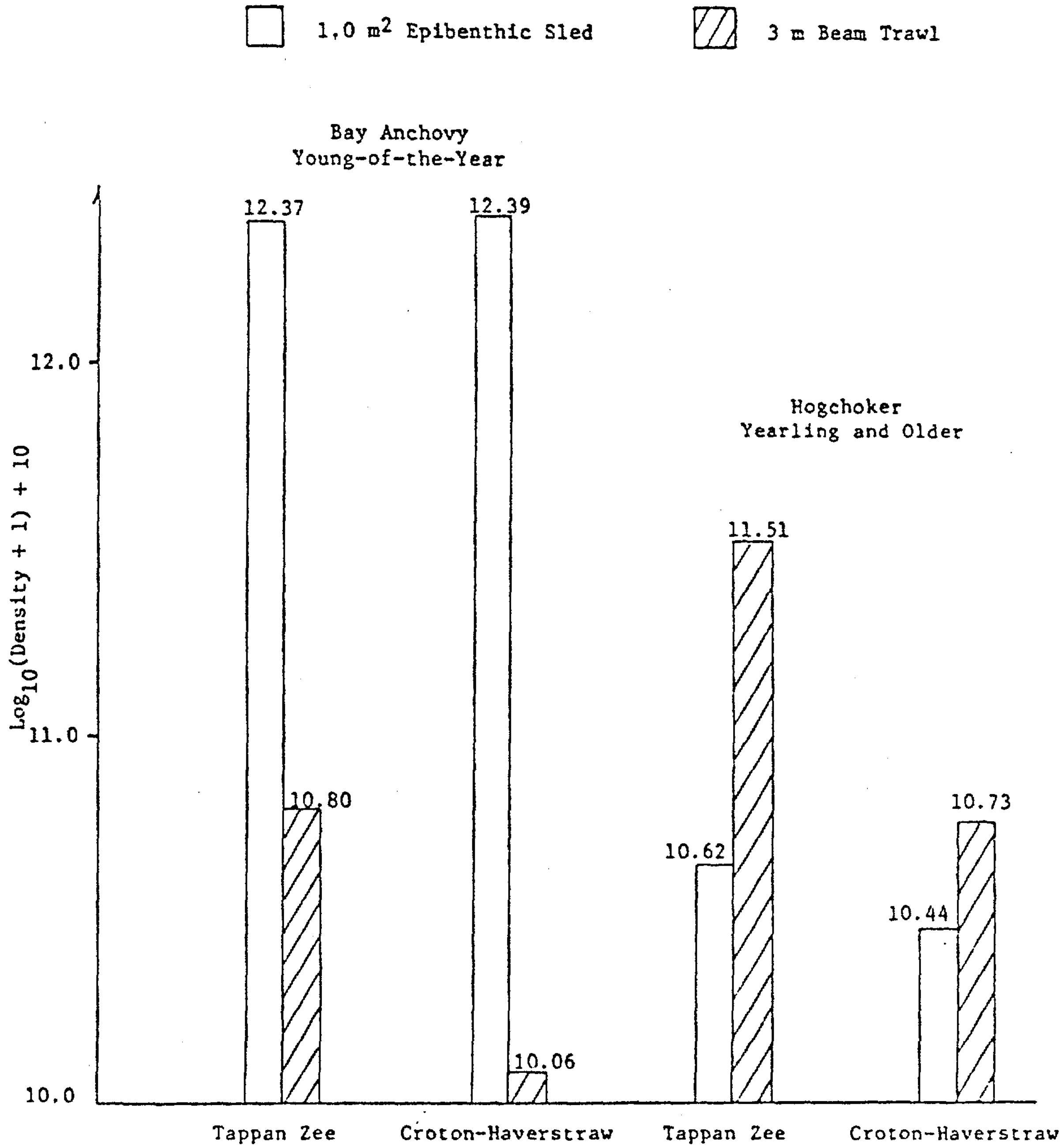

Appendix Figure 1. Analysis of Gear x Region Interations for bay anchovy (YOY) and hogchoker (yearling and older) from 2 x 2 ANOVA comparing epibenthic sled and beam trawl relative catch efficiency. Density expressed as number of fish per 1000 m^3, transformed as Log_{10} (Density +1) +10.

APPENDIX TABLE 1. COMMON AND SCIENTIFIC NAMES, AND CUT-OFF LENGTHS USED TO SEPARATE YOUNG-OF-THE-YEAR (YOY) AND OLDER FISH COLLECTED BY BEAM TRAWL AND EPIBENTHIC SLED, HUDSON RIVER ESTUARY, TAPPAN ZEE AND CROTON-HAVERSTRAW REGIONS, SEPTEMBER 1980.

COMMON NAME[a]	SCIENTIFIC NAME[a]	YOY CUT-OFF LENGTH (mm T.L.)[a]
alewife	Alosa pseudoharengus	130
bay anchovy	Anchoa mitchilli	60
american shad	Alosa sapidissima	130
bluefish	Pomatomus saltatrix	350
American eel	Anguilla rostrata	20
hogchoker	Trinectes maculatus	50
blueback herring	Alosa aestivalis	110
striped bass	Morone saxatilis	120
Atlantic tomcod	Microgadus tomcod	150
white catfish	Ictalurus catus	100
white perch	Morone americana	90
northern pipefish	Syngnathus fuscus	120
weakfish	Cynoscion regalis	200
spot	Leiostomus xanthurus	150
butterfish	Peprilus triacanthus	100
rough silverside	Membras martinica	225
summer flounder	Paralichthys dentatus	225
striped searobin	Prionotus evolans	120

[a]TI (1981a)

APPENDIX TABLE 2. 2 x 3 ANOVA (PHASE 1a) ON RELATIVE DISTANCE* MEASURED BY A 3-METER BEAM TRAWL PACER WHEEL, 8-12 SEPTEMBER 1980. MAIN FACTORS WERE TOW DISTANCE AND BOAT SPEED THROUGH WATER.

SOURCE	df	SS	MS	F	pr>F
Model	5	0.127	0.025	4.02	0.0065
Distance	1	0.008		1.23	0.2765
Speed	2	0.118		9.35	0.0007
Distance*Speed	2	0.001		0.09	0.9114
Error	30	0.190	0.006		
Total	35	0.317			

*Relative distance is the ratio of measured distance by the pacer wheel recording the highest number of revolutions divided by the known distance between two buoys.

df = degrees of freedom
SS = sum of squares
MS = mean square
F = calcualted F-ratio
p = probability of obtaining a larger F-ratio
R^2 = coefficient of determination = 0.40

Duncan's New Multiple Comparison Test**

Factor	Comparison Across Levels of Each Factor		
Distance Towed (m)	450	900	
Towing Speed (m · sec^{-1})	1.2	1.5	2.0

**For main effects with a significant ($p \leq 0.05$) F-ratio, using the error mean square and associated degrees of freedom as the testing term. Factor levels are arranged with means decreasing from left to right, and are underlined if no significant ($\alpha = 0.05$) differences exist.

APPENDIX TABLE 3. TAYLOR'S POWER LAW REGRESSION TO EVALUATE THE APPROPRIATE TRANSFORMATION OF RAW DATA FOR GEAR PERFORMANCE (PHASE 1b) ANOVA, 22-26 SEPTEMBER 1980.

SPECIES	LIFESTAGE[a]	SAMPLE UNIT[b]	REGRESSION[c] SLOPE	INTERCEPT	CORRELATION COEFFICIENT (r)
bay anchovy	YOY	Areal	1.85	0.24	0.98
		Volumetric	1.91	0.25	0.99
striped bass	YOY	Areal	1.83	0.03	0.80
		Volumetric	1.80	0.26	0.90
hogchoker	Old	Areal	2.14	-0.22	0.94
		Volumetric	2.17	-0.42	0.96

Average slope with 95% confidence limits : Areal = 1.94 ±0.43
Volumetric = 1.96 ±0.47

a = YOY = Young of the year fish; Old = Yearling and older fish
b = Areal = density based on number of fish . 1000 m^{-2}
Volumetric = density based on number of fish . 1000 m^{-3}
c = Regression of S^2 = (intercept) $\bar{x}^{(slope)}$, where the variance, S^2 and the mean density, $\bar{x}$ were calculated for each cell of the following ANOVA design (12 cells):
2 towing distances * 3 towing speeds * 2 towing directions * 3 replicates (one cell had 2 replicates)

APPENDIX TABLE 4. TAYLOR'S POWER LAW REGRESSION TO EVALUATE THE APPROPRIATE TRANSFORMATION OF RAW DATA FOR GEAR PERFORMANCE (PHASE 2) ANOVA, 15-19 SEPTEMBER 1980.

SPECIES	LIFESTAGE[a]	SAMPLE UNIT[b]	REGRESSION[c] SLOPE	INTERCEPT	CORRELATION COEFFICIENT (r)
bay anchovy	YOY	Volumetric	1.63	0.74	0.99
hogchoker	Old	Volumetric	2.16	0.04	0.98
striped bass	YOY	Volumetric	1.48	0.47	0.85
white perch	Old	Volumetric	1.77	0.52	0.96
weakfish	YOY	Volumetric	1.49	0.49	0.94

Average slope with 95% confidence limits : 1.71 ± 0.35

a = YOY = Young of the year fish; Old = Yearling and older fish
b = Areal = density based on number of fish . 1000 m^{-2}
Volumetric = density based on number of fish . 1000 m^{-3}
c = Regression of S^2 = (intercept) $\bar{x}^{(slope)}$, where the variance, S^2 and the mean density, $\bar{x}$ were calculated for each cell of the following ANOVA design (4 cells) with unbalanced replication:
2 river regions * 2 gear

APPENDIX TABLE 5. VARIATION IN RELATIVE DISTANCE* MEASURED BY THE BEAM TRAWL FOR TREATMENT COMBINATIONS IN THE GEAR PERFORMANCE ANOVA DESIGN, PHASE 1b, 22-26 SEPTEMBER 1980.

DISTANCE (m)	SPEED ($m \cdot sec^{-1}$)	DIRECTION	N	MEAN RELATIVE DISTANCE ± 2*S.E.
450	1.2	against	3	1.006 ± 0.057
		with	3	0.960 ± 0.055
	1.5	against	3	0.982 ± 0.018
		with	3	0.897 ± 0.070
	2.0	against	3	0.932 ± 0.110
		with	3	0.774 ± 0.057
900	1.2	against	3	0.977 ± 0.067
		with	3	0.953 ± 0.053
	1.5	against	3	0.973 ± 0.040
		with	2	0.920 ± 0.042
	2.0	against	3	0.933 ± 0.028
		with	3	0.354 ± 0.189

*Relative distance is the ratio of measured distance by the pacer wheel recording the highest number of revolutions divided by the known distance between two buoys.

APPENDIX TABLE 6. RESULTS OF ANOVA FOR SELECTED FISH DENSITY (BOTH AREAL AND VOLUMETRIC) COMPARING TOW DISTANCE, TOW SPEED, AND TOW DIRECTION FOR DAYTIME SAMPLING OVER A FIXED COURSE IN THE TAPPAN ZEE REGION OF THE HUDSON RIVER ESTUARY, 22-26 SEPTEMBER 1980 (PHASE 1b).

AREAL DENSITY (N . 1000 m^{-2})		MODEL			
SPECIES	LIFESTAGE	MSE	F	pr>F	R^2
bay anchovy	YOY	0.73	1.29	0.2882	0.38
hogchoker	Old	0.37	0.97	0.4981	0.32
striped bass	YOY	0.08	1.69	0.1391	0.45
white perch	Old	0.38	1.57	0.1743	0.43
VOLUMETRIC DENSITY (N . 1000 m^{-3})					
bay anchovy	YOY	0.89	1.50	0.1979	0.42
hogchoker	Old	0.53	1.05	0.4368	0.33
striped bass	YOY	0.17	1.65	0.1487	0.44
white perch	Old	0.44	1.33	0.2715	0.39

ANOVA Model Log_{10} (Density + 1) + 10 = Distance + Speed + Tow Direction + Distance x Speed + Distance x Direction + Speed x Direction + Distance x Speed x Direction + Error

Degrees of Freedom: Model = 11, Error = 23; Total = 34

Lifestage = YOY = young of the year fish; Old = yearling and older fish

MSE = mean square error

F = calculated F-ratio

pr>F = probability of obtaining a larger F-ratio

R^2 = coefficient of determination

APPENDIX TABLE 7. ANOVA TREATMENT CONTRASTS FOR DIFFERENCES IN DENSITY [Log 10(x+1) + 10] WHICH COULD BE DETECTED USING THE BEAM TRAWL EVALUATION DESIGN, PHASE 1b, 22-26 SEPTEMBER 1980. AREAL DENSITY AS FISH PER 1000 m^2; VOLUMETRIC DENSITY AS FISH PER 1000 m^3.

SPECIES	SAMPLE UNIT	S^2	LSD	SSD LOG10 2	SSD LOG10 12	SSD LINEAR 2	SSD LINEAR 12
bay anchovy YOY	Areal	0.56	0.61	0.61	0.71	4.07	5.13
	Volumetric	0.59	0.63	0.63	0.74	4.27	5.50
hogchoker Old	Areal	0.38	0.25	0.25	0.29	1.78	1.95
	Volumetric	0.51	0.58	0.58	0.68	3.80	4.79
striped bass YOY	Areal	0.05	0.18	0.18	0.21	1.51	1.62
	Volumetric	0.11	0.27	0.27	0.32	1.86	2.09

$T_{\alpha} = .05 = 2.069$ for 23 df (MSE)

$LSD = T\sqrt{\frac{2S^2}{r}}$ = least significant difference

r = 3 = number of replicates

S^2 = MSE = mean square error from ANOVA model

SSD = R * LSD
= Smallest significant difference detectable between 2 cell means or among 12 cell means

R = 1.0, 2

R = 1.17, 12

R = Table value for significant studentized factors at p = 0.05 for 2 or 12 contrasts.

Log_{10} = For log transformed data

Linear = Log_{10} values transformed to linear units for comparison purposes only.

APPENDIX TABLE 8. VARIATION IN SAMPLE UNIT SIZE FOR THE BEAM TRAWL DURING GEAR PERFORMANCE EVALUATION STUDIES, 8-12 SEPTEMBER AND 22-26 SEPTEMBER 1980 (PHASE 1a AND 1b COMBINED).

DISTANCE (m)	SPEED ($m \cdot sec^{-1}$)	DIRECTION	n	SAMPLE AREA (m^2)** MEAN ± 2*S.E.	C.V. (%)	SAMPLE VOLUME (m^3) MEAN ± 2*S.E.	C.V. (%)
450	1.2	against	4	1374 ± 56	4.1	745 ± 365	48.9
		with	5	1271 ± 70	6.1	885 ± 235	29.7
		none*	3	1394 ± 7	0.4	930 ± 261	24.3
	1.5	against	4	1325 ± 47	3.6	1147 ± 95	8.2
		with	5	1236 ± 53	4.8	896 ± 311	38.8
		none*	3	1356 ± 154	9.9	1038 ± 766	52.2
	2.0	against	6	1110 ± 179	19.8	1334 ± 59	5.4
		with	3	1062 ± 78	6.4	1161 ± 278	20.8
		none*	3	1062 ± 176	14.3	1281 ± 98	6.6
900	1.2	against	5	2694 ± 104	4.3	1694 ± 685	45.2
		with	4	2620 ± 102	3.9	1443 ± 629	43.6
		none*	3	2829 ± 67	2.1	2405 ± 157	4.6
	1.5	against	4	2627 ± 114	4.3	1916 ± 882	42.3
		with	4	2931 ± 840	28.7	2065 ± 48	2.3
		none*	3	2680 ± 81	2.6	2570 ± 116	3.9
	2.0	against	4	2762 ± 409	14.8	2571 ± 244	8.7
		with	5	1325 ± 532	45.0	1887 ± 458	27.1
		none*	3	1870 ± 656	30.4	2006 ± 591	25.5

*none = not recorded (from Phase 1a)
**based on the pacer wheel with the highest odometer reading

APPENDIX TABLE 9. SAMPLE UNIT CHARACTERISTICS FOR THE 3-METER BEAM TRAWL AND 1.0 m^2 EPIBENTHIC SLED DURING GEAR COMPARISON STUDIES, 15-19 SEPTEMBER 1980 (PHASE 2). BOTH THE BEAM TRAWL AND THE EPIBENTHIC SLED WERE TOWED AT 1.5 $m \cdot sec^{-1}$ AGAINST RIVER CURRENTS.

GEAR	TOW DURATION (min)	SAMPLE UNIT	n	MEAN	STD DEV.	STD ERROR	COEF. VAR. (%)
Epibenthic sled	5	volume (m^3)	45	425	50.3	7.5	11.8
Beam trawl	10	volume (m^3)	40	1389	643.2	101.7	46.3
Beam trawl	10	maximum area (m^2)	40	2113	380.1	60.1	18.0
Beam trawl	10	area for left odometer (m^2)	40	2089	375.4	59.4	18.0
Beam trawl	10	area for right odometer (m^2)	40	2054	388.4	61.4	18.9
Beam trawl	10	$\lvert$left - right$\rvert$ absolute value of difference between left and right odometers	40	84	95.6	15.1	114.4

ICHTHYOPLANKTON GEAR COMPARISON STUDY

ORANGE AND ROCKLAND
UTILITIES, INC.
1978

LMSE-78/0081 & 169/153

(1480)

Lawler Matusky & Skelly Engineers
Environmental Science & Engineering Consultants

One Blue Hill Plaza
Pearl River, New York 10965

BPGS

ICHTHYOPLANKTON GEAR COMPARISON STUDY

I. INTRODUCTION

Studies of Hudson River ichthyoplankton have been carried out by several investigators since 1966 using many types of ichthyoplankton sampling gear and deployment procedures. These investigators have examined several of the important variables: gear type, gear deployment, net mesh size, presence or absence of flow meter, tow velocity, and net diameter (Carlson and McCann 1969; QLM 1973; TI 1977).

A special study was designed and conducted to address the effect of two of the important variables - net diameter and tow velocity - on ichthyoplankton abundance estimates. The study was conducted over a five-day period in early June specifically to coincide with the occurrence of peak concentrations of Morone spp. larvae in the Bowline Point vicinity. In contrast to the case during most of the other studies (QLM 1973; TI 1977), the organisms under investigation were early post-yolk-sac larvae approximately 5 to 8 mm in length.

The sampling gear consisted of two commonly used larval nets, a 0.5-m conical net and a 1.0-m Hensen style larval net. Nets were deployed at collection velocities ranging from 0.3 to 3.0 fps (9.1-90.9 cm/sec).

II. METHODS AND MATERIALS

A. FIELD PROCEDURES

Ichthyoplankton sampling was conducted on 9, 11-12, and 14-15 June 1977 at Bowline West (BW). This station was located in 6-7 m of water between the pond inlet and the south end of the oil dock (Figure 1). All samples were collected at a depth of 3 m.

Bongo type frames were used to tow two nets simultaneously at the same depth: a 1.0-m diameter Hensen style net and a 0.5-m diameter conical net (Figure 2). Both nets consisted of a 571 micron mesh body. A TSK flow meter, center-mounted in each net was used to determine the volume sampled. Velocity of the net through the water was monitored using a General Oceanics flow meter towed off the side of the boat. Low velocities (<1.0 fps) were measured using a Cushing electromagnetic current meter attached to the side of the boat and positioned to the depth of the net (Figure 3).

Samples were collected at velocities less than 1.0 fps, approximately 1.5 fps, and 3.0 fps. Samples collected at the lowest velocities (<1.0 fps) utilized the tidal current moving past the anchored boat: to accomplish this, a bongo frame was suspended over each side of the boat, permitting the collection of four simultaneous samples (Figure 3). It was found that the 1.0 m Hensen net could not maintain a horizontal position at the low velocity without the aid of a flotation device attached to the cod-end bucket.

If sampling occur during time of h[...] current why is stated on p II-3 low velocity sa[...] was done in conj[...]tion with a sl[...] tide ?

Samples collected at 1.5 and 3.0 fps also utilized the bongo type frames rigged similarly to the low velocity collections. One bongo frame (two nets) was towed 61 m behind the boat while the boat

FIGURE 1

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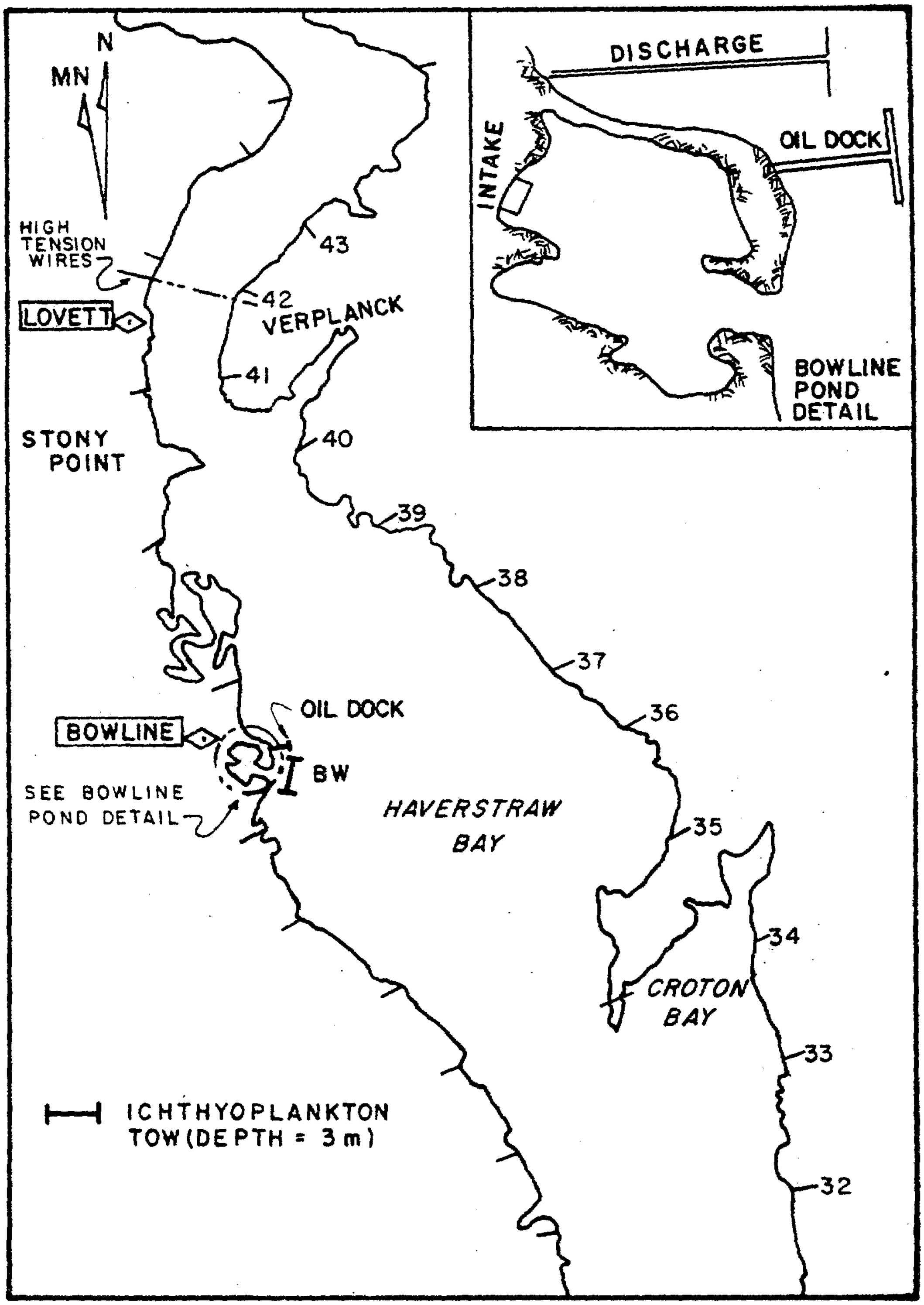
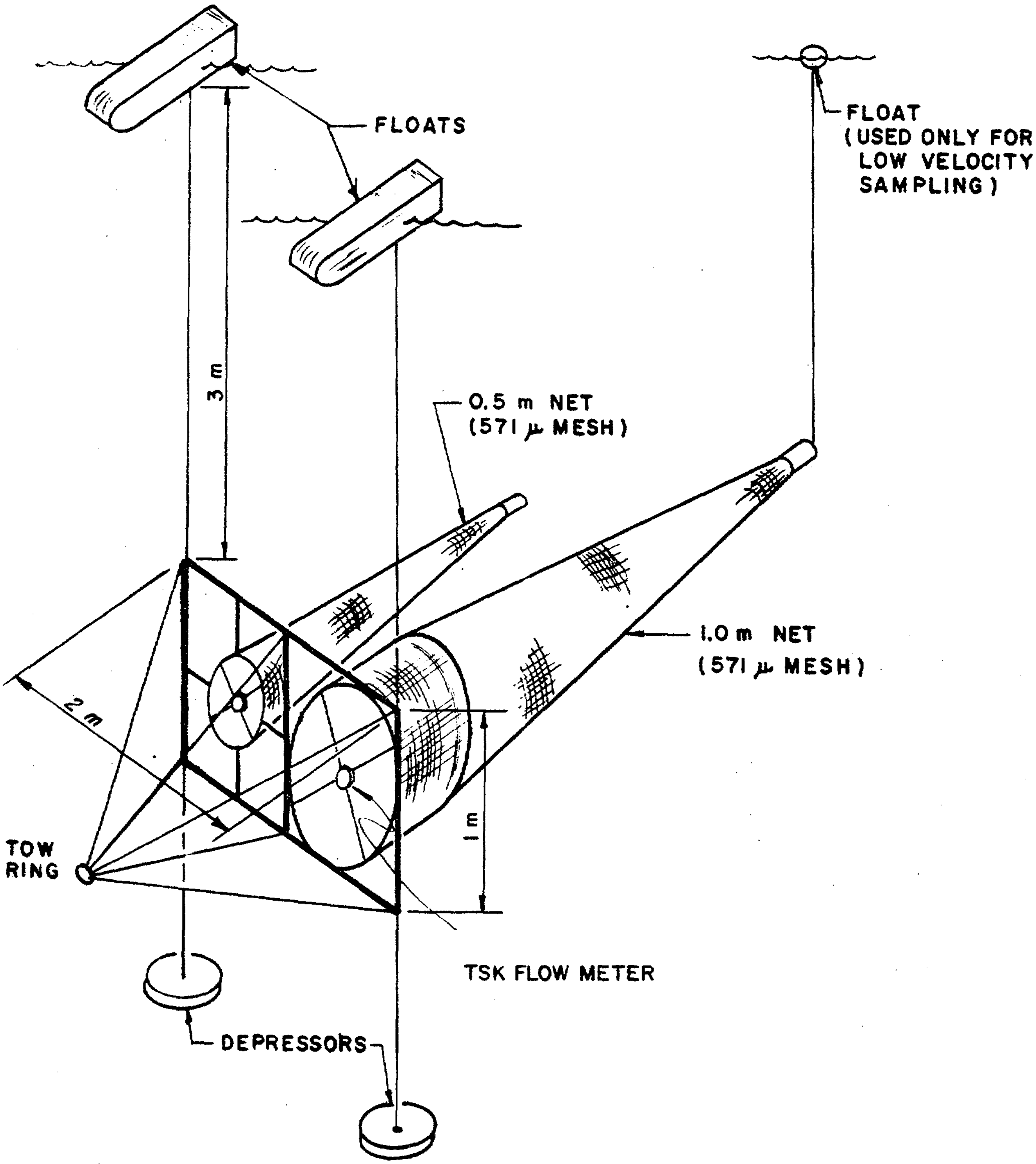
ICHTHYOPLANKTON GEAR COMPARISON STUDY

SAMPLING LOCATION

BOWLINE VICINITY-1977



ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY
BONGO TYPE FRAME SAMPLING APPARATUS
BOWLINE VICINITY—1977

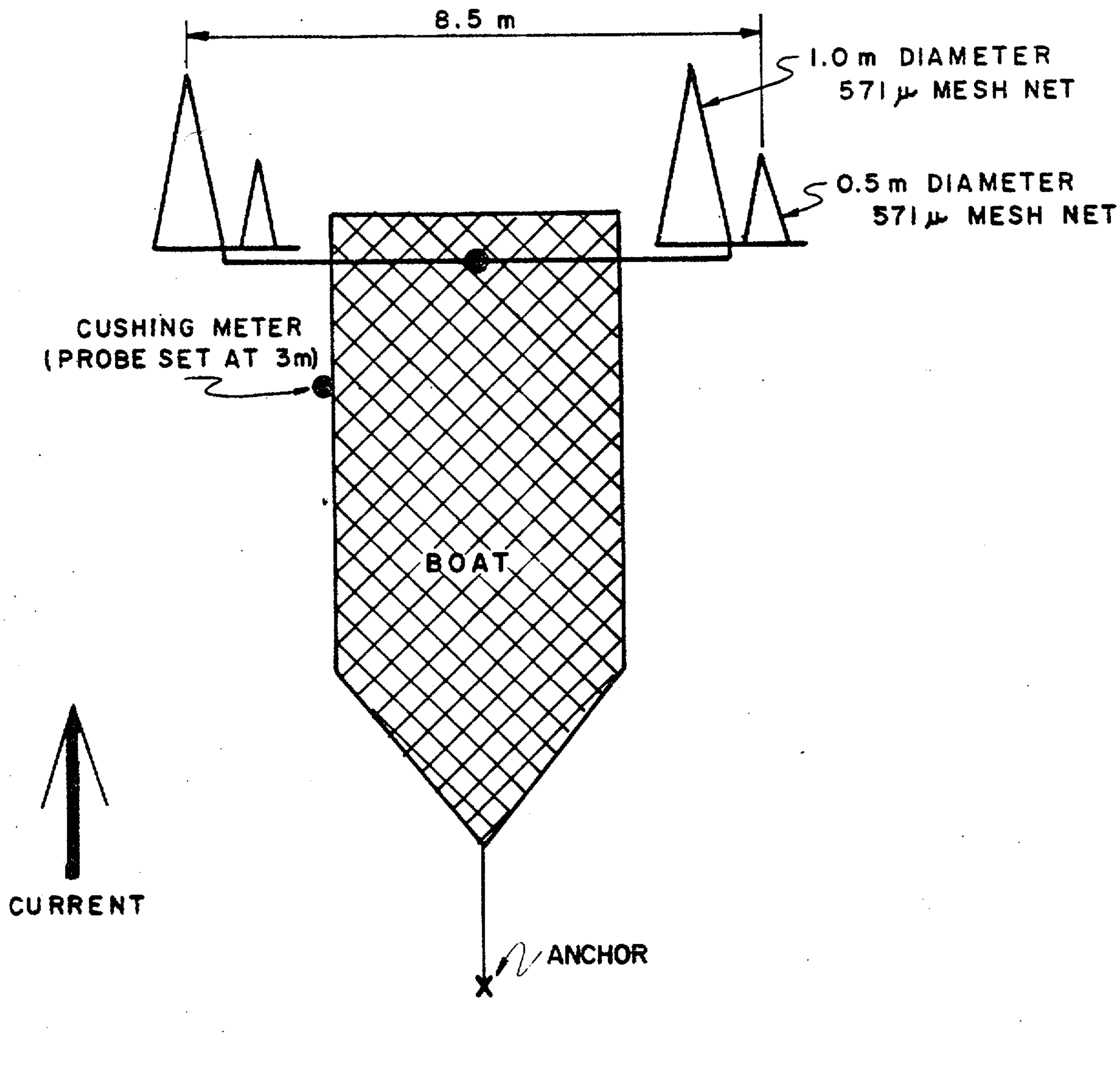


ORANGE AND ROCKLAND UTILITIES, INC.

ICHTHYOPLANKTON GEAR COMPARISON STUDY

SIMULTANEOUS SAMPLING ARRANGEMENT FOR LOW VELOCITY SAMPLING

BOWLINE VICINITY- 1977



velocity through the water was maintained at the desired speed. At these higher velocities, the flotation device on the 1.0-m net cod-end bucket was not necessary to maintain the net in a horizontal orientation.

Tow durations were varied in an attempt to equalize sample volumes regardless of the tow velocities. Samples collected at velocities of <1.0 fps, 1.5 fps, and 3.0 fps were towed for 15, 10, and 5 minutes, respectively.

Simultaneous collections at different velocities were made utilizing a second boat. Concurrent with the anchored collections, the second boat towed another bongo frame, also equipped with a 1.0-m diameter Hensen net and 0.5-m diameter conical net, alongside the anchored boat. By varying collection velocities of the different vessels, simultaneous collections were made through the same water mass over different velocities and gear types. Table 1 outlines the experimental design utilized.

B. LABORATORY PROCEDURES

All samples were preserved in a 5% buffered formalin solution and transported to the laboratory for analysis. All white perch, striped bass, and bay anchovy eggs and larvae were picked from each sample using a dissecting microscope at 40x magnification. Each larva was identified to species when possible and counted. White perch and striped bass larvae which could not be identified to species were recorded as UID *Morone* spp. and are reflected in the total *Morone* spp. abundances.

Larvae from each sample were randomly selected for length measurements and life stage classification. Length determinations were performed under a dissecting microscope using a calibrated ocular micrometer.

TABLE 1

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

FREQUENCY OF ICHTHYOPLANKTON SAMPLING AT SELECTED VELOCITIES

BOWLINE VICINITY - JUNE 1977

DATE	TIME	VELOCITY: / NET SIZE:	LOW 1.0 M	LOW 0.5 M	MEDIUM 1.0 M	MEDIUM 0.5 M	HIGH 1.0 M	HIGH 0.5 M
9 JUN 1977	0700-0800		2X	2X			X	X
	0900-1000		2X	2X			X	X
11 JUN 1977	1100-1200		2X	2X			X	X
	1300-1400				2X	2X	X	X
	1400-1500				X	X	X	X
	1500-1600				2X	2X		
	1600-1700		X	X			X	X
	1700-1800		2X	2X			X	X
	2200-2300		2X	2X			X	X
	2300-2400		2X	2X			X	X
12 JUN 1977	0000-0100				2X	2X		
	0100-0200						X	X
	0200-0300				X	X	X	X
	0300-0400				X	X		
	0400-0500				X	X		
	0500-0600						X	X
	0600-0700						X	X
14 JUN 1977	1100-1200		2X	2X			X	X
	1300-1400		2X	2X			X	X
	1400-1500				X	X		
	1500-1600				2X	2X	X	X
	1600-1700				2X	2X	X	X
	1800-1900		2X	2X				
	1900-2000		2X	2X			2X	2X
	2000-2100				2X	2X	2X	2X
	2100-2200				2X	2X	X	X
	2200-2300				X	X		
	2300-2400		2X	2X			X	X
15 JUN 1977	0000-0100		2X	2X				
NUMBER OF SAMPLES			25	25	20	20	23	23
GRAND TOTAL SAMPLES					136			

X = one sample collected and analyzed

2X = replicate samples collected and analyzed

LOW = 0.30-0.79 fps
MEDIUM = 1.48-1.82 fps
HIGH = $\geq$2.97 fps

C. ANALYTICAL METHODS

Concentrations (number of larvae per 1000 m^3) were calculated by dividing the number of larvae collected by the volume sampled (m^3) and multiplying by 1000. Volumes filtered were calculated using the following formula:

0.5-m net:
m^3 = (number of revolutions on TSK meter) x (0.02945 m^3/rev)

1.0-m net:
m^3 = (number of revolutions on TSK meter) x (0.1178 m^3/rev)

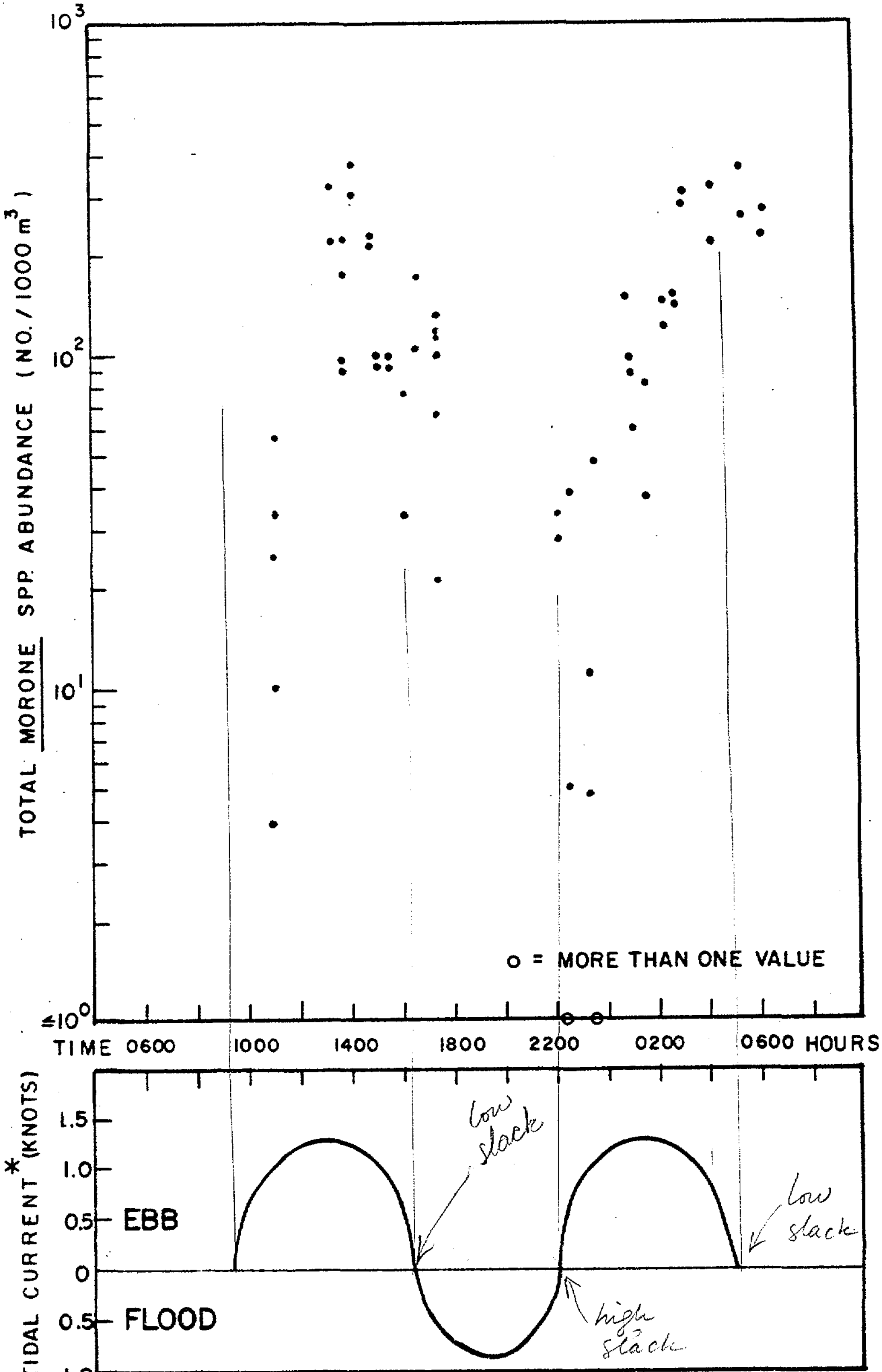
The data were handled in two stages: first, the abundance estimates generated by nets of two different diameters were investigated, and second, the abundance estimates from collections at different velocities were examined.

The basic criterion to be met in each comparison was that a sample pair must be collected simultaneously (or within certain time limits) at the same site and depth. Comparisons between net sizes were always balanced because of the deployment of the bongo sampling arrangement. Simultaneous collections were averaged by gear type and represented as a single value. The data for comparisons across velocity regimes were collected independently and did not necessarily coincide in time. Due to the variability in larval abundances exhibited as a result of tidal or diel factors (Figure 4), all comparisons between velocity regimes had to be balanced in time. Therefore, only a selected subset of the total samples could be used. (Figure 4 suggests a lower larval abundance associated with a slack tide.)

I don't see that. A low slack on June 11-12 at 0500 had high numbers

Since all low velocity sampling was done in conjunction with a slack tide, it would be expected that the mean concentrations for all low

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY
ABUNDANCE OF MORONE SPP. FOR ALL COLLECTIONS VERSUS TIDAL CURRENT
BOWLINE VICINITY—11-12 JUNE 1977



* TIDAL CURRENT AS ESTIMATED BY THE NATIONAL OCEANOGRAPHIC SURVEY (1977)

velocity collections would be lower than the mean of the other velocity regimes which were sampled throughout the day and night.

Therefore, in order to make a valid comparison of efficiencies among velocity regimes, it was important to eliminate long-term temporal differences from the analysis as sources of bias and variability. A criterion of one-hour intervals was established for all comparisons between velocity regimes. This was accomplished by dividing each day into 24 one-hour periods, each starting on the hour. Each period used in the comparison of two velocity groups contained at least one collection from each of the two velocities under consideration.

Standard statistical techniques were employed to evaluate the abundance data. A two-tailed paired-t test ($\alpha = 0.05$) was used to compare the mean abundances from the 1.0-m versus the 0.5-m collections, and a correlation analysis was performed in order to examine the consistency of paired 1.0 and 0.5-m collections. The correlation reflects the degree of linear predictability of 1.0-m from 0.5-m samples.

Larval abundances relative to collection velocity were compared by using non-orthogonal analysis of variance techniques. Due to the large variations in larval abundances exhibited over time (Figure 4), the data were log-transformed ($\log_{10} [x + 1]$) prior to statistical testing where required to stabilize the variance. This was not necessary for performing the paired-t test as the paired-t procedure does not assume homogeneity of variance.

Period was included as a factor in the analysis of variance in order to reduce the variability of velocity comparisons. The statistical significance of "periods" in most of the ANOVAs indicates that this was effective and that a one-way ANOVA or simple t test would have been much less able to detect velocity differences.

III. RESULTS AND DISCUSSION

The organisms collected in these studies were predominantly at the early post-yolk-sac life stage and approximately 5 to 8 mm in length. At this age, mobility would be minimal.

A. COMPARISON OF LARVAL ABUNDANCES FROM ONE-METER VERSUS HALF-METER NETS

Comparisons were made of paired 1.0-m and 0.5-m diameter net collections over three velocity ranges (representing low [0.30-0.79 fps], medium [1.48-1.82 fps], and high [>2.97 fps] sampling velocities). A total of 67 sample pairs were collected (Table 2) from three velocity groups. Totals of 20 and 23 pairs were used for the medium, and high velocity groups, respectively. As noted above, low velocity sampling involved the simultaneous collection of two pairs of 1.0-m and 0.5-m diameter nets. Due to the spatial and temporal proximity of such collections, the two bongo pairs were not considered to be independent paired samples for this analysis. Hence, the two 1.0-m samples were pooled and considered to be a single collection, as were the two 0.5-m samples. This resulted in a total of 12 pairs for low velocity, although 24 pairs of low velocity samples were reported in Table 2.

The larval taxa which were considered were striped bass, white perch, total *Morone* spp., and bay anchovy.

Mean larval abundances in simultaneous 1.0-m and 0.5-m diameter net collections were compared for each of the three velocity groups using paired-t tests at the 5% significance level. No significant differences were found in the larval abundance between the two net sizes for any of the three individual velocity groups for any of the taxa of interest; however, there was a significant difference demonstrated between the 1.0 and 0.5 m net for total *Morone* spp. and

TABLE 2

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

ABUNDANCE OF LARVAE FROM 0.5 AND 1.0 M NETS
DEPLOYED IN A BONGO ARRANGEMENT AT STATION BW

BOWLINE VICINITY - 1977

INVENTORY NO.	DATE	TIME	NET SIZE (m)	VELOCITY (fps)	SAMPLE VOL. (m^3)	CONC. (NO./1000 m^3) MORONE*	SB	WP	BA
14992	9 JUN	0705-0718	1.0	0.53	127	0	0	0	0
14993		" "	0.5	0.53	43	0	0	0	0
14990		0705-0720	1.0	0.53	201	65	35	30	0
14991		" "	0.5	0.53	53	0	0	0	0
15028		0705-0710	1.0	2.97	174	63	57	6	6
15029		" "	0.5	2.97	36	0	0	0	0
14994		0910-0925	1.0	0.43	61	148	148	0	0
14995		" "	0.5	0.43	14	71	71	0	0
15030		0910-0915	1.0	2.97	262	8	0	8	34
15031		" "	0.5	2.97	68	0	0	0	15
14996		0912-0927	1.0	0.43	59	85	85	0	0
14997		" "	0.5	0.43	18	222	222	0	0
14638	11 JUN	1108-1123	1.0	0.50	287	10	7	3	0
14639		" "	0.5	0.50	72	56	28	28	14
14640		1109-1124	1.0	0.50	271	33	18	11	4
14641		" "	0.5	0.50	79	25	25	0	0
15032		1110-1115	1.0	2.97	225	4	4	0	147
15033		" "	0.5	2.97	31	0	0	0	65
14644		1320-1325	1.0	2.97	225	320	222	71	44
14645		" "	0.5	2.97	59	220	186	0	136
14642		1350-1400	1.0	1.48	236	178	136	13	85
14643		" "	0.5	1.48	63	95	48	48	206
14662		1352-1402	1.0	1.48	251	227	195	8	16
14663		" "	0.5	1.48	65	92	62	31	15
14646		1419-1429	1.0	1.82	245	388	327	29	94
14647		" "	0.5	1.82	66	303	258	0	91
14648		1445-1450	1.0	2.97	209	220	196	24	172
14649		" "	0.5	2.97	57	228	193	0	175
14650		1505-1515	1.0	1.82	231	91	52	9	87
14651		" "	0.5	1.82	59	102	68	17	169
14652		1524-1535	1.0	1.82	231	91	56	13	48
14653		" "	0.5	1.82	58	103	52	17	121
14654		1609-1630	1.0	0.40	144	76	62	0	0
14655		" "	0.5	0.40	30	33	0	0	33
14666		1617-1622	1.0	2.97	197	173	102	41	41
14667		" "	0.5	2.97	48	104	42	21	42
14668		1735-1740	1.0	2.97	252	67	40	12	56
14669		" "	0.5	2.97	70	100	57	29	43
14658		1738-1753	1.0	0.46	173	116	69	23	6
14659		" "	0.5	0.46	45	133	67	22	0
14660		1739-1754	1.0	0.46	167	114	42	72	0
14661		" "	0.5	0.46	48	21	0	21	0
14670		2202-2217	1.0	0.59	212	28	14	0	0
14671		" "	0.5	0.59	63	0	0	0	0
14672		2205-2220	1.0	0.59	212	33	24	5	5
14673		" "	0.5	0.59	57	0	0	0	0
14694		2225-2230	1.0	2.97	197	5	0	0	5
14695		" "	0.5	2.97	53	38	38	0	0
14674		2320-2335	1.0	0.56	7	143	0	0	0
14675		" "	0.5	0.56	1	0	0	0	0
14676		2325-2340	1.0	0.56	8	0	0	0	0
14677		" "	0.5	0.56	2	0	0	0	0
14696		2335-2340	1.0	2.97	167	48	18	0	0
14697		" "	0.5	2.97	49	20	20	0	0

*Morone include Striped bass, White perch and all UID Morone that could not be identified to species

TABLE 2 (Continued)

ABUNDANCE OF LARVAE FROM 0.5 AND 1.0 M NETS DEPLOYED IN A BONGO ARRANGEMENT AT STATION BW

INVENTORY NO.	DATE	TIME	NET SIZE (m)	VELOCITY (fps)	SAMPLE VOL. (m^3)	CONC. (NO./1000 m^3) MORONE*	SB	WP	BA
14678	12 JUN	0050-0100	1.0	1.65	223	99	63	0	22
14679		" "	0.5	1.65	65	154	123	0	0
14698		0050-0100	1.0	1.48	205	88	54	0	29
14699		" "	0.5	1.48	51	59	59	0	0
14680		0140-0145	1.0	2.97	209	81	67	0	0
14681		" "	0.5	2.97	54	37	19	0	0
14682		0210-0220	1.0	1.65	218	124	110	0	18
14683		" "	0.5	1.65	54	148	111	37	0
14684		0245-0250	1.0	2.97	188	154	138	0	5
14685		" "	0.5	2.97	50	140	100	0	80
14686		0320-0330	1.0	1.65	251	307	243	12	0
14687		" "	0.5	1.65	66	288	212	0	15
14688		0410-0420	1.0	1.65	224	326	281	22	9
14689		" "	0.5	1.65	60	217	167	17	17
14712		0530-0535	1.0	2.97	127	370	354	0	8
14713		" "	0.5	2.97	38	263	211	0	26
14714		0615-0620	1.0	2.97	177	277	266	6	23
14715		" "	0.5	2.97	52	231	173	0	19
14598	14 JUN	1140-1145	1.0	2.97	152	53	33	20	7
14599		" "	0.5	2.97	45	89	44	22	0
14578		1140-1155	1.0	0.30	21	0	0	0	0
14579		" "	0.5	0.30	7	0	0	0	0
14580		1140-1155	1.0	0.30	2	0	0	0	0
14581		" "	0.5	0.30	4	0	0	0	0
14582		1340-1355	1.0	0.79	119	42	42	0	17
14583		" "	0.5	0.79	27	0	0	0	0
14584		1340-1355	1.0	0.79	170	6	6	0	0
14585		" "	0.5	0.79	41	24	24	0	73
14600		1345-1350	1.0	2.97	127	8	8	0	16
14601		" "	0.5	2.97	47	21	21	0	0
14586		1439-1449	1.0	1.82	233	52	34	0	52
14587		" "	0.5	1.82	59	153	68	0	0
14602		1505-1515	1.0	1.48	177	164	45	119	6
14603		" "	0.5	1.48	47	43	0	43	21
14588		1530-1535	1.0	2.97	203	79	39	0	25
14589		" "	0.5	2.97	53	19	0	0	94
14590		1544-1554	1.0	1.82	283	212	131	18	67
14591		" "	0.5	1.82	72	208	181	14	14
14592		1605-1610	1.0	2.97	190	405	311	26	53
14593		" "	0.5	2.97	49	327	184	41	41
14594		1622-1632	1.0	1.82	282	131	78	11	74
14595		" "	0.5	1.82	74	81	81	0	432
14596		1645-1655	1.0	1.82	273	77	59	15	297
14597		" "	0.5	1.82	71	56	28	28	239
14550		1853-1908	1.0	0.40	24	208	125	42	0
14551		" "	0.5	0.40	8	0	0	0	0
14552		1855-1910	1.0	0.40	26	77	38	38	0
14553		" "	0.5	0.40	5	200	0	200	0
14616		1900-1905	1.0	2.97	217	143	74	51	207
14617		" "	0.5	2.97	59	85	68	0	68
14554		1920-1935	1.0	0.69	81	198	123	37	0
14555		" "	0.5	0.69	25	120	120	0	0
14556		1925-1940	1.0	0.69	123	154	130	0	0
14557		" "	0.5	0.69	34	29	29	0	0

*Morone include Striped bass, White perch and all UID Morone that could not be identified to species

TABLE 2 (Continued)

ABUNDANCE OF LARVAE FROM 0.5 AND 1.0 M NETS DEPLOYED IN A BONGO ARRANGEMENT AT STATION BW

INVENTORY NO.	DATE	TIME	NET SIZE (m)	VELOCITY (fps)	SAMPLE VOL. (m^3)	CONC. (NO./1000 m^3) MORONE*	SB	WP	BA
14618	14 JUN	1930-1935	1.0	2.97	207	155	63	58	48
14619		" "	0.5	2.97	57	123	123	0	18
14620		2010-2015	1.0	2.97	203	148	103	25	143
14621		" "	0.5	2.97	52	231	77	77	38
14558		2010-2020	1.0	1.65	279	226	186	25	72
14559		" "	0.5	1.65	78	244	205	0	38
14560		2025-2030	1.0	2.97	246	126	102	4	122
14561		" "	0.5	2.97	68	147	118	15	147
14622		2025-2035	1.0	1.48	239	176	92	13	218
14623		" "	0.5	1.48	67	254	119	60	313
14562		2100-2110	1.0	1.65	266	4	0	0	0
14563		" "	0.5	1.65	73	0	0	0	14
14564		2120-2125	1.0	2.97	240	25	25	0	0
14565		" "	0.5	2.97	65	77	31	15	31
14566		2140-2150	1.0	1.65	286	28	7	0	0
14567		" "	0.5	1.65	78	26	26	0	13
14568		2205-2215	1.0	1.65	239	33	21	0	0
14569		" "	0.5	1.65	65	108	77	0	0
14632		2350-2355	1.0	2.97	229	9	0	4	26
14633		" "	0.5	2.97	60	0	0	0	50
14570		2350-0005	1.0	0.66	66	0	0	0	0
14571		" "	0.5	0.66	16	0	0	0	0
14572		2351-0006	1.0	0.66	70	71	29	14	29
14573		" "	0.5	0.66	22	45	0	0	0
14574	15 JUN	0025-0040	1.0	0.30	6	0	0	0	0
14575		" "	0.5	0.30	1	0	0	0	0

*Morone include Striped bass, White perch and all UID Morone that could not be identified to species

TABLE 3

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

STATISTICAL ANALYSIS OF MEAN ABUNDANCES[a] OF ICHTHYOPLANKTON
COLLECTED IN 0.5 AND 1.0 M NETS DEPLOYED IN A BONGO ARRANGEMENT

BOWLINE VICINITY - 1977

TAXON	VELOCITY	n	0.5 m MEAN	0.5 m S.D.	1.0 m MEAN	1.0 m S.D.	AVG. DIFF.[b]	% DIFF.[c]	CORR.	t	D.F.
Total *Morone* spp.	Low	12	40.83	46.80	69.83	54.52	29.00	41.5	0.705*	2.541*	11
	Med	20	136.70	88.95	151.10	104.81	14.40	9.5	0.774*	0.962	19
	High	23	108.70	98.56	127.87	119.76	19.17	15.0	0.914*	1.801	22
	Total	55	104.07	92.08	123.66	106.04	19.59	15.8	0.860*	2.680*	54
Striped Bass	Low	12	24.75	46.25	44.25	44.04	19.50	44.1	0.723*	2.005	11
	Med	20	97.25	73.33	108.50	92.99	11.25	10.4	0.809*	0.921	19
	High	23	74.13	71.96	96.61	104.17	22.48	23.3	0.906*	2.134	22
	Total	55	71.76	71.91	89.51	92.02	17.75	19.8	0.857*	2.743*	54
White Perch	Low	12	9.33	22.44	11.33	16.29	2.00	17.7	0.730*	0.452	11
	Med	20	15.60	19.28	15.35	26.02	-0.25	-1.6	0.357	0.045	19
	High	23	9.57	18.73	15.48	21.07	5.91	38.2	0.149	1.065	22
	Total	55	11.71	19.62	14.53	21.82	2.82	19.4	0.335*	0.872	54
Bay Anchovy	Low	12	7.00	15.03	2.42	4.48	-4.58	-189.3	0.161	1.060	11
	Med	20	85.90	123.81	59.70	76.18	-26.20	-43.9	0.666*	1.266	19
	High	23	47.30	50.06	51.65	61.54	4.35	8.4	0.579*	0.389	22
	Total	55	53.49	85.40	43.84	63.95	-9.65	-22.0	0.640*	1.080	54

[a] # larvae/1000 m^3
[b] Difference in number of organisms (1.0-0.5 m)
[c] As a percent of 1.0 m collections
S.D. - Standard deviation
Corr. - Correlation between 0.5 m and 1.0 m abundances
t - Paired t tests, two sided

*Significant at $\alpha = 0.05$

K = 16

See TI 1977 Annual Draft p V-8 for repeated t tests the α must be adjusted by α/k striped bass when the comparison was made across all the velocities (Table 3). Correlation between paired 1.0-m and 0.5-m net collections was significant for total Morone, striped bass, and bay anchovy, indicating a linear relationship between 1.0-m and 0.5-m net samples. A forced-intercept regression analysis of the data provided the following predictive equations for total Morone spp. and striped bass:

Total Morone; 1.0 m concentration = 1.102 (0.5 m concentration)

Striped Bass; 1.0 m concentration = 1.172 (0.5 m concentration)

The results are summarized below.

FORCED-INTERCEPT REGRESSION ANALYSIS OF MEAN ABUNDANCES OF ICHTHYOPLANKTON COLLECTED IN 0.5 AND 1.0 m NETS DEPLOYED AT ALL VELOCITIES IN A BONGO ARRANGEMENT

	Degrees of Freedom	Slope	Mean Square Error	95% Confidence Interval
Total Morone spp.	54	1.102	3123.13	± 0.109
Striped Bass	54	1.172	2313.84	± 0.129

B. COMPARISON OF LARVAL ABUNDANCES RELATIVE TO COLLECTION VELOCITY

As in the first comparison, samples were classified according to collection velocity: low (0.30-0.79 fps), medium (1.48-1.82 fps), and high (>2.97 fps). As previously discussed, in order to protect against biases in making comparisons due to potentially large differences in abundance associated with diel or tidal factors (Figure 4), it was necessary to extract a subset of the available data that was balanced in time. This was accomplished by dividing each day into 24 one-hour periods, each starting on the hour, and using those periods containing at least one collection from each of the two velocities under consideration for the comparison (Table

TABLE 4

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

LARVAL ABUNDANCE* IN COLLECTIONS AT LOW VS. HIGH VELOCITY WITH 0.5 AND 1.0 M NETS

BOWLINE POINT GENERATING STATION - 1977

TAXON	NET SIZE (m)	VELOCITY	9 JUN 0700	9 JUN 0900	11 JUN 1100	11 JUN 1600	11 JUN 1700	11 JUN 2200	11 JUN 2300	14 JUN 1100	14 JUN 1300	14 JUN 1900	14 JUN 2300	ADJUSTED MEAN
Striped bass	0.5	Low	0	71	28	0	67	0	0	0	0	120	0	
			0	222	25		0	0	0	0	24	29	0	
		Mean	0	146	26	0	34	0	0	0	12	74	0	26.5
		High	0	0	0	42	57	38	20	44	21	68	0	
												123		
		Mean	0	0	0	42	57	38	20	44	21	96	0	28.9
	1.0	Low	35	148	7	62	69	14	0	0	42	123	0	
			0	85	18		42	24	0	0	6	130	29	
		Mean	18	116	12	62	56	19	0	0	24	126	14	40.6
		High	57	0	4	102	40	0	18	33	8	74	0	
												63		
		Mean	57	0	4	102	40	0	18	33	8	68	0	30.0
White perch	0.5	Low	0	0	28	0	22	0	0	0	0	0	0	
			0	0	0		21	0	0	0	0	0	0	
		Mean	0	0	14	0	22	0	0	0	0	0	0	3.3
		High	0	0	0	21	29	0	0	22	0	0	0	
												0		
		Mean	0	0	0	21	29	0	0	22	0	0	0	6.5
	1.0	Low	30	0	3	0	23	0	0	0	0	37	0	
			0	0	11		72	5	5	0	0	0	14	
		Mean	15	0	7	0	48	2	2	0	0	18	7	9.0
		High	6	8	0	41	12	0	0	20	0	51	4	
												58		
		Mean	6	8	0	41	12	0	0	20	0	54	4	13.2
Morone spp.	0.5	Low	0	71	56	33	133	0	0	0	0	120	0	
			0	222	25		21	0	0	0	24	29	45	
		Mean	0	146	40	33	77	0	0	0	12	74	22	36.7
		High	0	0	0	104	100	38	20	89	21	85	0	
												123		
		Mean	0	0	0	104	100	38	20	89	21	104	0	43.3
	1.0	Low	65	148	10	76	116	28	143	0	42	198	0	
			0	85	33		114	33	0	0	6	154	71	
		Mean	32	116	22	76	115	30	72	0	24	176	36	63.5
		High	63	8	4	173	67	5	48	53	8	143	9	
												155		
		Mean	63	8	4	173	67	5	48	53	8	149	9	53.4
Bay anchovy	0.5	Low	0	0	14	33	0	0	0	0	0	0	0	
			0	0	0		0	0	0	0	73	0	0	
		Mean	0	0	7	33	0	0	0	0	36	0	0	6.9
		High	0	15	65	42	43	0	0	0	0	68	50	
												18		
		Mean	0	15	65	42	43	0	0	0	0	43	50	23.5
	1.0	Low	0	0	0	0	6	0	0	0	17	0	0	
			0	0	4		0	5	0	0	0	0	29	
		Mean	0	0	2	0	3	2	0	0	8	0	14	2.6
		High	6	34	147	41	56	5	0	7	16	207	26	
												48		
		Mean	6	34	147	41	56	5	0	7	16	128	26	42.4

*Number of larvae per 1000 m^3

TABLE 5

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

LARVAL ABUNDANCE* IN COLLECTIONS AT MEDIUM
VS. HIGH VELOCITY WITH 0.5 AND 1.0 M NETS

BOWLINE POINT GENERATING STATION - 1977

TAXON	NET SIZE (m)	VELOCITY	11-12 JUN 1300	11-12 JUN 1400	11-12 JUN 0200	14 JUN 1500	14 JUN 1600	14 JUN 2000	14 JUN 2100	ADJUSTED MEAN
Striped bass	0.5	Medium	48	258	111	0	81	205	0	
			62			181	28	119	26	
		Mean	55	258	111	90	54	162	13	106.1
		High	186	193	100	0	184	77	31	
								118		
		Mean	186	193	100	0	184	98	31	113.1
	1.0	Medium	136	327	110	45	78	186	0	
			195			131	59	92	7	
		Mean	166	327	110	88	68	139	4	128.9
		High	222	196	138	39	311	103	25	
								102		
		Mean	222	196	138	39	311	102	25	147.6
White perch	0.5	Medium	48	0	37	43	0	0	0	
			31			14	28	60	0	
		Mean	40	0	37	28	14	30	0	21.3
		High	0	0	0	0	41	77	15	
								15		
		Mean	0	0	0	0	41	46	15	14.6
	1.0	Medium	13	29	0	119	11	25	0	
			8			18	15	13	0	
		Mean	10	29	0	68	13	19	0	19.9
		High	71	24	0	0	26	25	0	
								4		
		Mean	71	24	0	0	26	14	0	19.3
Morone spp.	0.5	Medium	95	303	148	43	81	244	0	
			92			208	56	254	26	
		Mean	94	303	148	126	68	249	13	143.0
		High	220	228	140	19	327	231	77	
								147		
		Mean	220	228	140	19	327	189	77	171.4
	1.0	Medium	178	388	124	164	131	226	4	
			227			212	77	176	28	
		Mean	202	388	124	188	104	201	16	174.7
		High	320	220	154	79	405	148	25	
								126		
		Mean	320	220	154	79	405	137	25	191.4
Bay anchovy	0.5	Medium	206	91	0	21	432	38	14	
			15			14	239	313	13	
		Mean	110	91	0	18	336	176	14	106.4
		High	136	175	80	94	41	38	31	
								147		
		Mean	136	175	80	94	41	92	31	92.7
	1.0	Medium	85	94	18	6	74	72	0	
			16			67	297	218	0	
		Mean	50	94	18	36	186	145	0	75.6
		High	44	172	5	25	53	143	0	
								122		
		Mean	44	172	5	25	53	132	0	61.6

*Number of larvae per 1000 m^3; 571μ mesh net

1). Eleven such periods were used for the low vs. high velocity comparison (Table 4) and seven for the medium vs. high velocity comparison (Table 5); however, insufficient data were available (only one period) to permit comparing low against medium velocity.

Comparisons were made using analysis of variance techniques at the 5% significance level for each taxon (total <u>Morone</u> spp., striped bass, white perch, and bay anchovy) separately by net size.

Comparisons of mean abundances for a given collection gear (1.0-m Hensen or 0.5-m conical net) over velocity showed a significant difference (α = 0.05) between the mean abundances from high and low velocity collections for bay anchovy for both collection gears (Table 6). There were no significant differences (α = 0.05) found in the mean concentrations of any of the other taxa (total <u>Morone</u> spp., striped bass, or white perch) within a specific collection gear for low vs. high (Table 6) or medium vs. high (Table 7) sampling velocities. As previously demonstrated (Figure 4), significant differences were commonly found between periods for both net sizes.

Therefore, with the exception of bay anchovy abundances, sampling velocity does not appear to affect the mean abundance as measured with either the 0.5 or 1.0 m net.

Analysis of variance was also run on the relationship between mean abundances from the 0.5-m low velocity collections and those from the 1.0-m high velocity collections (Table 8). Significant differences (α = 0.05) were found in abundance for all taxa (total <u>Morone</u> spp., white perch, and bay anchovy).

TABLE 6

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

STATISTICAL ANALYSIS OF MEAN ABUNDANCES OF ICHTHYOPLANKTON FOR 0.5 AND 1.0 M NETS AT HIGH VS. LOW SAMPLING VELOCITIES

BOWLINE VICINITY - 1977

		ANALYSIS OF VARIANCE[a]							
		0.5 M NETS				1.0 M NETS			
TAXON	SOURCE	DF	SS	MS	F	DF	SS	MS	F
Striped bass	Velocities	1	1.1391	1.1391	4.19	1	0.0786	0.0786	0.31
	Periods	10	9.0000	0.9000	3.31*	10	8.2429	0.8243	3.28*
	Interaction	10	10.1686	1.0169	3.74*	10	7.7372	0.7737	3.08*
	Error	11	2.9936	0.2721		11	2.7615	0.2510	
White perch	Velocities	1	0.2667	0.2667	2.74	1	0.5228	0.5228	1.48
	Periods	10	5.7468	0.5747	5.91*	10	5.4572	0.5457	1.54
	Interaction	10	2.3200	0.2320	2.39	10	4.3227	0.4323	1.22
	Error	11	1.0695	0.0972		11	3.8891	0.3536	
Morone spp.	Velocities	1	0.2387	0.2387	0.86	1	0.0275	0.0275	0.05
	Periods	10	10.4968	1.0497	3.80*	10	6.4480	0.6448	1.15
	Interaction	10	10.7506	1.0751	3.89*	10	4.3089	0.4309	0.77
	Error	11	3.0420	0.2765		11	6.1777	0.5616	
Bay anchovy	Velocities	1	2.5707	2.5707	10.90*	1	8.3794	8.3794	30.93*
	Periods	10	7.1743	0.7174	3.04*	10	3.7282	0.3728	1.38
	Interaction	10	5.6104	0.5610	2.38	10	2.9565	0.2957	1.09
	Error	11	2.5955	0.2360		11	2.9800	0.2709	

[a]Non-orthogonal analysis; log transformed data
*Significant at $\alpha = 0.05$

TABLE 7

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

STATISTICAL ANALYSIS OF MEAN ABUNDANCES OF ICHTHYOPLANKTON
FOR 0.5 AND 1.0 M NETS AT HIGH VS. MEDIUM SAMPLING VELOCITIES

BOWLINE VICINITY - 1977

		ANALYSIS OF VARIANCE[a]							
		0.5 M NETS				1.0 M NETS			
TAXON	SOURCE	DF	SS	MS	F	DF	SS	MS	F
Striped bass	Velocities	1	0.0133	0.0133	0.02	1	0.1386	0.1386	1.44
	Periods	6	6.4778	1.0796	1.74	6	3.7944	0.6324	6.57*
	Interaction	6	1.7200	0.2867	0.46	6	0.8739	0.1457	1.51
	Error	6	3.7306	0.6218		6	0.5778	0.0963	
White perch	Velocities	1	0.3063	0.3063	0.61	1	0.0712	0.0712	0.67
	Periods	6	2.4909	0.4151	0.82	6	5.8680	0.9780	9.18*
	Interaction	6	6.0833	1.0139	2.01	6	2.3318	0.3886	3.65
	Error	6	3.0260	0.5043		6	0.6390	0.1065	
Morone spp.	Velocities	1	0.1463	0.1463	0.68	1	0.0186	0.0186	0.33
	Periods	6	2.6176	0.4363	2.04	6	2.6253	0.4376	7.78*
	Interaction	6	1.5098	0.2516	1.18	6	0.4798	0.0799	1.42
	Error	6	1.2851	0.2142		6	0.3374	0.0562	
Bay anchovy	Velocities	1	0.6056	0.6056	2.92	1	0.0240	0.0240	0.14
	Periods	6	2.5780	0.4297	2.07	6	9.3125	1.5520	19.03*
	Interaction	6	2.5646	0.4274	2.06	6	0.2786	0.0464	0.27
	Error	6	1.2433	0.2072		6	1.0310	0.1718	

[a]Non-orthogonal analysis; log transformed data
*Significant at 5% level

TABLE 8

ORANGE AND ROCKLAND UTILITIES, INC.
ICHTHYOPLANKTON GEAR COMPARISON STUDY

STATISTICAL ANALYSIS OF MEAN ABUNDANCES OF ICHTHYOPLANKTON COLLECTED IN 0.5 M NETS AT LOW VELOCITY AND 1.0 M NETS AT HIGH VELOCITY

BOWLINE VICINITY - 1977

	ANALYSIS OF VARIANCE[a]				
TAXON	SOURCE	DF	SS	MS	F
Striped bass	Net Size and Velocity	1	1.3711	1.3711	5.09*
	Periods	10	8.3873	0.8387	3.11*
	Interaction	10	9.3485	0.9349	3.47*
	Error	11	2.9636	0.2694	
White perch	Net Size and Velocity	1	2.3432	2.3432	24.07*
	Periods	10	4.3654	0.4365	4.48*
	Interaction	10	4.6784	0.4678	4.81*
	Error	11	1.0710	0.0974	
Morone spp.	Net Size and Velocity	1	1.8995	1.8995	6.90*
	Periods	10	7.7740	0.7774	2.82
	Interaction	10	6.4930	0.6493	2.36
	Error	11	3.0300	0.2755	
Bay anchovy	Net Size and Velocity	1	7.6454	7.6454	31.91*
	Periods	10	5.3653	0.5365	2.24
	Interaction	10	3.3466	0.3347	1.40
	Error	11	2.6357	0.2396	

[a]Non-orthogonal analysis, log transformed data
*Significant at $\alpha = 0.05$

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An Evaluation of High Frequency Sonar
For Fish Counting and Relative Biomass
Estimation in the Lower Hudson Estuary.

1181

A report prepared for
Consolidated Edison Company of New York Inc.

By

V.W. Kaczynski and the Indian Point Ecological Team
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FOREWARD

A sonar survey was conducted by Texas Instruments Incorporated during the fall of 1972 under contract to Consolidated Edison Company of New York Inc. to evaluate the use of an echo sounding technique to measure the density and distribution of fish in the lower Hudson River. This report describes the methods used for data collection and analysis, results obtained, and an evaluation of the System.

The data collection was conducted by Texas Instruments personnel assigned to the Fish Impingement project under the direction of Dr. James Mudge. The data analysis and report were prepared by Dr. Victor Kaczynski with the assistance of Dr. Daniel McKenzie and Mr. Donald Grosse all of Texas Instruments Incorporated.

Texas Instruments Incorporated subcontracted the primary conversion of the analog tape signals to numerical data to Ecosonics Inc. of Seattle, Washington.

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SUMMARY

This technique is applicable in Hudson River waters for obtaining absolute population estimates, dispersion patterns and relative abundances of fish. It is very complementary to more traditional techniques. A distinct problem associated with measurements of fish in the surface water exists. A high density of very small, true sonic targets resulted in high relative biomass values in this stratum (0 to 1.5 or 3.0 meters) throughout the study regions. These fine targets could be dense patches of zooplankton, fish eggs, larvae, air bubbles, or detritus.

A reasonable correlation (r = 0.73) resulted between targets counted in the bottom 3 meters and the total number of fish captured in a bottom trawl towed simultaneously some 15 meters behind the acoustic device. This relationship allowed us to determine that our bottom trawls are approximately 9% efficient (e.g., one could multiply our bottom trawl densities by 11 to obtain true estimates of standing stocks in the shoal areas of the Hudson Estuary). The relationship between relative biomass estimates and the weight of fish caught in the bottom trawl was highly variable because of the interplay between the size of the fish and their avoidance ability. This relationship was not statistically significant. Qualitative inspection revealed that we are missing many large fish.

The phenomenon of distinct diel vertical migrations of adult fish is not occurring in the Hudson Estuary during the period studied. A slight tendency for vertical migration was observed.

Differences existed in the measured densities of fish between Ossining, Indian Point region I, and Cornwall in September. On a volumetric basis (numbers per cubic meter of water) this resulted in a ratio of 3.1:1.3:1 and on an areal basis (numbers under a square meter of water) of 2.1:1.3:1.0 respectively. In October these ratios changed to 1.3:2.6:1.0 (volumetric) and 1.0:3.3:1.1 (areal) respectively. The densities at Ossining were significantly higher in September but those at Indian Point were significantly higher in October (α = .05). Internal station differences also existed but variability in the densities in time tended to mask this. Generally speaking more station differences were detected at Ossining than at Indian Point and Cornwall.

A significant inverse relationship between fish density per cubic meter and the depth of the station was found in September. After an apparent shift in the fish distribution in October the relationship broke down (depth then had no affect on volumetric density).

Despite some minor problems encountered in applying these techniques to the Hudson estuary, these initial results are highly encouraging. The data collected via sonar adds significantly to the overall evaluation of the fishery stocks. The results from the conventional approach, i.e. trawling, coincide with the sonar results in areas of overlap, suggesting that the two methods are compatiable. There are indications that sonar can provide valuable information and it is recommended that a sonar program be continued. Future studies should concentrate on applying these techniques to define cross sectional isopleths of fish densities, in the immediate vicinity of the plant intake.

Introduction

The purpose of this paper is to evaluate the application and results of a hydroacoustic technique for estimating fish stocks in the Hudson Estuary. To evluate the technique, simultaneous bottom trawls were taken slightly behind replicated sonar surveys made in three separate regions of the lower estuary, representing a cline in salinity and the species of fish associated with it. Correlation analyses were performed between the trawl catches and the estimated densities and standing stock values calculated by sonar.

Several successful applications of hydroacoustic systems for fish stock assessment have been made (Truskanov and Scherbino 1964, Dragesund and Olsen 1965, Cushing 1968, Thorne and Woodey 1970, Thorne et al 1971, Shibata 1971 among others). The development of the mathematical theory, statistical application and specific technology required is well documented (Craig and Forbes 1969, Thorne and Lahore 1969, Lenarz and Green 1971, Moose and Ehrenberg 1971, Shibata 1971). Little doubt exists that sonar techniques can provide critical data on fish numbers, dispersion patterns, size estimates and relative biomass estimates. However, reasonable doubt existed that the application could be made in the Hudson. All of the previous studies took place in water bodies that are pristine in comparison. To further the doubt, 1972 was a year of record rainfalls, and the sediment and detrital loads were proportionately high.

Methods and Materials

Three areas were surveyed (Figure 1): The Ossining region (northern portion of the Tappan Zee, a potential site for a conventional power plant), the Indian Point region (which immediately surrounds Con Edison's nuclear facility), and a northern region in the vicinity of Cornwall and Storm King Mountain (the site of a future hydroelectric facility). Seven stations were monitored at Indian Point, five at Cornwall and seven at Ossining during August, September and October (September and October only for the latter).

A reasonable description of the hydroacoustical system used (high frequency sonar coupled to an analog tape recorder) and the initial data processing techniques (some electrical hardware converting the analog signals to a digital mode which then feeds into a computer) are given by Moose et al (1971). Briefly, an echo integration technique was used which integrated target values in up to 10 depth strata simultaneously. The system also had a automatic bottom following facility. Fish population densities are a function of acoustic target strength. Debris and extraneous gas bubbles are also measured and are included as absolute errors (not statistical "error") in estimates of fish densities and biomass.

Simultaneous to the sonar recordings, a 7.6 m semiballoon otter trawl (1.9 cm mesh) was towed along the bottom approximately 15 meters behind the vessel. A fixed time duration of 10 minutes was employed at a speed of one meter per second against the current. Tow speed was regulated by maintaining constant rpm settings on the twin diesel towing vessel and was periodi-

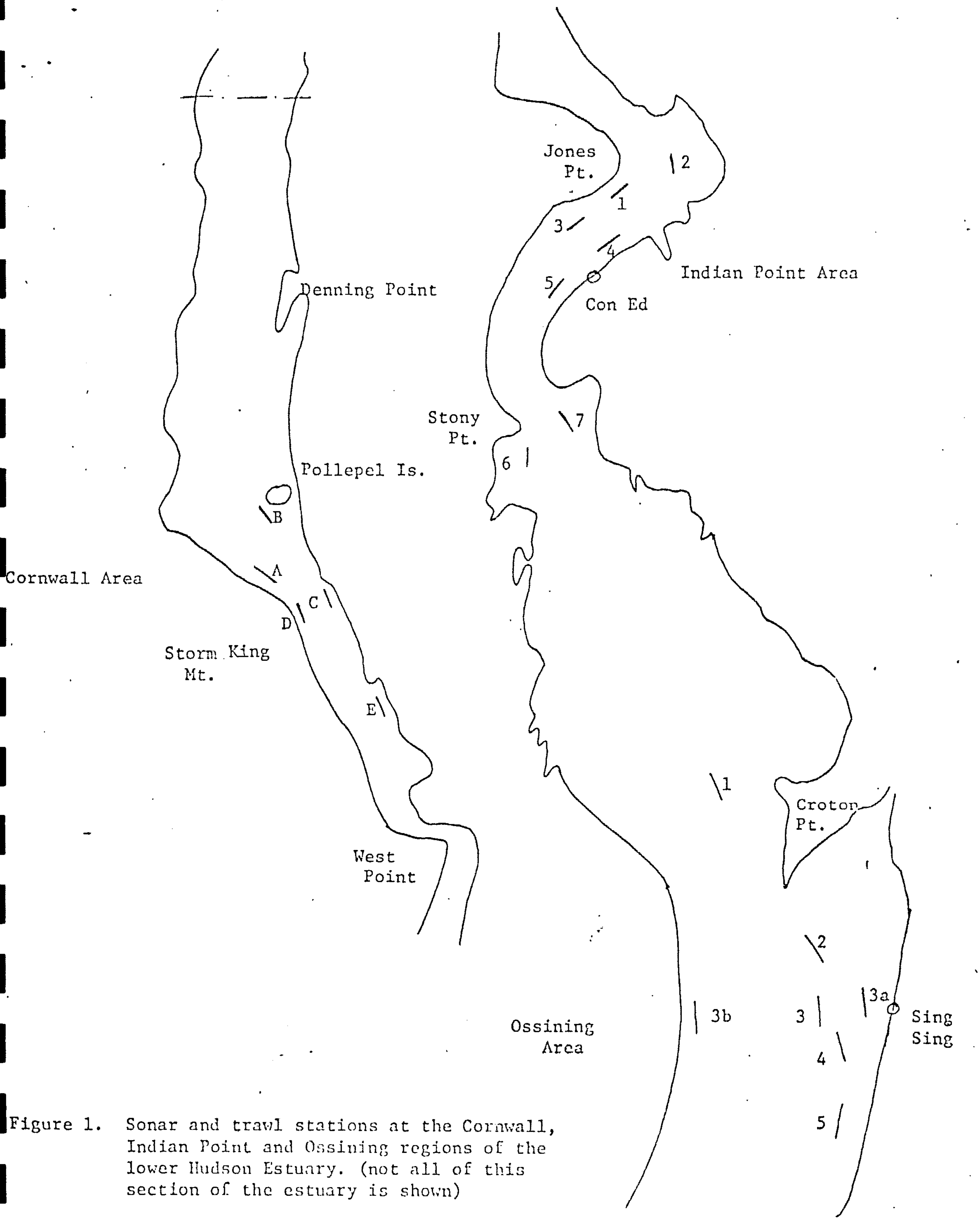

Figure 1. Sonar and trawl stations at the Cornwall, Indian Point and Ossining regions of the lower Hudson Estuary. (not all of this section of the estuary is shown)

cally checked by timing a dropped float.

Normal linear correlations were determined between the average density (targets per cubic meter) in the bottom three meters at the individual stations and the numbers of fish caught in the slightly lagged bottom trawl, and between the estimated average biomass in this same stratum and the weight of fish caught.

The two parameters derived from sonar, relative biomass and number of targets per cubic meter, were used to test for differences between the three river areas and for differences between the standard stations within each region. Three procedures and three statistical tests were used.

In the first procedure, we tested for differences between total water column values using L.S.D. (Least Significant Difference test) and Friedman's two way analysis of variance on untransformed data with the upper 2.5 m of water column omitted. The second procedure was to test for differences in the mean densities of the water columns (less upper 2.5 m) using the same two tests. Finally a four-way analysis of variance was used to test for differences of mean densities at depth intervals of 1.5 m from 1 m below the surface, also considering day-night, monthly and location differences on the transformation $\underline{X} = \sqrt{X + .5}$. Shallow depths eliminated Ossining stations 3A and 3B and Cornwall station F from the latter analysis. Since August data was available only in Indian Point, August was eliminated from the latter analysis.

RESULTS

I. Correlations With Bottom Trawls

The number of fish caught in the bottom trawl resulted in a reasonable regression. The least squares fit of the data yields (for y = a + b x) an intercept of -51.6 and a slope of 11.36 (Figure 2). While the regression coefficient is significant (r = 0.734) the standard error is high (Sy. x = 90.0) with respect to the main body of data points.

The average catch per trawl was 20.6 fish while the mean number of targets per 1000 cubic meters was 45.8. Since our average bottom trawl sweeps about 4000 cubic meters, the sonar would have detected an average of 183.2 targets in an equivalent volume. This is a ratio of 8.9 sonar targets to one fish caught. The slope of the regression line (the best measure of the relationship by least squares) results in a ratio of 11.4 to 1.

Actual trawl catches (means ± 1 standard error) are compared to the number of targets per 4000 cubic meters, in the bottom 3 meters (mean volume ± 1 standard error) at each of the three regions (Ossining, Indian Point and Cornwall) in Figures 3, 4 and 5 respectively.

The average relative biomass estimates in the bottom three meters compared to the weight of fish caught in the trawls did not yield a significant regression. The set of data points and the regression line are shown in Figure 6. The least squares fit for this line (y = a + b x) yielded an intercept of 2.1, a slope of 0.0000942, correlation coefficient of 0.0496 and an error of 2.806 (Sy.x).

Although the regression itself is not significant it is still possible and reasonable to calculate a conversion from relative biomass units to real biomass based on mean proportionality.

The mean weight of fish caught per trawl was 829 g, while the average relative biomass contained in 4000 cubic meters (in the bottom 3 meter stratum) was 8830 relative biomass units. This results in a ratio of 10.8 biomass units to 1 g of fish caught in the trawls. This ratio can be corrected by the 11.4:1 avoidance factor from the numerical analysis, making one relative biomass unit equal to 1.06 grams of fish (10.8:11.4). This relationship is minimal because qualitative inspection of Figures 2 and 3 indicates that much of the variability is associated with many targets appearing on sonar and not showing up in the trawl catch. Further, these were the large values (e.g., many large fish avoided the trawl). The 1:1.06 relationship assumes an average weight of 40 grams per fish (the average weight of the trawl caught fish). On this basis the bottom layer of moderately deep areas of the Hudson River contains an average biomass of 2.3 grams of fish per cubic meter of water during the late summer season.

II. Problem With The Upper Stratum Of Water

A distinct problem associated with measuring values in the upper stratum of water was encountered during this study. Exceedingly large biomass values (associated with numerous small targets) were often encountered in the top 1.5 meters of water. This often extended through the top 3 meters of water. This phenomenon was aggravated early in the study by the selection of too high a sensitivity setting on the sonar equipment itself.

These values generally were true sonar targets but on several occasions surface reverberations compounded the problem. Dense patches of detritus, zooplankton, fish larvae, or even air bubbles could cause this. Several areas exist in our study region where streams of air bubbles can be traced to deep, relatively sharp-side "holes" in the river bottom. These streams of air bubbles could be coming from seepage springs or from pockets of decomposing organic matter. No attempt was made to collect or analyze the gas.

Sub-surface accumulations of detritus are known to collect in regions of upwelling associated with Langmuir spirals, and where two distinct water masses meet each other (i.e., along a tidal rip). This meeting and upwelling can be subtle and not recognizable to the eye. Accumulations of zooplankton are also often found in these same areas as are small zooplanktivorous fish.

To decrease the possibility of introducing an artifact into the analysis we have eliminated the top three meters in most of our calculations. This omission is tentatively supported by ancillary surface trawl catch data. Surface trawls on the same days (but not at the same times) had consistently low catches tentatively supporting the hypothesis that these targets were not fish (at least 35 mm long). However, this might be an artifact caused by the passage of the towing vessel through the very waters that are being fished by the following net. This will be clarified in 1973 by using two towing vessels with the surface net towed between them. Unless it is specifically mentioned, the top three meters are not included in the calculations or subsequent analyses.

This problem becomes less serious by the selection of a lower gain setting on the equipment. The gain setting acts as a minimum threshold value. The original setting was based on previous experience in cleaner waters.

III. Time Of Day Of Maximum Fish Detection

There were no significant differences (α = .05) between the abundance of fish on an integrated water column basis (e.g., number of fish per square meter of water) or in changes in the internal vertical distribution of fish within a water column, as a function of the time of day. This was determined by an Analysis of Variance comparison on those days when replicate surveys were taken through a 24 hour period at 4 hour intervals. It was not surprising that there were no differences in total densities on a square meter basis during a diel cycle, but the absence of internal vertical migration patterns was surprising. The small differences in day to night density patterns are shown in Figures 7, 8 and 9. Stations 1, 2 and 7 had similar depths and were lumped to provide replication in Figure 7. Stations A, D and E (also of similar depth) were lumped to provide the replication shown in Figures 8 and 9. Depth is known to affect the internal vertical spacing of fish. The relatively shallow and dissimilar depths of the Ossining Stations make a similar analysis of rather doubtful value. However, a general analysis of variance comparison (α = .05) indicates that the time of day had no affect on density or internal depth distribution. This is consistent with the trawl catch data (both surface and bottom) which also indicates no changes in density, day to night (α = .05, paired difference test).

IV. Biomass Distribution At Ossining

The mean densities of fish at Ossining for September and October, 1972 are shown in Figure 10. The densities are significantly different (α = .05). This is a compilation of the densities at Stations 1, 2, 3, 3a, 3b, 4, and 5; the respective station densities are shown in Figures 11-17 inclusive. The relative biomass values (1 relative unit equals 1.06 grams of fish) of fish per cubic meter of water at Ossining, for this same time period, are shown in Figure 18. Table 1 lists:

(a) the mean number of fish per cubic meter of water ($\pm$ 95% confidence intervals)

(b) the mean number per square meter of water and

(c) the mean number of fish per square meter of water when the upper 3 meters have been corrected by the average value of the remainder of the water column at the Ossining stations.

On an areal basis (fish /m^2 of water) station 3A was consistently and significantly lower in density than all the stations in September, but only less than Station 1 in October (α = .05, LSD test). Station 2 also had a lower density than Station 1 in October. None of the other stations had significant differences in areal density. The ANOVA results appear as Table 2.

Briefly, the following sources of variability can be accounted for: 14.4% by monthly differences in density (highly significant), only 1.7% by station differences (not significant), 8.2% by differences in the distribution of density with depth (significant), 7.6% by a monthly/depth interaction (significant). 54.8% of the variability cannot be explained and remains as residual "error." A generally decreasing density of fish with depth was observed at the Ossining stations.

V. Biomass Distribution At Indian Point

The trend in the mean fish densities (per cubic meter of water) during August through October is shown in Figure 19, while Figures 20-26 break this down on a station basis (Stations 1-7 respectively). The trend in relative biomass at Indian Point is shown in Figure 27. Relative biomass and numerical densities show the same trends. Table 3 lists the mean numbers of fish per cubic meter and the integrated values on a square meter basis (± 95% confidence intervals).

Statistically no significant differences exist between the summed areal densities of the stations, because of the high variability (indicating mobility of the populations) associated with this series of measurements. The mean densities at these stations were generally higher in September than in August or October.

The analysis of variance table for the density of fish per cubic meter comparing monthly, station and depth differences, and interactions is presented as Table 4. Highly significant differences occurred in the mean densities (per cubic meter of water) at Indian Point, and this accounts for 4.8% of the variability in the data. The densities were higher in September than in August and October. There were no significant station differences in density, confirming the areal density analysis; only 1.5% of the variability can be accounted for by station differences. A highly significant difference in the internal depth distribution of fish was found at Indian Point (more so than at Ossining); that is, depth at Indian Point is a very important factor affecting the vertical distribution of fish in the water column. Depth by itself directly affects the average number of fish on a volumetric basis. This factor accounts for 25.9% of the variability in the data.

A highly significant interaction occurs between stations and months that accounts for 4.6% of the variability. The density at Station 1 dropped disproportionately in October relative to the other stations. Generally Station 7 ranked first in fish abundance throughout this period. The month/depth and station/depth interactions were not significant but accounted for 1.9 and 3.4% of the variability. A residual error of 57.8% remained after the analysis.

Table 5 presents the transformed means (which should be viewed on a relative and not absolute basis) from the ANOVA table and shows the vertical distribution of fish in September and October. The top 3 meters of water was included in this analysis. Generally speaking a consistent decrease in the number of targets occurs with depth, except for the bottom stratum which increases in density. Omitting the top 3 meters does not change the pattern.

Relationships between the density of fish per cubic meter of water in the shoal areas and the salinity and temperature values were evaluated to see if any correlation existed. A slightly negative relationship with both was found but neither was significant ($\alpha = .05$). This is not very surprising because each species reacts independently to salinity and temperature, and the sonar cannot separate the species but sees fish in total.

VI. Biomass Distribution At Cornwall

Figure 28 presents the mean density of fish per cubic meter at Cornwall for September and October based on the measured densities at Stations A through E (Figures 29-33 respectively), while Figure 34 shows the trend in relative biomass per cubic meter of water. The mean numerical biomass values per cubic meter and integrated square meter of water ($\pm$ 95% confidence interval) are listed in Table 6. The Cornwall areal density measurements were the most variable of the three regions, and because of this there were no significant differences in abundance between months, between stations, or within stations in any month or months.

Table 7 presents the analysis of variance results for the Cornwall stations on a volumetric density basis (e.g., fish /m^3). Densities were significantly greater in September than in October and 7.5% of the variability can be accounted for. There were no statistical differences in density between the stations; only 0.8% of the variability can be accounted for by a station effect. Depth was also very important in affecting density (as at Indian Point), accounting for 10.8% of the variability (highly significant). There was also a highly significant interaction between month and depth at Cornwall (accounting for 13.4% of the variability). In September the fish were more dense at the surface and the density decreased with depth. However a major shift in depth distribution occurred in October when the fish were least dense in the mid-depths while the greatest density occurred in the bottom depths. Interestingly a major shift in the size distribution of fish at Cornwall also occurred between September and October; a relatively large number of small fish were present in September compared to a fewer number of much larger fish being present in October (compare Figure 27 to Figure 33). The month/station interaction was not significant and could only account for 0.7% of the variability; neither was the station/depth interactin (1.5% of the variability) (e.g., the depth distribution was similar at all the stations).

VII. Regional Comparisons

The average numerical standing stock values for the three regions are shown in Table 8. The results of an analysis of variance on fish/m^3 at the sonar stations in Ossining, Indian Point and Cornwall during September and October are presented in Table 9. All of the direct effects and interaction effects are highly significant. Significant differences in fish densities due to month, region, depth and the interactions of month/region, month/depth and region/depth existed. The density of fish per cubic meter of water was significantly higher ($\alpha = .05$) at Ossining than at Indian Point and Cornwall in September but not in October. The volumetric densities at Cornwall were absolutely lowest in both months but not statistically lower (except lower than Indian Point in October at $\alpha = 0.1$). The change in ranking from Ossining, Indian Point, Cornwall to Indian Point, Ossining, Cornwall probably accounts for the significant month/region interaction. The densities at all three regions were significantly lower in October than in September. This month effect accounts for 3.2% of the variability. The shallower the depth (Ossining, Indian Point, Cornwall) the greater the volumetric density, while the greater the depth (Cornwall, Indian Point, then Ossining) the more important depth was in affecting the internal vertical distribution of density. The former effect accounts for 17.6% of the observed variability in the data and was the single most important factor affecting this biomass parameter in the Hudson Estuary. Also important (and related) are the month/depth interaction (5.1%) and the region/depth interaction (5.8%). In September a generally inverse relationship between depth and the mean density per cubic meter was found. However, in October this did not hold true; if anything a slight positive relationship between density per cubic meter and the station depth existed. In September the highest densities per cubic meter were found in Ossining (which had the shallowest stations), the lowest densities were found in Cornwall (station depths similar to Indian Point). This pattern did not hold in October. A residual error of 66.1% cannot be accounted for by the variables listed.

On an areal basis (using a correction factor for the top 3 meters based on the average density of the remainder of the water column) the density of fish at Ossining was greater than that at Indian Point, than that at Cornwall in September (1.5:1.3:1). Following an apparent shift in distribution in October, the number of fish under a square meter of water in Indian Point was significantly greater than Ossining or Cornwall in the shoal areas (3.2:1:1).

General Discussion

The results obtained in previous sonar studies (for example Thorne et al 1971) often had correlations coefficients in the high 0.80's to even low 0.90's. Several factors tended to reduce the apparent fit of our trawl catches to sonar targets. First, qualitative inspection of the data clearly indicates that much of the variability is associated with sonar targets with large biomass values appearing on sonar but not in the trawl catches. Relatively small trawls (as ours are) are notoriously inefficient on large fish. Second, our trawl catches often contained a few true bottom fish (e.g., hogchokers) which do not appear on sonar. On several occasions the catches of hogchokers were very large. Third, surface fish (e.g., blueback herring, alewife and bay anchovy) were often taken incidently in the bottom trawl as it was being lowered and raised from its fishing depth. These latter two effects contribute to the regression (Figure 2) having a negative intercept (i.e., several fish are caught in the trawls when no targets appeared in the bottom three meters on sonar).

A second quantitative evaluation of the sonar application can be made through comparing the residual error left in an analysis of variance. The residuals from our trawl data fall in the 70's while the residuals from beach seine data are in the 80's. This indicates that quantitatively the sonar technique is a better sampler than either the trawls or beach seines.

Another evaluation of the sonar technique can be made through its ability to discern and describe phenomena such as vertical migration (or the lack of it). Quantitative comparisons made between day and night surface trawl catches and day and night bottom trawl catches revealed that no significant differences existed in the densities of adult fish caught day or night. The sonar application yielded the same results in a more convincing manner. Shifts in species (and size) composition that were detected in the net catches were also detected in the sonar analysis. These latter abilities are practically impossible to quantitatively evaluate but add considerable weight to the success of the sonar application in general.

Overall the sonar application, as a tool in evaluating fishery stocks in the Hudson, is valid and yields data that not only agrees with the data collected by conventional techniques but complements them as well.

The logical next step in the sonar program is to shift from an evaluation approach to an application approach. For example, we should shift to near field transects directly off the intakes at Indian Point to further define the relationship between fish stocks available and actually impinged, vertical distributions of fish directly at the intakes to aid in the design of fish protective devices, cross sectional transects to plot isopleths of areal fish densities throughout the region, etc.

Table 1. Mean numerical biomass (± 95% confidence interval) in the Ossining Region of the Hudson Estuary in late summer, 1972.

A. Mean number of fish per cubic meter of water (upper 3m omitted)

Station	September		October	
1	0.384	(.022)	0.398	(.013)
2	0.190	(.089)	0.023	(.002)
3	0.213	(.057)	0.092	(.048)
3A	0.235	(.059)	0.024	(.013)
3B	0.108	(.029)	0.015	(.006)
4	0.265	(.068)	0.036	(.014)
5	0.394	(.117)	0.035	(.012)

B. Mean number of fish per square meter of water (upper 3m omitted)

Station	September		October	
1	2.131	(1.051)	0.334	(.188)
2	1.660	(1.617	0.077	(.052)
3	2.073	(.919)	0.296	(.319)
3A	0.565	(.427)	0.103	(.010)
3B	0.974	(.503)	0.107	(.088)
4	1.681	(1.110)	0.107	(.114)
5	2.760	(1.110)	0.255	(.179)

Table 1. (continued)

C. Mean number of fish per square meter of water (upper 3m corrected by the average value of the remainder of the water column).

Station	Mean Depth	September	October
1	8.9m	3.28 (1.05)	0.45 (.19)
2	6.4m	2.23 (1.63)	0.15 (.05)
3	10.0m	2.71 (.93)	0.57 (.33)
3A	2.9m	1.27 (.44)	0.17 (.03)
3B	7.7m	1.30 (.51)	0.15 (.09)
4	4.4m	2.48 (1.12)	0.21 (.12)
5	7.9m	3.94 (1.13)	0.36 (.18)

Table 2. Analysis of variance table for density/m^3 at the Ossining sonar Stations 1, 2, 3, 3a, 3b, 4, and 5.

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F
MEAN	45.66111	1	45.66111	3184.02740
MONTH	.27122	1	.27122	18.91265**
STATION	.03114	4	.00778	.54285
DEPTH	.15405	3	.05135	3.58078*
MONTH(STATION)	.14372	4	.03593	2.50543*
MONTH(DEPTH)	.15678	3	.05226	3.64427*
STATION(DEPTH)	.09307	12	.00776	.54082
ERROR	1.03253	72	.01434	

* Significant at .05 level

** Significant at .01 level

Table 3. Mean densities (± 95% confidence interval) in the Indian Point Region of the Hudson Estuary in late summer-early fall, 1972.

A. Mean number of fish per cubic meter of water (upper 3m omitted)

Station	August		September		October	
1	0.250	(.230)	0.191	(.044)	0.033	(.023)
2	0.035	(.018)	0.117	(.043)	0.079	(.032)
3	0.021	(.005)	0.108	(.027)	0.040	(.024)
4	0.019	(.006)	0.055	(.009)	0.057	(.012)
5	0.017	(.008)	0.077	(.027)	0.037	(.007)
6	0.021	(.003)	0.064	(.015)	0.107	(.084)
7	0.294	(.136)	0.157	(.056)	0.221	(.120)

B. Mean number of fish per square meter of water (upper 3m omitted)

Station	August		September		October	
1	3.761	(6.814)	2.641	(1.440)	0.273	(0.430)
2	.360	(.400)	1.121	(.751)	0.620	(.480)
3	.200	(.120)	1.00	(.417)	0.243	(.280)
4	.308	(.229)	0.933	(.293)	0.800	(.290)
5	.255	(.242)	1.040	(.750)	0.430	(.200)
6	.294	(.053)	0.946	(.445)	1.060	(.43)
7	2.218	(1.99)	1.258	(.814)	1.616	(1.80)

Table 3. (continued)

C. Mean number of fish per square meter of water (upper 3m corrected by the average value of the remainder of the water column).

Station	Mean Depth	August		September		October	
1	10.5m	4.51	(6.83)	3.21	(1.44)	0.37	(.43)
2	9.0m	0.47	(.40)	1.47	(.76)	0.86	(.48)
3	8.5m	0.26	(.12)	1.33	(.42)	0.36	(.28)
4	17.5m	0.36	(.23)	1.10	(.29)	0.97	(.29)
5	13.0m	0.31	(.24)	1.27	(.75)	0.54	(.20)
6	14.3m	0.36	(.05)	1.14	(.45)	1.38	(.46)
7	8.5m	3.10	(2.01)	1.73	(.82)	2.28	(1.82)

Table 4. Analysis of variance table for density/m^3 at the Indian Point sonar stations.

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F
MEAN	147.49416	1	147.49416	5782.91680
MONTH	.51045	1	.51045	20.01371**
STATION	.16420	6	.02737	1.07296
DEPTH	2.76264	5	.55253	21.66340**
MONTH(STATION)	.49122	6	.08187	3.20992**
MONTH(DEPTH)	.20124	5	.04025	1.57806
STATION(DEPTH)	.35858	30	.01195	.46863
ERROR	6.14674	241	.02551	

** Significant at .01 level

Table 5. Means from ANOVA of density $/m^3$ at the Indian Point sonar stations.

STATIONS

SEPTEMBER

Depth(m)							
1.0-2.5	1.133	1.226	1.055	.974	1.038	1.055	1.146
2.5-4.0	1.049	.898	.909	.833	.836	.863	1.036
4.0-5.5	.853	.808	.797	.759	.736	.714	.840
5.5-7.0	.822	.796	.801	.751	.740	.681	.762
7.0-8.5	.799	.786	.794	.735	.743	.680	.750
8.5-10.0	.786	.795	.714	.742	.743	.685	.776
10.0-11.5	.763	.827	.906	.770	.752	.697	.386

STATIONS

OCTOBER

Depth(m)	1	2	3	4	5	6	7
1.0-2.5	.828	.988	.816	.822	.871	1.027	.967
2.5-4.0	.805	.722	.731	.742	.730	.896	.919
4.0-5.5	.680	.702	.689	.739	.701	.818	.793
5.5-7.0	.655	.696	.699	.737	.711	.791	.721
7.0-8,5	.630	.685	.691	.719	.712	.789	.707
8.5-10.0	.607	.683	.600	.715	.702	.783	.723
10.0-11.5	.576	.708	.785	.736	.703	.787	.326

Table 6. Mean numerical biomass (± 95% confidence interval) in the Cornwall Region of the Hudson Estuary in late summer-early fall, 1972.

A. Mean number of fish per cubic meter of water (upper 3m omitted)

Station	September		October	
A	0.093	(.024)	0.017	(.005)
B	0.091	(.021)	0.046	(.020)
C	0.048	(.014)	0.012	(.005)
D	0.074	(.021)	0.019	(.007)
E	0.138	(.035)	0.034	(.016)

B. Mean number of fish per square meter of water (upper 3m omitted)

Station	September		October	
A	0.905	(.438)	0.760	(1.280)
B	1.090	(.490)	0.440	(.450)
C	0.883	(.476)	0.088	(.083)
D	0.685	(.402)	0.132	(.112)
E	1.380	(.739)	0.223	(.194)

C. Mean number of fish per square meter of water (upper 3m corrected by the average value of the remainder of the water column)

Station	Mean Depth	September		October	
A	9.3m	1.18	(.44)	0.81	(1.28)
B	11.4m	1.36	(.49)	0.58	(.45)
C	16.3m	1.03	(.48)	0.12	(.08)
D	9.3m	0.91	(.40)	0.19	(.11)
E	9.6m	1.80	(.74)	0.33	(.20)

Table 7. Analysis of variance table for density/m^3 at the Cornwall sonar stations

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F
MEAN	205.07075	1	205.07075	20917.95000
MONTH	.26079	1	.26079	39.31887**
STATION	.02964	4	.00741	1.11725
DEPTH	.37829	4	.09457	14.25847**
MONTH(STATION)	.02565	4	.00641	.96661
MONTH(DEPTH)	.47052	4	.11763	17.73493**
STATION(DEPTH)	.05254	16	.00328	.49507
ERROR	2.26840	342	.00663	

** Significant at .01 level

Table 8. Mean numerical standing stocks (± 95% confidence limits) for the shoal areas (depths of 5 to 20m) of three regions of the Hudson Estuary.

Densities per cubic meter of water (upper 3m omitted)

Area	August	September	October
Ossining		0.28 (.07)	0.04 (.01)
Indian Point	0.086 (.07)	0.12 (.03)	0.08 (.04)
Cornwall		0.09 (.02)	0.03 (.01)

Densities per square meter of water (upper 3m omitted)

Area	August	September	October
Ossining		1.86 (.47)	0.24 (.09)
Indian Point	0.87 (.81)	1.31 (.32)	0.92 (.50)
Cornwall		1.00 (.25)	0.29 (.11)

Densities per square meter of water (upper 3m corrected by the average value of the remainder of the water column)

Area	August	September	October
Ossining		2.69 (.49)	0.35 (.09)
Indian Point	1.23 (.88)	1.66 (.33)	1.16 (.51)
Cornwall		1.27 (.25)	0.37 (.11)

Table 9. Analysis of variance table for density/m^3 at the sonar stations in Ossining, Indian Point, and Cornwall during September and October 1972.

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F
MEAN	267.86737	1	267.86737	21364.97900
MONTH	.56878	1	.56878	45.36600**
REGION	.25116	2	.12558	10.01619**
DEPTH	3.11941	6	.51990	41.46717**
MONTH(REGION)	.13154	2	.06577	5.24583**
MONTH(DEPTH)	.90493	6	.15082	12.02950**
REGION(DEPTH)	1.02199	12	.08517	6.79281**
ERROR	11.68512	932	.01254	

** Significant at .01 levels

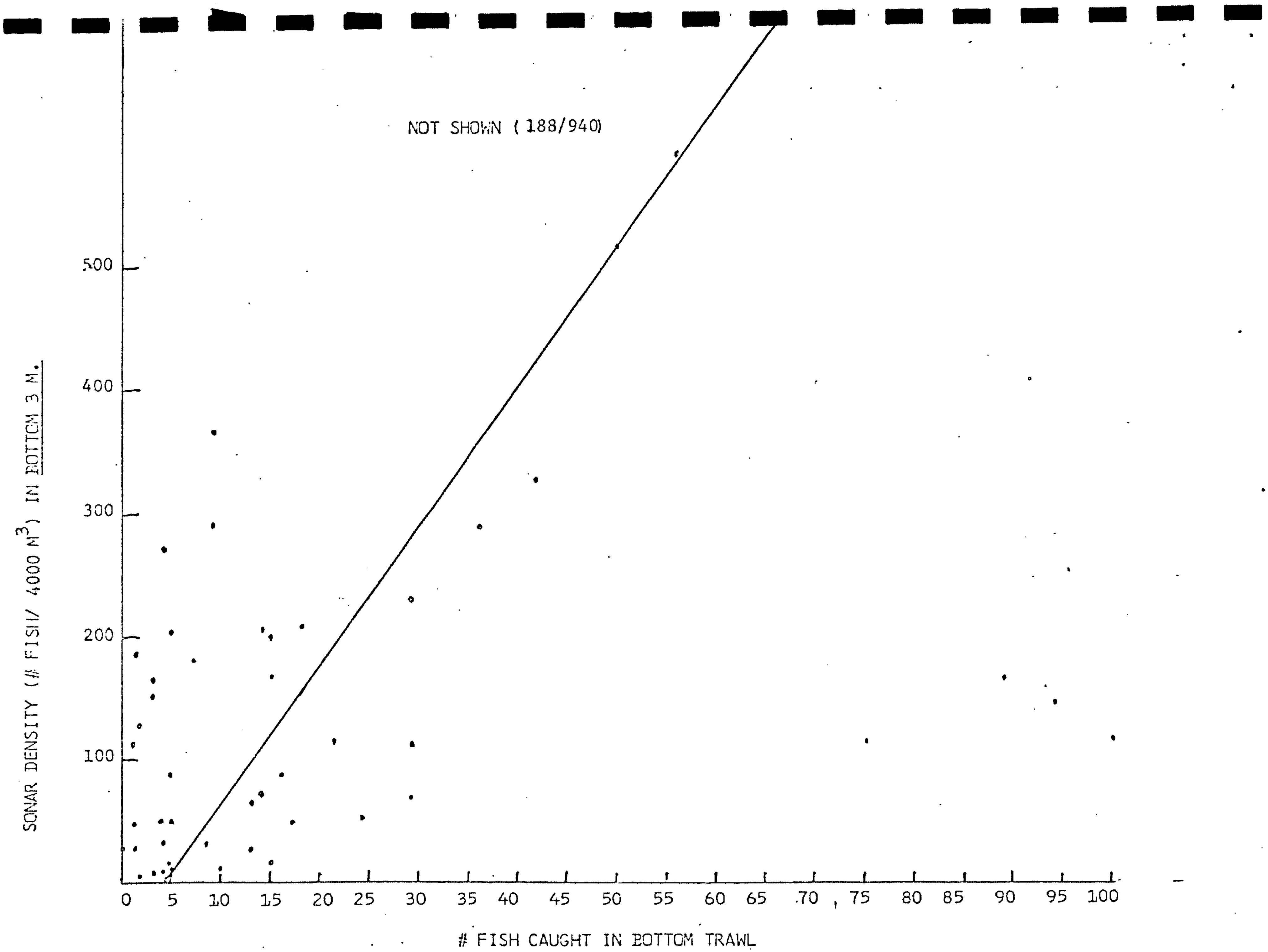

Figure 2. Correlation between the number of fish caught in a bottom trawl and the sonar density in the bottom three meters of water.

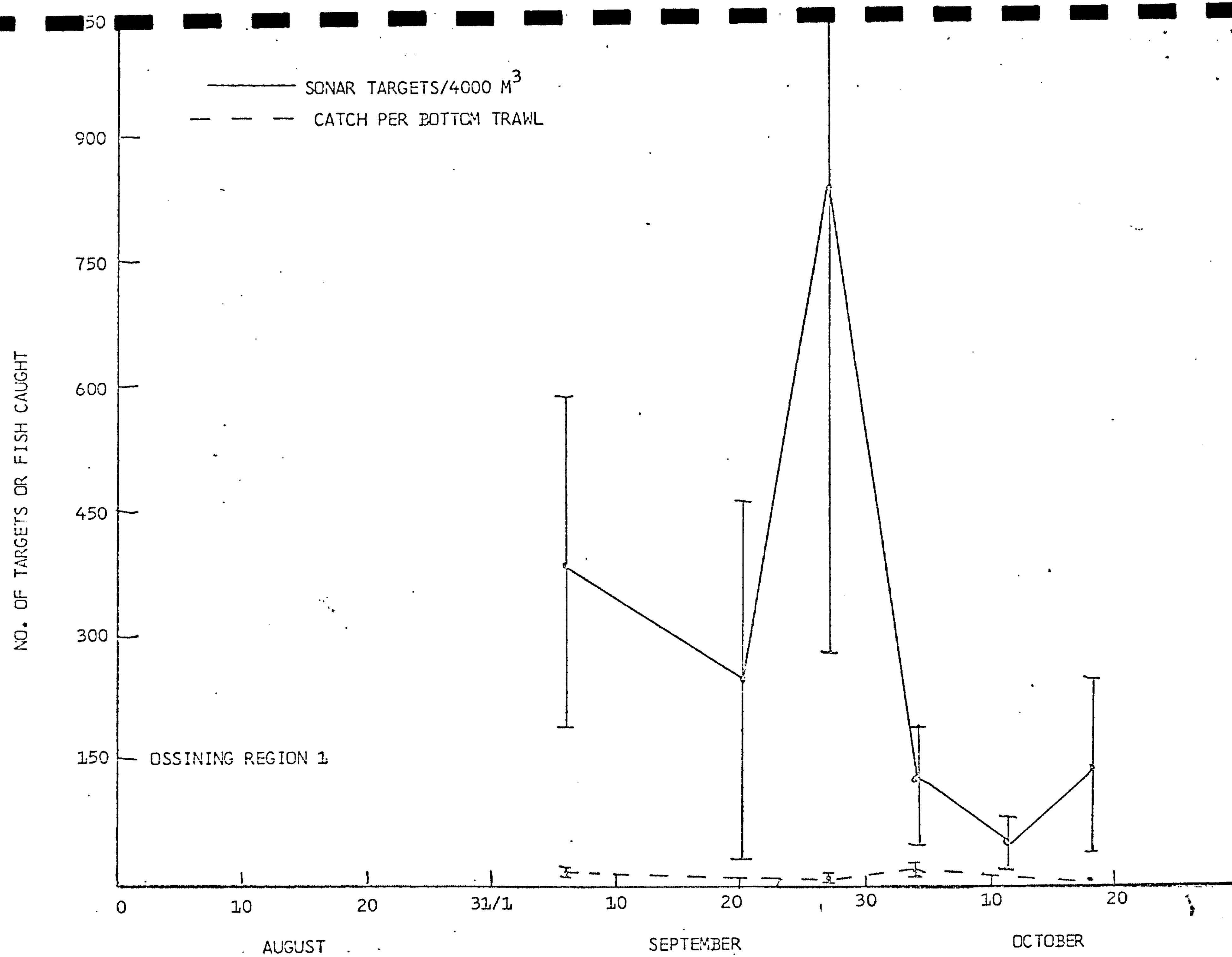

Figure 3. Actual mean trawl catches (± 1SE) and the corresponding mean number of sonar targets (± 1SE) at Ossining for September and October, 1972.

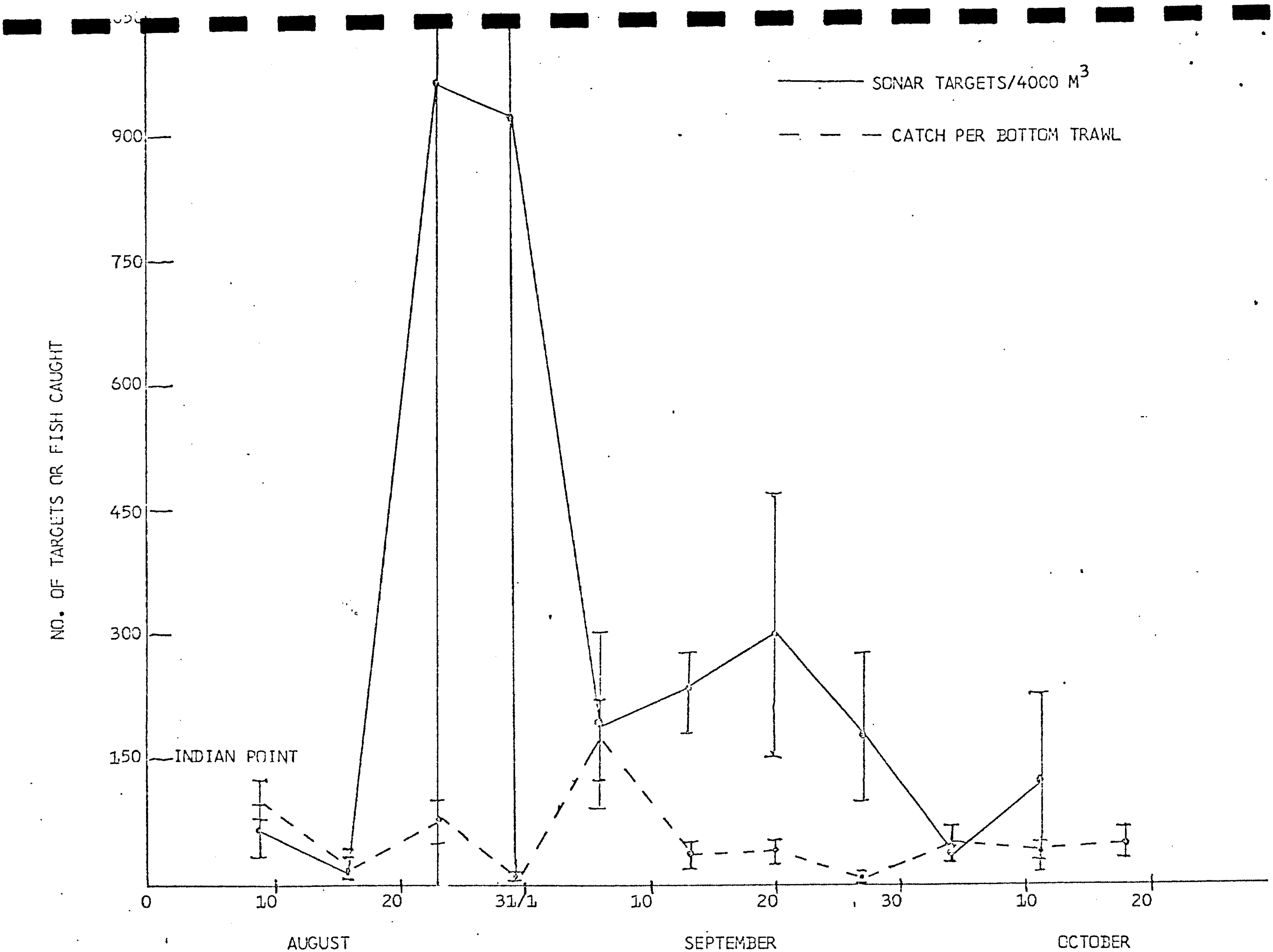

Figure 4. Actual mean trawl catches (± 1SE) and the corresponding mean number of sonar targets (+ 1SE) at Indian Point for August, September and October, 1972.

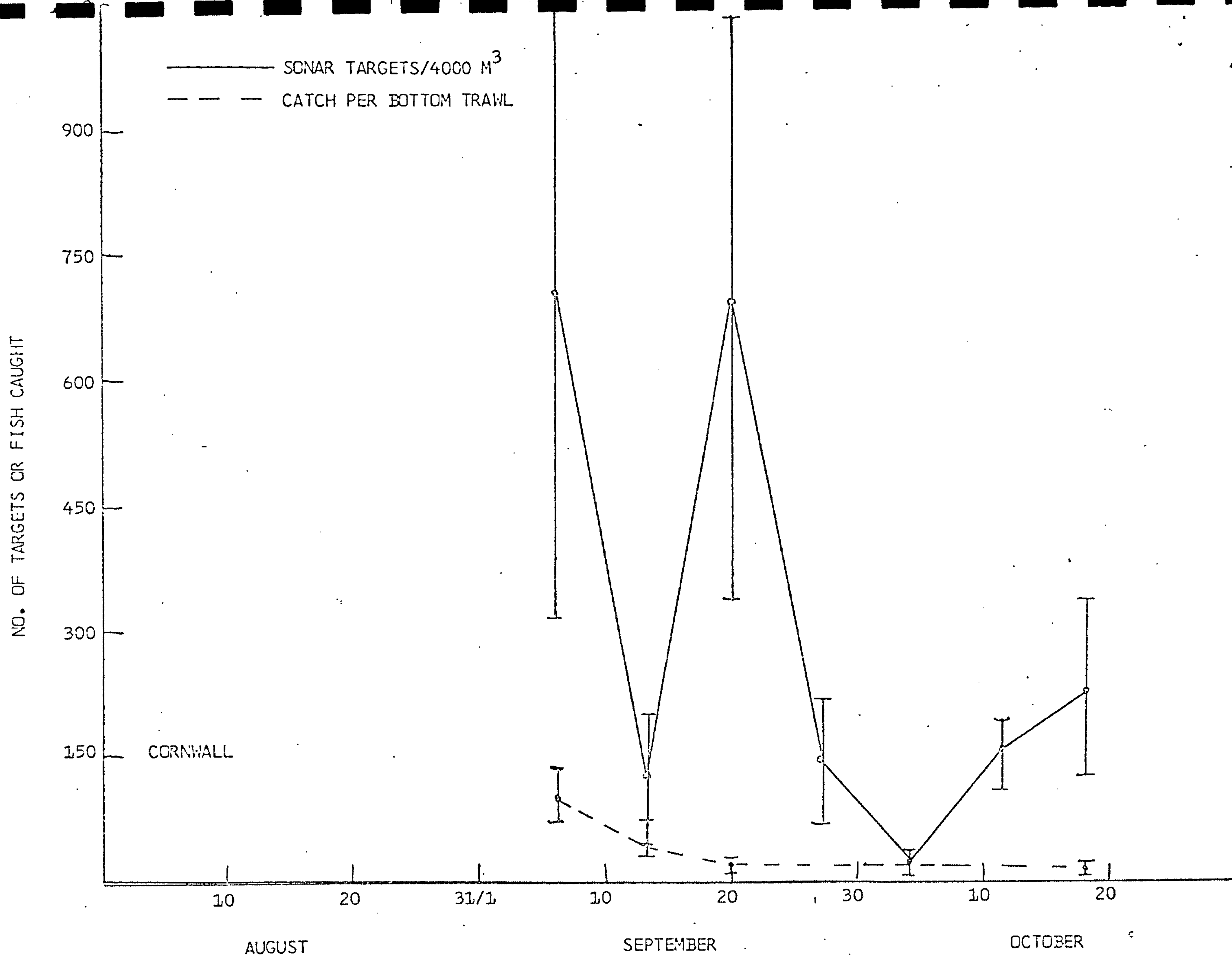

Figure 5. Actual mean trawl catches ($\pm$ 1SE) and the corresponding mean number of sonar targets ($\pm$ 1SE) at Cornwall for September and October, 1972.

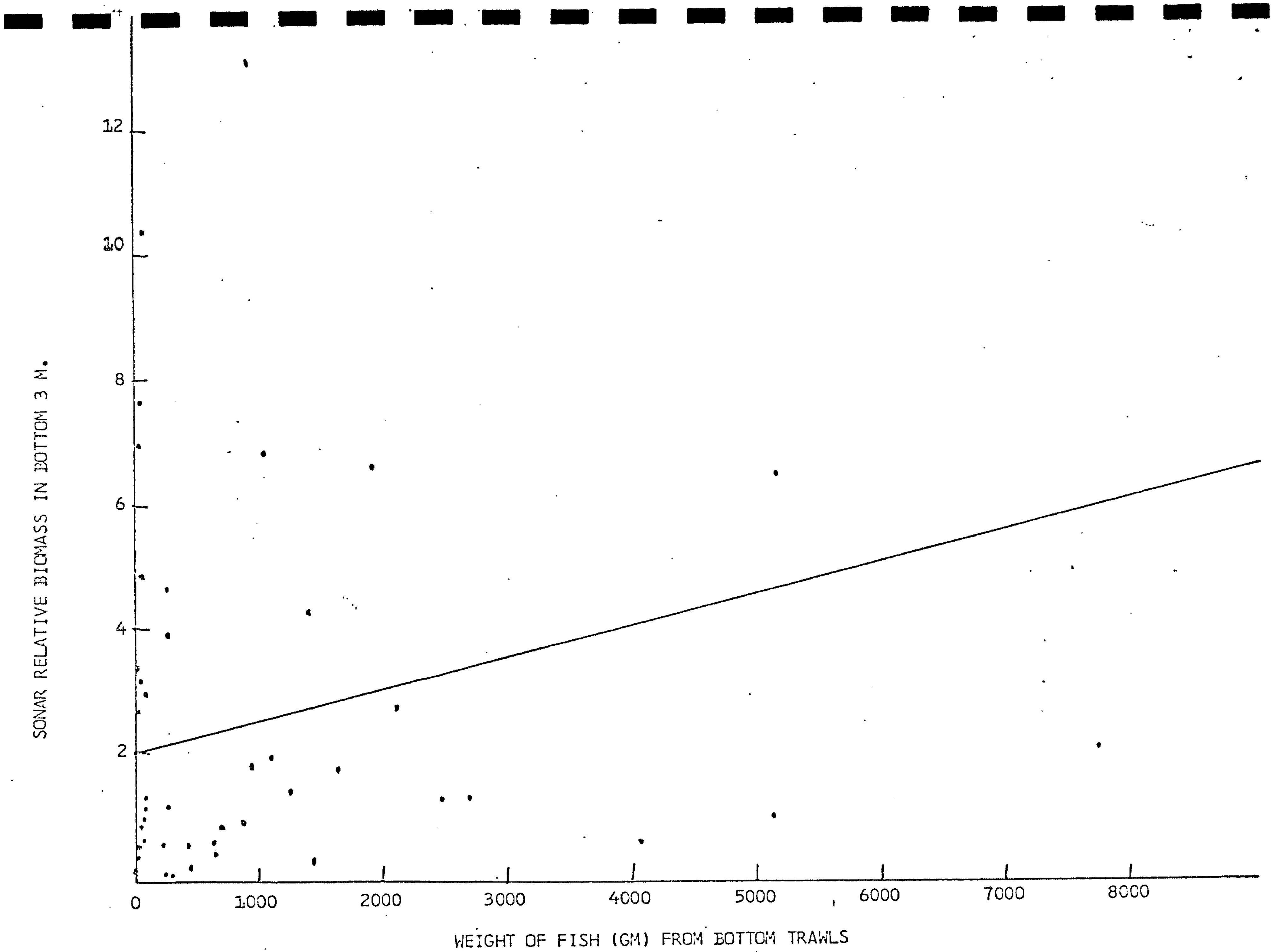

Figure 6. Correlation between the total weight of fish caught in bottom trawls and the relative biomass in the bottom three meters as measured by sonar.

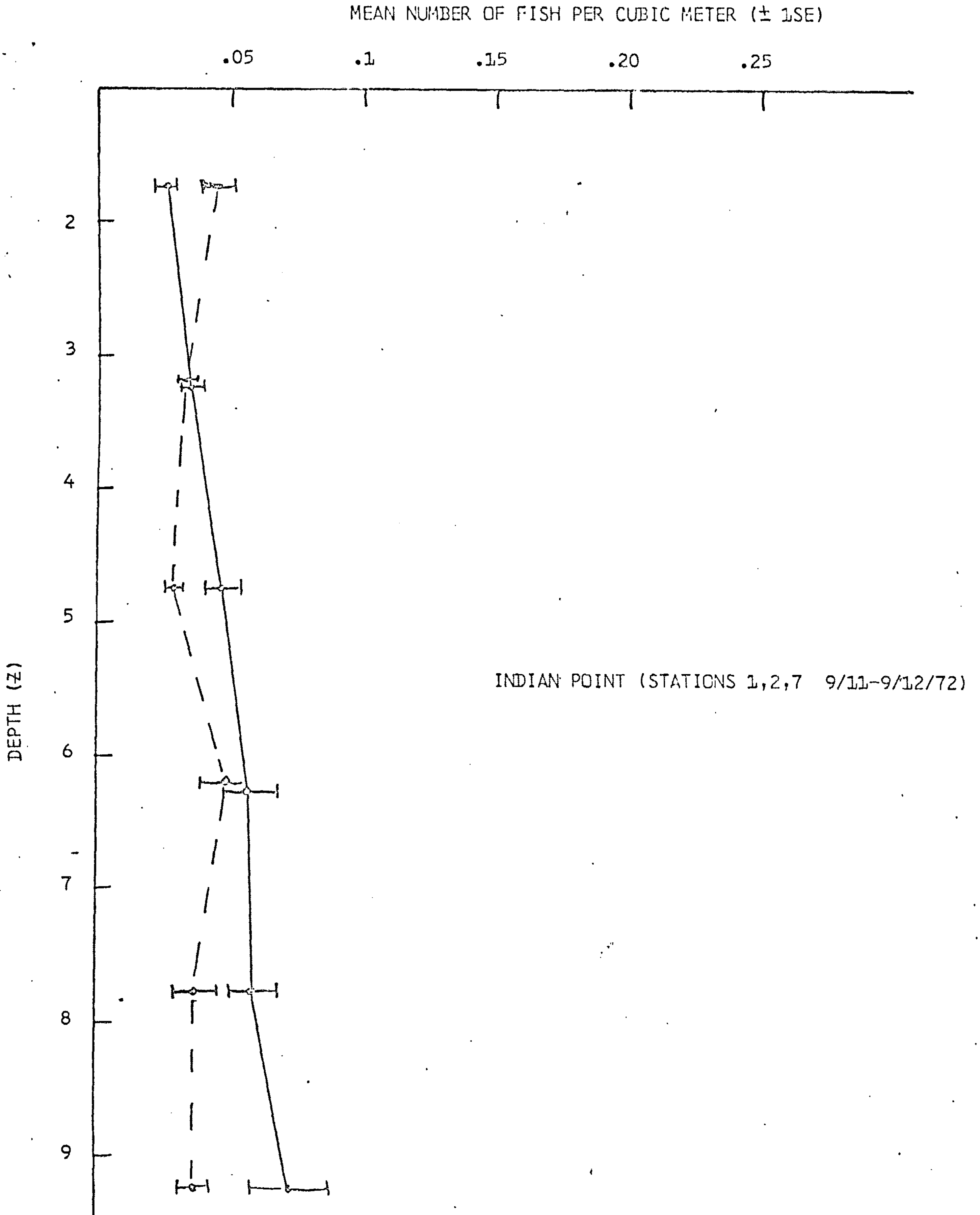

Figure 7. Diel vertical distribution of fish densities at Indian Point for the 24 hour period spanning 0800 hrs. September 11 to 0800 hrs. September 12, 1972. Solid line represents measurements taken during hours of darkness and dashed line during hours of light.

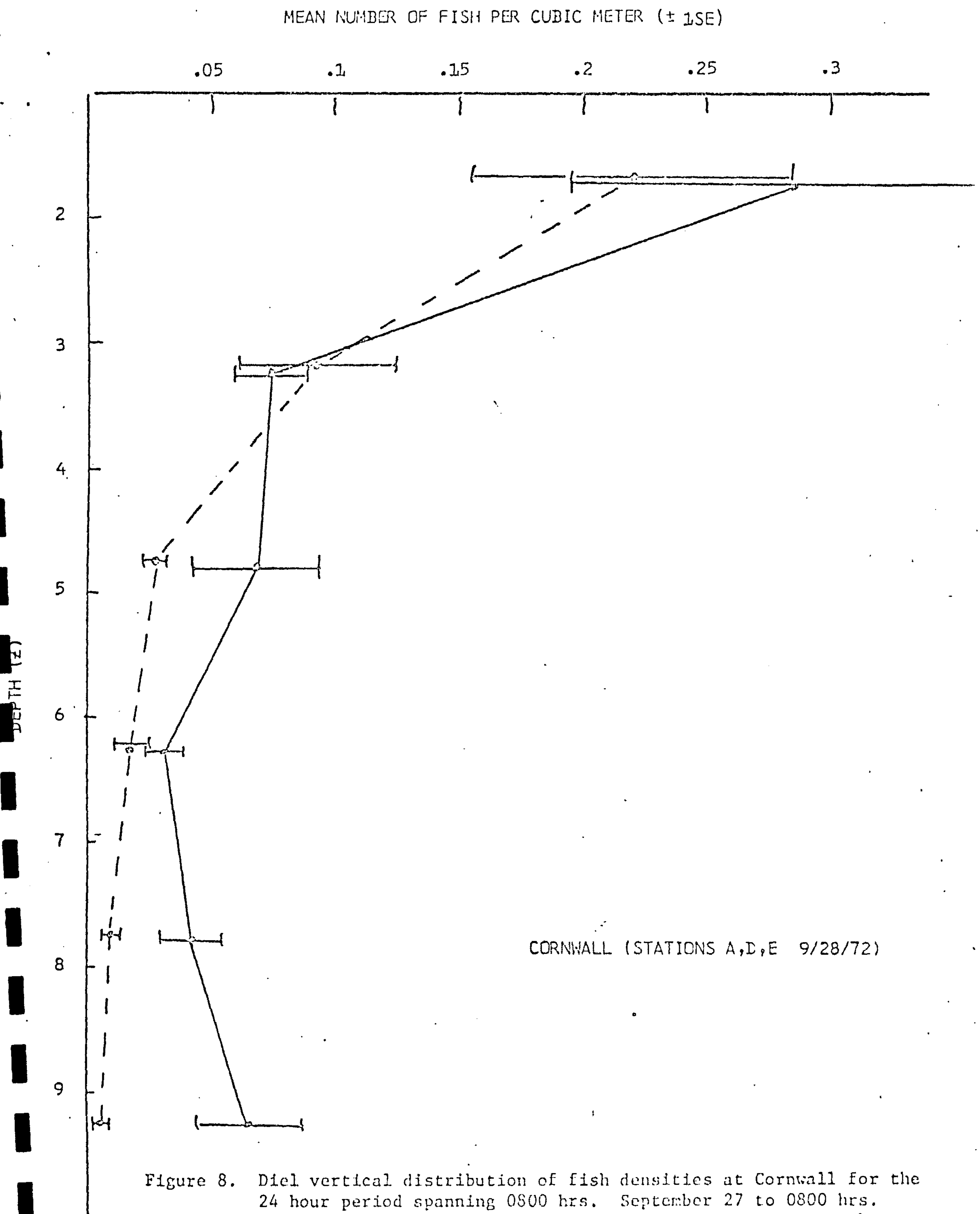

Figure 8. Diel vertical distribution of fish densities at Cornwall for the 24 hour period spanning 0800 hrs. September 27 to 0800 hrs. September 28, 1972. Solid line represents measurements taken during hours of darkness and dashed line during hours of light.

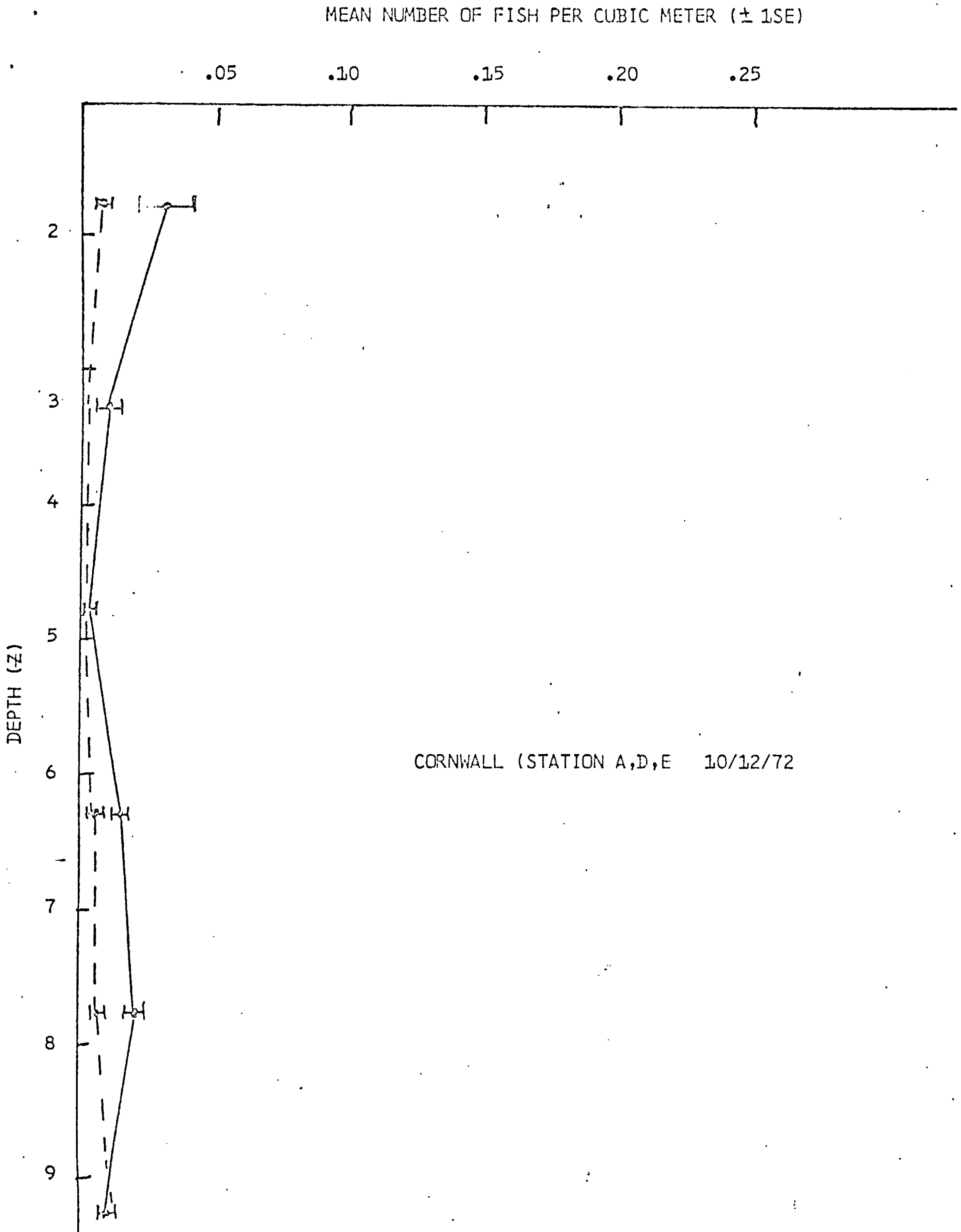

Figure 9. Diel vertical distribution of fish densities at Cornwall for the 24 hour period spanning 0800 hrs. September 10 to 0800 hrs. September 11, 1972. Solid line represents measurements taken during hours of darkness and dashed line during hours of light.

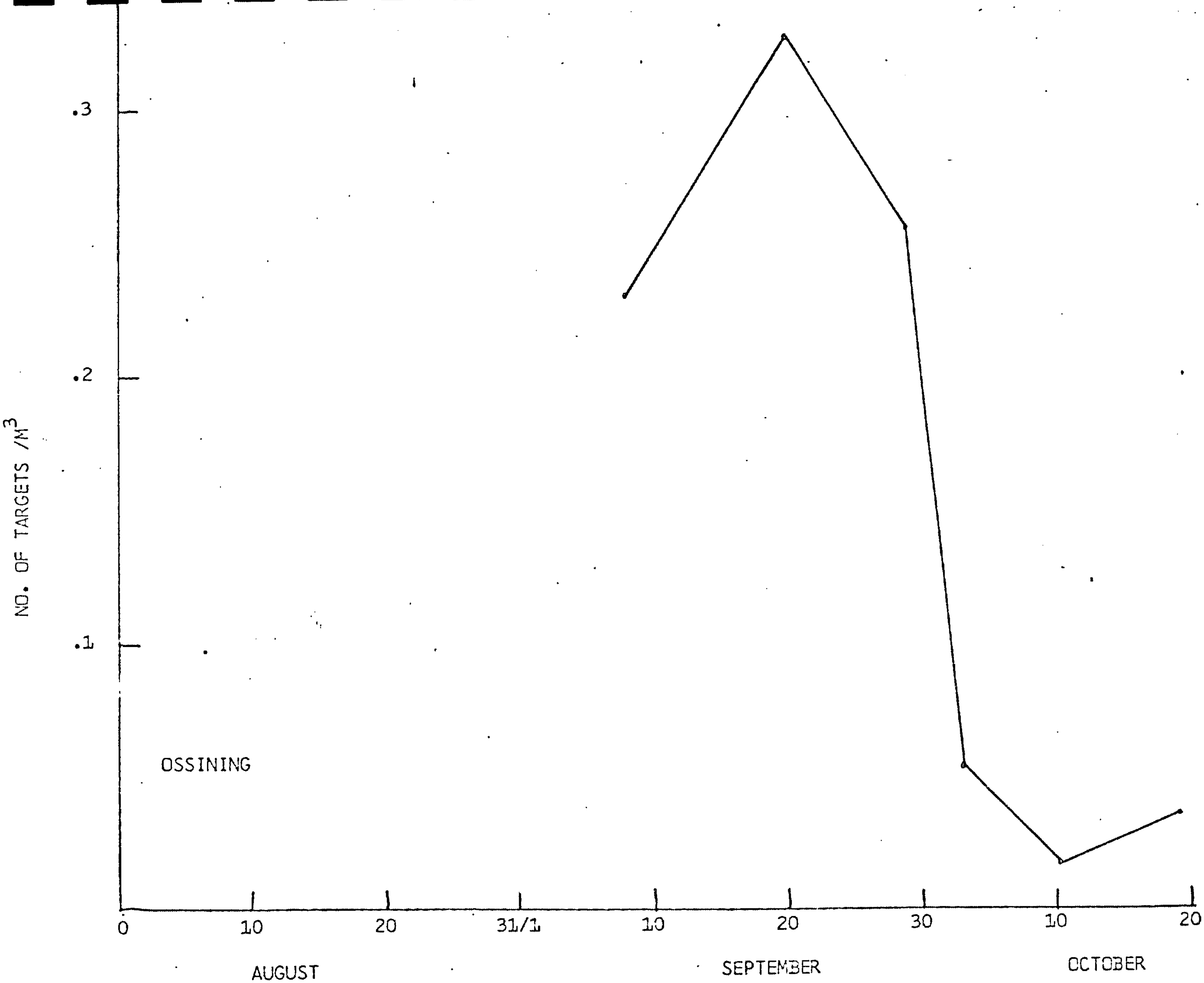

Figure 10. Mean density of fish per cubic meter at Ossining for September and October, 1972.

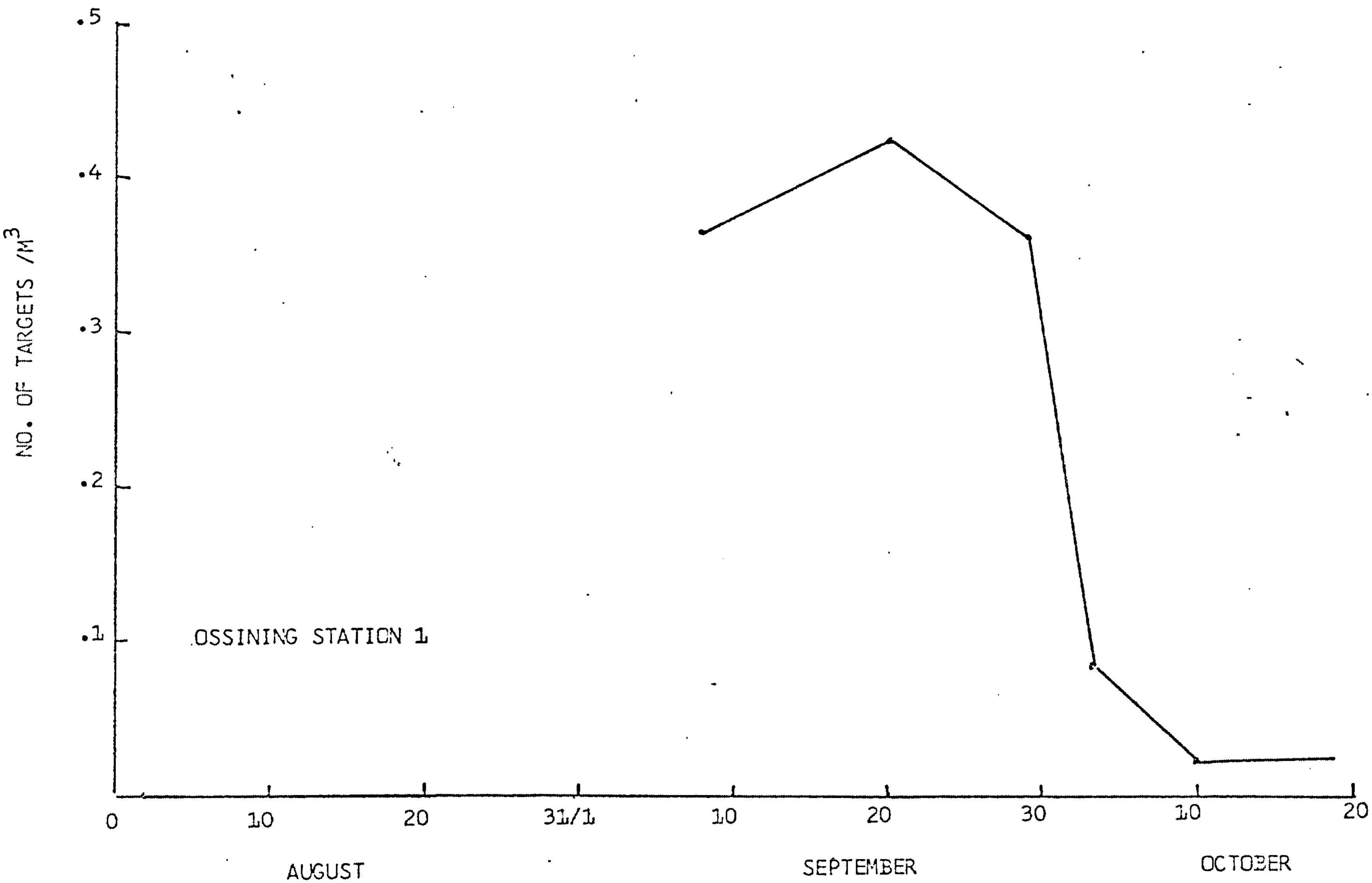

Figure 11. Density of fish per cubic meter at Ossining Station 1 for September and October, 1972.

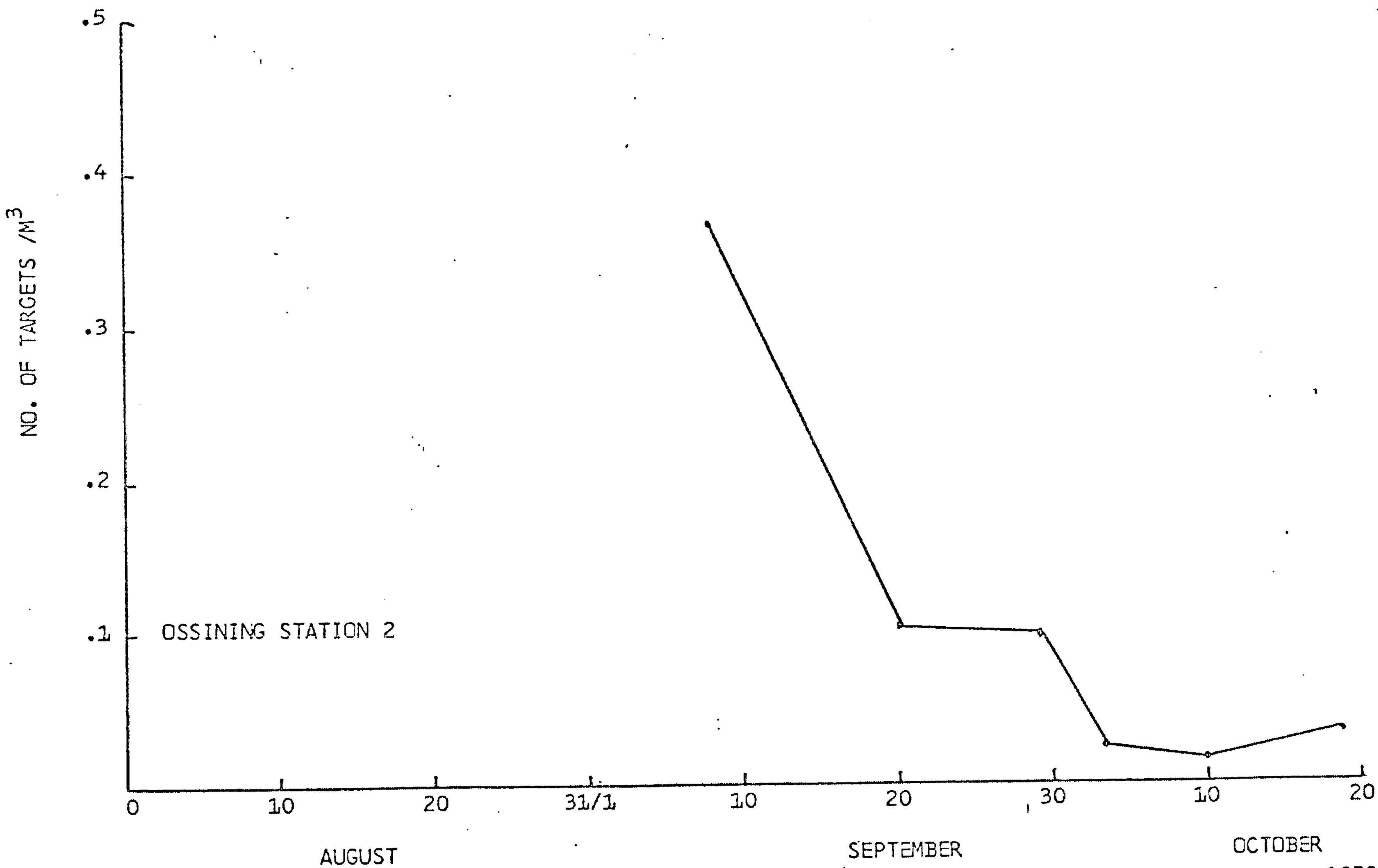

Figure 12. Density of fish per cubic meter at Ossining Station 2 for September and October, 1972.

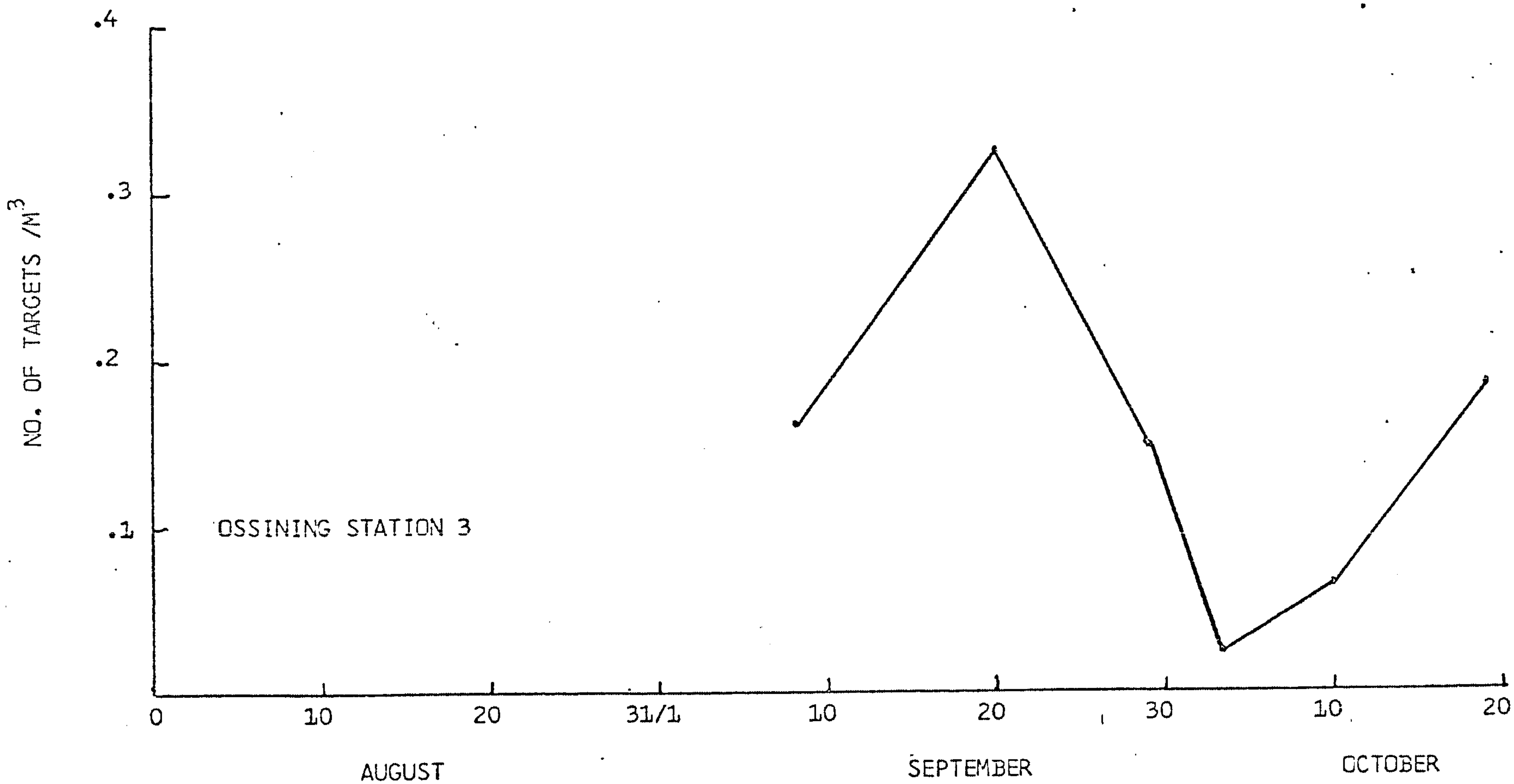

Figure 13. Density of fish per cubic meter at Ossining Station 3 for September and October 1972.

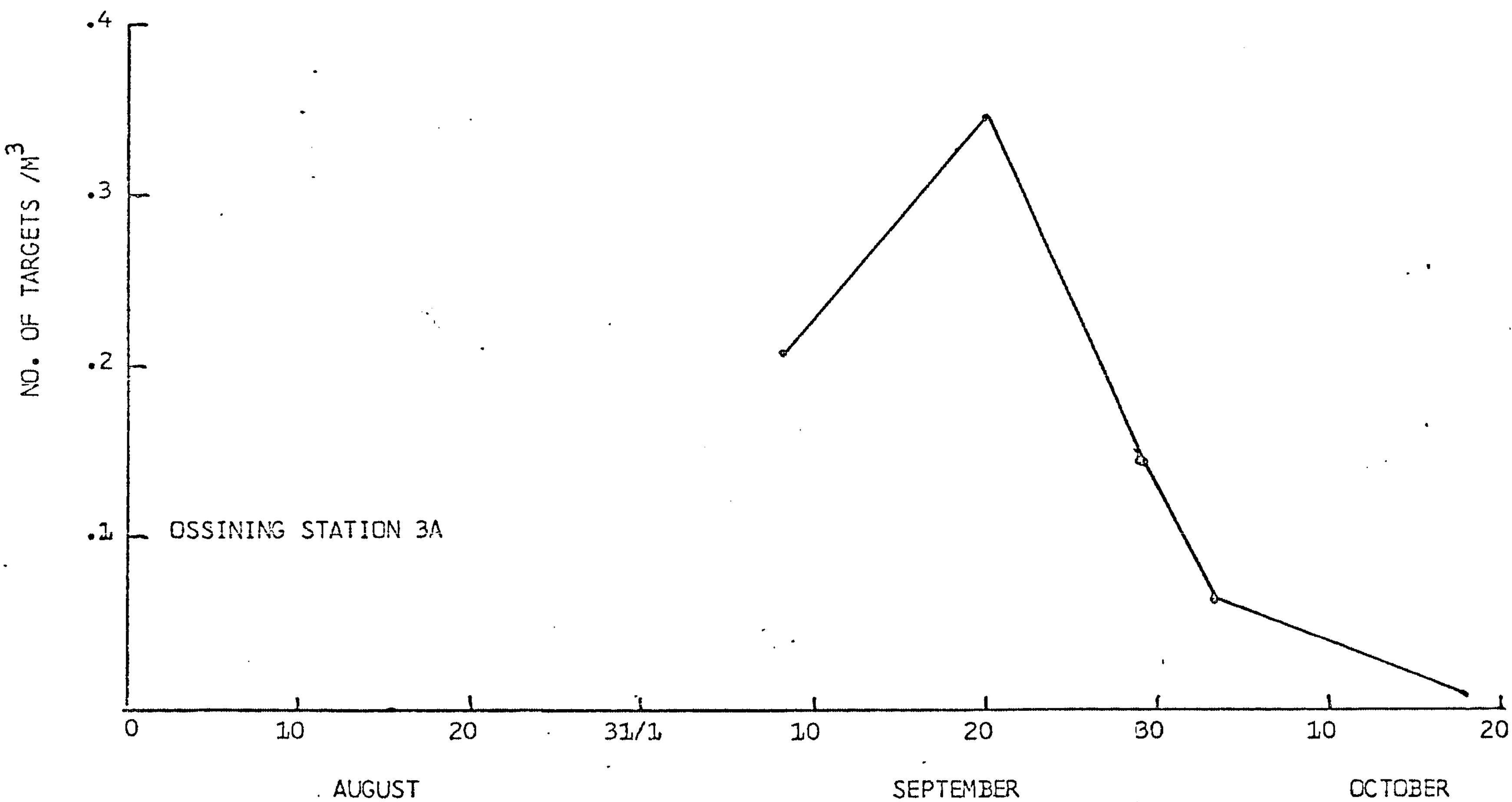

Figure 14. Density of fish per cubic meter at Ossining Station 3A for September and October, 1972.

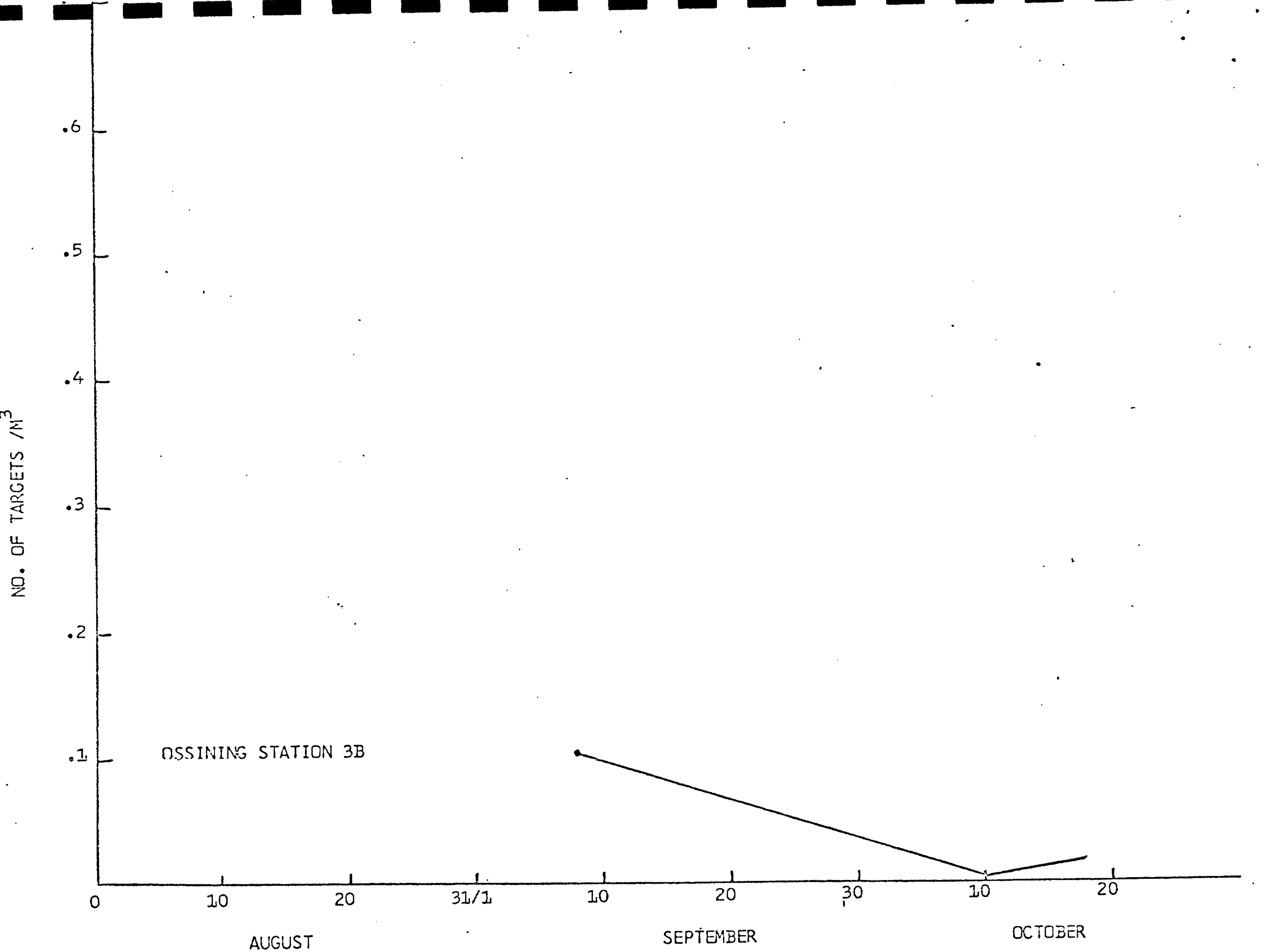

Figure 15. Density of fish per cubic meter at Ossining Station 3B for September and October, 1972.

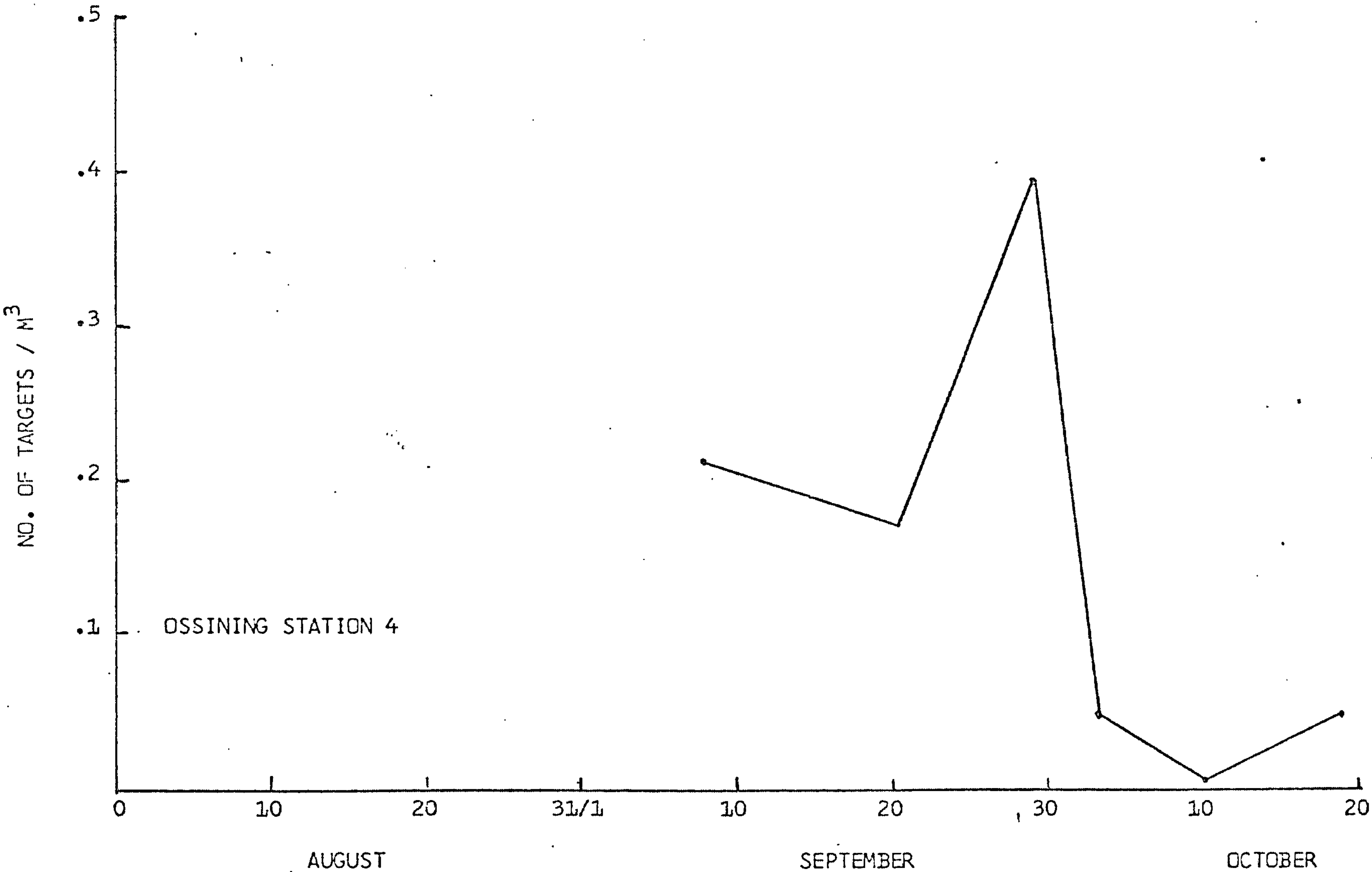

Figure 16. Density of fish per cubic meter at Ossining Station 4 for September and October, 1972.

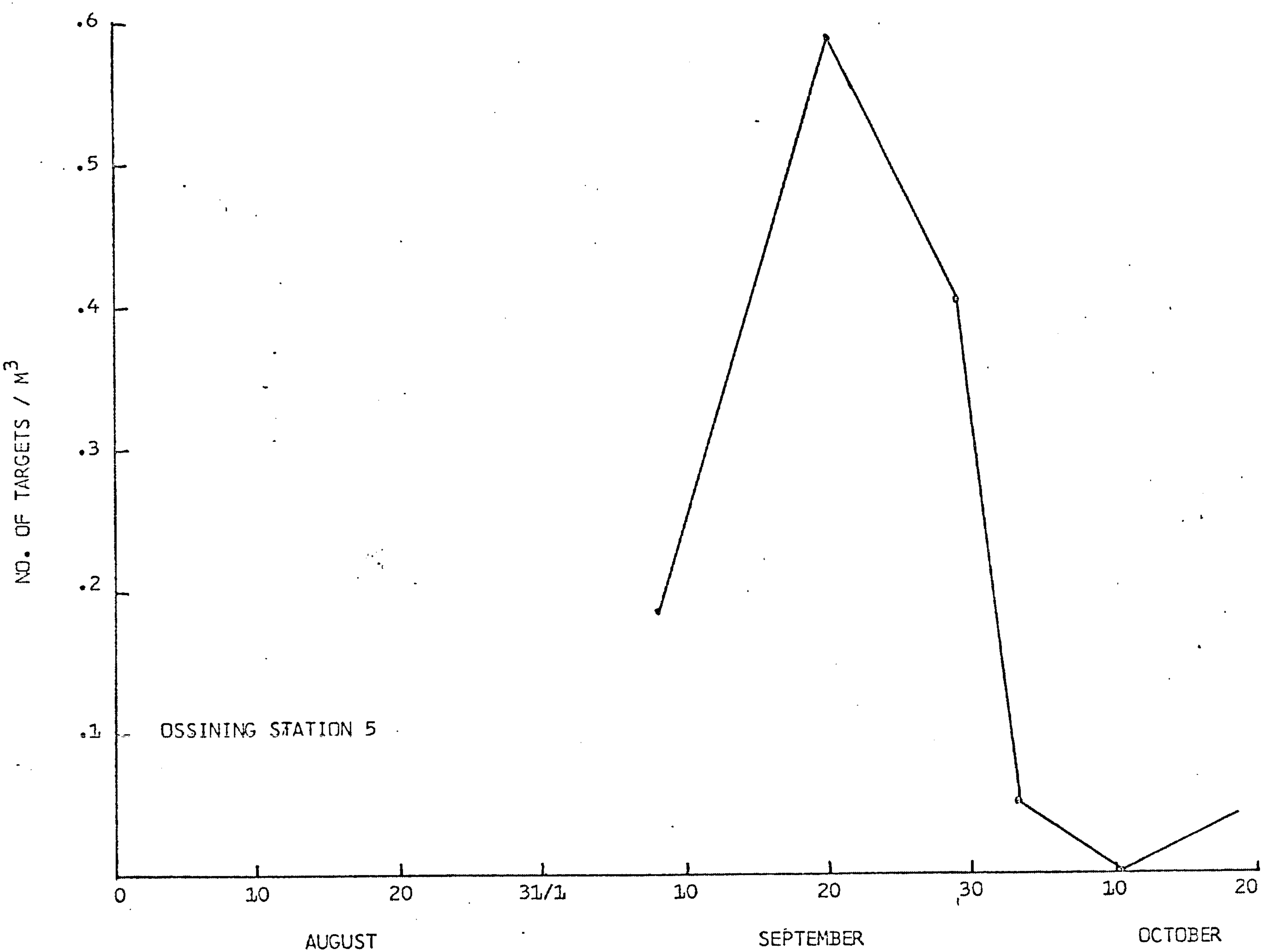

Figure 17. Density of fish per cubic meter at Ossining Station 5 for September and October, 1972.

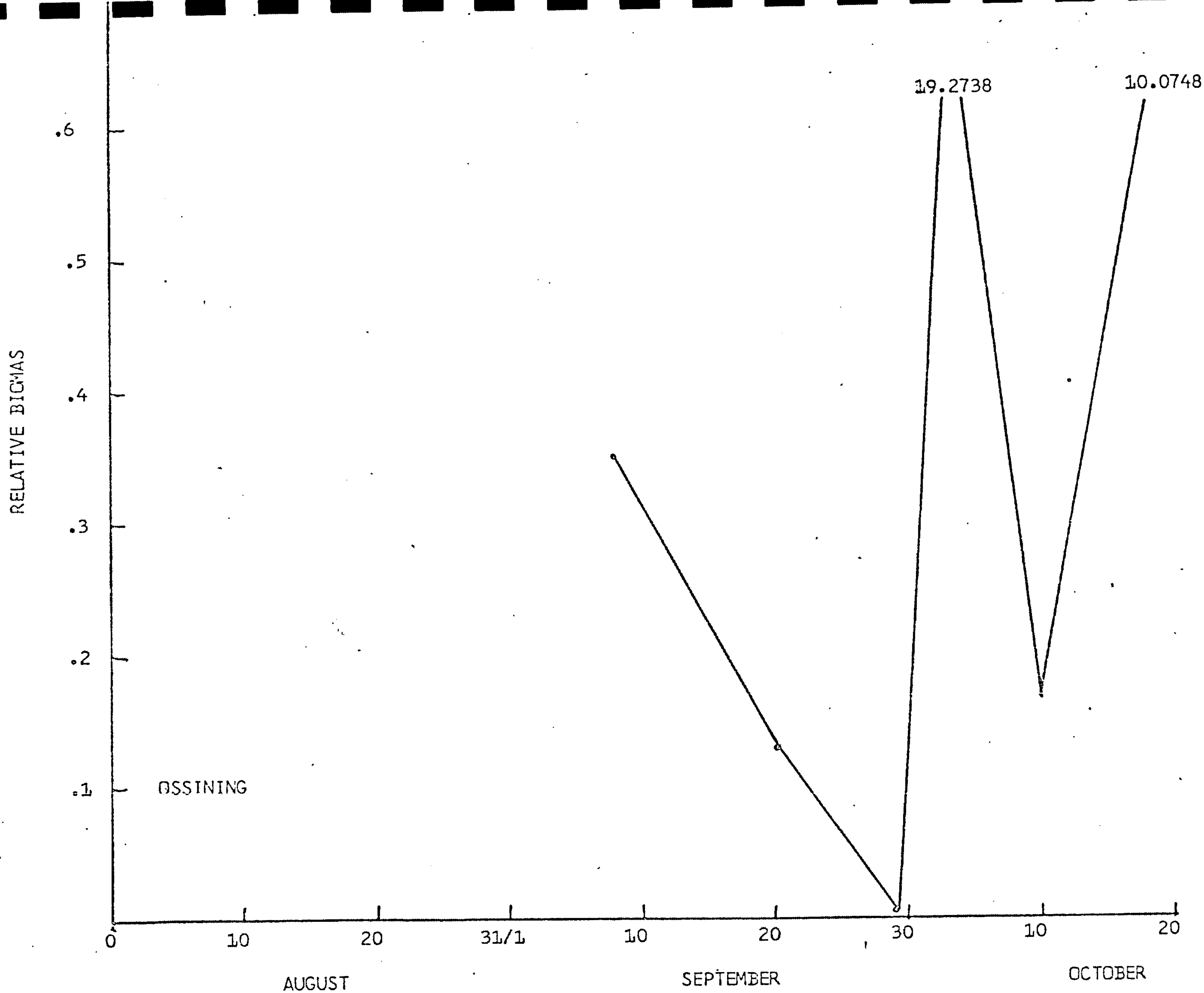

Figure 18. Relative average biomass of fish per cubic meter of water in the Ossining Region for September and October, 1972.

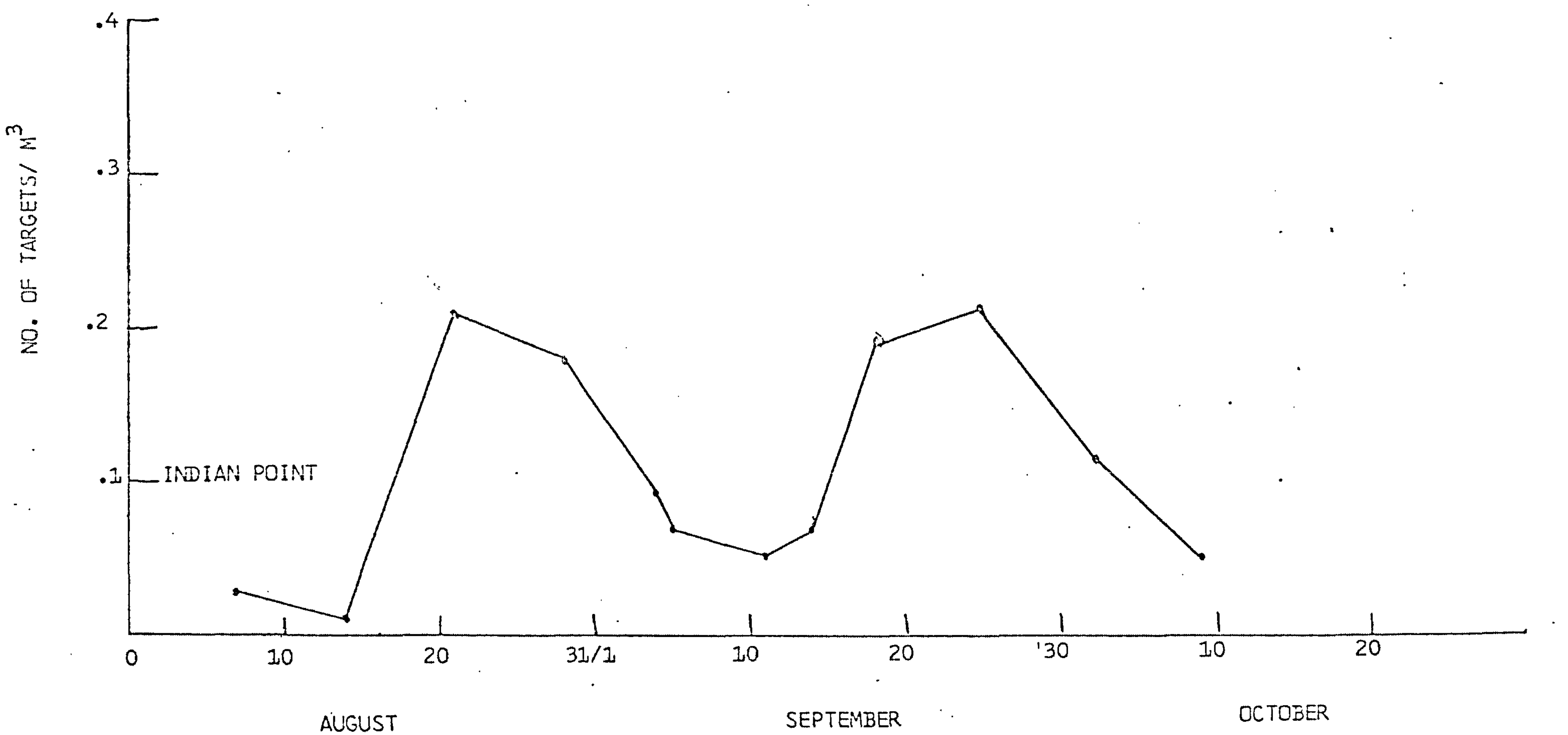

Figure 19. Mean density of fish per cubic meter at Indian Point during August through September, 1972.

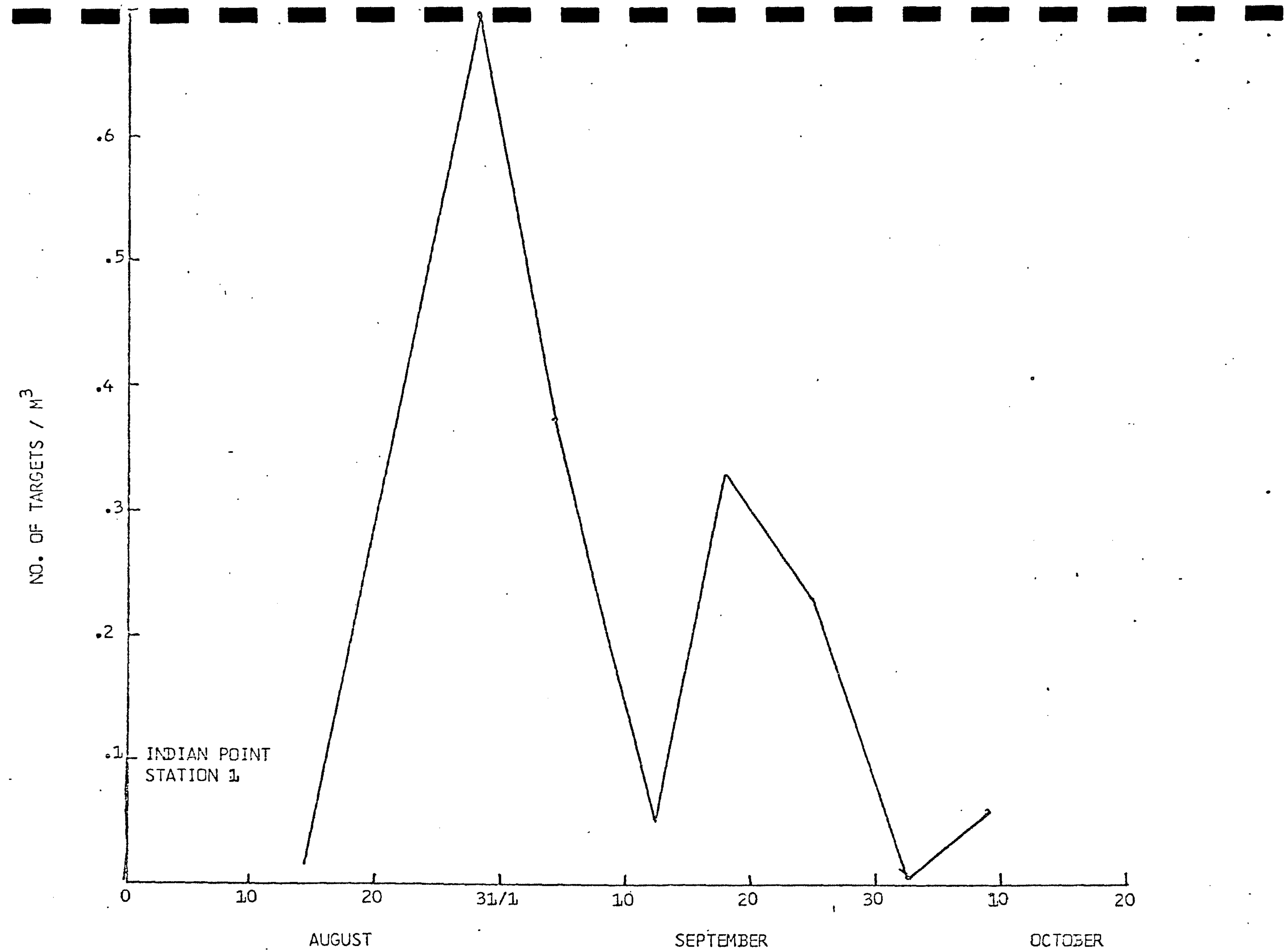

Figure 20. Density of fish per cubic meter of water at Station 1 during August through September, 1972.

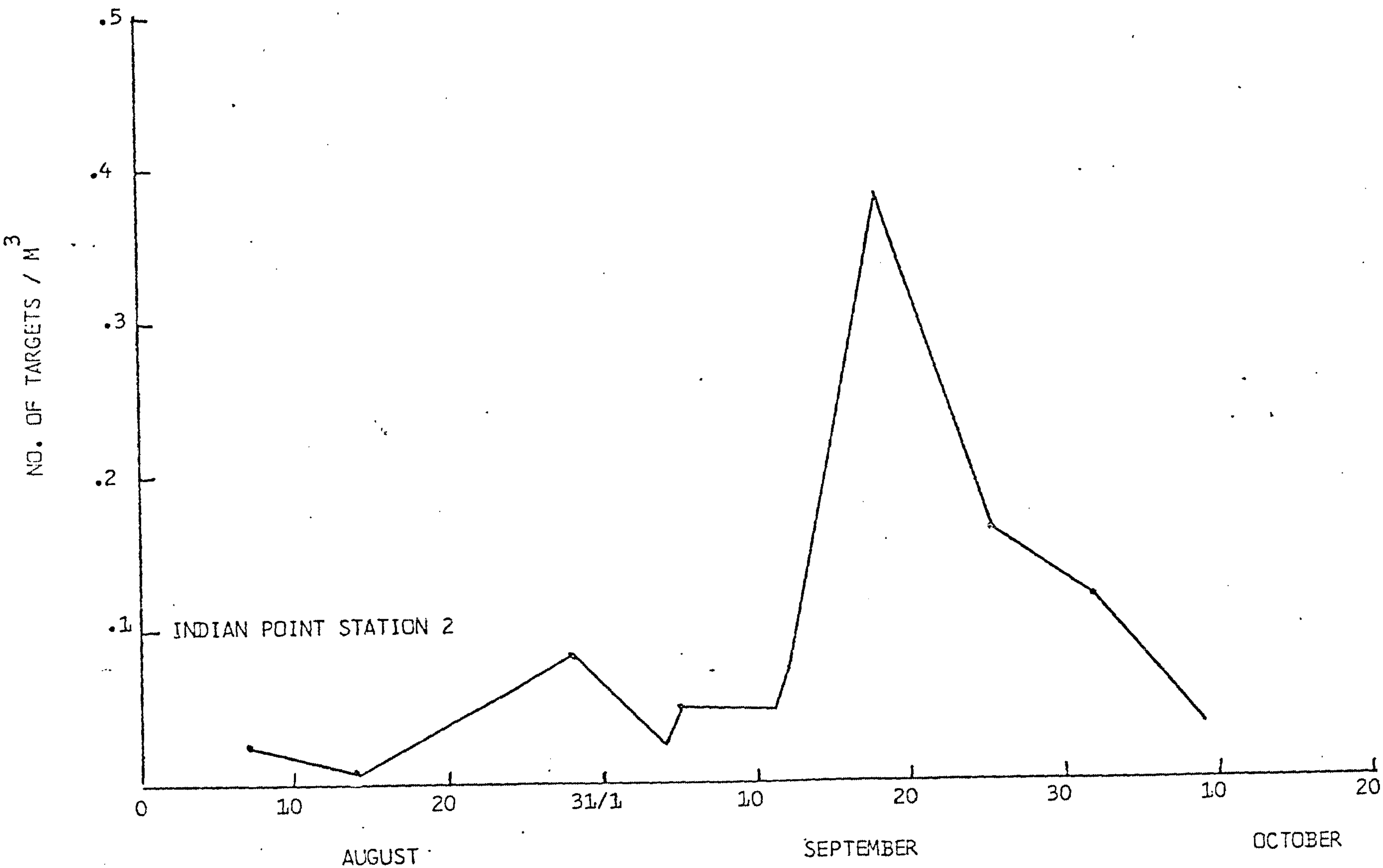

Figure 21. Density of fish per cubic meter of water at Station 2 during August through September, 1972.

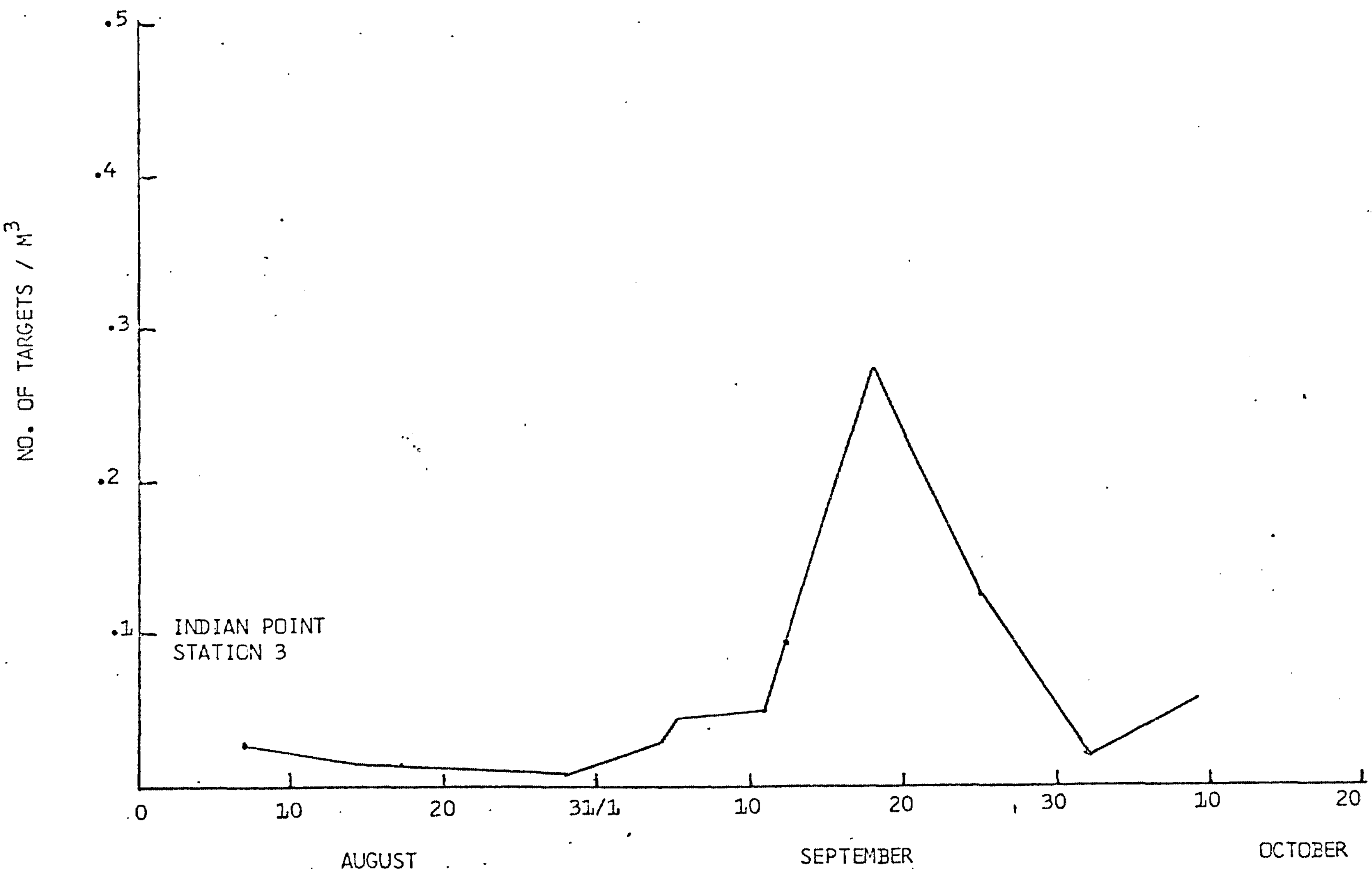

Figure 22. Density of fish per cubic meter of water at Station 3 during August through September, 1972.

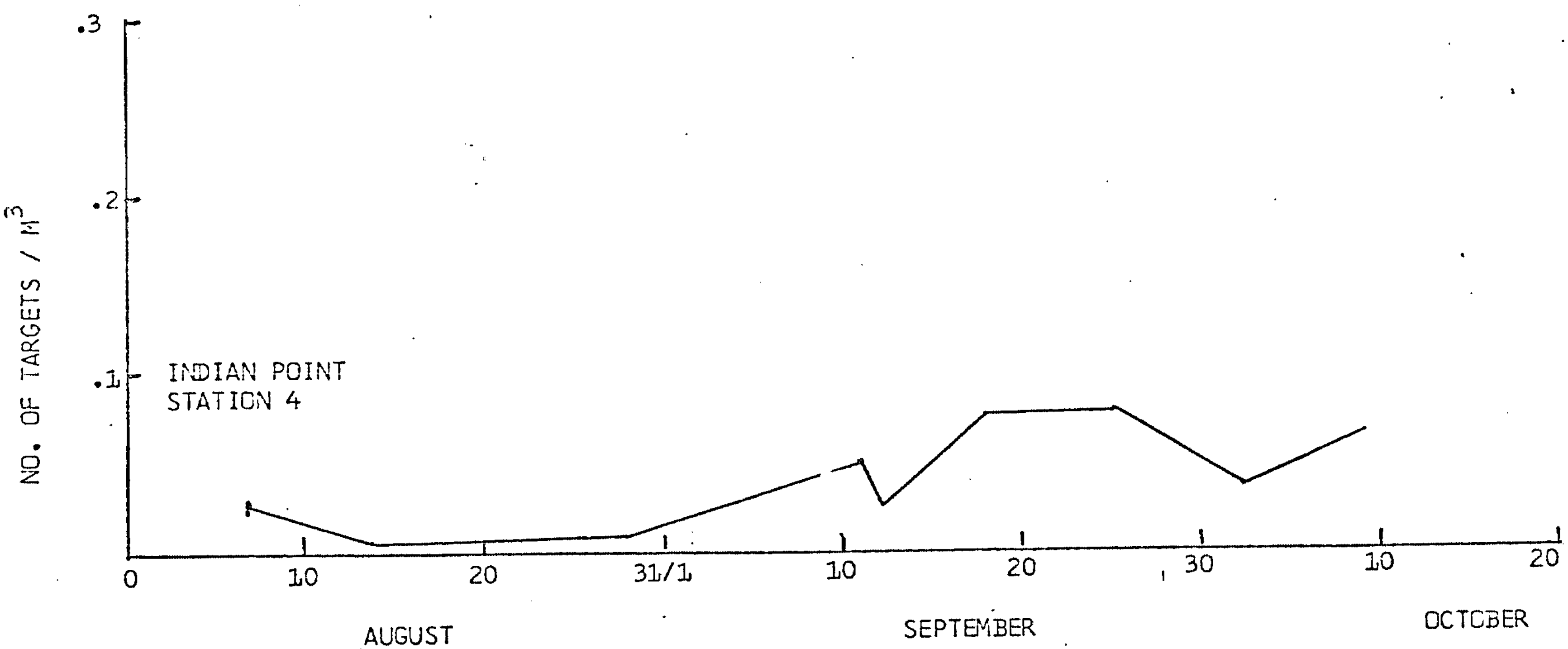

Figure 23. Density of fish per cubic meter of water at Station 4 during August through September, 1972.

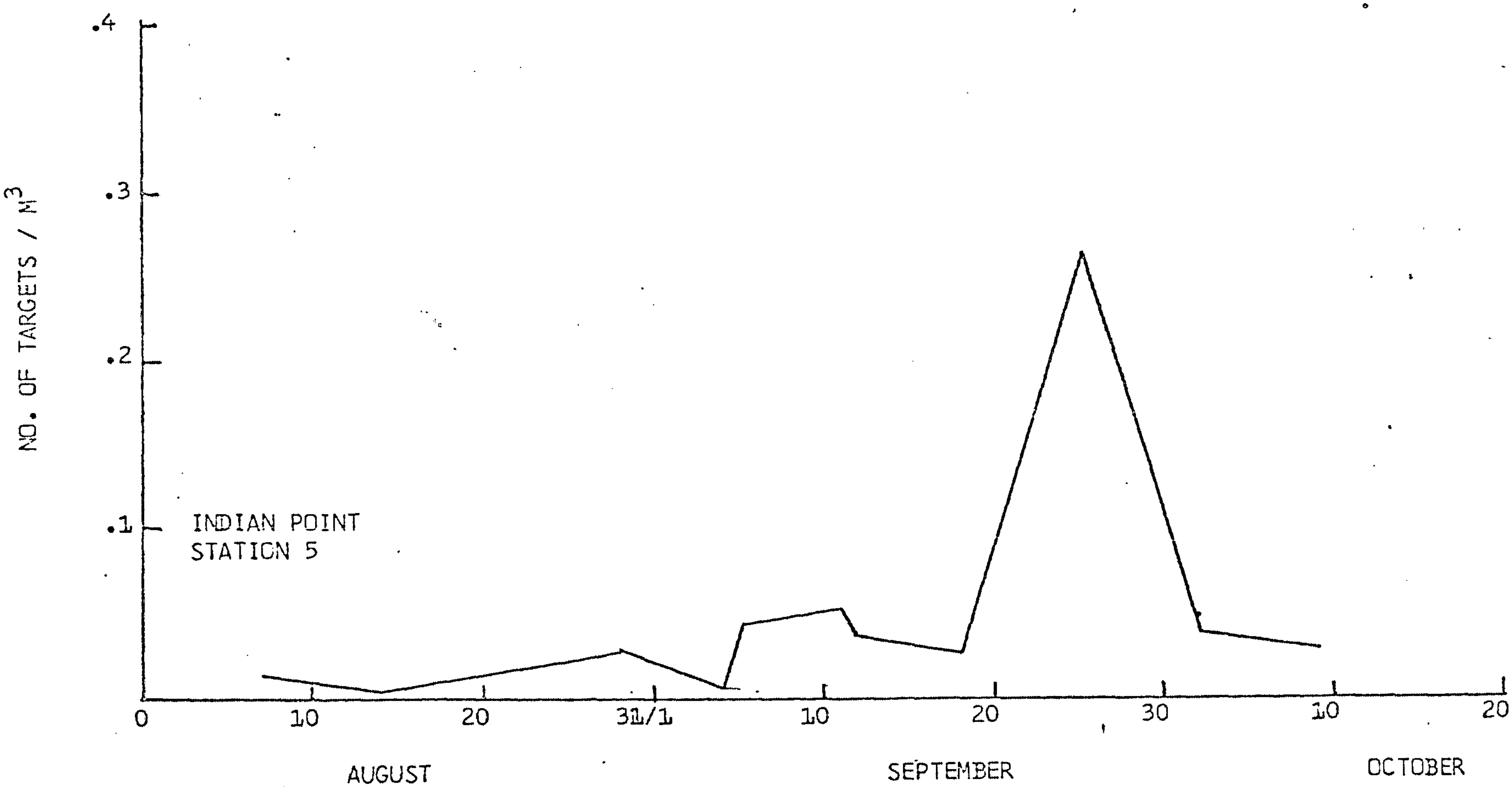

Figure 24. Density of fish per cubic meter of water at Station 5 during August through September, 1972.

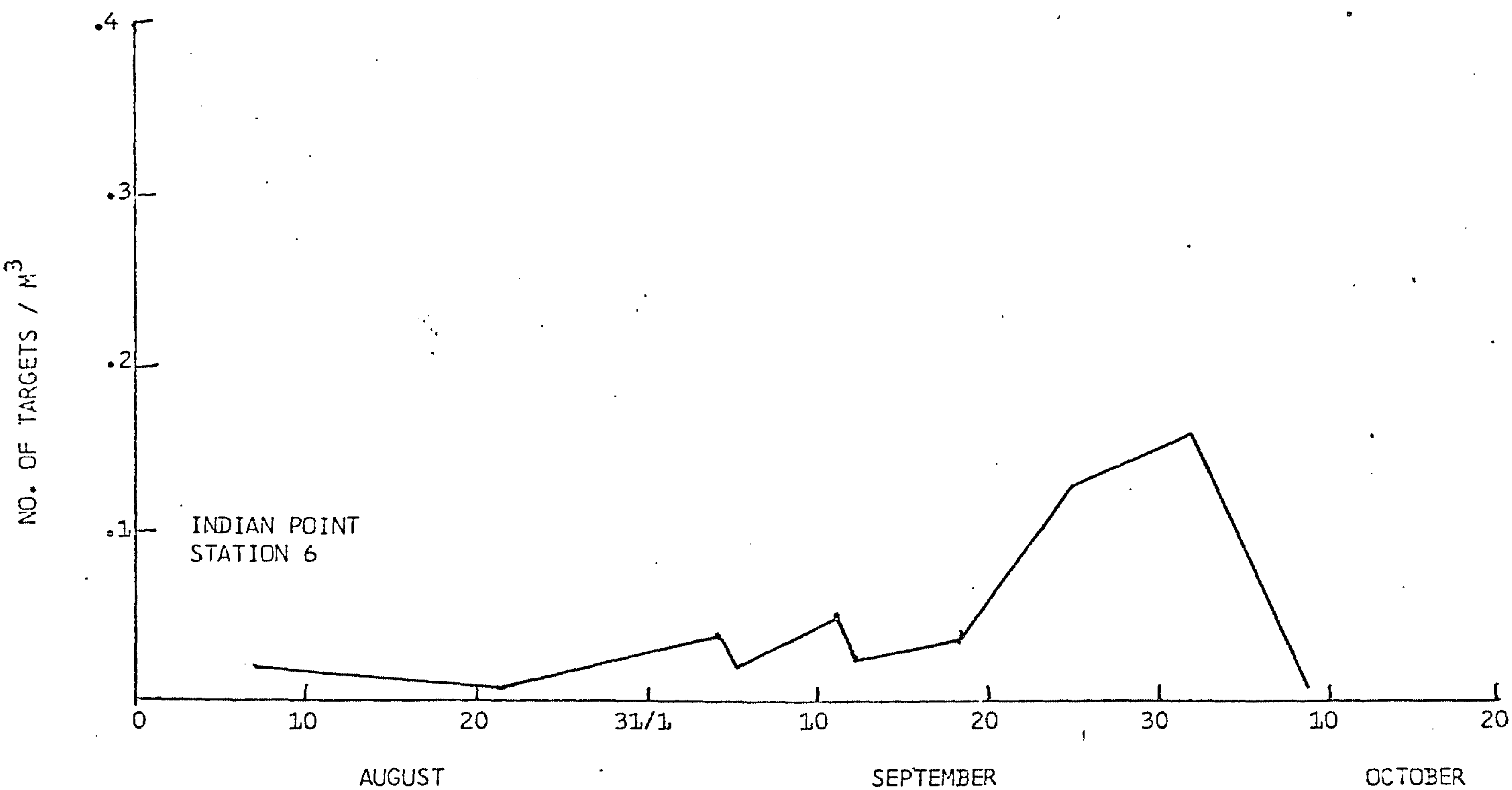

Figure 25. Density of fish per cubic meter of water at Station 6 during August through September, 1972.

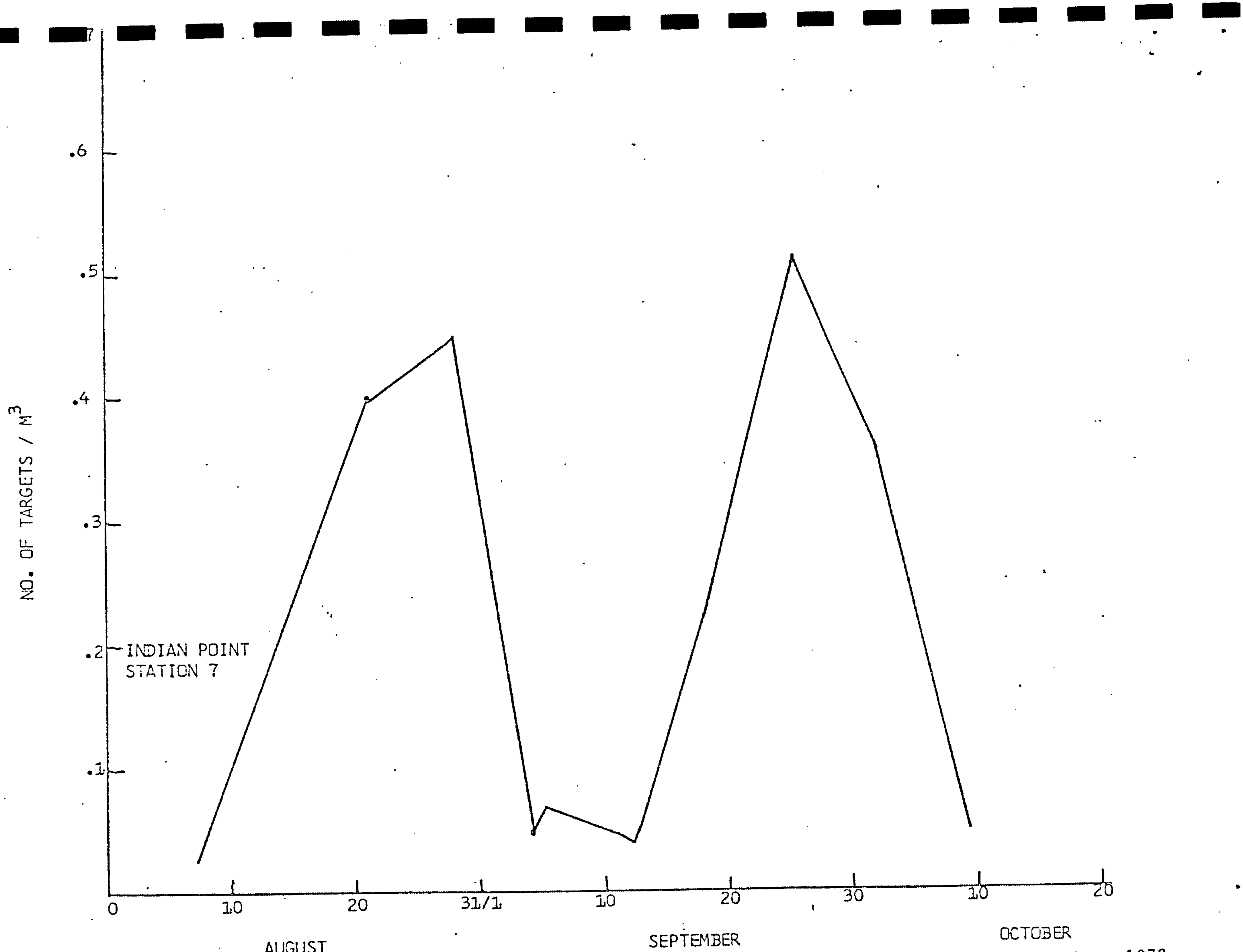

Figure 26. Density of fish per cubic meter of water at Station 7 during August through September, 1972.

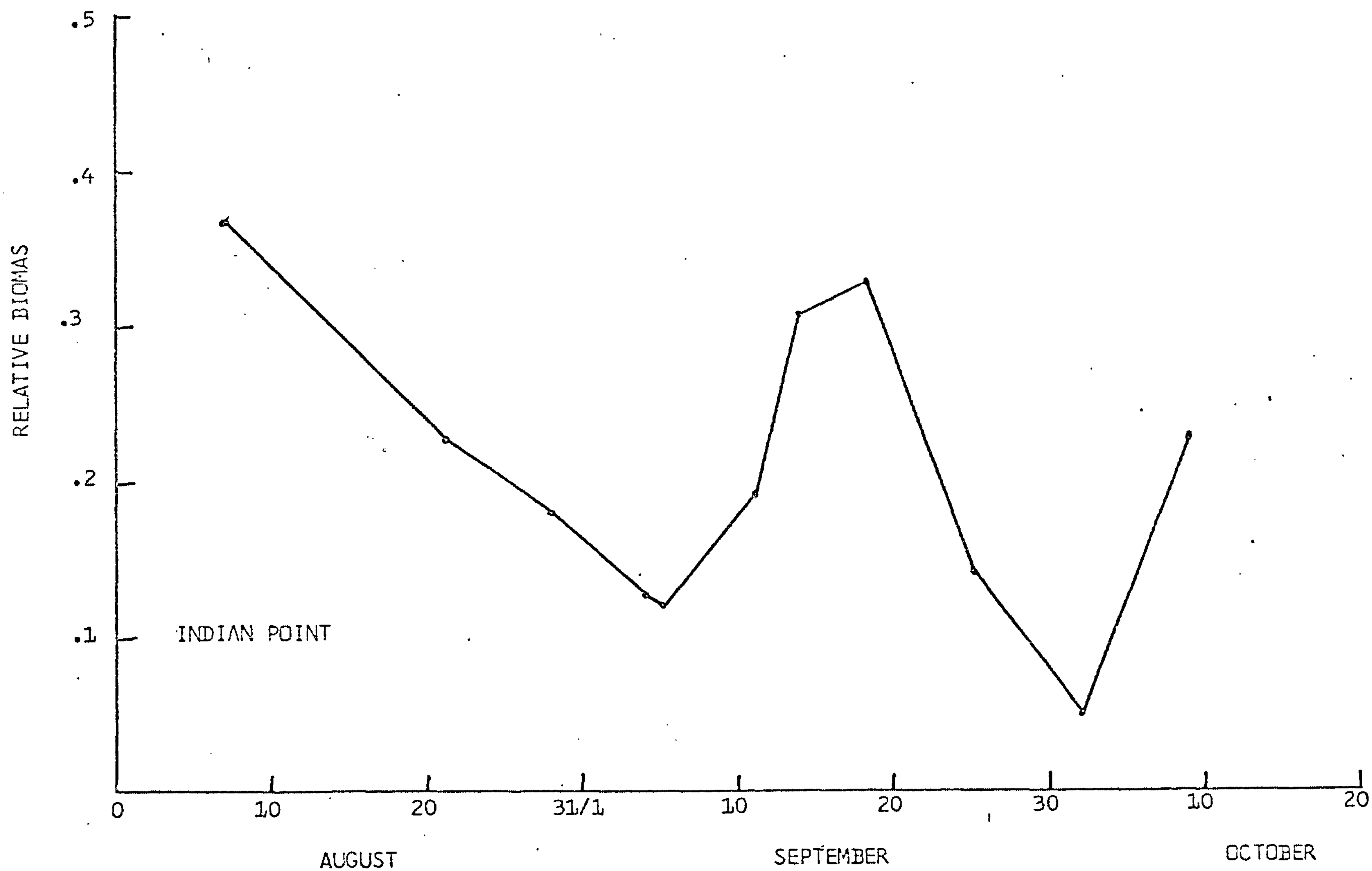

Figure 27. Mean relative fish biomass (measured at the seven trawling stations) at Indian Point by sonar in August, September, October, 1972.

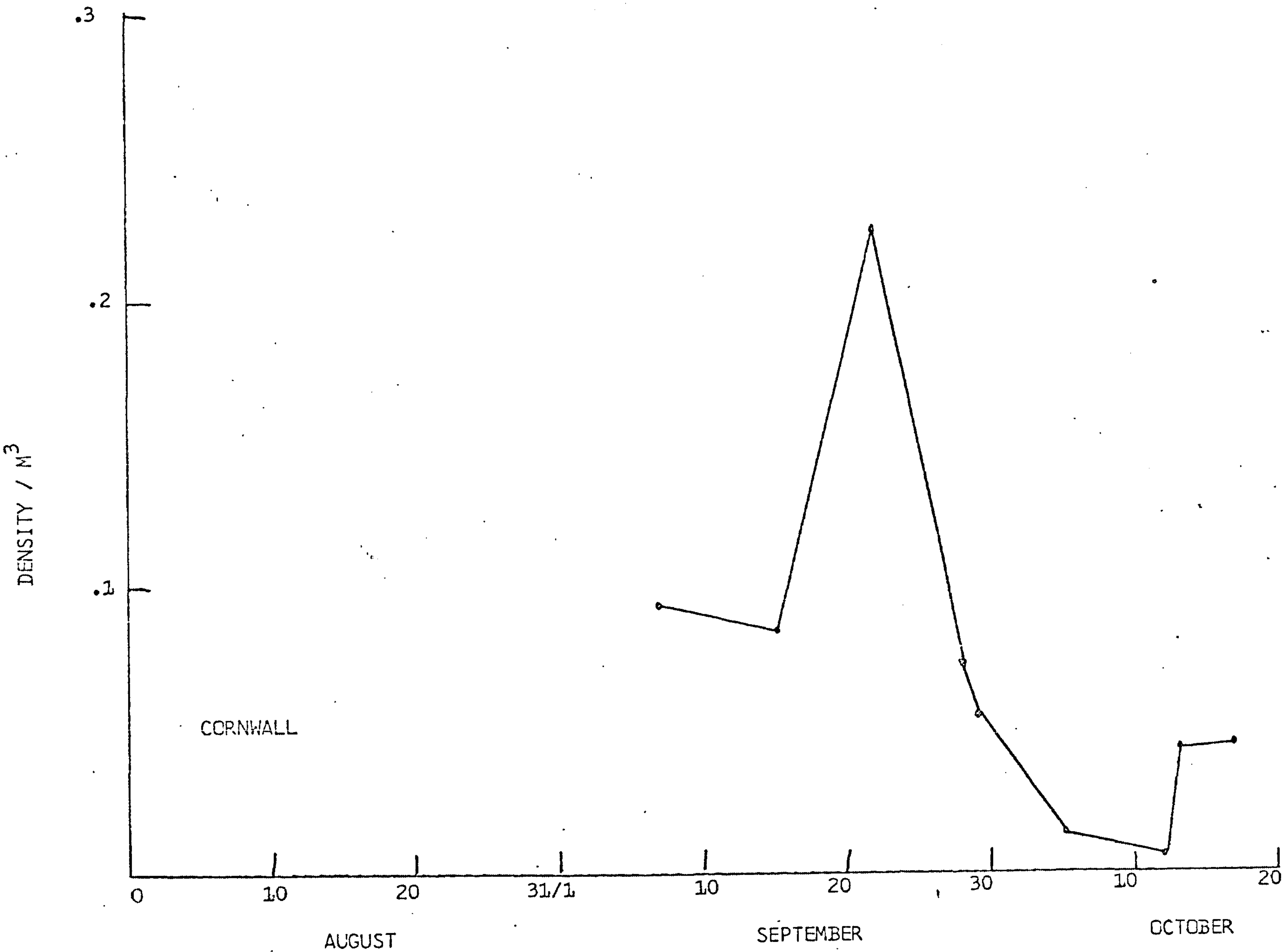

Figure 28. Mean density of fish per cubic meter of water at Cornwall for September and October, 1972.

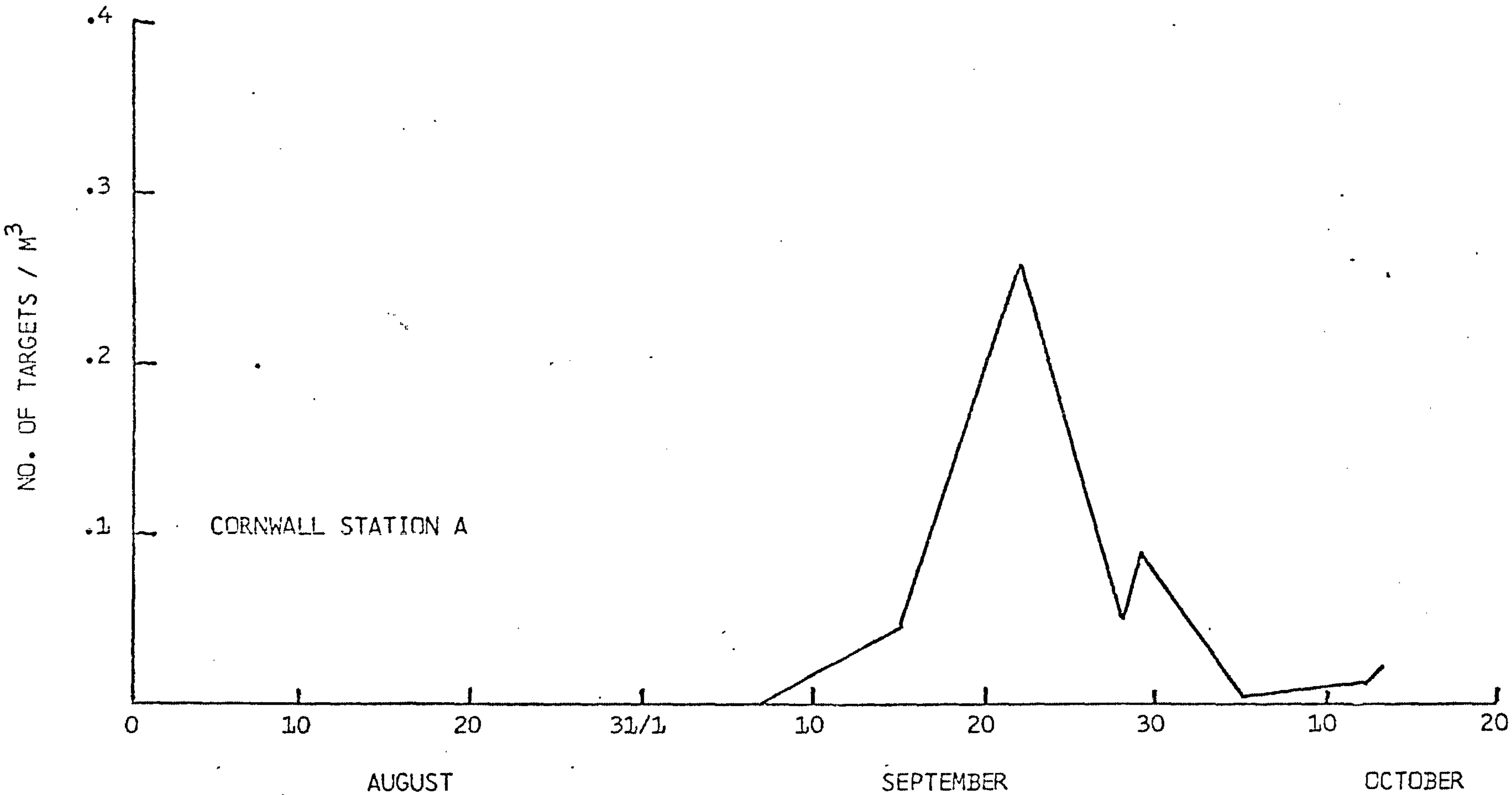

Figure 29. Mean density of fish per cubic meter of water at Cornwall Station A for September and October, 197

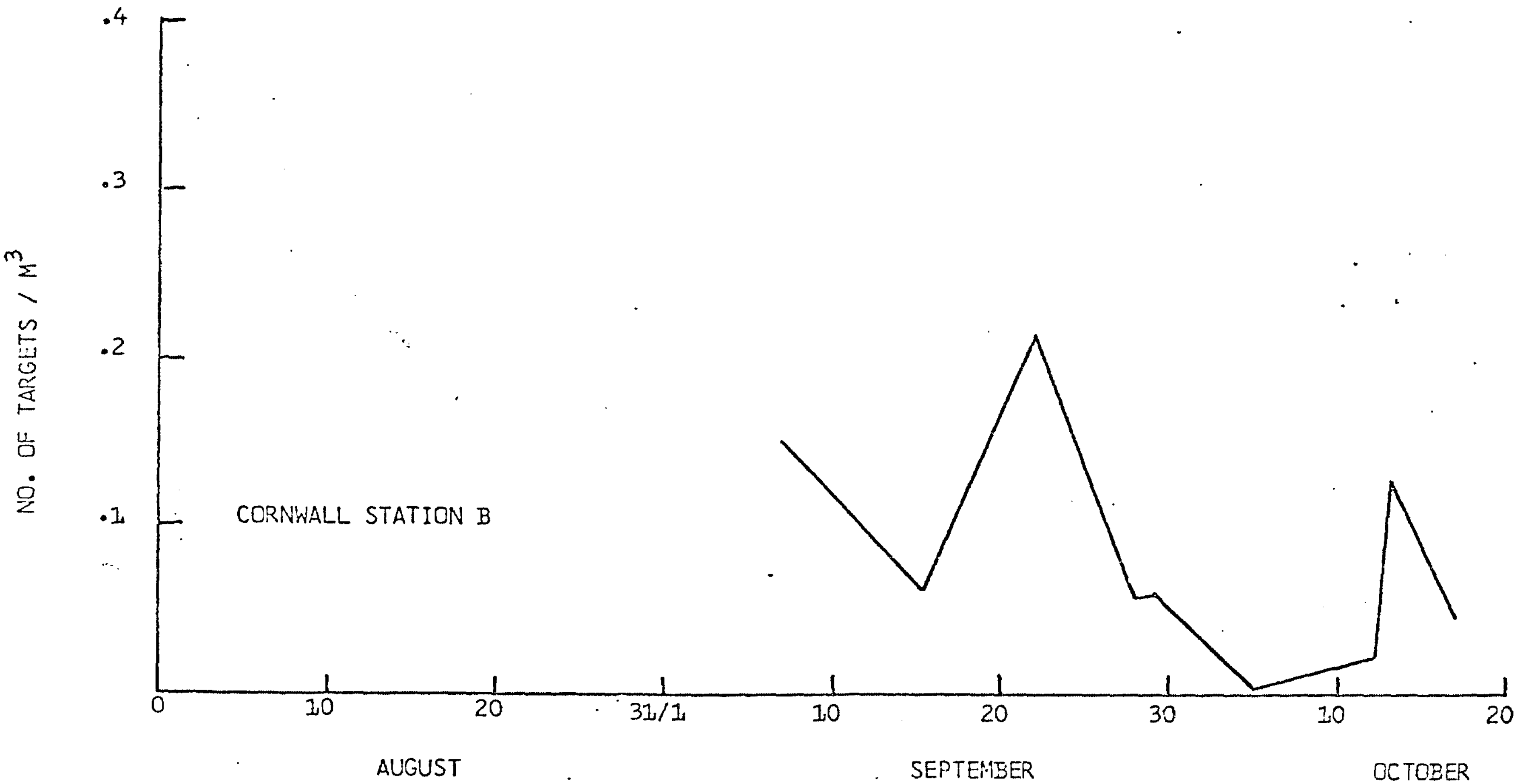

Figure 30. Mean density of fish per cubic meter of water at Cornwall Station B for September and October, 19

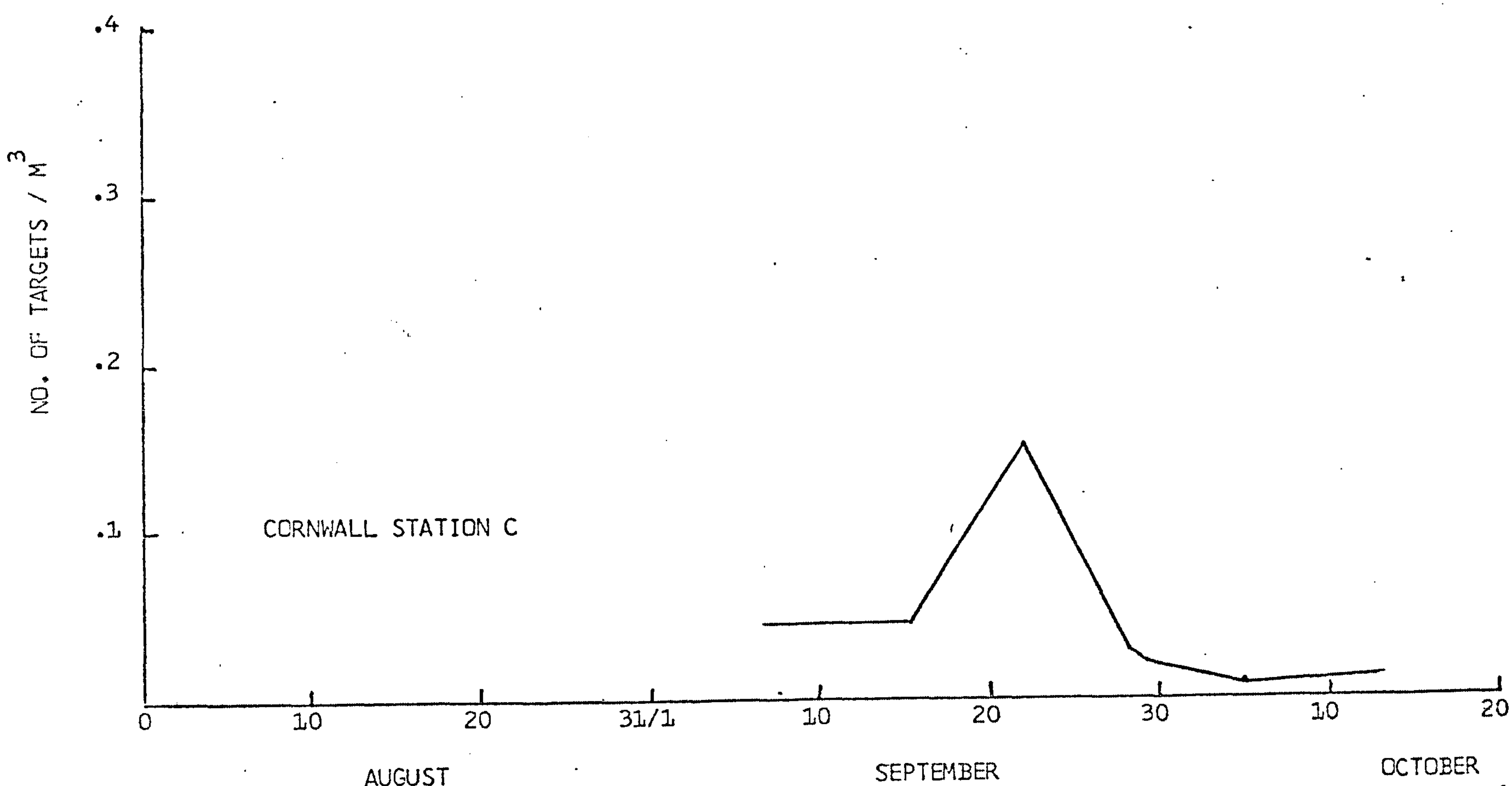

Figure 31. Mean density of fish per cubic meter of water at Cornwall Station C for September and October, 197

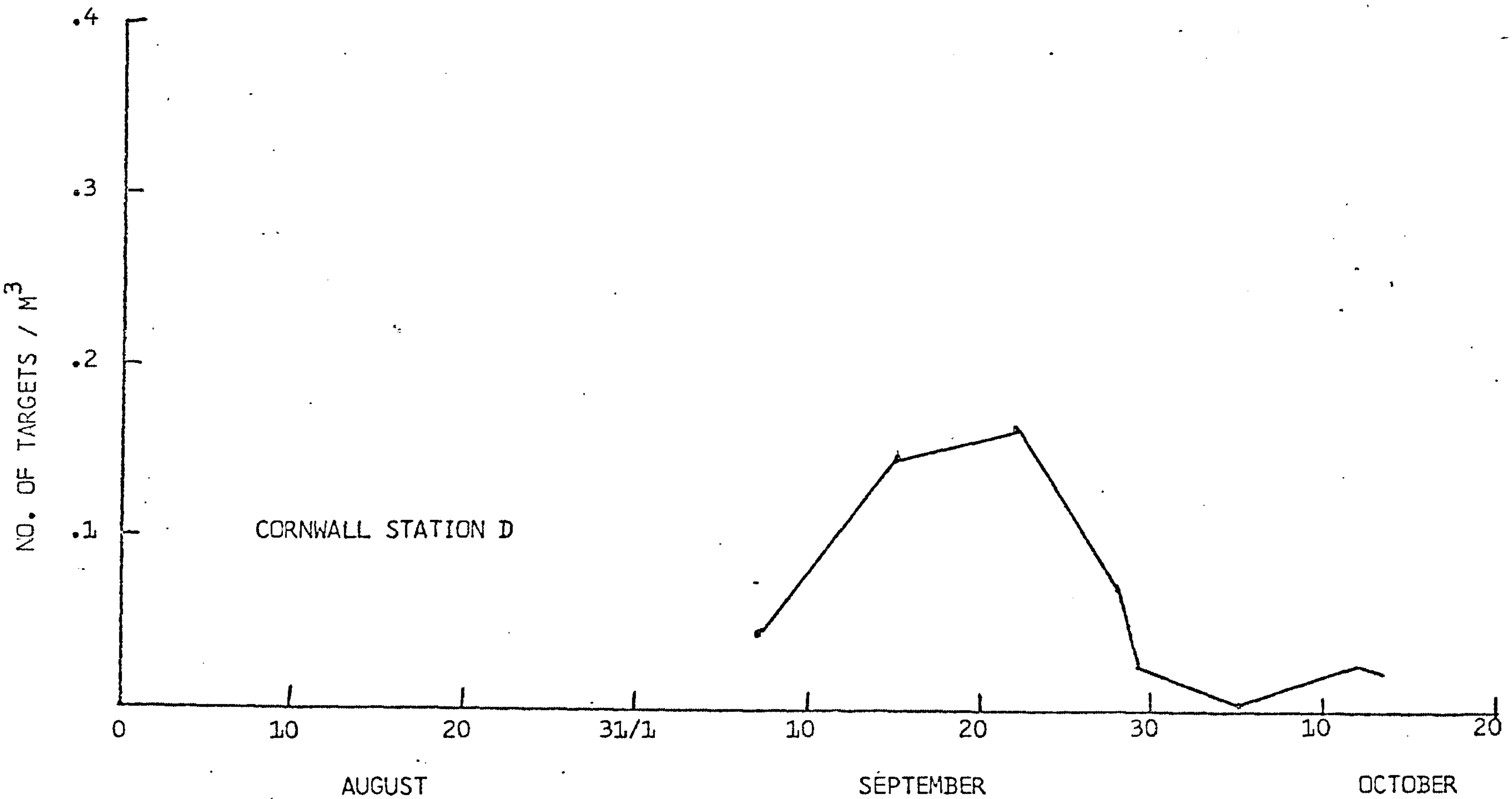

Figure 32. Mean density of fish per cubic meter of water at Cornwall Station D for September and October, 1972

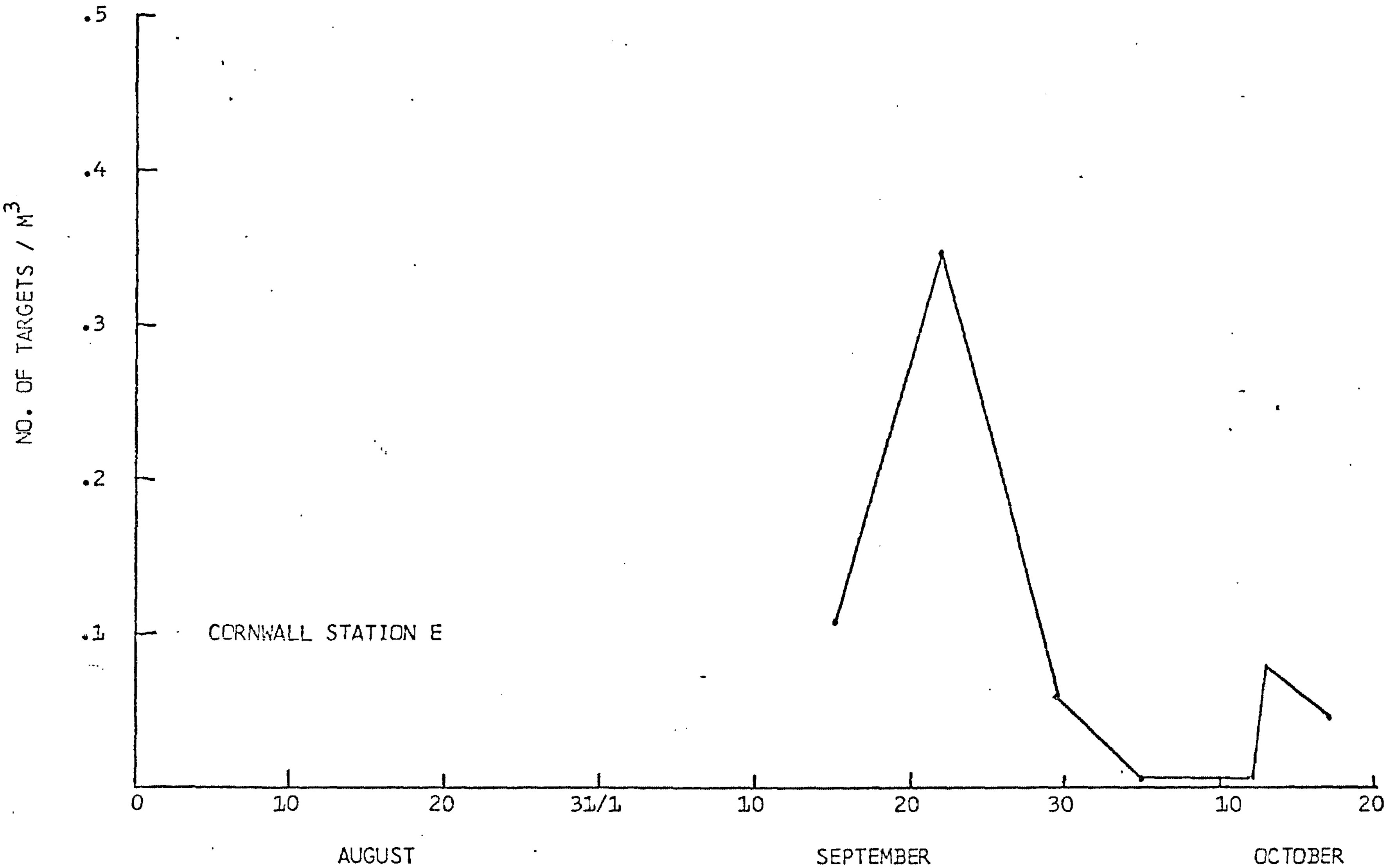

Figure 33. Mean density of fish per cubic meter of water at Cornwall Station E for September and October, 1972

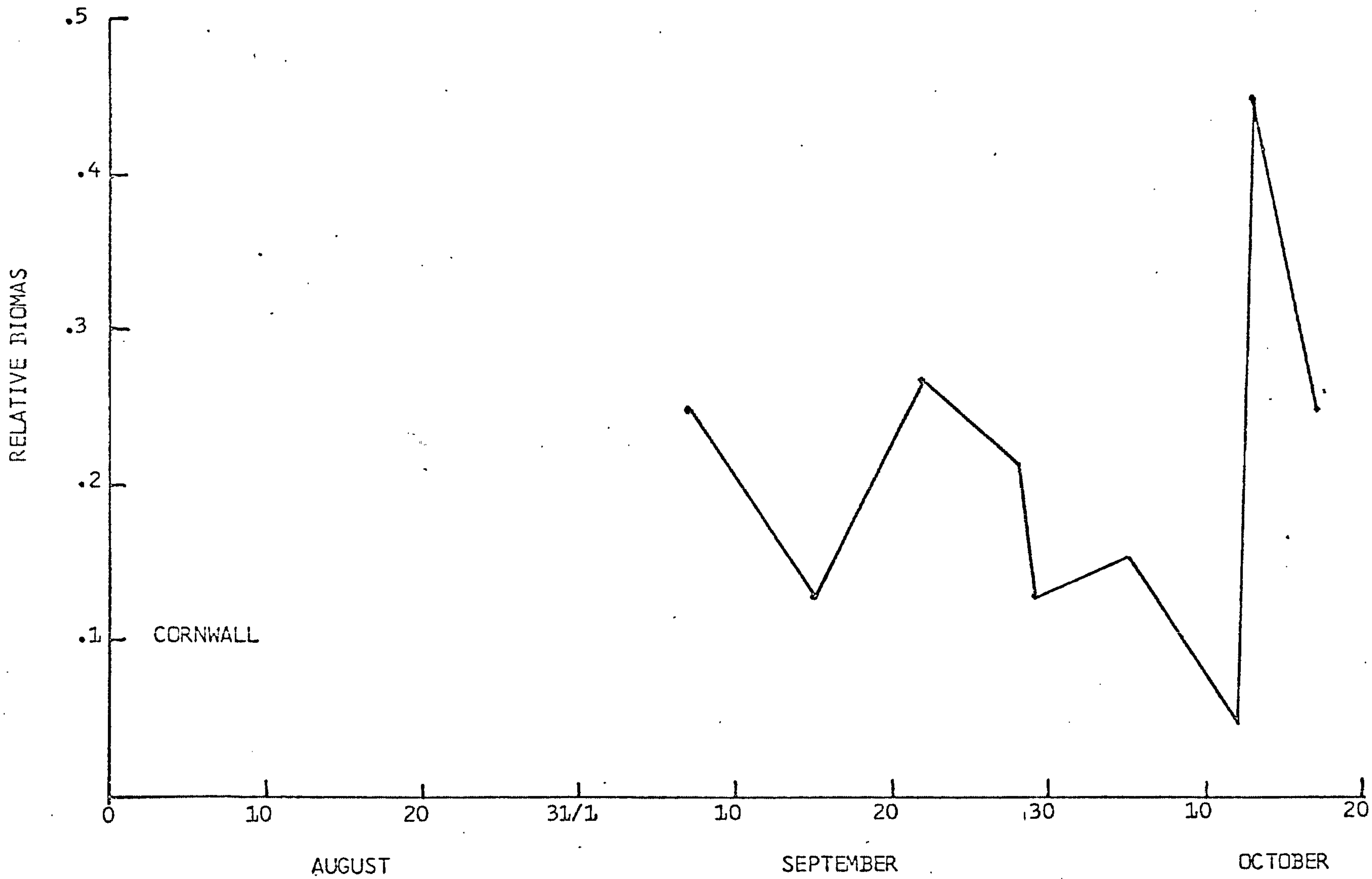

Figure 34. Average relative biomass per cubic meter of water at Cornwall during September and October, 1972.