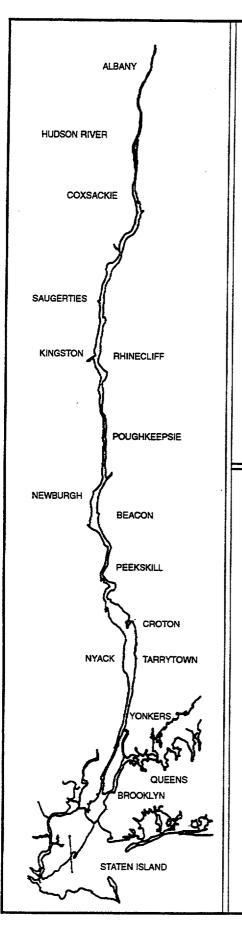
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1992

YEAR CLASS REPORT

for the
Hudson River Estuary
Monitoring Program

Prepared by

Consolidated Edison Company of NewYork, Inc.

Jointly Funded 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.

Edison

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Prepared by

Consolidated Edison Company of New York, Inc. New York, New York

April 1996

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CHAPTER 1 INTRODUCTION

Since 1973, an annual Year Class Report has been prepared for five utilities: Central Hudson Gas and Electric Corporation; Consolidated Edison Company of New York, Inc.; New York Power Authority; Niagara Mohawk Power Corporation; and Orange and Rockland Utilities, Inc. The main purpose of the reports has been to present and analyze data on the distribution and abundance of early life stages of selected fish species based on surveys conducted throughout the Hudson River estuary.

The first report, First Multiplant Report (TI 1975), summarized estuary-wide data collected to estimate the impact of five electric generating stations on striped bass, white perch, and Atlantic tomcod. The multiplant effort was refined and renamed the Year Class Report for the 1974 data (TI 1977). Patterns of abundance and distribution of early life stages were examined in greater detail in the 1975 report, but impacts of station operations were not estimated (TI 1978). The 1976 report (TI 1979) expanded the focus to include ecological relationships of selected fish populations. In the 1977 and 1978 reports (TI 1980a,b), the life histories and distributional information on nine additional fish species were included. Data analysis of the 1979 report (TI 1981) was also extended to include predictions of environmental impact based on fish population age structure and age-specific survival. Further statistical analyses of biocharacteristics data available from 1973 to 1979 were included for the three initial key species.

The Hudson River Settlement Agreement among the Utilities, the U.S. Environmental Protection Agency, and other interested parties was announced in 1980 and became effective in May 1981 (Sandler and Schoenhard 1981). The 1980-1981 Year Class Report (Battelle 1983), the first one prepared after execution of the Settlement Agreement, continued the presentation of life history and population dynamics studies of selected Hudson River estuary fish species. The 1981 study program was also the first in which the length of the sampling season was reduced to focus on the period when most Hudson River fish were maturing from the larval to juvenile stage. The 1982 Year Class Report (NAI 1985a) was similar in content to the 1980-1981 report, but the estimation of year class strength was extended to include a fall index. In addition to the basic survey results, the 1983 report (NAI 1985b) included data on the first recaptures of fish released from a striped bass hatchery that began operation in 1983. This report also examined the relationship between environmental variables and the early life histories of striped bass, white perch, and American shad. The 1984 Year Class Report (MMES 1986) contained the types of information presented in 1982 and 1983 reports, but placed additional emphasis on the indices of year class strength and their interpretation.

1992 Year Class Report 1-1

The 1985 Year Class Report (Versar 1987) described the results from the 1985 Longitudinal River Ichthyoplankton, Fall Shoals, and Beach Seine surveys. This report focused on: (1) the spatiotemporal distributions for 12 fish species with respect to life history and prevailing environmental factors; (2) year class strength indices, including development of a new index of year class strength for white perch, striped bass, American shad, and bay anchovy; and (3) factors that may influence year class strength for these four species.

The 1986 and 1987 Year Class Report (LMS 1989) described the results from the 1986 and 1987 Longitudinal River Ichthyoplankton, Fall Shoals, and Beach Seine surveys. This report continued the description of the spatiotemporal distribution for 12 selected species, as well as an assessment of trends in year class abundance and growth for a limited number of species as in the previous year class reports. In addition, this report described the historical patterns of variability in selected physical/chemical parameters which may influence fish distribution and abundance, estimated the influence of inclusion of previously unsampled regions on abundance and standing crop estimates, and described changes in the fish community of the Hudson River estuary over time.

The 1988, 1989, 1990 and 1991 Year Class Reports (EA 1990, 1991 and LMS 1992, 1996) describe the results of the 1988, 1989, 1990 and 1991 Longitudinal River Ichthyoplankton, Fall Shoals, and Beach Seine surveys. These reports focused on physical/chemical parameter patterns and spatiotemporal distribution for 12 selected species (rainbow smelt was added in the 1991 Year Class Report, for a total of 13 species), as well as assessments of trends in year class abundance and growth for a limited number of species following the pattern established in previous year class reports.

The present report adds to the historical database by describing the results of the Longitudinal River Ichthyoplankton, Fall Shoals, and Beach Seine surveys for 1992. The 1992 Year Class Report presents basic abundance and distribution data with the following objectives:

- Describe the patterns and variability of environmental parameters that may have affected fish distribution and abundance in the Hudson River estuary in 1992.
- Describe the distribution and abundance of 16 selected species of fish (Table 1-1) in the Hudson River estuary in 1992 and provide information on length frequency where applicable. Three additional species (bluefish, hogchoker, and gizzard shad) were added since they have been of interest to the NY State Department of Environmental Conservation (NYSDEC).

This report is organized into four chapters with supporting appendices. Data collection and analysis methods are described in Chapter 2. Physical and chemical parameters are described in Chapter 3 and spatiotemporal distribution of selected fish species is presented in Chapter 4. Detailed data tables supporting report analyses are contained within the appendix section as follows: Appendix A - Quality Assurance Program for the Ichthyoplankton, Fall Shoals and Beach Seine Laboratory Programs; Appendix B - Physical/ Chemical Parameters; Appendix C - Density and Standing Crop

1992 Year Class Report

TABLE 1-1 FISH SPECIES^a TREATED IN DEPTH IN THE 1992 YEAR CLASS REPORT

Common Name Scientific Name^b Alewife Alosa pseudoharengus American shad Alosa sapidissima Atlantic sturgeon Acipenser oxyrhynchus Atlantic tomcod Microgadus tomcod Bay anchovy Anchoa mitchilli Blueback herring Alosa aestivalis Bluefish Pomatomus saltatrix Gizzard shad Dorosoma cepedianum Hogchoker Trinectes maculatus Rainbow smelt Osmerus mordax Shortnose sturgeon Acipenser brevirostrum Spottail shiner Notropis hudsonius Striped bass Morone saxatilis Weakfish Cynoscion regalis White catfish Ictalurus catus White perch Morone americana

a. Species identified by NYSDEC as of interest for discharge permitting purposes.

b. Names recognized by American Fisheries Society (Robins et al. 1980).

Estimates; Appendix D - Length-Frequency Distribution; and Appendix E - Numbers of fish/species collected in ichthyoplankton, beach seine and fall shoals sampling programs, 1988-1992.

CHAPTER 2 MATERIALS AND METHODS

2.1 SAMPLING DESIGN

Several fishery techniques were employed in three separate sampling programs to obtain comprehensive information on the abundance and distribution of selected larval, young-of-year, and adult fish species in the Hudson River estuary. Temporally, the programs covered spring through fall, the period of greatest biological activity in north temperate waters. Program-specific techniques were employed to adequately sample all habitats and permit the determination of spatial distribution patterns. The three programs followed the same general design and employed gear similar to that of previous Hudson River sampling programs.

The three sampling programs that made up the overall program and their objectives were:

Longitudinal River Ichthyoplankton Survey (LRS). The entire length of the Hudson River estuary, from River Mile (RM) 1 at the Battery to RM 152 at the Federal Dam in Troy, was sampled to provide ichthyoplankton data that would allow calculations of standing crop, mortality, and growth rates for selected Hudson River fish species. The primary species were Atlantic tomcod (Microgadus tomcod), American shad (Alosa sapidissima), striped bass (Morone saxatilis), white perch (M. americana) and bay anchovy (Anchoa mitchilli). LRS sampling was concentrated during the spring, summer and early fall when eggs and larvae of the primary species were usually abundant.

<u>Fall Shoals Survey (FSS)</u>. Samples were collected every other week from the George Washington Bridge to the Troy Dam in midsummer and fall. The objective was to provide data on young-of-year fish that would allow calculation of standing crops and conditional mortality rates for selected Hudson River fish species. The target species were Atlantic tomcod, American shad, striped bass, and white perch.

Beach Seine Survey (BSS). Beach seine samples were collected in alternate weeks with the FSS at stations from the George Washington Bridge to the Troy Dam. The objective was to obtain distribution and relative abundance information on young-of-year American shad, Atlantic tomcod, striped bass, and white perch while they were concentrated primarily in the shallow, near-shore region. The survey was conducted from mid-June through October, when young-of-year of these species were utilizing the shore zone nursery.

Sampling for all programs was conducted according to a stratified random design in which the Hudson River estuary from the George Washington Bridge (River Mile [RM] 12) to the Federal Dam at Troy (RM 152) was divided into 12 regions (Figure 2-1). For LRS, an additional region from the Battery (RM 1) to the George Washington Bridge was sampled

1992 Year Class Report 2-1

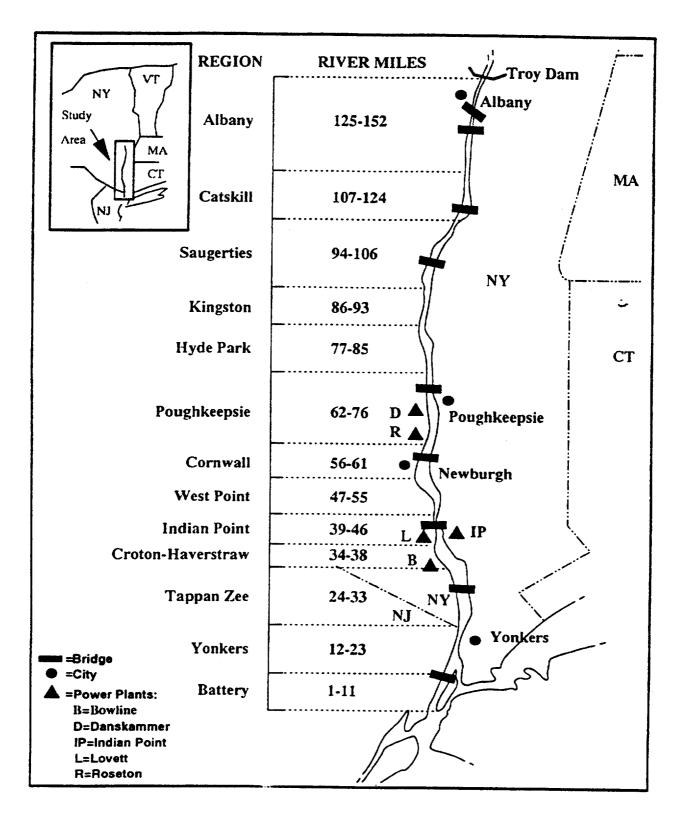


Fig 2-1. Location of 13 geographic regions (with river mile boundaries) sampled during 1992 field sampling programs in the Hudson River estuary.

in 1992. Each region was further divided into "strata" on the basis of river depth. The strata based on river depth are graphically presented in Figure 2-2 and defined below:

- . <u>Shore</u> that portion of the Hudson River estuary extending from the shore to a depth of 10 ft (the stratum defined only for BSS).
- . <u>Shoal</u> that portion of the Hudson River estuary extending from the shore to a depth of 20 ft at mean low tide.
- . <u>Bottom</u> that portion of the Hudson River estuary extending from the bottom to 10 ft above the bottom where river depth is greater than 20 ft at mean low tide.
- . <u>Channel</u> that portion of the Hudson River estuary not considered bottom where river depth is greater than 20 ft at mean low tide.

The proportional relationships of the shoal, bottom, and channel strata vary over the length of the Hudson River estuary. Presented in Figure 2-2 are three types of cross-sectional views. The low relief sectional is characteristic of the Tappan Zee and Croton-Haverstraw regions, the high relief sectional is exemplified by the Yonkers and Poughkeepsie regions, and the fjord relief sectional represents the West Point region.

A minimum of two samples were assigned to each stratum in most regions for the LRS. However, no samples were scheduled in the Battery region during the first half of the LRS (April 12 through June 6) or in the Hyde Park through Albany regions during the final seven weeks of the LRS (July 12 through October 17). A minimum of three samples were assigned to each stratum in each region for the FSS and a minimum of three samples were also taken in each region for the BSS. The strata actually sampled in each region during the 1992 survey period are given in Table 2-1. Shoal strata samples were not assigned in upriver regions nor were shoal or shore strata samples assigned in the Battery region.

A general summary of the three sampling programs for the annual study is presented in Table 2-2. The field and laboratory methods used for each survey are described in detail in the following sections.

2.2 LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

2.2.1 Field Methods

The 1992 LRS covered 27 weeks from 12 April to 17 October (Table 2-2 and Figure 2-5) with all sampling conducted at night. Sampling was conducted weekly for the first 8 weeks between RM 12 and RM 152. For the next 5 consecutive weeks, sampling encompassed RM 1 - RM 152. Beginning the week of 19 July and ending the week of 11 October, sampling was conducted biweekly between RM 1 and 76. Between 24 May and 11 July an additional 20 trawl (channel strata) samples were collected per week. The samples were preserved so that aging of striped bass larvae using daily otolith rings could be conducted.

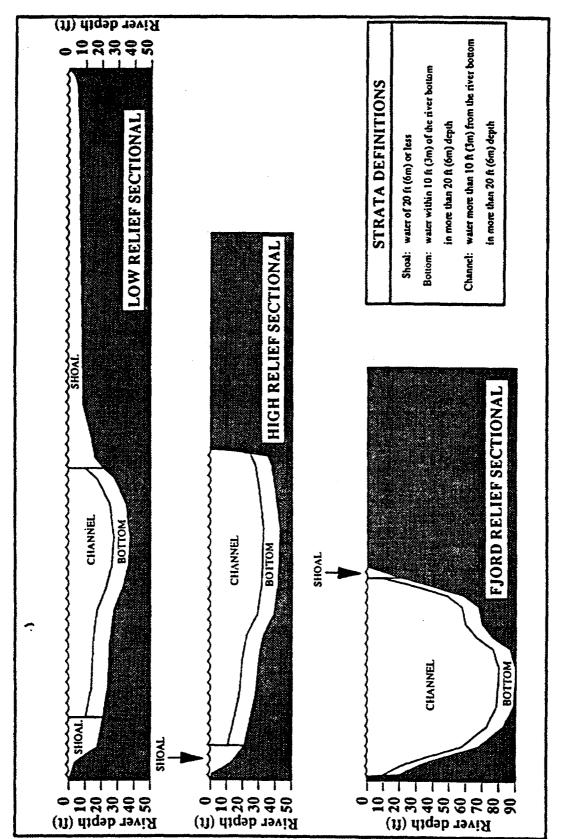


Figure 2-2. Cross sections of the Hudson River estuary showing locations and typical proportional relationships of the shoal, bottom and channel strata.

TABLE 2-1 STRATA SAMPLED WITHIN THE 13 GEOGRAPHIC REGIONS OF THE HUDSON RIVER ESTUARY DURING 1992

			River	1992 Survey			
Region	Abbreviation	River Miles	<u>Kilometers</u>	Shore		Channel	Bottom
Battery	ВТ	1-11	1-19			X	X
Yonkers	YK	12-23	19-39	X	X	X	X
Tappan Zee	TZ	24-33	39-55	X	X	X	X
Croton-Haverstrav	у СН	34-38	55-63	X	X	X	X
Indian Point	IP	39-46	63-76	X	X	X	X
West Point	WP	47-55	76-90	X		X	\mathbf{X}^{i}
Cornwall	CW	56-61	90-100	X	X	X	X
Poughkeepsie	PK	62-76	100-124	X		X	X
Hyde Park	HP	77-85	124-138	X		X	X
Kingston	KG	86-93	138-151	X		X	X
Saugerties	SG	94-106	151-172	X		X	X
Catskill	CS	107-124	172-201	X		X	X
Albany	AL	125-152	201-246	X		X	X

NOTE: Dashes (--) indicate no sampling scheduled.

			ic sled or		ic sled					
		Sampling Gear	1.0-m ² net on epibenthic sled or 1.0-m ² Tucker trawl	1.0-m ² Tucker trawl	1.0-m² net on epibenthic sled	3.0-m beam trawl	1.0-m ² Tucker trawl	3.0-m beam trawl	30.5-m beach seine	
1		.si		,_,		3.0	1.0	3.0	30) }
ber	Lab	Analys	415	789	782					
Sample Number	Collection Lab	Actual	502	1,687* 1,685	1,158	512	440	728	1,000))) (1
Sam	Collec	Projected Actual Analysis	502	1,687*	1157	512	440	728	1,000	22061
	Strata	Sampled	Shoal	Channel	Bottom	Shoal	Channel	Bottom	Shore	A1011
	Number of Sampling Strata	River Runs Frequency Sampled	Weekly/ Shoal Biweekly			Biweekly Shoal			Biweekly Shore	Carried and Carrie
	Number of	River Run	20			œ			10) 1
	Sampling Schedule	Start Date End Date	15 OCT			23 OCT			24 OCT	1)
	Sampling	Start Date	13 APR			13 JUL			NI 18 11 V	
		Program Phase	Longitudinal River 13 APR Ichthyonlankton	Survey		Fall Shoals	Survey		Beach Seine Survey 18 IIIN	Car mo armon reman

^{*} Includes 141 samples collected for striped bass otolith analysis.

The allocation of sampling effort among river regions and strata was temporally adjusted in response to the projected presence and distribution of target species and life stages. The 1992 LRS sampling program was scheduled as five separate multiweek efforts. The first, which covered the last 3 weeks of April, was directed toward the collection of American shad eggs. The second effort covered the first 2 weeks of May and was designed to collect eggs of *Morone* spp. and American shad. The third effort encompassed the next 3 weeks from the middle of May through the beginning of June and targeted *Morone* spp. and American shad yolk-sac larvae. The fourth effort consisted of 5 weeks extending from the middle of June through the second week in July. This sampling effort was designed to collect *Morone* spp. and American shad post yolk-sac larvae. The LRS sampling program concluded with a 13-week period, sampled biweekly, from the middle of July to the middle of October. The final sampling effort was designed to collect all life stages of bay anchovy.

The allocation of sampling effort among regions and strata is given in Table 2-4. During 1992, 3,346 ichthyoplankton samples (including 141 striped bass otolith aging samples) were scheduled for collection; 3,345 samples were collected, accounting for 99.97 percent of the scheduled total.

Two gear types were used to sample the shoal, channel, and bottom strata in the LRS: a 1.0-m² Tucker trawl (Figure 2-3) to sample the channel strata, an epibenthic sled-mounted 1.0-m² net similar in design to the Tucker trawl (Figure 2-4) to sample the bottom strata, and both gear types to sample the shoal strata. Table 2-3 presents design specifications for the sampling gear.

Both gear types were towed against the prevailing current for 5 minutes. The tow started with the remote opening of the net and terminated with its remote closing. If the river depth was 20 ft or less, an open set and retrieval of the net was allowed. The tow speed for the trawl was approximately 0.9 m/second; for the epibenthic sled-mounted net, approximately 1.0 m/second. An electronic flowmeter mounted along the side of the research vessel and equipped with an on-deck readout display was used to establish and maintain tow speed. A calibrated digital flowmeter mounted in the center of the net mouth was used to calculate the volume of water filtered for each sample.

Following net washing and sample concentration in the codend bucket, the samples were examined for yearling and older fish. All of these fish were identified, enumerated, and returned to the Hudson River estuary. Special care was taken for sturgeon and for marked and tagged fish. After yearling and older fish were removed, the remaining sample was placed in container(s) so that the sample occupied no more than 25% of the container volume. The containers were filled with 10 percent formalin.

In situ measurements of water temperature (°C), dissolved oxygen (mg/liter), and specific conductance (microsieman/cm at 25 °C) were taken with calibrated meters at fixed river mile and strata stations in conjunction with the biological sampling. Physical/chemical sampling locations, by river mile and strata, are presented in Table 2-5 for the 1992 LRS. Physical/chemical measurements were recorded from surface, middepth, and bottom water depth at channel stations and from the surface and bottom water depth at shoal stations. During the 20 collection weeks of the 1992 LRS, 2,899 samples were scheduled, with 2,901 samples actually collected.

Ichthyoplankton samples collected for striped bass otolith aging were handled in the same manner as regularly scheduled LRS samples except that the preservative was 5 percent buffered formalin. Within 48 hours, the samples were drained and placed in 70 percent ethyl alcohol (ETOH).

2-7

1992 Year Class Report

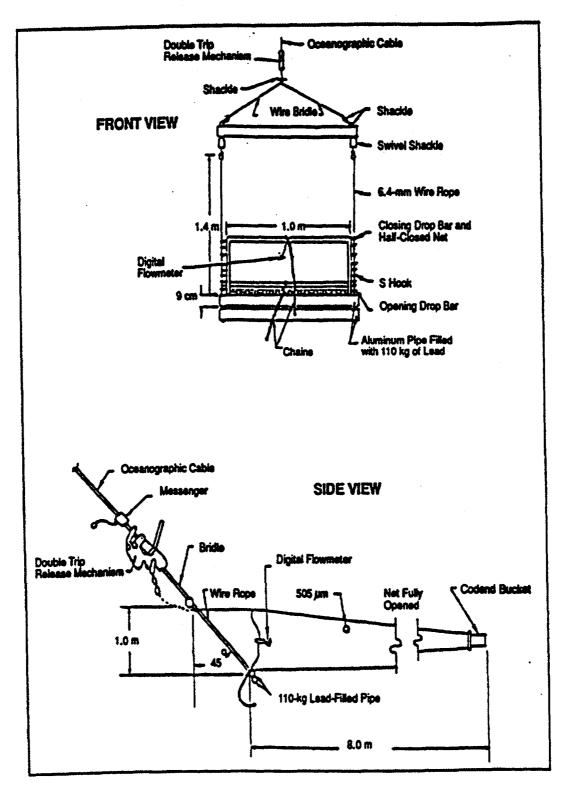


Figure 2-3. Design and dimensions of 1.0 m² Tucker trawl.

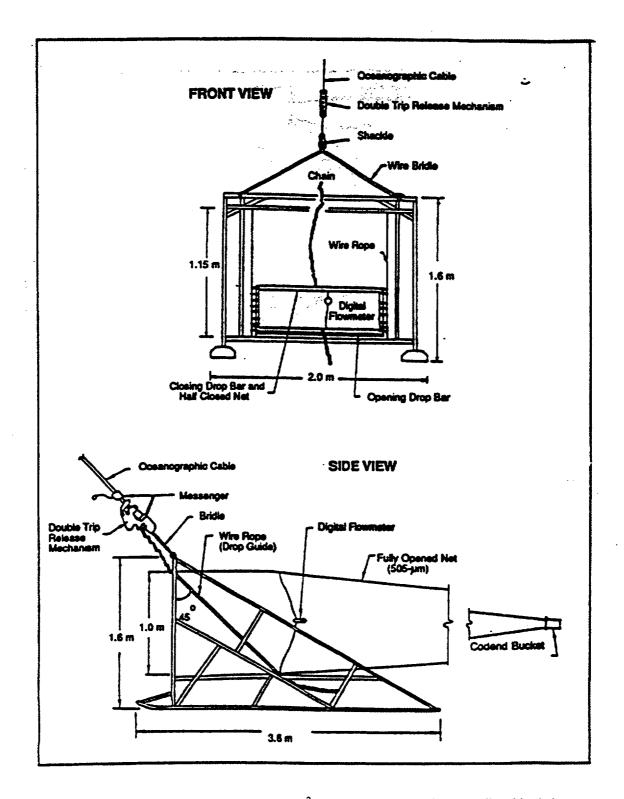


Figure 2-4. Design and dimensions of 1.0 m² Tucker trawl mounted on an epibenthic sled.

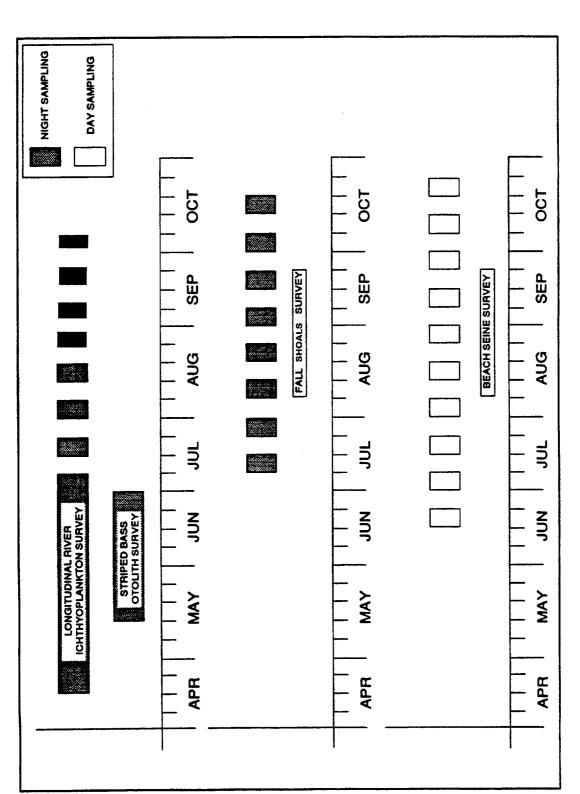


Figure 2-5. Sampling schedule for 1992

TABLE 2-3 SPECIFICATIONS OF SAMPLING GEAR USED DURING THE 1992 LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

1.0-m² Tucker Trawl

Length8.0 mMouth (width)1.0 mMouth (height)1.4 mMesh size500 mm

Net material Nytex (monofilament nylon)

Collection cup30 cmLength30 cmLength with net-retaining ring37 cmMesh size500 mm

Net material Nytex (monofilament nylon)

1.0-m² Net Mounted on Epibenthic Sled

Length8.0 mMouth (width)1.0 mMouth (height)1.4 mMesh size505 mm

Net material Nytex (monofilament nylon)

Collection cup

Length30 cmLength with net-retaining ring37 cmMesh size500 mm

Net material Nytex (monofilament nylon)

TABLE 24 SUMMARY OF 1992 SAMPLE COLLECTION INFORMATION BY RIVER REGION AND STRATUM FOR THE LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

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Region	Battery Yonkers Tappan Zee Croton-Haverstraw Indian Point West Point Cornwall	Poughkeepsic Hyde Park Kingston Saugerties Catskill Albany	Total	Region Battery Yonkers Tappan Zee Croton-Haverstraw Indian Point West Point Cornwall Poughkeepsie Hyde Park Kingston Saugerties Catskill Albany Total

NOTE: Dashes (--) indicate no sampling scheduled.

TABLE 2-5 WATER QUALITY SAMPLING LOCATIONS DURING THE 1992 LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

		ing Locations (RM) es Scheduled	Number of Water Quality Samples Collected
River Region	Shoals*	<u>Channel</u>	Per Region Per Run
Yonkers	19	14, 17, 19, 22	16
Tappan Zee	29	25, 27, 29, 32	16
Croton-Haverstraw	36	35, 36, 37, 38	16
Indian Point	43	40, 42, 43, 46	16
West Point		49, 51, 53, 55	12
Cornwall	59	56, 57, 59, 61	16
Poughkeepsie	-	63, 67, 71, 75	12
Hyde Park		78, 80, 82, 84	12
Kingston		87, 89, 91, 93	12
Saugerties		96, 99, 102, 105	12
Catskill	-	109, 114, 118, 122	12
Albany		126, 131, 135, 138, 142	15
Total			167

NOTE: Dashes (--) indicate no sampling scheduled.

^{*} Sample collected from east and west shoals at designated river mile.

2.2.2 <u>Laboratory Methods</u>

In 1992, approximately 60 percent of the regular LRS samples were scheduled for analysis. Selection of samples for laboratory analysis began with the grouping of all samples according to river run, region, and strata. Based on these groupings, samples were selected based on one of the following criteria:

- 1. If there were less than 6 samples in the group, then all were selected for analysis.
- 2. If there were between 6 and 12 samples in the group, then 50 percent of the samples were randomly selected for analysis.
- 3. If there were more than 12 samples in the group, then 20 percent of the samples were randomly selected for analysis.

The allocation of samples for laboratory analysis among regions, strata, and gear types based on these criteria is listed in Table 2-6. The total number of analyzed samples was 1,986, comprising 61.98 percent of the collected regular samples.

In 1992 as in the previous year, splitting (or subsampling) was permitted. A trained technician first determined if the sample needed splitting. This was done by visual inspection. Any sample containing large numbers of eggs may have been split so that eggs were only sorted from one or more splits containing a total of at least 250 eggs (all species combined).

There were two different sets of criteria for subsampling larvae, depending on the river run. Beginning with the river run in which striped bass post yolk-sac larvae first appeared, and for the next eight river runs (a total of nine consecutive river runs), a minimum of 500 Morone larvae (i.e., the combined total of yolk-sac larvae, post yolk-sac larvae, and juveniles of striped bass, white perch, and unidentified Morone) were sorted from the entire sample and a minimum of 500 non-Morone larvae must be sorted. Because some of the more difficult distinctions between species (e.g., striped bass vs. white perch) or between life stages could not be made reliably during sorting, samples from these nine river runs were usually sorted in their entirety for larvae (i.e., yolk-sac larvae, post yolk-sac larvae, and young of year combined) of all species combined. An exception to this may have been made, at the discretion of the laboratory supervisor, under the following circumstances: when extremely large numbers of non-Morone larvae occurred in the sample and a qualified identifier has verified that sufficient numbers of both Morone larvae and non-Morone larvae are sorted to meet their respective subsampling quotas. The purpose of this exception was to allow splitting before sorting of taxa such as clupeids which could readily be distinguished from Morone by sorters.

The second set of criteria for subsampling larvae applied to the six other river runs not covered in the previous paragraph (before and after the period of striped bass abundance). Any sample from these river runs may have been subsampled so that larvae were sorted from one or more splits containing at least 100 larvae (i.e., yolk-sac larvae, post yolk-sac larvae, and young of year combined) of all species combined.

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TABLE 2-6 SUMMARY OF 1992 SAMPLE ANALYSIS INFORMATION BY RIVER REGION AND STRATUM FOR THE LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

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NOTE: Dashes (--) indicate no sampling scheduled.

To eliminate any chance of bias, some steps in the splitting procedure were performed by an assistant so that the sorter had no prior knowledge of which splits were to be used for the analysis. This procedure is explained in Figure 2-6.

Randomness of the splitting procedure was monitored and controlled by testing selected samples to determine whether splits from the same sample differed by more than random variation. Samples were selected to test for randomness by a continuous sampling plan, shown in Figure 2-7 (CSP-V from MIL-STD-1235B, AQL = 10 percent).

For each split sample evaluated, three fractions of the same size were sorted and compared by the chi-square test according to the following procedure. The counts of the three splits (including any quality control [QC] finds) were averaged to obtain the expected value for the sample. Chi-square was calculated as:

chi square =
$$(O_1 - E)^2 + (O_2 - E)^2 + (O_3 - E)^2$$

E E E

where

$$O_1$$
, O_2 , and O_3 = observed counts for splits 1, 2, and 3
E = expected value for the sample (average of O_1 , O_2 , and O_3).

If the calculated value for chi-square was less than 5.99, then the splits of that sample were considered random, and the sample passed the split QC (5.99 was the critical value of chi-square with two degrees of freedom at an alpha level of 0.05). If a sample was split for both eggs and larvae, then both stages were tested separately. The sample passed the split QC only if chi-square was below the critical value for both life stages.

Eggs and larvae were separated from detrital material, sorted by major taxonomic group and life stage, counted, and placed in vials containing 5 percent formalin or in alcohol. Sorted samples were evaluated by a trained technician under magnification and all organisms were identified and enumerated. The following life stage designations were used in identification:

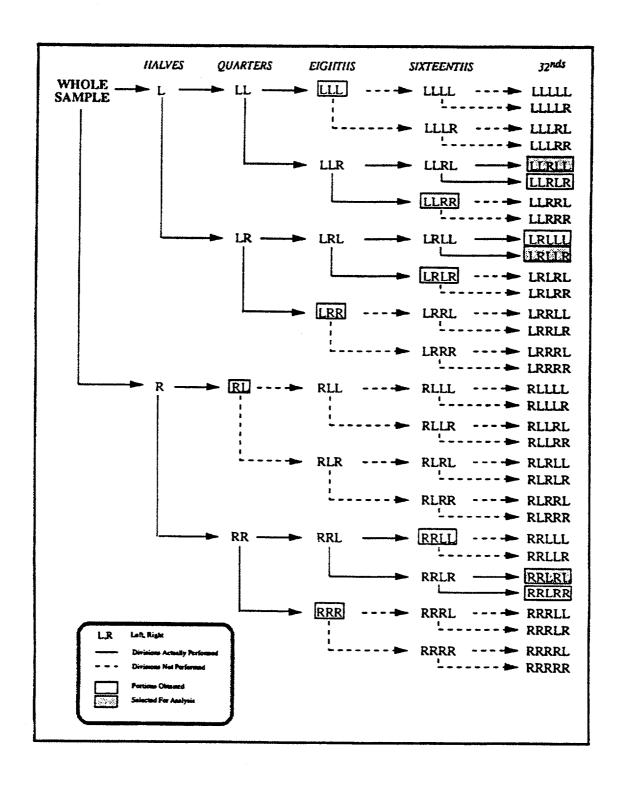


Figure 2-6. Conceptual diagram of the splitting process.

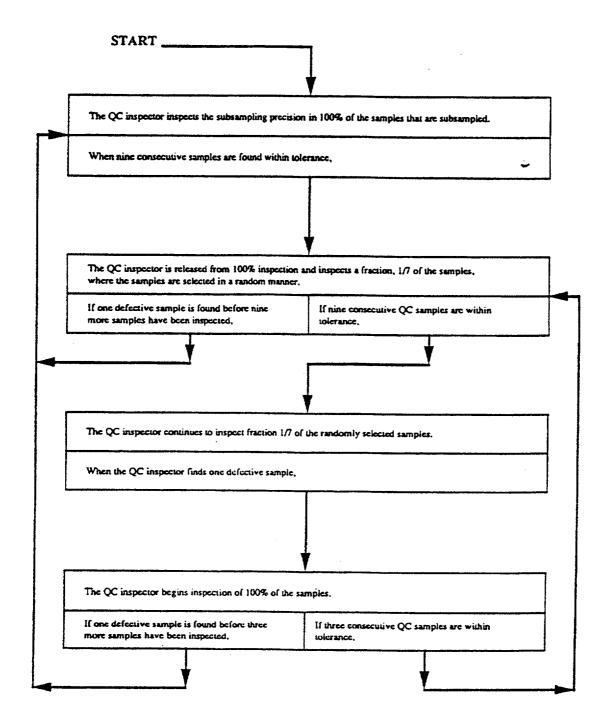


Figure 2-7. Inspection plan for evaluation of splitting precision.

Life Stage	Description
Egg	Embryonic stage from spawning to hatching
Yolk-Sac Larvae	From hatching to development of a complete and functional digestive system
Post Yolk-Sac Larvae	From development of a complete digestive system to acquisition of a full complement of adult fin rays
Young of Year	From acquisition of a full complement of adult fin rays to 31 December of the year spawned

Whenever possible, a maximum of 30 striped bass, 30 white perch, and 30 American shad per sample were measured. Organisms were chosen at random from each taxon regardless of life stage until the required numbers were obtained; life stages to be included were yolk-sac larvae, post yolk-sac larvae, and young of year. In addition, 30 striped bass eggs were measured and an aggregate dry weight taken from each of the five samples with the greatest number of striped bass eggs. Eggs (diameter) and yolk-sac larvae and post yolk-sac larvae (total length) were measured to the nearest 0.1 mm and young of year to the nearest 1 mm. Measurements were recorded on the laboratory data sheet. Selection of specimens for measuring was randomized by spreading them uniformly in a gridded container, selecting a starting point in the grid by means of a random number table, and then measuring the first 30 measurable specimens encountered in a predetermined pattern commencing at the starting point. Every grid space had an equal probability of being selected as the starting point, so every specimen had an equal probability of being included in the subsample.

Continuous sampling inspection was employed during the sort and identification procedures to ensure an average outgoing quality of <0.1. Two sampling modes were required in the continuous sampling plan (CSP-1):

Mode 1: The first eight samples sorted or analyzed for larval identification by an individual are subject to 100 percent QC reanalysis. If all eight pass the reanalysis, i.e., if ≤10 percent of the ichthyoplankton are missed or misidentified per sample, the individual is placed in CSP Mode 2. If any sample fails during Mode 1, then Mode 1 is continued until eight consecutive samples pass. For example, if a sample with QC No. 7 fails, then samples with QC Nos. 8 through 15 are subject to QC resorting.

Mode 2: Lots of seven consecutive samples per individual are assigned. One sample from each lot is randomly chosen for QC analysis. If a sample fails (>10 percent of organisms missed or misidentified) during Mode 2, that individual is placed back into Mode 1. For example, if a sample with QC No. 6 fails in a lot of seven samples, then samples with QC Nos. 7 through 14 are subject to QC reanalysis. If samples 7 through 14 pass, the individual is again placed in Mode 2.

Results of the 1992 CSP-1 QA/QC Program are contained in Appendix A.1.

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2.3 FALL SHOALS SURVEY

2.3.1 Field Methods

A 1.0-m² Tucker trawl and a 3.0-m beam trawl were used to collect young-of-year fish in the FSS. The Tucker trawl with 3.0-mm mesh was used to collect samples in the channel strata, while the beam trawl (Figure 2-8) was used to sample the shoal and bottom strata. The latter gear was first used in this capacity in the 1985 FSS; prior to 1985 an epibenthic sled-mounted Tucker trawl was used (see Table 2-7 for design specifications for both trawl types).

Both gear types were towed against the prevailing current for approximately 5 minutes. For the Tucker trawl vessel speed is adjusted as necessary to achieve and maintain a 45° wire angle; the resultant tow speed is recorded. The beam trawl is towed speed of approximately 1.5 m/second. Tow speed was established and maintained by use of an electronic flowmeter mounted along the side of the research vessel and equipped with an ondeck readout display. A calibrated digital flowmeter mounted in the center of the net mouth was used to calculate the volume of water filtered for each sample.

The 1992 FSS biweekly sampling program covered 15 weeks from 9 July to 17 October (Figure 2-5), with all samples collected at night. Table 2-8 presents the distribution of the sampling effort among the 12 river regions by stratum for the 1992 FSS. In 1992, 1,680 samples were scheduled for collection; 1,680 samples, or 100.0 percent of the scheduled number were actually collected.

Calibrated meters were used to measure water temperature (°C), dissolved oxygen (mg/liter), and specific conductance (microsieman/cm at 25°C) at fixed river mile and strata stations in conjunction with field sampling. Sampling locations were the same as those used for the 1992 LRS sampling program (Table 2-5). Measurements of physical/chemical parameters were recorded during each biweekly FSS sampling period from surface, mid, and bottom water depths at channel stations and from surface and bottom water depths at shoal stations. During the 8 collection weeks of the 1992 FSS, 1,336 samples were scheduled and 1,333 samples were actually collected, or 99.8 of the number of samples scheduled for collection..

Samples collected during the first two sampling periods (River Runs 1 and 2) for the 1992 FSS program were preserved with 10 percent formalin at the time of collection and returned to the laboratory for analysis. Before preservation, samples were examined for sturgeon determined to be yearling or older, based on length categorization; live fish were returned to the river. Samples from the first two river runs were returned to the laboratory for analysis because of the difficulty in differentiating some species, especially young-of-year *Morone* (striped bass, white perch) and *Alosa* (alewife, blueback herring).

Samples collected following the second biweekly sampling period were evaluated in the field; only fish required to fill length measurement quotas were returned to the laboratory. The quota was to be 20 specimens of a selected species from each river region per run; because of the necessity of returning fish to the river alive, the first 20 specimens of a selected species were brought to the laboratory for length measurements. In 1992, the Hyde Park through Albany regions were considered one region for the purpose of filling length measurement quotas during the entire FSS and during River Runs 4 through 11 of the BSS. Also for the BSS during River Runs 1 through 3, the Yonkers through West Point regions

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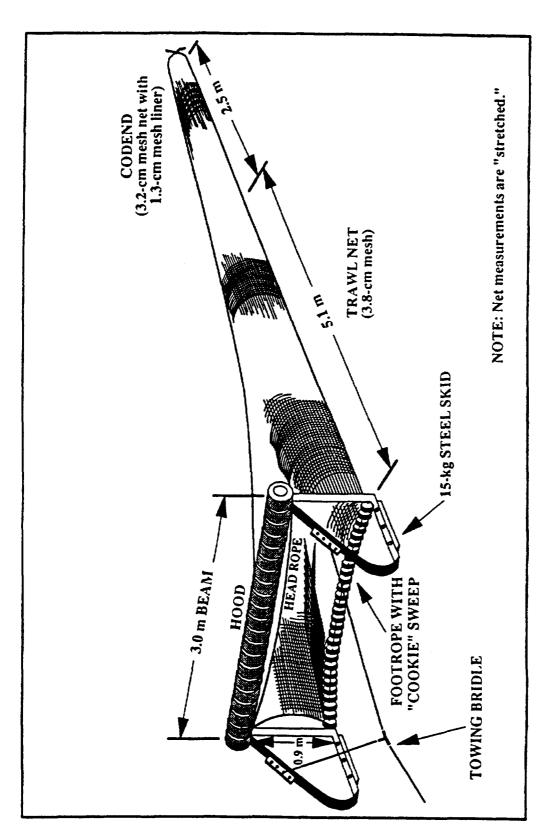


Figure 2-8. Design and dimensions of the 3.0 m beam trawl used in the 1992 Fall Shoals Survey.

TABLE 2-7 SPECIFICATIONS OF SAMPLING GEAR USED DURING THE 1992 FALL JUVENILE SURVEY

1.0-m² Tucker Trawl

Length	8.0 m
Mouth (width)	1.0 m
Mesh size	3.0 mm

Collection cage (codend)

Length	81 cm
Diameter	41 cm
Mesh size	3.0 mm

3.0-m Beam Trawl

Length	7.6 m
Beam width	3.0 m
Net body	3.8-cm mesh (stretch)
Codend	3.2-cm mesh (stretch) net with
	1.3-cm mesh (stretch) liner
Hood	3.8-cm mesh (stretch)
Footrope	Equipped with 5.1-cm rollers
Headrope	Equipped with three floats
Mouth area	2.7 m^2

TABLE 2-8 NUMBER OF BIWEEKLY SAMPLES COLLECTED DURING THE 1992 FALL SHOALS SURVEY

13 July - 23 October

Region	Shoal (Beam Trawl)	Strata Channel (Tucker Trawl)	Bottom (Beam Trawl)	<u>Total</u>
Yonkers	56	40	40	136
Tappan Zee	240	64	64	368
Croton-Haverstraw	128	24	64	216
Indian Point	48	24	40	112
West Point		24	40	64
Comwall	40	24	40	104
Poughkeepsie		24	40	64
Hyde Park		32	48	80
Kingston		48	72	120
Saugerties		48	96	144
Catskill		48	120	168
Albany		40	64	104
Total	512	440	728	1,680*

NOTE: Dashes (--) indicate no sampling scheduled.

^{*} All samples collected at night.

were considered as one region for the same purpose. In river regions where fewer than 10 samples were collected per survey, no more than 10 specimens of each selected species from an individual sample were used to fill the length measurement quota. This criterion was used in the following surveys by river region:

Sampling Program	Region
BSS	YK, IP, WP, CW, PK
FSS	WP, PK

In all other regions, when the sample schedule resulted in 10 or more samples per survey, no more than five specimens per species in a sample were used to fill the length measurement quotas. If more specimens of a species were collected than needed, the individuals used to fill the quotas were randomly selected.

All fish not returned to the laboratory were identified and enumerated into length classes as described in the following section.

2.3.2 Laboratory Methods

Fish from the FSS identified and enumerated in both the field and laboratory were separated into the following length classes:

- Length Class 1 Less than or equal to the young-of-year length limit ("Division 1"), obtained on a weekly basis for each species.
- Length Class 2 Greater than Division 1 and less than or equal to the yearling length limit ("Division 2"); set at 150 mm for most species, also obtained weekly from the impingement contractor. From 1 January through 31 May, Division 2 represents the upper length limit for yearling fish for all species. From 1 June through 31 December, Division 2 is assigned a static value of 150 mm TL for all species except alewife, American shad, blueback herring, striped bass, Atlantic tomcod, and white perch. For these species, Division 2 is maintained as a dynamic upper length limit for yearling fish throughout the year.
- Length Class 3 Greater than Division 2 and less than or equal to 250 mm.
- Length Class 4 Greater than 250 mm.

Twenty specimens of the following selected species collected in each river region were measured for total length (nearest millimeter) in the laboratory:

. Alewife

. American shad

. Atlantic sturgeon

. Atlantic tomcod

. Bay anchovy

. Blueback herring

. Shortnose sturgeon

. Spottail shiner

. Striped bass

. Weakfish

. White catfish

. White perch

2.4 BEACH SEINE SURVEY

2.4.1 Field Methods

The BSS utilized a 30.5-m bag beach seine to collect young-of-year fish in the shore zone of each region. Table 2-9 presents specifications for the beach seine. One end of the net was held on shore and the other end was towed perpendicularly away from the shore by boat. The seine was then hauled, clockwise if possible, in a semicircular path toward shore. The complete tow swept an area of approximately 450 m² (TI 1981). All BSS samples were collected on a diurnal schedule during alternate weeks of the FSS.

The 1992 BSS biweekly sampling program was conducted from 22 June through 30 October (Figure 2-5). Ten of the 19 weeks in this time period were collection weeks. Allocation of the proposed 100 beach seine samples per river run by river region and the total number of samples collected for the 1992 BSS are presented in Table 2-10. All of the scheduled 1,000 samples projected for collection in 1992 were collected.

Measurements of water temperature (°C), dissolved oxygen (mg/liter), and specific conductance (microsieman/cm at 25°C) were taken with each beach seine sample. Physical/chemical measurements were taken 1 ft below the water surface and approximately 50 ft from the shoreline. During the 10 collection weeks of the 1992 BSS, 1,000 samples were scheduled and 1,000 samples were actually collected.

Young-of-year fishes collected during the first four beach seine river runs in 1992 were processed in the laboratory because of the difficulty in distinguishing species at the young-of-year life stage, adults were processed in the field. All samples collected following River Run 4 were field processed; 20 specimens of the selected species from each region per run were collected (as described in Section 2.3.1) for length determination in the laboratory. Samples maintained for laboratory analysis were preserved using 10 percent formalin.

All sturgeon collected during both the FSS and BSS in 1992 were measured to the nearest 1 mm and weighed to the nearest 1 g. Fish that remained alive were returned to the Hudson River estuary; dead fish were frozen and held for the New York State Department of Environmental Conservation (NYSDEC).

TABLE 2-9 SPECIFICATIONS OF SAMPLING GEAR USED DURING THE 1992 BEACH SEINE SURVEY

30.5-m Beach Seine

Number of wings	2
Length of wings	12.0 m
Depth of wings	2.4 m
Wing mesh (bar)	1.0 cm
Length of bag	6.1 m
Depth of bag	3.0 m
Bag mesh (bar)	0.5 cm
Sample area	450 m ²

TABLE 2-10 NUMBER OF BIWEEKLY SAMPLES COLLECTED DURING THE 1992 BEACH SEINE SURVEY

22 June - 30 October

Region	Number of Beaches Sampled
Yonkers	44
Tappan Zee	201
Croton-Haverstraw	119
Indian Point	44
West Point	44
Cornwall	51
Poughkeepsie	59
Hyde Park	59
Kingston	59
Saugerties	108
Catskill	126
Albany	85
Total	1,000

2.4.2 Laboratory Methods

All fish returned to the laboratory were measured for total length to the nearest 1.0 mm. Laboratory analysis was conducted in the same manner as described for samples collected during the FSS.

2.5 ANALYTICAL METHODS

2.5.1 Physical/Chemical Parameters

To display the spatial and temporal patterns of temperature, salinity, and dissolved oxygen, a mean of each parameter for each sampling location and sampling week, weighted by stratum volume, was calculated. Equation 1 was used to compute these means for the standard physical/chemical stations sampled in conjunction with the LRS and FSS. Equation 2 was used for data taken in conjunction with the BSS. Salinity data were computed from conductivity data (microsieman/cm at 25°C) using Equation 3 (TI 1976). This equation differs from that used in some of the previous Year Class Reports in that pressure data is not required. The maximum deviation between this equation and the previous equation is 0.1 percent (TI 1976).

$$W_{lw} = \sum_{k=1}^{n_{lw}} P_{kr} \left[1/n_{klw} \sum_{d=1}^{n_{klw}} \left(1/n_{dklw} \sum_{i=1}^{n_{dklw}} W_{idklw} \right) \right]$$

$$(1)$$

where

W_{lw} = Weighted mean of a physical/chemical parameter at sampling location 1 during week w of the LRS and FSS

W_{idklw} = Physical/chemical measurement for location i at depth d in stratum k at sampling location l during week w

P_{kr} = Proportion of the river volume of region r containing sampling location l that is contained by stratum k (bottom and channel strata were combined for water quality analysis)

n_{dklw} = Number of sites at which measurements were made at depth d in stratum k at sampling location l during week w

n_{klw} = Number of depths sampled in stratum k at sampling location 1 during week w

 n_{lw} = Number of strata sampled at sampling location 1 during week w.

$$W_{rw} = 1/n_{rw} \sum_{i=1}^{n_{rw}} W_{irw}$$
(2)

where

W_{rw} = Mean of a physical/chemical parameter at river mile r during biweek w of the BSS

W_{irw} = Physical/chemical measurement for location i at river mile r during biweek w

 n_{rw} = Number of physical/chemical measurements taken at river mile r during biweek w.

Salinity =
$$-100 \ln \left(1 - \frac{C_{25}}{178.5}\right)$$
 (3)

where

 C_{25} = Conductivity (millisieman/cm at 25 C).

2.5.2 Spatiotemporal Distribution Indices

2.5.2.1 Density and Catch-Per-Unit-Effort (CPUE) Estimates

Estimates of population densities were made for the LRS and FSS. For these two surveys the number of fish (by species and life stage) in individual samples was first converted to density (no./m³ of water sampled) using Equation 4. The mean density and the standard error of the mean were calculated for each stratum, region, and sampling week using Equations 5 and 6. To obtain a mean density and standard error for each region during each sampling week, the stratum densities were weighted by the proportion of the regional river volume found in the stratum (Equations 7 and 8). If a stratum was not sampled, its volume was added to the volume of an adjacent stratum that was sampled. Stratum volume adjustments were made according to the following rules:

If This Stratum
Was Not Sampled

Shoal
Bottom

Its Volume Was Added
To This Stratum

Bottom

Channel

$$D_{ikrw} = \frac{C_{ikrw}}{V_{ikrw}}$$
 (4)

where

D_{ikrw} = Density (for a life stage and species)/m³ for sample i in stratum k in region r during week w

C_{ikrw} = Number of fish caught in sample i in stratum k in region r during week w

 V_{krw} = Volume sampled (m³) by sample i in stratum k in region r during week w.

$$D_{krw} = \frac{1}{n_{krw}} \sum_{i=1}^{n_{krw}} D_{ikrw}$$
 (5)

where

 D_{krw} = Average density in stratum k in region r during week w

 D_{ikrw} = Sample density calculated in Equation 4

 n_{krw} = Number of samples taken in stratum k in region r during week w.

$$SE(D_{krw}) = \sqrt{\frac{\sum_{i=1}^{n_{krw}} (D_{ikrw} - D_{krw})^{2}}{(n_{low})(n_{low} - 1)}}$$
(6)

where

SE(D_{krw}) = Standard error of the average density in stratum k in region r during week w

D_{ikrw} = Sample density calculated in Equation 4

 D_{krw} = Average stratum density calculated in Equation 5.

$$D_{rw} = \sum_{k=1}^{n_{rw}} (D_{krw})(P_k)$$
(7)

where

 D_{rw} = Average density in region r during week w

 D_{krw} = Average stratum density calculated in Equation 5

 P_k^* = Proportion of the regional river volume found in stratum k (Table 2-11)

 n_{rw} = Number of strata sampled in region r during week w.

$$SE(D_{rw}) = \sqrt{\sum_{k=1}^{n_{rw}} \left[SE(D_{krw})^2 (P_k)^2 \right]}$$
(8)

where

SE(D_{rw}) = Standard error of average density in region r during week w

 $SE(D_{krw})$ = Standard error of the average stratum density calculated in Equation 6.

Catches from the BSS were reported as number caught per seine haul (CPUE) by life stage and species. The average CPUE for a region and its standard error were calculated using Equations 9 and 10:

$$C_{rw} = \frac{1}{n_{rw}} \sum_{i=1}^{n_{rw}} C_{irw}$$
(9)

where

 C_{rw} = Average CPUE in region r during week w

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^{*}When a stratum is missing, P_k for the sampled stratum is equal to the sum of the P_k for the sampled stratum and the P_k for the unsampled stratum.

C_{irw} = CPUE for sample i in region r during week w

 n_{rw} = Number of samples taken in region r during week w.

$$SE(C_{rw}) = \sum_{\substack{i=1 \\ n_{rw}(n_{rw}-1)}}^{n_{rw}} (C_{irw} - C_{rw})^{2}$$
(10)

where

SE(C_{rw}) = Standard error of average CPUE in region r during week w

 C_{rw} = Average regional CPUE calculated in Equation 9.

2.5.2.2 Standing Crop Estimates

An index of standing crop (the number of fish in an area at a particular time) was estimated by life stage and species for each of the three surveys. Standing crop indices and the associated standard errors were calculated for each stratum in a region by taking the product of the average stratum density (or the standard error) and the volume of water contained in that stratum (Equations 11 and 12 for the LRS and FSS) (Table 2-11). The regional standing crop index was then estimated as the sum of the stratum index values (Equations 13 and 14). Similarly, an estimate of the standing crop index for the Hudson River estuary for each week was calculated by summing the standing crops for the 12 (13 for the LRS) river regions (Equations 15 and 16). This value is an index rather than an absolute standing crop values because no adjustment was applied for collection efficiency.

$$SC_{krw} = (V_{kr})(D_{krw}) \tag{11}$$

where

SC_{krw} = Standing crop estimate for stratum k in region r during week w

 V_{kr} = River volume contained by stratum k in region r

 D_{krw} = Average stratum density calculated in Equation 5.

$$SE(SC_{krw}) = (V_{kr})[SE(D_{krw})]$$
 (12)

where

 $SE(SC_{krw})$ = Standard error of the standing crop index for stratum k in region r during week w

TABLE 2-11 STRATUM AND REGION VOLUMES (m³) AND SURFACE AREAS (m²) USED IN ANALYSIS OF 1992 HUDSON RIVER ESTUARY DATA

Shorezone Surface Area	*	3,389,000	20,446,000	12,101,000	4,147,000	1,186,000	4,793,000	3,193,000	558,000	3,874,000	7,900,000	8,854,000	6,114,000	76,555,000
Region Volume	209,012,784	229,420,288	321,811,465	147,736,754	208,336,266	207,455,769	139,791,019	298,133,444	165,484,666	141,469,879	176,295,711	160,731,743	71,149,105	2,476,828,893
Shoal Volume	18,747,833	26,654,767	121,684,992	53,910,105	12,648,163	2,647,885	8,140,123	5,990,260	2,307,625	12,332,868	20,307,338	34,526,456	25,606,842	345,505,257
Bottom Volume	48,455,129	59,312,978	62,125,705	32,517,633	33,418,632	25,977,862	36,768,629	63,168,132	32,012,000	35,479,990	42,845,077	42,281,206	13,517,183	527,880,156
Channel	141,809,822	143,452,543	138,000,768	61,309,016	162,269,471	178,830,022	94,882,267	228,975,052	131,165,041	93,657,021	113,143,296	83,924,081	32,025,080	1,603,443,480
Geographic Region	Battery*	Yonkers	Tappan Zee	Croton-Haverstraw	Indian Point	West Point	Cornwall	Poughkeepsie	Hyde Park	Kingston	Saugerties	Catskill	Albany	Total

Battery region. Estimation of strata volumes for the Battery Region is described in the 1989 year class report (EA 1990). * Shorezone surface area is unknown and not used in data analysis as no beach seine sampling is performed in the

 $SE(D_{krw})$ = Standard error of average stratum density calculated in Equation 6.

$$SC_{rw}^{**} = \sum_{k=1}^{3} SC_{krw}$$
 (13)

where

SC_{rw} = Standing crop index for region r during week w

SC_{krw} = Stratum standing crop index calculated in Equation 11.

$$SC_{krw} = \sqrt{\sum_{k=1}^{3} \left[SE(SC_{krw}) \right]^2}$$
 (14)

where

 $SE(SC_{rw})$ = Standard error of standing crop index for region r during week w

 $SE(SC_{krw})$ = Standard error of stratum standing crop index calculated in Equation 12.

$$SC_{w} = \sum_{r=1}^{12} SC_{rw}$$
 (15)

where

SC_w = Standing crop index for week w

 SC_{rw} = Regional standing crop index calculated in Equation 13 or 17.

^{**}Volumes of unsampled strata were added to the volumes of an adjacent stratum according to the rules for stratum volumes in Section 2.5.2.

$$SE(SC_w) = \sqrt{\sum_{r=1}^{12} \left[SE(SC_{rw}) \right]^2}$$
(16)

where

SE(SC_w) = Standard error of standing crop estimate for week w. For the LRS, regional standing crops include the Battery Region (Region 0).

 $SE(SC_{rw})$ = Standard error of regional standing crop estimate calculated in Equation 14 or 18.

An index of regional standing crop (and standard error) for the BSS was obtained by multiplying CPUE and the surface area of the shore zone and dividing by the empirically derived estimate of the area sampled by the 30.5-m beach seine (Equations 17 and 18). The weekly index of standing crop for the shore zone was calculated as the sum of the 12 regional index values (Equations 15 and 16).

$$SC_{rw} = (C_{rw} A_r) / A$$
 (17)

where

SC_{rw} = Standing crop index for the shore zone in region r during week w

C_{rw} = Average regional CPUE calculated in Equation 9

 A_r = Surface area (m²) of the shore zone in region r

A = Surface area (m^2) sampled by the beach seine (450 m^2) (TI 1981).

$$SE(C_{rw}) = [SE(SC_{rw})](A_r)$$
(18)

where

 $SE(SC_{rw})$ = Standard error of standing crop estimate for the shore zone in region r during week w

 $SE(C_{rw})$ = Standard error of average regional CPUE calculated in Equation 10.

2.5.2.3 Temporal and Geographic Distribution Indices

Distribution indices were computed to facilitate presentation of changes in distribution of selected species and life stages through time and space. A geographic index that collapses data over weeks was calculated for LRS, FSS and BSS data as the relative density in each region. To allow comparisons of 1992 data with historical data, only data from samples collected from Weeks 18-27 (where Week 1 begins with the first Monday in January) and north of RM 12 were used for LRS; data from Weeks 33-40 were used for the FSS and BSS. In all cases, data were used only when Regions 1-12 were sampled. This geographic index was calculated as follows:

$$G_{ry} = \frac{\sum_{w=1}^{n_y} SC_{rwy}}{\sum_{r=1}^{12} \sum_{w=1}^{n_y} SC_{rwy}}$$
(19)

where

 G_{ry} = Geographic index for region r in year y

 SC_{rwy} = Regional standing crop for region r in week w in year y calculated in Equation 17

 n_y = Number of weeks sampled in year y.

The LRS and BSS were used for calculating the temporal and geographic indices for striped bass, white perch, Atlantic tomcod, bay anchovy, American shad, alewife, and blueback herring. The LRS and FSS were used to calculate the temporal and geographic distribution indices for rainbow smelt. The BSS was to calculate geographical distribution indices for gizzard shad, spottail shiner and bluefish. The FSS was used to calculate geographical distribution indices for hogchoker, white catfish, and weakfish.

The periods used for the LRS and BSS spanned 1974-1992, whereas the time period for the FSS extended from 1979 (when the FSS sampled the entire river, from RM 1-152) through 1992. Temporal and geographic indices for bay anchovy used the period from 1988-1992, when the sampling design for the LRS included the Battery region and extended into mid October.

A temporal index that collapses data for the entire Hudson River estuary was computed for early life stages from LRS standing crops (Equation 20):

$$T_{wy} = \frac{\sum_{w=1}^{n_y} SC_{rwy}}{\sum_{12} \sum_{n_y} SC_{rwy}}$$

$$(20)$$

where

 T_{wy} = Temporal index for week w in year y

SC_{rwy} = Weekly standing crop estimate in year y calculated in Equation 15

 n_y = Number of weeks sampled in year y.

CHAPTER 3 PHYSICAL/CHEMICAL PARAMETERS

This chapter provides information on the parameters of temperature, salinity, and dissolved oxygen as measured during the 1992 surveys. Although parameters were measured with the BSS, emphasis will be placed on data from the LRS/FSS because these surveys encompassed the entire fish sampling period. In addition, freshwater flow data obtained from the U.S. Geological Survey (USGS) gauging station at the Green Island Dam near Troy, New York, and daily water temperature data from the Poughkeepsie Water Works (PWW) are discussed. Physical and chemical parameters are presented in Appendix B.

3.1 GREEN ISLAND DAM FLOWS

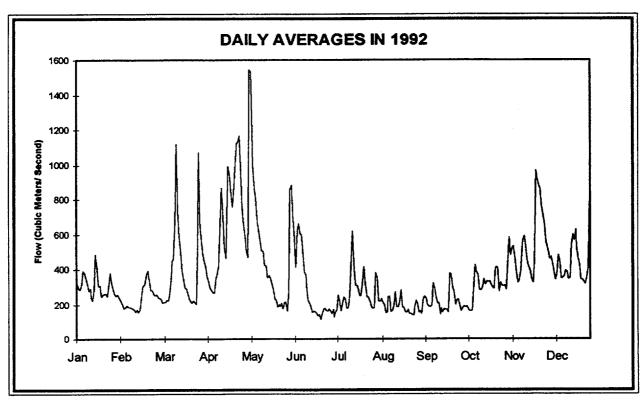
During 1992, daily freshwater flow as measured at the United States Geological Service (USGS) gauging station at Green Island, N.Y., ranged from approximately 200 to 1,600 m³/sec/day (Figure 3-1). The primary peak in daily flows occurred between early April and early May with flows of 500 to 1,600 m³/sec/day. A secondary peak of approximately 1,000 m³/sec/day occurred in mid November. Periods of low daily flow averages of 200 - 500 m³/sec/day occurred from mid June through early October (Figure 3-1) (Appendix Table B-1). The 1992 monthly freshwater flow rates differed from the long term monthly average (1947-1991) flow rates with lower than average flows occurring from January through May and higher than average flows evident from June through December (Figure 3-1). Discharge peaked at 1,545 m³/sec/day on May 3, 1,115 m³/sec/day on March 12, 1,163 m³/sec/day on April 26, 880 m³/sec/day on June 2, and 968 m³/sec/day on November 23 (Appendix Table B-1).

3.2 POUGHKEEPSIE WATER WORKS TEMPERATURES

Long-term (1951-1992) daily temperature records are available from the Poughkeepsie Water Works (PWW), located just north of the City of Poughkeepsie, New York, at RM 76. The lowest recorded temperature in 1992 was 0.7 °C on January 21 and 29, and February 4. Water temperatures in 1992 remained relatively low (<2.5°C) through early March. Water temperature began increasing in early March and reached a high of 24.6°C on July 21. Temperatures started to decline after late August (Figure 3-2, Table B-4).

The 1992 mean water temperature profile generally resembles the long-term pattern (Figure 3-2). However, from July through mid September water temperatures recorded during 1992 were well below the long term average, particularly during August when the temperature approached the long term minimum. During two short periods (mid March and late September), water temperatures approached the long term maximum.

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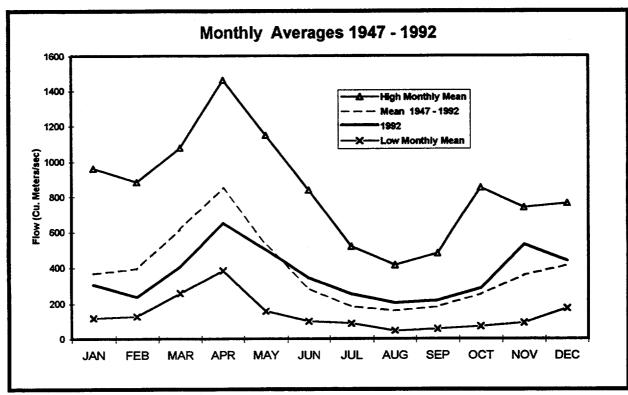


Figure 3-1 Hudson River daily average flow rate in 1992 and monthly average flow rates from 1946 to 1992, Green Island Dam, Troy, NY.

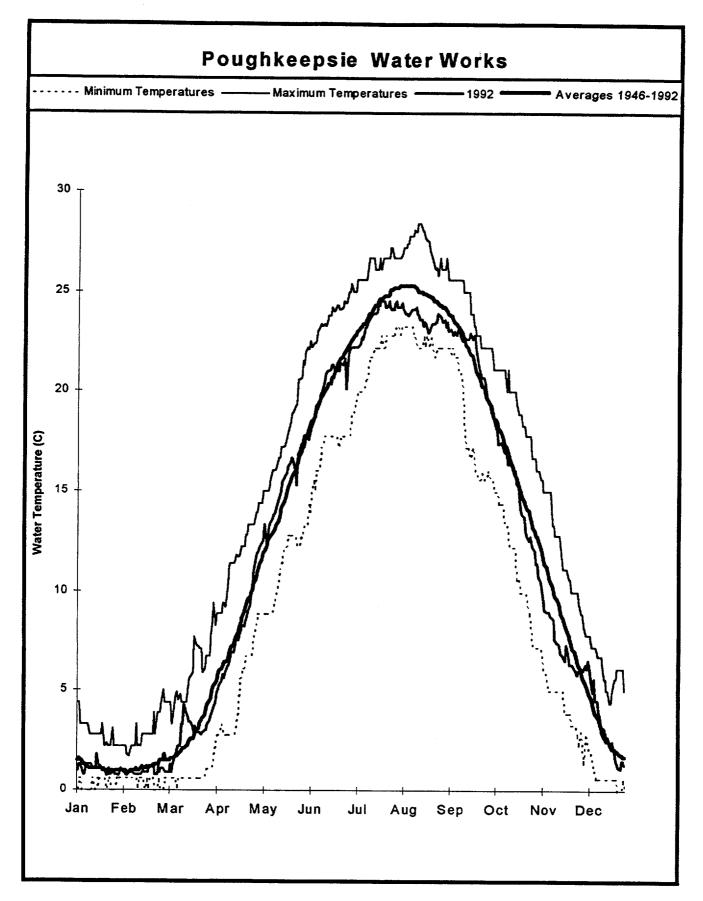


Figure 3-2. Seasonal variations In water temperature from 1951-1992. Source - Poughkeepsie Water Works.

3.3 LONGITUDINAL RIVER ICHTHYOPLANKTON/FALL JUVENILE SURVEYS

3.3.1 Spatiotemporal Pattern in Temperature

Mean weekly water temperature measured during the LRS/FSS increased from the beginning of sampling in April to late July and then decreased steadily until the end of the sampling program in October (Figure 3-3). This temporal pattern observed throughout the Hudson River estuary closely reflected that recorded at PWW. Weekly mean temperatures measured during the LRS/FSS were similar to concurrent PWW temperatures. Peak river temperatures occurred during the week beginning 20 July, as with PWW, when the riverwide mean was 25.4°C and regional mean values were between 24.8 and 26.3°C (Table B-5). Lowest values occurred during the first week of sampling when the mean riverwide temperature was 6.9°C (PWW daily temperatures were 6.9-8.3°C) and regional mean temperatures ranged from 5.8 to 7.5°C.

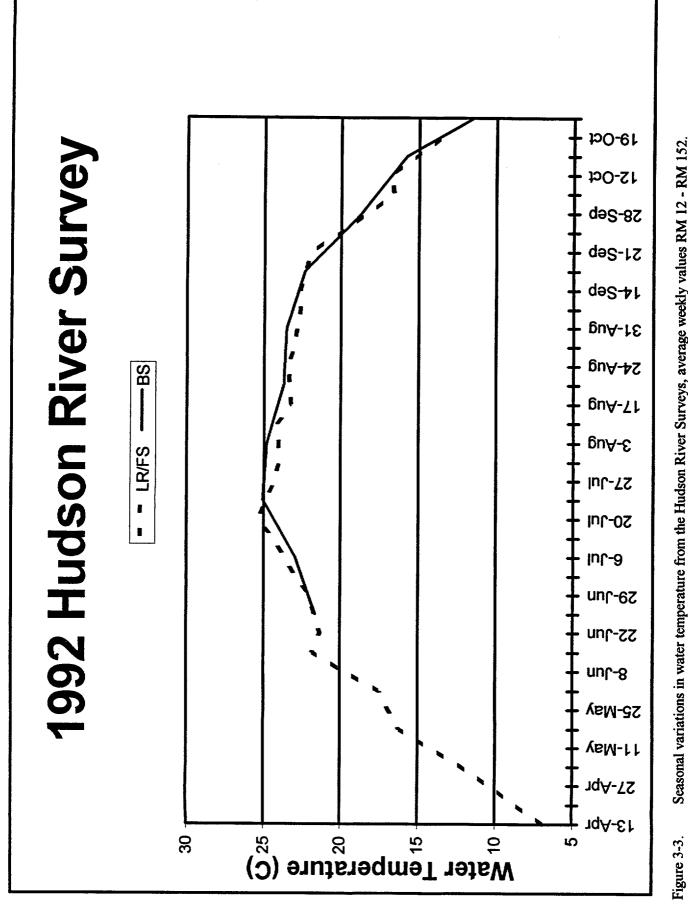
Temporal patterns in the BSS temperature data are generally in agreement with LRS/FSS measurements, but the shallowness of the shore zone resulted in slightly higher temperatures measured during the BSS than were recorded during the LRS/FSS in the spring and summer (Figure 3-3). Mean weekly regional temperatures increased during the spring and summer to a peak of 26.1°C in the Tappan Zee and Cornwall regions during the 20 July sampling week (Table B-6). BSS mean temperatures decreased steadily through the end of the summer and the fall, generally on par with LRS/FSS temperatures. A minimum mean temperature of 8.0°C was recorded from the Albany region during the last week of sampling that began on 26 October.

3.3.2 Spatiotemporal Pattern in Salinity

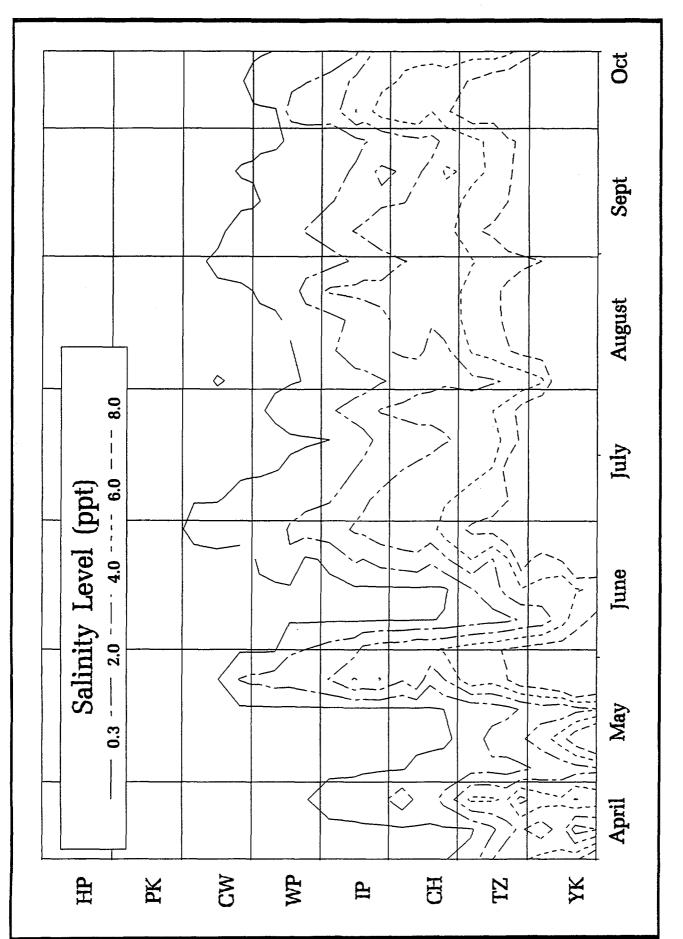
Seasonal variations in salinity in 1992 resemble the pattern observed in previous years of the Hudson River surveys; decreased values in spring in response to increased freshwater flows, increasing summer levels as freshwater input slows, and finally, decreased salinity in the fall as freshwater discharges increase again. The lowest salinity encountered riverwide occurred during the week of 20 April when all regions from Croton-Haverstraw through Albany recorded salinities less than or equal to 0.1 ppt. Mean salinity was less than 3 part per thousand (ppt) in the Yonkers and Tappan Zee regions (Figure 3-4 and Table B-7).

Salinity in the lower river regions quickly increased after freshwater flow declined in mid-May and remained high through mid-October. Salinity values generally increase during the summer months, because freshwater flows are often at their lowest point during this time. Low flows resulted in increased salinities in the Cornwall region during late May, mid June through mid July, and in most sampling weeks between late August and mid October. Salinity over 8 ppt reached lower portions of the Tappan Zee region throughout the summer and early fall (Figure 3-4 and Table B-7).

The spatiotemporal pattern of salinity observed during the BSS resembles that observed in the LRS/FSS. Mean weekly regional salinity was highest in the Yonkers region and decreased upstream (Table B-8). Peak salinity measurements (0.2 - 9.5 ppt from Croton-Haverstraw to Yonkers) were recorded during the week of 8 October and lowest values (0.1-2.8 ppt from West Point to Yonkers)



Seasonal variations in water temperature from the Hudson River Surveys, average weekly values RM 12 - RM 152.



Seasonal variations on the 1992 Longitudinal River Icthyoplankton and Fall Juvenile Surveys, average weekly values RM 12 - RM 152. Figure 3-4.

were observed during the final week of sampling beginning on 26 October. Actual salinity encountered during the BSS was lower than during the LRS/FSS because of the tendency for the denser, saline water to follow the deeper channel rather than the shore zone area. In upriver regions above Poughkeepsie, mean regional salinities in the BSS were recorded as 0.2 ppt (as compared to 0.1 ppt for the LRS/FSS). This difference was probably a result of slightly higher specific conductance measured at shallow beach seine locations compared to deeper channel areas where water quality measurements were taken for the LR/FSS (Tables B-7 and B-8).

3.3.3 Spatiotemporal Pattern in Dissolved Oxygen

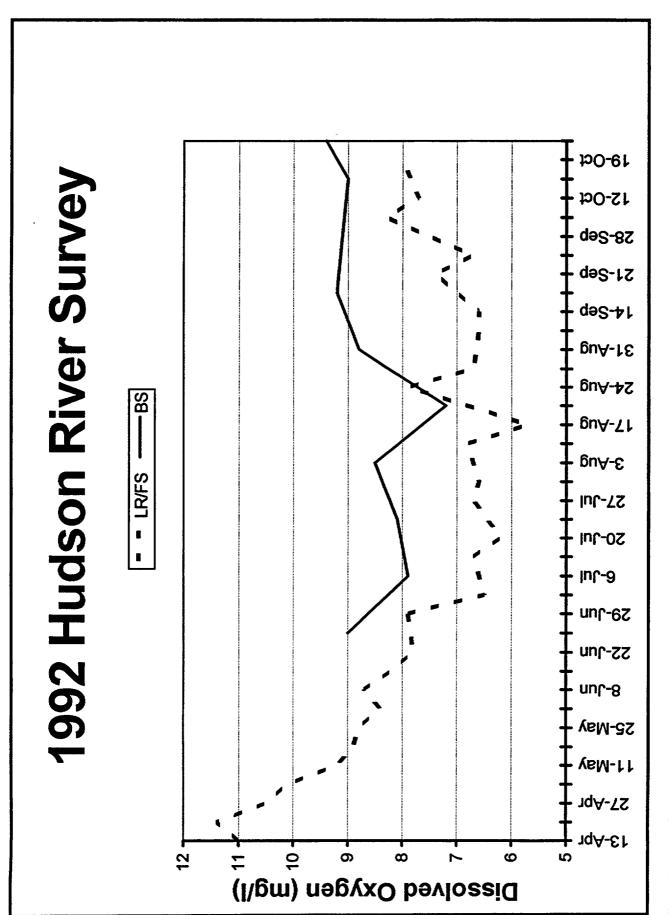
As temperatures rose in the spring and summer of 1992, dissolved oxygen (DO), as recorded in the LRS/FSS, declined from peak mean weekly regional values of 11.0 - 12.3 mg/liter on 20 April to minimum mean levels of 5.3-6.0 mg/liter on 17 August when temperatures were elevated (Figure 3-5 and Table B-9).

Percent oxygen saturation relates the theoretical limit of oxygen saturation, based on temperature and salinity, to the observed DO concentrations. Mean weekly regional percent saturation based on measurements taken during the LR/FSS was usually above 90 percent during the spring. Percent saturation declined slightly in the summer, but still generally averaged above 80 percent. Individual mean weekly regional values never dropped below 53.7 percent, the minimum recorded during the week of 6 July from the Yonkers region.

Data collected in the BSS (Figure 3-5 and Table B-12) indicated slightly higher mean regional DO and percent oxygen saturation than recorded in the LR/FSS. In many instances, mean regional percent oxygen saturation indicated supersaturated conditions. Turbulence from wave action and oxygen released as a by-product of photosynthesis could be two causes of this supersaturation.

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Seasonal variations in dissolved oxygen from the Hudson River Surveys, average weekly values RM 12 - RM 152. Figure 3-5.

CHAPTER 4 SPATIOTEMPORAL DISTRIBUTION OF SELECTED SPECIES OF HUDSON RIVER ESTUARY FISHES

FISH COMMUNITY

4.1.1 General Description of the Fish Community

The fish community of the Hudson estuary reflects the convergence of the two primary fish habitats: fresh water and salt water. Fish are generally confined to one or the other habitat, but a relatively small number of estuarine and migratory species can pass from one to the other, or live in the narrow zone where there is a gradient between fresh and salt water. As a result of this convergence of different habitats in estuaries such as the Hudson, many species can be found in a relatively small area. The Hudson estuary's species diversity is enhanced by its mid-latitude location on the Atlantic coast. Southern tropical marine forms enter the FHudson during the summer, and a number of northern fishes are near their southern limit.

Smith and Lake (1990) documented the Hudson River fish fauna, including the river upstream of the dam at Green Island and the Mohawk River subsystem. They report 201 species, including three known from contiguous waters but not yet reported from the Hudson. Beebe and Savidge (1988), based on sampling through 1980, reported 140 fish species in the Hudson south of the dam at Green Island. Smith and Lake (1990) classified the probable origin of each species, showing that the fish community, particularly in the estuarine reach, is a mixture of both temperate and tropical marine forms, freshwater forms, and intentional and accidental introductions.

The estuary and its tributary streams provide a wide range of chemical, physical, and biological habitat conditions. This diversity is reflected in the range of migratory and movement patterns, reproductive strategies, and food preferences among the members of the fish community. Daniels and Lawrence (1991) grouped 71 Hudson estuary fish species collected in a variety of sampling programs from 1936 through 1991 into 8 trophic categories (feeding behavior) developed by Grossman et al. (1982): surface feeders, water column feeders, soft-bottom benthos feeders, rocky-bottom feeders, ooze feeders, algae feeders, macrocarnivores, and omnivores. Although this analysis did not include all recorded fish species from the estuary, it illustrates the broad range of feeding behaviors among the members of the Hudson estuary fish community. Such an array of feeding behaviors reflects a diversity of habitat conditions.

Carlson (1986) identified assemblages of fish species based on 6 habitat types for the freshwater portion of the Hudson estuary: vegetated backwaters, tributaries, rock pile, shore, offshore shoals and channel, and tailwater. Carlson's assemblages illustrate the diversity of physical habitats in the estuary. A similar analysis for the middle and lower regions of the estuary would show additional physical habitat types, including man-made habitats such as riprap shoreline, bulkheading, and piling clusters associated with piers and docking facilities.

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Because many fish species are tolerant of a wide range of habitat conditions and because there are no well-defined boundaries between habitat types, it is useful to classify the fish community into assemblages based on migratory behavior (anadromous and catadromous) and salinity preference (freshwater, estuarine, and marine). In the Hudson only the American eel is catadromous; thus our discussion is focused on the other four assemblages.

4.1.2 Species Occurrence Through Time

The number of species in these assemblages over long periods of time shows broad-scale suitability of the environment for each assemblage. The disappearance of species may indicate some change has taken place, such as degradation of environmental conditions, introduction of competing species, or overexploitation. Although presence or absence data are limited because they do not reveal major shifts in abundance, one can expect to see broad trends in environmental conditions.

The total number of fish species collected in the utilities' monitoring program in the Hudson River estuary has varied from 64 to 93 between 1974 and 1992 (Table 4-1) with no apparent trend. Total number of fish collected by species in the LRS from 1988 - 1992 and the BSS and FSS from 1985 - 1992 are provided in Appendix Tables E-1 through E-3. These summary tables also provide the number of samples collected and total sampling volumes used in calculating densities.

Although the estuarine and anadromous assemblages have fluctuated very little, there have been changes in the freshwater and marine assemblages. The freshwater assemblage has shown fewer species in recent years compared to the years from 1973 to 1980. However, the fewest species in this assemblage occurred in 1982 and 1983, and numbers have increased slowly since then.

When the individual species in the freshwater assemblage are examined, there is only one species, bluntnose minnow, that occurred consistently in the early years and has not been recorded recently. The bluntnose minnow occurred from 1973 through 1980; more than two-thirds of the occurrences were between RM 125 and RM 152, well beyond the influence of Roseton, Indian Point, or Bowline Point. It has not been recorded since then. Swallowtail shiner and tiger muskellunge were new freshwater species recorded in 1992.

Marine species show more year-to-year variation, but overall there is a trend toward more marine species (Table 4-1). As expected, the largest increase in marine species occurred in the downstream sampling segments. The complementary trends in the freshwater and marine assemblages could be related to the shift in annual freshwater inflow. During the 1970s, when the number of freshwater species was relatively high, freshwater flow was higher than normal. In the 1980s freshwater flow was typically below normal, and freshwater species declined while the number of marine species increased. Newly captured marine species in 1992 were the blackcheek tonguefish, oyster toadfish and permit.

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4-2

TABLE 4-1 - SPECIES COMPOSITION OF FISH COLLECTED DURING HUDSON RIVER STUDIES FROM 1974 TO 1992

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Common Name	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
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Striped anchovy		×				×			×			×				:	:	:	: ×
Striped cuskeel							×					×	×	>	>	>		>	< >
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Summer flounder	×	×	×	×	×	×		×	×		×	×	×	×	: ×	: ×	: ×	: ×	: ×
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Common Name	1974	1975	1976	1976 1977 1978	1978		1980	1981	1982	1983	1984 19	1985 19	1986	1987 1	1988	1989	1990	1991	1992
Anadromous																			
Alewife	×	×	×	×	×	×	×									×	×	×	×
American shad	×	×	×	×	×	×	×		×	~ ×	×	×	×			×	×	×	×
Atlantic sturgeon	×	×	×	×	×	×	×									×	×	×	×
Atlantic tomcod	×	×	×	×	×	×	×									×	×	×	×
Blueback herring	×	×	×	×	×	×	×									×	×	×	×
Rainbow smelt	×	×	×	×	×	×	×									×	×	×	×
Sea lamprey	×	×				×	×	×		^	×			^	×		×		
Striped bass	×	×	×	×	×	×	×	×		~ ×						×	×	×	×
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All Categories Total	85	8	8	82	52	84	8	75	89	7	76 81	-88		75 8	8	8	85	8	82

TABLE 4-2. SPECIES COMPOSITION OF FISH COLLECTED IN EACH OF THE HUDSON RIVER SURVEYS DURING 1992

Common Name	BSS	FJS	LRS
Anadromous			
Alewife	X	X	X
American shad	X	X	X
Atlantic sturgeon		X	X
Atlantic tomcod	X	X	X
Blueback herring	X	X	X
Rainbow smelt	X	X	X
Striped bass	X	X	X
<u>Total</u>	6	7	7
Catadromous			
American eel	X	X	X
<u>Total</u>	1	1	1
<u>Estuarine</u>			
Fourspine stickleback	X		X
Hogchoker	X	X	X
Inland silverside	X		X
Mummichog	X		
Shortnose sturgeon		X	X
Threespine stickleback	X		
White perch	X	X	X
<u>Total</u>	6	3	5

TABLE 4-2. SPECIES COMPOSITION OF FISH COLLECTED IN EACH OF THE HUDSON RIVER SURVEYS DURING 1992

Common Name	BSS	FJS	LRS
Freshwater			
Banded killifish	X		X
Black crappie	X		
Bluegill	X	X	
Brown bullhead	X	X	X
Brown trout			X
Carp	\mathbf{X}	X	X
Chain pickerel	X		
Channel catfish		X	
Common shiner	X		
Emerald shiner	X		
Fallfish	X		
Freshwater drum		X	X
Gizzard shad	X		X
Golden shiner	X	X	
Goldfish	X	X	X
Largemouth bass	X		
Logperch	X		X
Northern hog sucker	X		
Northern pike	X		
Pumpkinseed	X	X	
Redbreast sunfish	X		
Rock bass	X		X
Silvery minnow	X		
Smallmouth bass	X		X
Spottail shiner	X	X	X

TABLE 4-2. SPECIES COMPOSITION OF FISH COLLECTED IN EACH OF THE HUDSON RIVER SURVEYS DURING 1992

Common Name	BSS	FJS	LRS
Freshwater (Cont.)			
Swallowtail shiner	X		
Tesselated darter	X	X	X
Tiger muskellunge	X		
Walleye			X
White catfish	X	X	X
White crappie	X		
White sucker	X		X
Yellow perch	X		X
<u>Total</u>	29	11	16
<u>Marine</u>			
American sand lance			X
Atlantic croaker	X	X	X
Atlantic herring Atlantic mackerel			X
Atlantic mackerei Atlantic menhaden	X	X	X
Atlantic needlefish	X	Λ	X
Atlantic silverside	X	v	•
		X	X
Bay anchovy	X	X	X
Blackcheek tonguefish	5 7	T 7	X
Bluefish	X	X	X
Butterfish	X	X	X
Conger eel			X

TABLE 4-2. SPECIES COMPOSITION OF FISH COLLECTED IN EACH OF THE HUDSON RIVER SURVEYS DURING 1992

Common Name	BSS	FJS	LRS
Marine (Cont.)			
Crevalle jack	X	X	
Cunner	X	X	X
Fourbeard rockling			X
Goosefish			X
Grubby			X
Inshore lizardfish	X	X	X
Moonfish		X	
Naked goby	X	X	X
Northern kingfish	X	X	X
Northern pipefish	X	X	X
Northern puffer		X	
Northern stargazer		X	
Oyster toadfish		X	
Permit	X		
Red hake			X
Rock gunnel			X
Rough silverside	X	X	X
Seabord goby			X
Silver perch	X		
Smallmouth flounder		X	X
Spot	X	X	
Spotted hake		X	X
Striped anchovy		X	
Striped killifish			X
Striped cuskeel		X	X

TABLE 4-2. SPECIES COMPOSITION OF FISH COLLECTED IN EACH OF THE HUDSON RIVER SURVEYS DURING 1992

Common Name	BSS	FJS	LRS
Marine (Cont.)			
Striped searobin	X	X	X
Summer flounder	X	X	X
Swallowtail flounder	X		
Tautog	X	X	X
Weakfish	X	X	X
Windowpane		X	X
Winter flounder	X	X	X
Yellowtail flounder			X
<u>Total</u>	22	27	34
<u>Undetermined</u>			
Acipenseridae			X
Centrarchidae	X		X
Clupeidae	X	X	X
Cyprinidae			X
Fundulus sp.			X
Gobiidae		X	X
Menidia sp.			X
Morone sp.			X
Catostomidae			X
Unidentifiable			X
<u>Total</u>	2	2	10

Thirty-two out of the 92 species recorded during 1992 were collected in all three sampling surveys. Thirty-nine species were collected in only one of the surveys (Table 4-2); of the 33 freshwater species, 13 (39%) of them were collected only in the BSS.

Although all analyses show generally robust fish assemblages that may vary from year to year but have not changed substantially from the mid-1970s to early 1990s, there is a general perception among some Hudson River fishermen and the lay public that abundance of several species of fish, amphibians, and invertebrates in the upper areas of the estuary has declined severely from prior levels. The evidence and possible explanations for the decline were discussed at a public meeting hosted by the Hudson River Foundation in 1990. There was general agreement that data support a decline in some species, but no clear explanation for the declines was apparent. Hypotheses that were considered included chlorine discharges at upriver sewage treatment facilities, improving water quality leading to a subsequent increase in pollution-intolerant predator species, declining nutrient levels, and habitat degradation caused by expansion of water chestnut (Waldman 1991).

The cause for the decline in the number of freshwater species sampled in the estuary since the 1970s is not clear, and in fact may be due to changes in the temporal extent of the sampling. In the 1970s the BSS program began in April and continued through November. In the 1980s the program typically ran from July or August to October. Alternatively, habitat alteration due to the increase in water chestnut or a general decline in freshwater inflow may be responsible for the changes.

Similarly, the increase in marine species may result from changes to the sampling programs and from changes in the more saline areas of the estuary. The lower freshwater flow in the 1980s relative to the 1970s would result in higher salinities in the lower part of the estuary, making it suitable for more obligate saltwater species. Additionally, due to increased treatment of sewage in New York City, dissolved oxygen levels have increased at the mouth of the Hudson, increasing the potential for movement of marine fish into the river.

4.2 STRIPED BASS

Striped bass (*Morone saxatilis*) are anadromous (i.e., they spend most of their life in the marine environment but return to fresh water to reproduce) members of the temperate bass family (the Percichthyidae). They are native to North America and range along the Atlantic coast from the St. Lawrence River in Canada to the St. Johns River in northern Florida and from western Florida to Louisiana along the coast of the Gulf of Mexico. They were introduced in the Sacramento-San Joaquin River system in 1879 and are now found from British Columbia to Ensalada, Mexico. Striped bass have also been successfully introduced into the inland waters of at least 24 states. The U.S. east coast rivers and bays that support the principal spawning populations are the Hudson River; Delaware Bay and Delaware River; Chesapeake Bay and tributaries; the Roanoke and Chowan rivers and Albermarle Sound, North Carolina; the Santee River, South Carolina; and the St. Johns River, Florida. Small spawning populations also occur in several river systems in eastern Canada. Since 1983, the utilities' striped bass hatchery has provided larvae for rearing and stocking by the State of Maine in its efforts to establish striped bass in the Kennebec River.

On the Atlantic coast adult striped bass, which commonly reach 30 lb and can weigh over 50 lb, feed in nearshore waters from summer through late winter. During the warmer months fish typically travel north and return south as the coastal waters cool in the fall. Northward migration of Hudson River fish extends as far north as the Bay of Fundy, Nova Scotia, and older fish tend to travel farther north. Over the winter adult striped bass tend to aggregate near the mouths of their natal rivers. Once water temperatures rise in the spring, native adults (ages 4 and older) begin moving upriver to spawning areas in the freshwater portions of the estuaries.

Spawning begins in the spring when water temperatures are rising rapidly and reach about 57 °F. Peak spawning occurs at about 60 to 65 °F in freshwater areas where currents are moderate to swift (Albrecht 1964; Setzler et al. 1980). In the Hudson River spawning occurs primarily between mid-May and mid-June in the middle portion of the Hudson River estuary (Figure 4-1). Depending on their age and size, females produce up to several million semibuoyant eggs that are suspended by currents. The eggs are relatively large (average 1/10 in. in diameter after water hardening), but vary with the size of the female. Older, larger females tend to have larger eggs.

In 1 to 4 days, depending on temperature, yolk-sac larvae (YSL) hatch from the eggs. Typically 1/8 in. long, they initially drift with the current but can swim for short bursts. During the YSL stage the eyes become pigmented, the jaws and digestive tract form, fin buds appear, and they at least partially absorb the yolk-sac and oil globule. Older YSL are mobile and exhibit a positive phototaxis, or movement toward light (Doroshev 1970). The end of the yolk-sac stage is marked by the completion of the digestive tract, although some of the yolk sac and oil globule may still remain.

During 1992 striped bass YSL were most abundant upriver, where the eggs were most abundant (Figure 4-1). However, a difference in egg and yolk-sac distribution, with the peak in yolk-sac seen further upriver than the peak in eggs, is often seen in the Hudson River. The difference in distribution may mean that YSL migrate upriver using tidal currents, although other explanations have been proposed (Polgar et al. 1976; Fay et al. 1983).

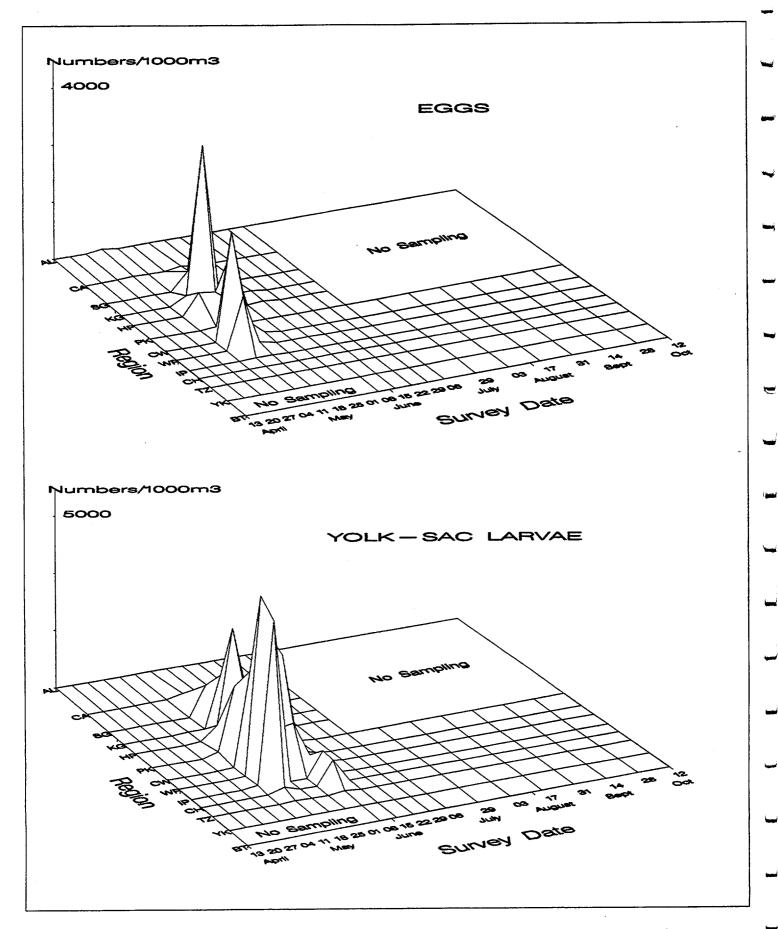


Figure 4-1. Spatiotemporal distribution of egg and yolk-sac stages of striped bass in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

Transformation to the post-yolk-sac larvae (PYSL) stage occurs from four to nine days after hatching, when the larvae are ¼ in. long. The remainder of the yolk sac and oil globule are absorbed, body pigmentation becomes noticeable, fins begin to form, the gas bladder is inflated, and larvae begin to feed actively on zooplankton. This stage lasts approximately one month or longer, ending when the fin rays are fully developed, which occurs when the fish are just over ½ in. long. During 1992 striped bass PYSL were most abundant in the middle estuary (Figure 4-2), but typically they are found throughout the estuary.

Toward the end of the PYSL stage young striped bass begin moving out of the middle estuary into the lower estuary, which is broader, shallower, and may be more productive, and they feed on copepods and amphipods. This downriver movement of juveniles is evident in the 1992 spatiotemporal distribution pattern seen in both the LRS (Figure 4-2), and BSS and FSS (Figure 4-3). Larger juveniles, over $2\frac{1}{2}$ in. long, feed on insect larvae, worms, opossum shrimps, crabs, and small fish (Gardinier and Hoff 1982). Low numbers of yearling striped bass (and rarely older than yearling fish) were collected in the BSS and FSS during 1992, with larger numbers evident in the middle estuary (Figure 4-4).

Comparing the temporal distribution of early life stages of striped bass in 1992 with previous years (1974-1991), it is apparent that in 1992 close to 90% of striped bass eggs occurred in weeks 19-20, or May 10-22, which is early in the period of occurrence recorded for eggs (Figure 4-5). Yolk-sac larvae (YSL) in 1992 likewise tended to be somewhat early, whereas post yolk-sac larvae (PYSL) tended to more highly concentrated towards the middle of the historical trend.

Striped bass eggs in the 1992 LRS were primarily in the Cornwall, Hyde Park and Kingston regions (Figure 4-6). The proportions of eggs in the Cornwall and Kingston regions were substantially higher than those observed in the historical trend. However, YSL and PYSL distribution was generally consistent with patterns seen across years.

The 1992 geographical distribution of young-of-the-year, or juvenile, striped bass in the BSS was consistent with the long term trend, with the main distribution centered in the Tappan Zee and Croton-Haverstraw regions (Figure 4-7). At the end of their first summer, many of the juvenile striped bass move to the southern extreme of the estuary and are found in New York Harbor, western Long Island Sound, and along the south shore of Long Island (McKown 1992a).

Weekly length statistics for striped bass from yolk sac through juvenile life stages collected in 1992 show a rapid growth period in early July and steady growth thereafter through the end of BSS/FSS collections in mid October (Figure 4-8 and Appendix Tables D-1 through D-3). As striped bass grow, fish become an increasingly important component of their diet. Juvenile striped bass are also preyed upon by some marine and estuarine predator species.

At age 2 or 3 striped bass leave Atlantic coast estuaries and begin the typical seasonal migration, northward during the spring and summer and southward during the fall. Adult striped bass are at the top of the food chain and have few natural enemies other than man. Since they rarely go more than 10 miles offshore, they are typically available to sport and commercial fishermen all along their migration route.

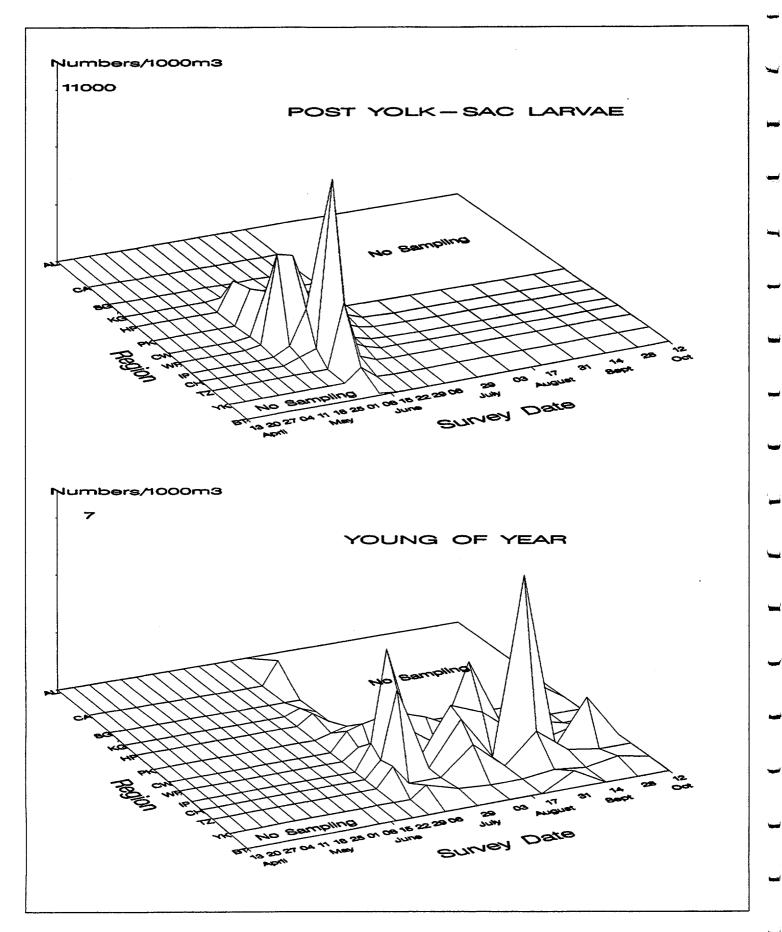


Figure 4-2. Spatiotemporal distribution of post yolk-sac and young-of-year stages of striped bass in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

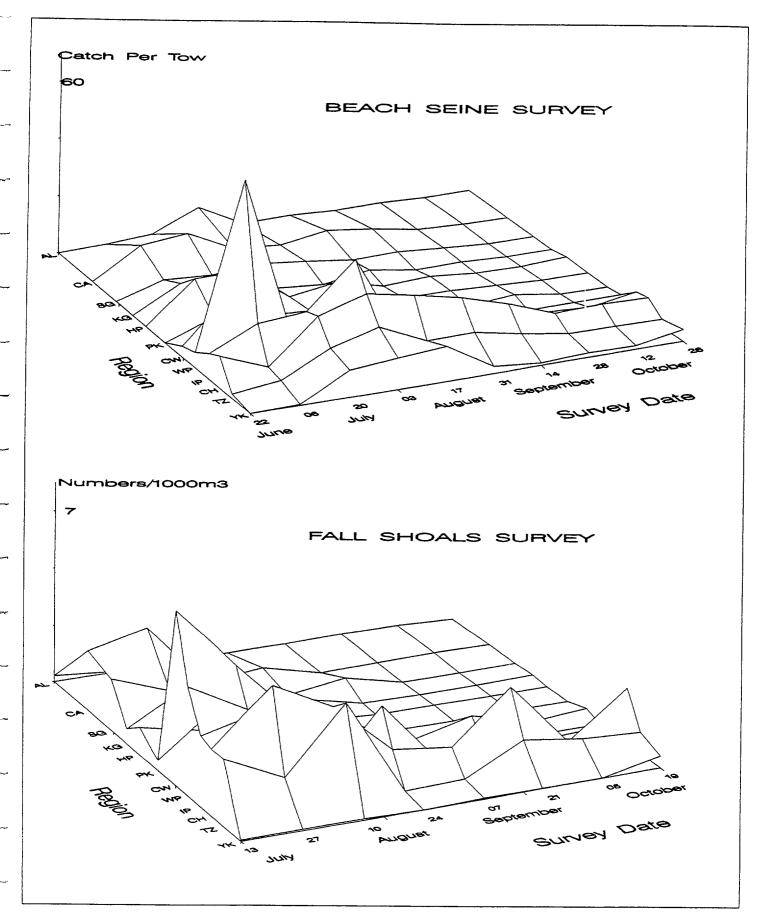


Figure 4-3. Spatiotemporal distribution of young-of-year striped bass in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

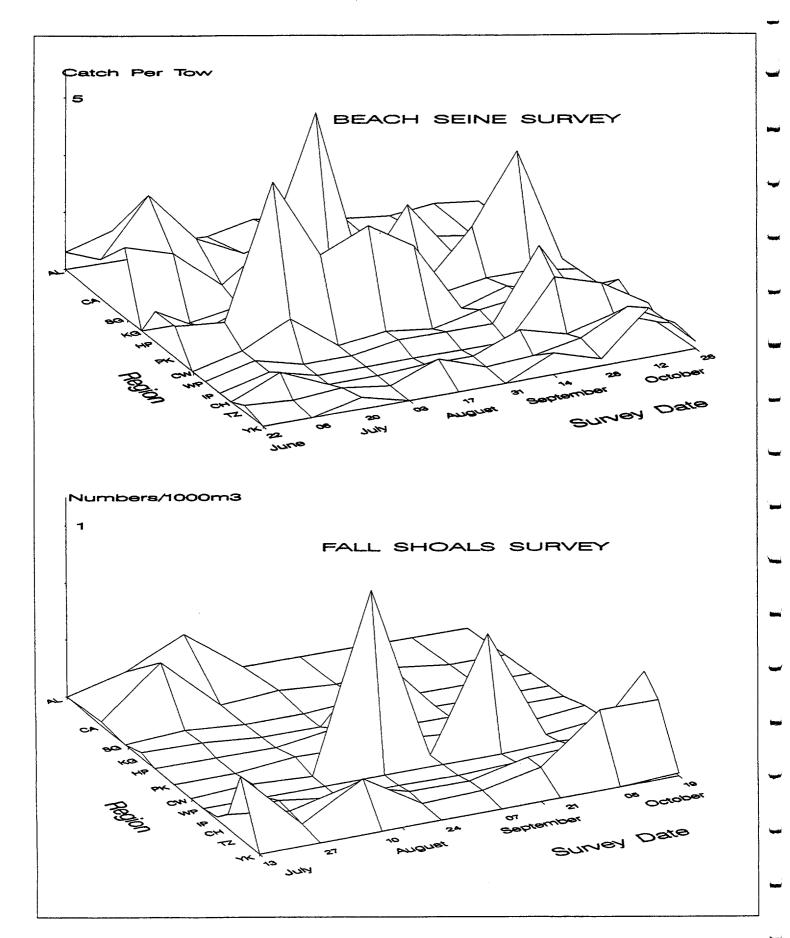


Figure 4-4. Spatiotemporal distribution of yearling and older striped bass in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

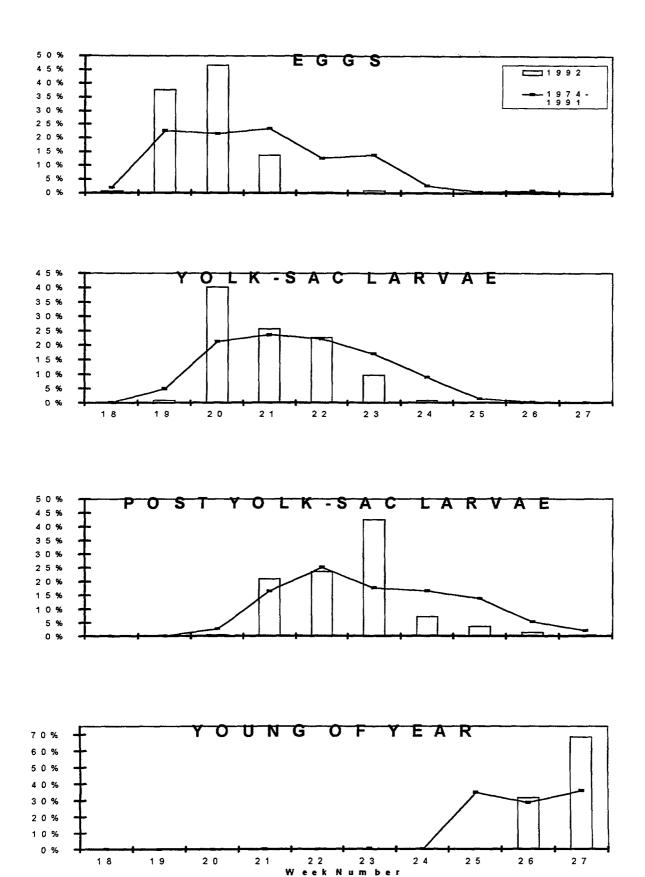


Figure 4-5 Temporal distribution indices for striped bass collected during Longitudinal Ichthyoplankton surveys of the Hudson River Estuary, 1974 - 1992.

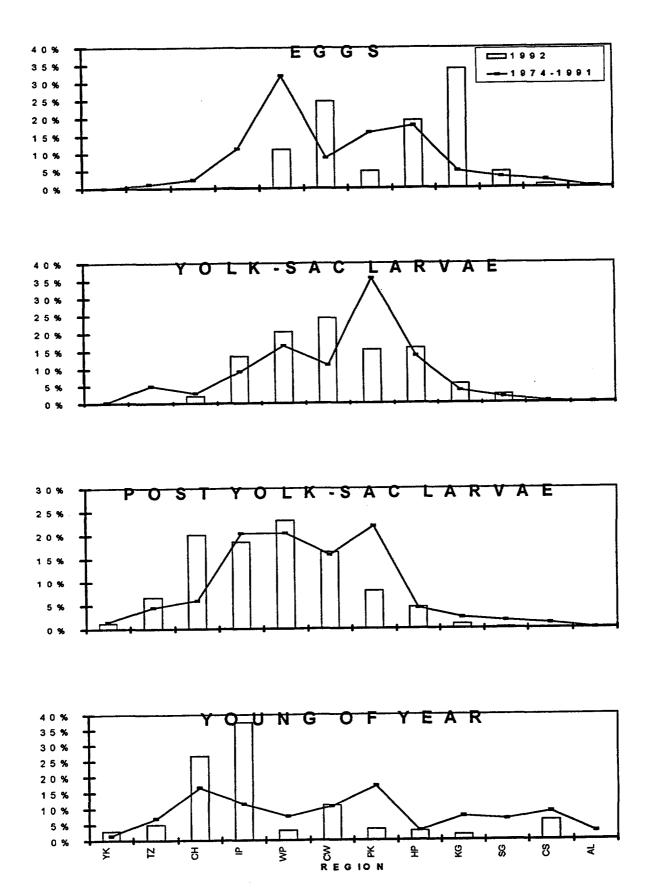
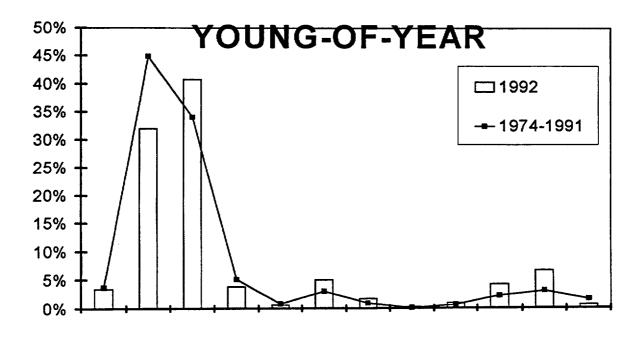


Figure 4-6 Geographical distribution indices for early life stages of striped bass collected during Longitudinal River Ichthyoplankton surveys of the Hudson River Estuary, 1974 - 1992.



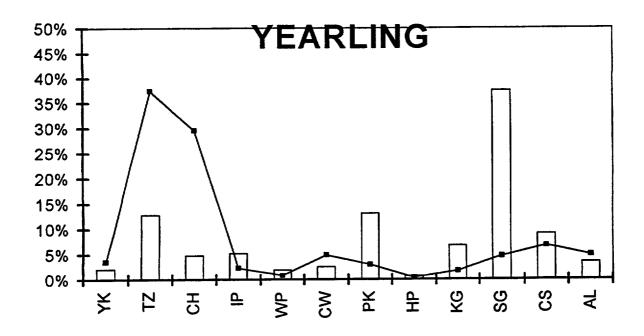


Figure 4-7 Geographical distribution indices for young-of-year and yearling striped bass collected during Beach Seine surveys of the Hudson River Estuary, 1979 - 1992.

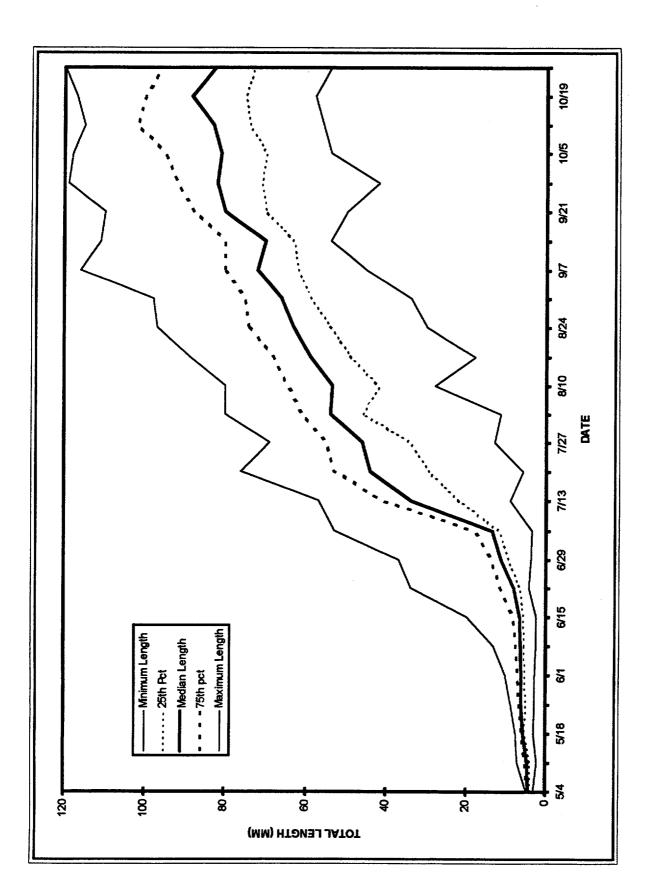


Figure 4-8 Weekly length statistics for striped bass larvae and young-of-the year in the Hudson River Estuary, 1992

4.3 WHITE PERCH

White perch (*Morone americana*) resemble the closely related striped bass in general form and structure but are deeper bodied, more laterally compressed, and have no stripes. Adult white perch are much smaller than adult striped bass, averaging less than 10 in. in length and less than 3 lb in weight. Coloration ranges from dark olive to dark gray on the dorsal surface, shading to silvery white on the belly.

The natural range of this species extends along the Atlantic coast of North America from the southern Maritime Provinces of Canada and the St. Lawrence River to South Carolina in brackish and freshwater areas near the coast. White perch are essentially estuarine, but landlocked populations exist in fresh water throughout their range (Mansueti 1964). Freshwater populations predominate in the northern part of the range and white perch are uncommon in salt water north of Cape Cod (Rounsefell 1975). Probably as a result of dispersal through canals, they are now found in Lakes Ontario and Erie (Hubbs and Lagler 1958). They have also been introduced accidentally into the Missouri River drainage (Hergenrader and Bliss 1971).

Coastal populations overwinter in the deeper waters of middle and lower estuaries (Mansueti 1957; Markle 1976). White perch spawn in shallow water following upstream migrations to areas of fresh or slightly brackish waters during the spring and early summer. Spawning also occurs in tributary streams. After spawning, adult white perch generally return to the lower reaches of estuaries. In the Hudson River estuary spawning occurs from early May to early July, primarily north of Croton Bay. After spawning, many adults move downriver to areas of higher salinity in Haverstraw Bay and the Tappan Zee region.

Female Hudson River white perch produce from 16,000 to 161,000 eggs (Bath and O'Connor 1982). White perch eggs do not contain an oil globule and are small, 1/16 in. in diameter. They sink to the bottom and, because they are very adhesive, stick to each other and to anything else they contact (Mansueti 1964). In the Hudson River during 1992 white perch eggs were most abundant in the upper estuary (Figure 4-9).

Hatching occurs in 1.5 to 6 days, with development occurring faster at higher temperatures. Newly hatched YSL are 1/16 to 1/8 in. long. They remain on or near the bottom for three to five days and do not move about actively until the yolk sac is absorbed (Mansueti 1964). White perch YSL larvae were most abundant in the upper estuary during 1992 but extended somewhat downriver of the area where eggs were most abundant (Figure 4-9).

The yolk sac is completely absorbed when the larvae are a little over 1/8 in. long; the end of the PYSL stage occurs when the adult fin complement develops, usually about one month after hatching and when the young white perch are about 1 in. in length. During 1992 white perch PYSL were most abundant in the upper estuary but also were found in the middle estuary, from Poughkeepsie south to Indian Point (Figure 4-10). In the middle estuary white perch PYSL co-occur extensively with striped bass PYSL.

White perch reach the juvenile stage beginning in mid June and during 1992 young-of-the-year fish were found primarily in the middle estuary between the Hyde Park and Cornwall regions (Figure 4-11).

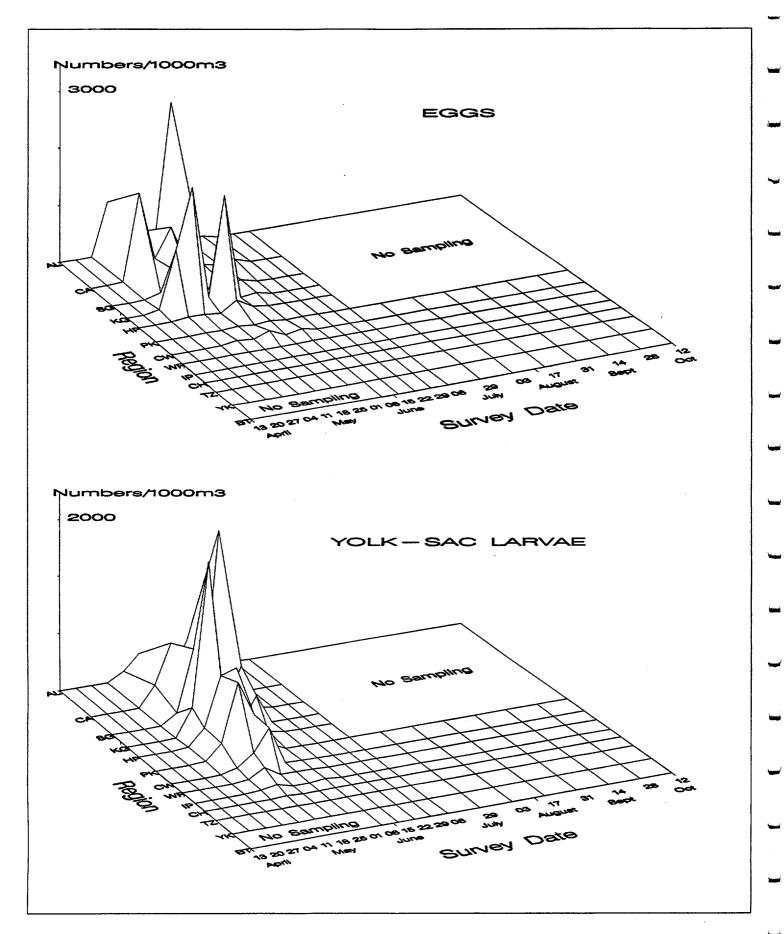


Figure 4-9. Spatiotemporal distribution of egg and yolk-sac stages of white perch in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

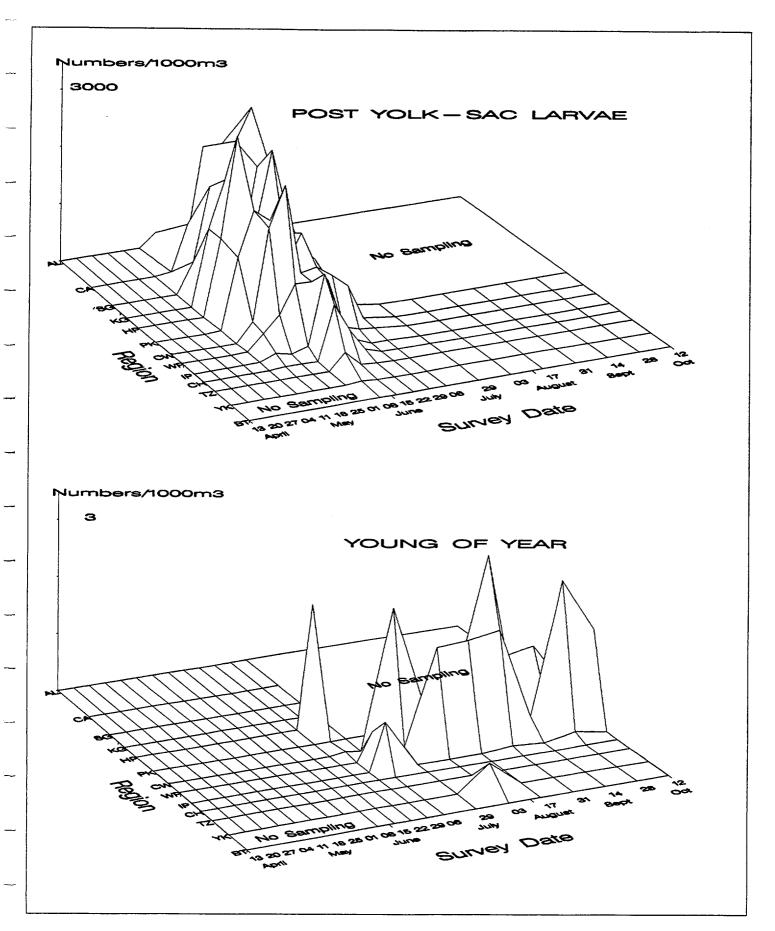


Figure 4-10. Spatiotemporal distribution of post yolk-sac and young-of-year stages of white perch in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

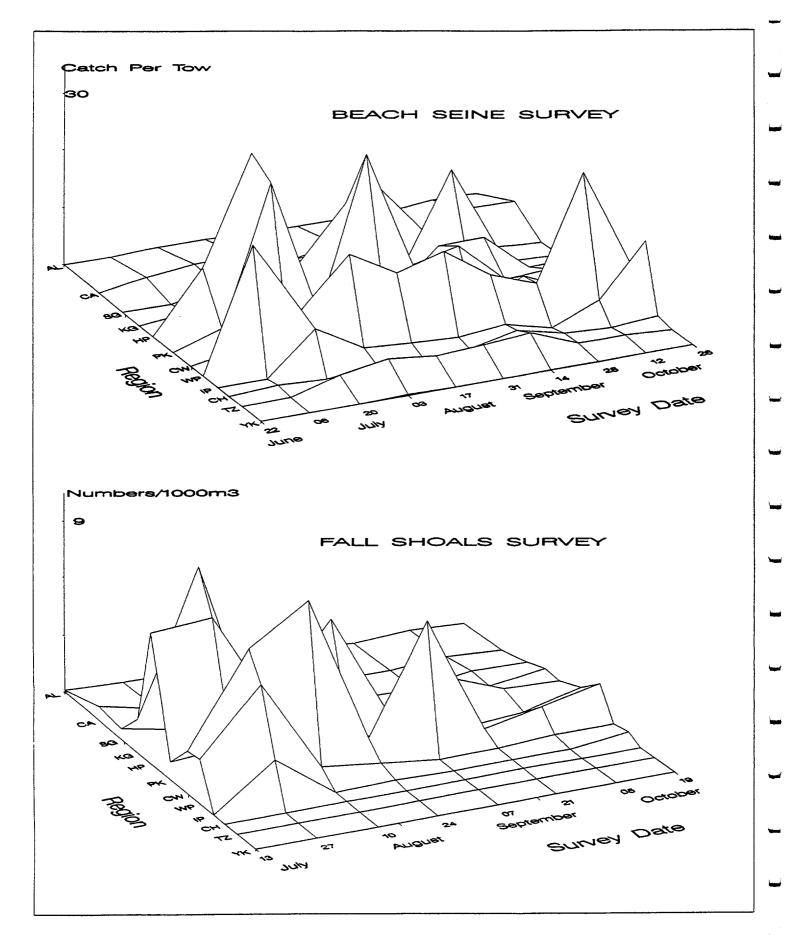


Figure 4-11. Spatiotemporal distribution of young-of-year white perch in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

Juvenile white perch are about 3 in. long by the end of their first summer (Klauda et al. 1988a). They are prey for larger predators (including adult white perch and striped bass). Based on the 1992 BSS and FSS, yearling and older white perch were more evenly distributed throughout the Hudson River than juveniles (Figure 4-12). In the Hudson River estuary some white perch of both sexes become sexually mature at age 2, but all males and females are mature by ages 4 and 5, respectively (Klauda et al. 1988a).

Comparing the temporal distribution of early life stages of white perch in 1992 with previous years (1974-1991), it is apparent that in 1992 white perch eggs were generally evenly distributed over weeks 18-22 (May through the first week in June), which is somewhat early in the period of occurrence recorded for eggs (Figure 4-13). YSL temporal distribution tended not to be as evenly distributed in 1992 as seen in the long term record, whereas PYSL distribution was generally consistent with the historical trend (Figure 4-13).

White perch eggs in the 1992 LRS were primarily in the Kingston, Catskill and Albany regions and the proportions of eggs in the Kingston region was substantially higher than observed in the historical trend. However, YSL and PYSL distributions were generally consistent with patterns seen across years (Figure 4-14).

The 1992 geographical distribution of young-of-the-year and yearling white perch in the BSS was not consistent with the long term trend, since the main distribution was not centered in the Tappan Zee and Croton-Haverstraw regions but tended to be more evenly distributed with a larger proportion found in upriver regions, such as Saugerties and Catskill (Figure 4-15).

Weekly length statistics for white perch from yolk sac through juvenile life stages collected in 1992 show a rapid growth period beginning in early July and steady growth through the end of BSS/FSS collections in mid October (Figure 4-16 and Appendix Tables D-4 through D-6).

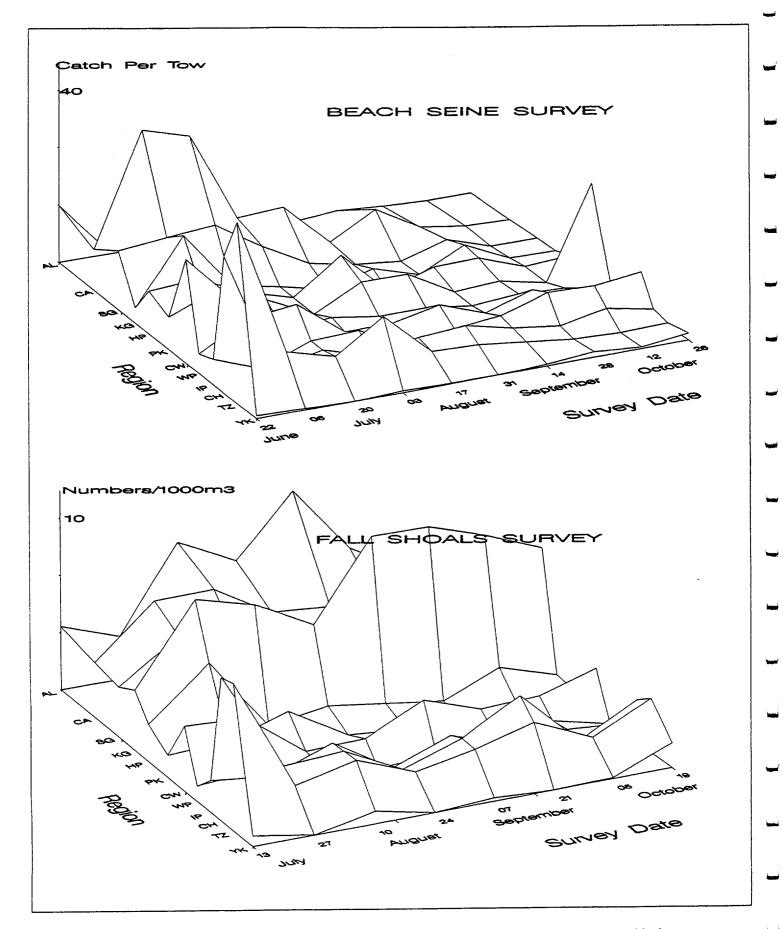


Figure 4-12. Spatiotemporal distribution of yearling and older white perch in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

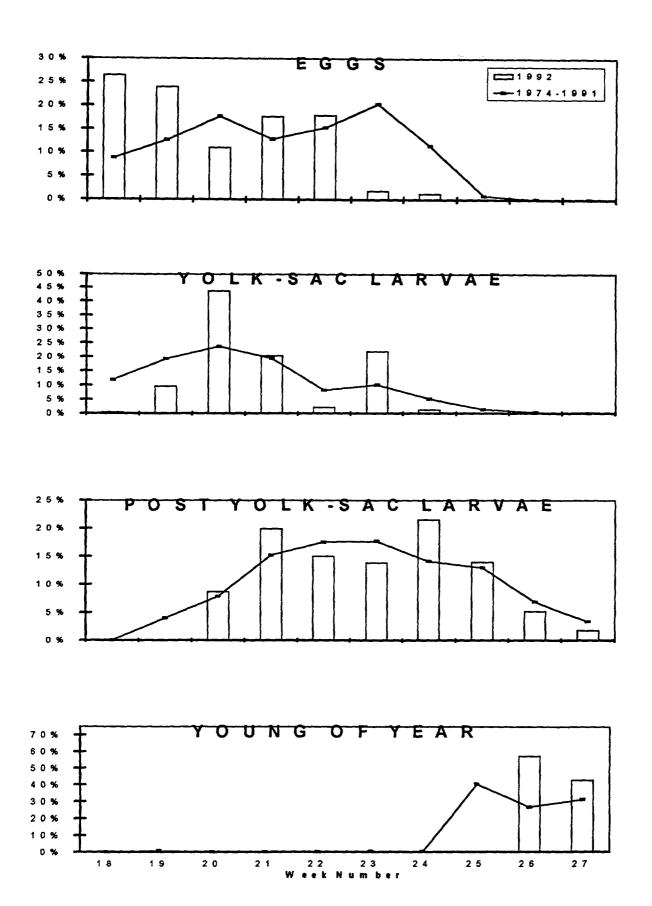
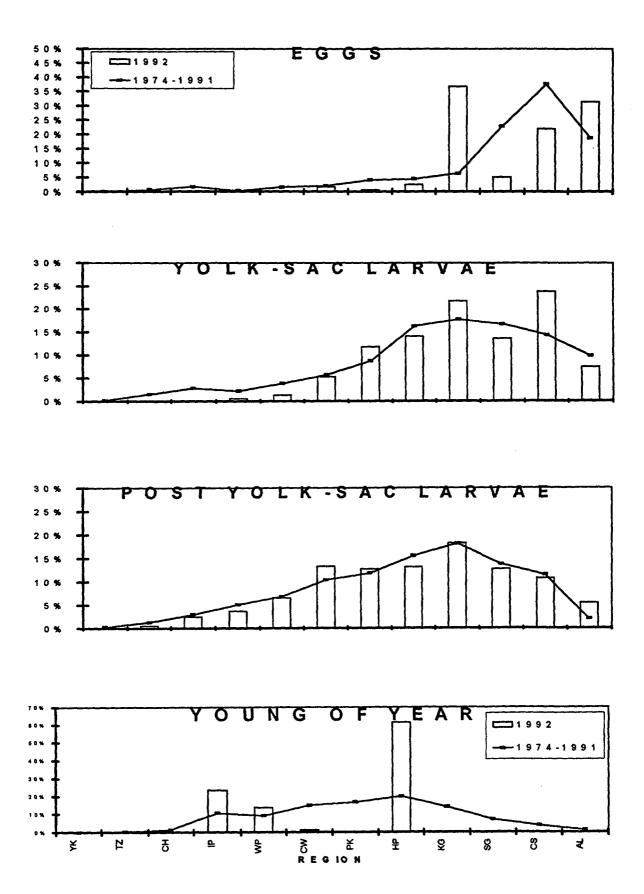
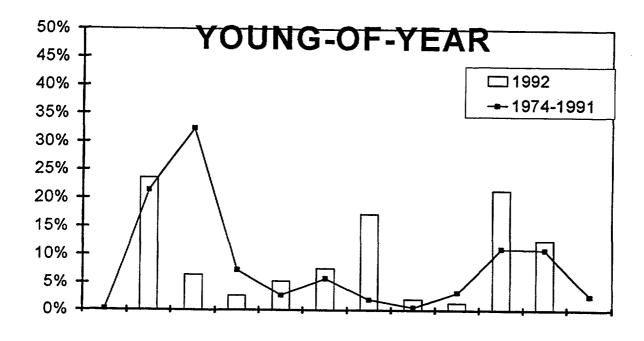


Figure 4-13 Temporal distribution indices for early life stages of white perch collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.



Eigure 4-14 Geographical distribution indices for early life stages of white perch collected during Longitudinal River Ichthyoplankton surveys of the Hudson River Estuary, 1974 - 1992.



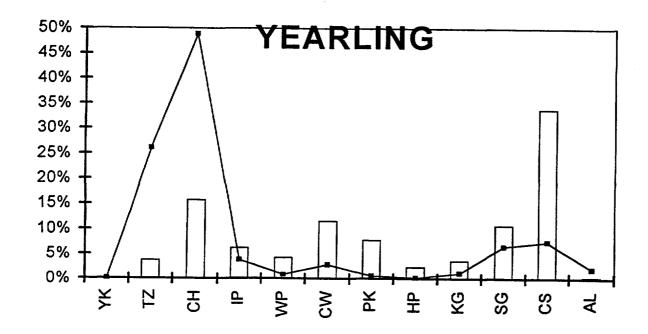


Figure 4-15 Geographical distribution indices for young-of-year and yearling white perch collected during Beach Seine Surveys of the Hudson River Estuary, 1974 - 1992.

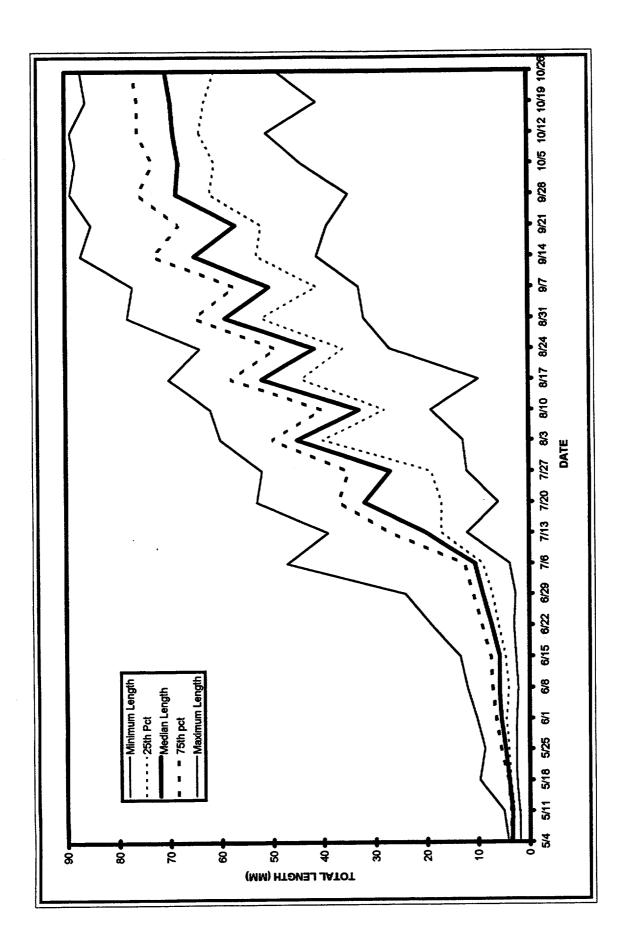


Figure 4-16 Weekly length statistics for white perch larvae and young-of-the year in the Hudson River Estuary, 1992

4.4 ATLANTIC TOMCOD

Nineteen members of the codfish family (Gadidae) are found along the Atlantic coast of Canada and the United States, but only the Atlantic tomcod (*Microgadus tomcod*), an inshore species that ranges from Labrador to the Chesapeake Bay, is anadromous; the southern limit of its spawning range is the Hudson River (Grabe 1978). In Canada the Atlantic tomcod occurs in the mid- to lower St. Lawrence River and is landlocked in at least two freshwater lakes (Scott and Crossman 1973).

Atlantic tomcod enter coastal estuaries and rivers to spawn in shallow fresh or brackish water during midwinter. In the Hudson River estuary adult Atlantic tomcod occur at least as far north as the Saugerties region during spawning runs; the largest concentrations, however, are consistently found in the middle estuary between West Point and Poughkeepsie. After spawning in late December or early January, Atlantic tomcod return to coastal waters.

The Hudson River population is the southernmost major breeding population (Dew and Hecht 1976). No spawning has been documented in either the Connecticut River (Marcy 1976) or Long Island Sound (Richards 1959), and limited spawning may occur in the Raritan River and/or Raritan Bay (IA 1977). Unlike more northern populations, age 1 fish constitute most of the Hudson River spawning stock.

Atlantic tomcod eggs are about 1/16 in. in diameter and nonadhesive. The average number of eggs per female in the Hudson River population has ranged from 12,400 to 22,500 eggs at age 1 and from 32,500 to 53,100 eggs at age 2 (NAI 1992). In the Hudson River water temperatures are generally less than 37 °F when spawning occurs, and the eggs take at least a month to hatch.

Tomcod larvae are about 1/5 in. long at hatching. YSL are pelagic and move downstream as they develop. The yolk sac is absorbed by ¼ in., and onset of feeding by PYSL may depend on water temperatures. In the Hudson River the abundance of YSL peaks in March. YSL are found throughout the lower half of the estuary, whereas PYSL are concentrated in the Yonkers and Tappan Zee regions.

Since the LRS began in mid April during 1992, no YSL were collected in ichthyoplankton samples. However, during 1992 PYSL were collected from mid April through early May between the West Point and Yonkers regions (Figure 4-17). Juvenile Atlantic tomcod collected in the LRS reached their peak numbers in mid-May 1992, mainly in the Indian Point through Tappan Zee regions. Although some juvenile tomcod remain in the Hudson River throughout the summer, some proportion of the population may move out of the lower estuary into New York Bay and Raritan Bay when water temperatures rise during late May and June. Throughout summer and fall 1992, the BSS collected juvenile Atlantic tomcod primarily in the Tappan Zee and Croton-Haverstraw regions whereas in the FSS they were collected primarily in the Cornwall and West Point regions (Figure 4-18). Few yearling and older Atlantic tomcod were collected in the BSS or FSS; however, a rapid increase in catch effort in the FSS is evident in October in the Yonkers region (Figure 4-19). This increase in catch may reflect the beginning of the upriver spawning migration which occurs in late fall and early winter.

Comparing the temporal distribution of early life stages of Atlantic tomcod in 1992 with the long term data base (beginning in early May) available from previous years (1974-1991), it is apparent that in 1992 post yolk-sac and young-of-the-year distributions were consistent with the long term record (Figure 4-20). The geographical distributions of post yolk-sac and juveniles collected in the 1992 LRS

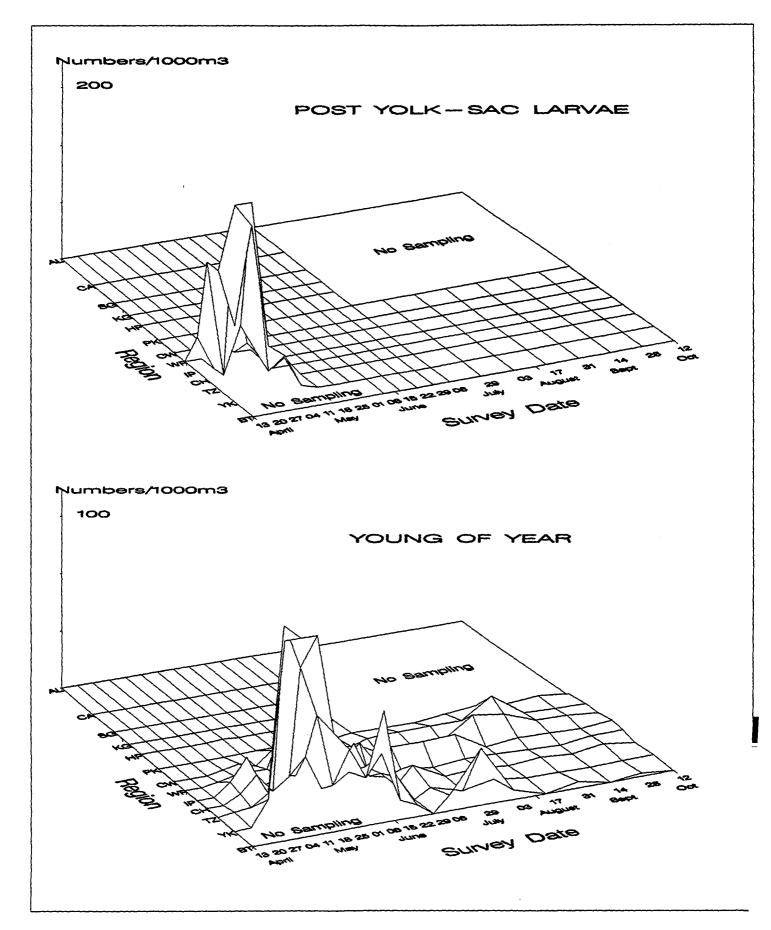


Figure 4-17. Spatiotemporal distribution of post yolk-sac and young-of-year stages of Atlantic tomcod in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

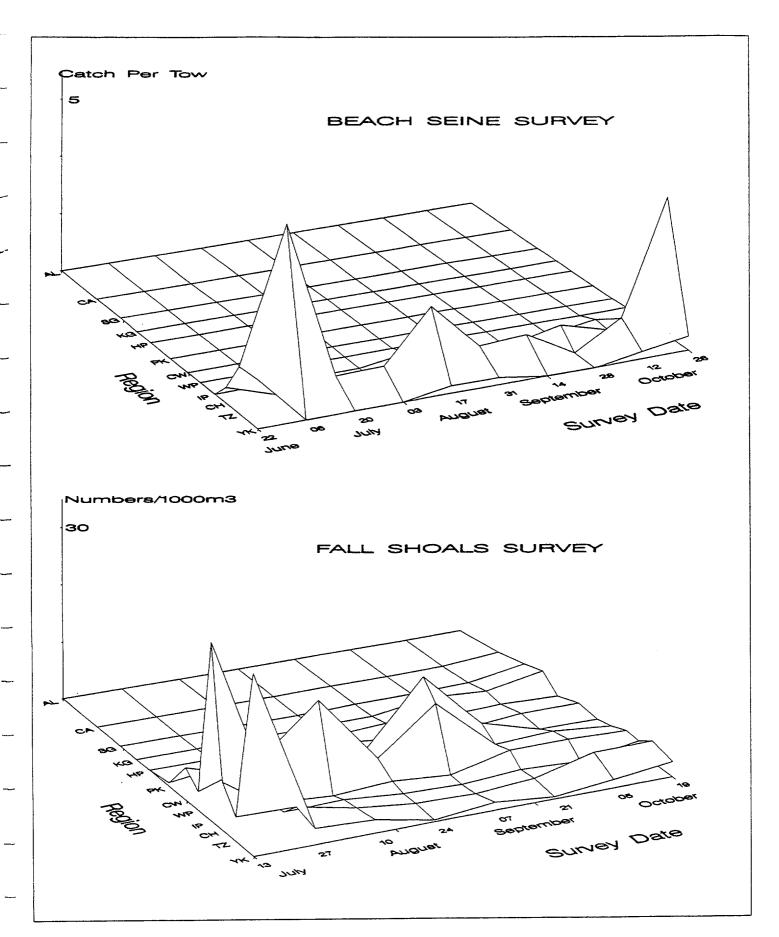
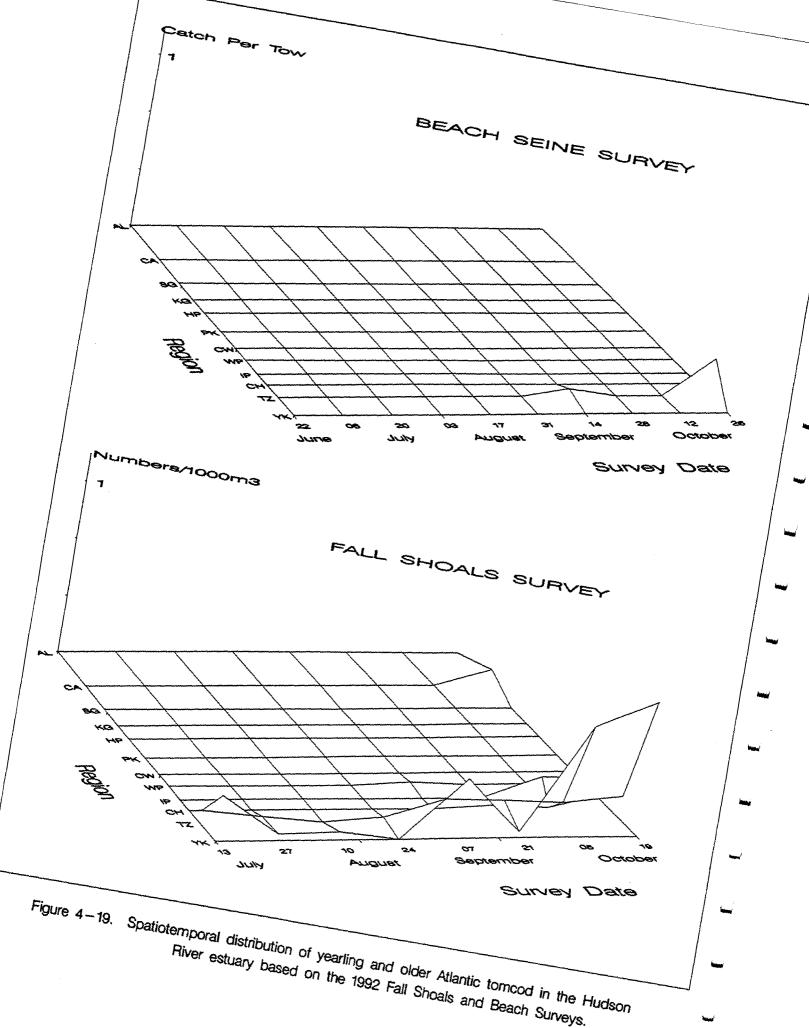
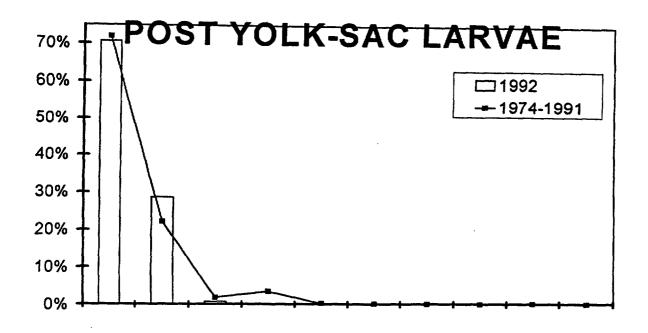


Figure 4-18. Spatiotemporal distribution of young-of-year Atlantic tomcod in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



River estuary based on the 1992 Fall Shoals and Beach Surveys.



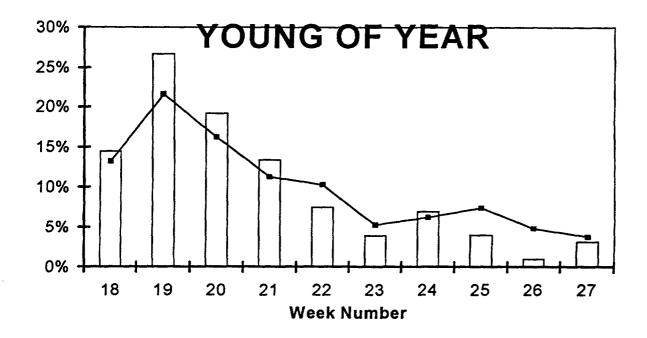
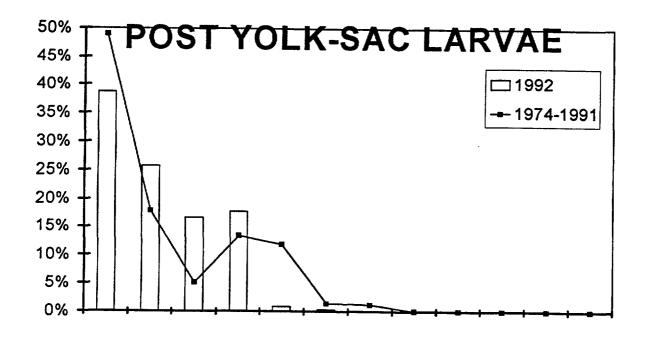


Figure 4-20 Temporal distribution indices for early lifestages of Atlantic tomcod collected during Longitudinal Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.

were also consistent with the long term trend with the bulk of the population found in the Yonkers and Tappan Zee regions (Figure 4-21). Geographical distribution indices based on the beach seine survey program indicated that 1992 was very consistent with the long term record, with a high proportion of all juveniles and older Atlantic tomcod found in the Tappan Zee region (Figure 4-22).

Juvenile growth slows or ceases in summer (Grabe 1978; Klauda et al. 1988b). Growth slows at temperatures above 66 °F and essentially stops in early July when temperatures exceed 71 °F. It begins again when water temperatures fall below 77 °F during late August and early September (TI 1978). During 1992, cessation of growth in the summer is evident from weekly length statistics obtained from BSS and FSS collections (Figure 4-23 and Appendix Tables D-7 and D-8). Following a period of rapid growth during the fall, mature young-of-year (YOY) migrate upriver to spawn. Juvenile tomcod generally double their summer length by December to a mean total length about 6 in. Most of the juvenile Atlantic tomcod in the Hudson River are sexually mature by the end of December and reproduce in early January.



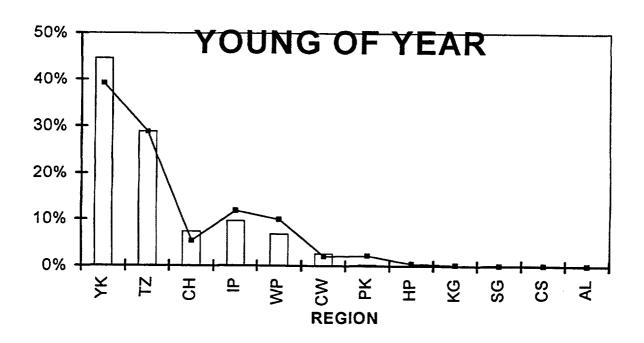
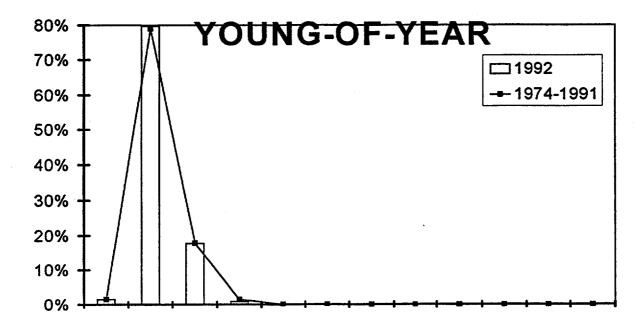


Figure 4-21 Geographical distribution indices for early lifestages of Atlantic tomcod collected during Longitudinal Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.



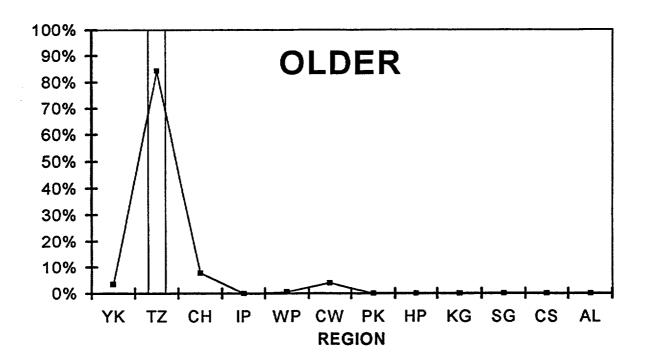


Figure 4-22 Geographical distribution indices for young-of-year and older Atlantic tomcod collected during Beach Seine Surveys of the Hudson River Estuary, 1974 - 1992.

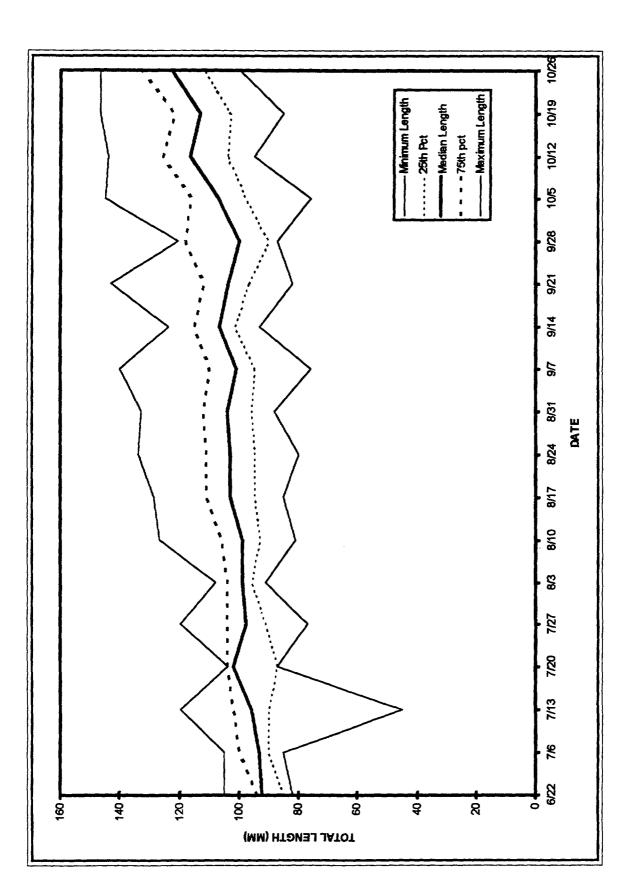


Figure 4-23 Weekly length statistics for Atlantic tomcod larvae and young-of-the year in the Hudson River Estuary, 1992

4.5 BAY ANCHOVY

Bay anchovies (Anchoa mitchilli) are small, slender fish, 1½ to 4 in. long, that are ubiquitous in shallow coastal waters of North America from southern Maine to the Yucatan Peninsula. They have a wide salinity tolerance from fresh water to more than twice the salinity of normal sea water, but they prefer salinities found at seaward ends of estuaries. Where temperatures do not drop below 41 F during the winter, bay anchovies remain in the estuaries throughout the year (Wang and Kernehan 1979).

However, north of Delaware Bay, where water temperatures do go below 41°F during the winter, NMFS trawl data indicate that a movement of bay anchovies out of coastal estuaries and southward during the fall, resulting in an overwintering distribution ranging from Cape Hatteras to Delaware Bay and the virtual absence of bay anchovy from the inshore continental shelf of New York and New Jersey during the winter months (Vouglitois et al. 1987).

Bay anchovy school in large numbers and feed on plankton as they swim. Their mouths are large relative to their small size, which enables them to pass relatively large quantities of water through their gill rakers (long, slender projections on their gills) and filter out their prey. They feed throughout the water column and primarily eat invertebrates. Larval anchovies feed on a variety of microzooplankton, including the larval stages of crustaceans and mollusks. Juvenile and adult bay anchovy feed on larger macrozooplankton, including copepods, cladocerans, amphipods, and mysids.

Bay anchovies rarely survive more than two years. They grow rapidly and mature at a size of 1 to 2 in. In warm waters they may mature within three months of hatching, but in cooler, northern waters they usually mature in their second summer, 11 to 14 months after hatching. They are also very prolific: individual females may spawn 50 or more times per year, averaging about 1100 eggs per spawn (Houde and Zastrow 1991). Partially as a result of this early maturity and high fecundity, bay anchovies may be the most abundant fish species in the western north Atlantic (McHugh 1967).

Bay anchovies spawn in lower estuarine and inshore coastal waters throughout the warmer months of the year. In the New York Bight spawning occurs from May through August and September, with peak egg abundance occurring in late June or early July when water temperatures exceed 70 °F. Adults spawn in areas where the salinity is greater than 10 ppt. Egg abundance is typically highest in waters with salinities greater than 20 ppt, and egg viability apparently declines at salinities lower than 8 ppt. Spawning occurs throughout all areas of the Hudson-Raritan Bay complex, including Raritan and Newark bays, Arthur Kill, Kill Van Kill, and the upper and lower bays as well as throughout Long Island Sound.

Within the Hudson River, bay anchovy eggs are most abundant in the Yonkers and Tappan Zee Regions (Figure 4-24). The eggs, which are about 1/16 in. long, are transparent and initially buoyant, but sink after 12 to 16 hrs of floating. Hatching occurs approximately 24 hrs after spawning. Newly hatched YSL are about 1/16 to 1/8 in. long, transparent, and drift along the bottom with the tidal currents. The YSL stage is very brief, and typically lasts less than one day. Due to their small size, short duration, and epibenthic nature, few YSL are collected in the utilities' ichthyoplankton samples. The PYSL stage is longer, and lasts about a month. In the Hudson River the peak abundance of PYSL occurs during early July and the center of their distribution shifts slightly upriver compared to that of eggs and yolk-sac larvae (Figure 4-25).

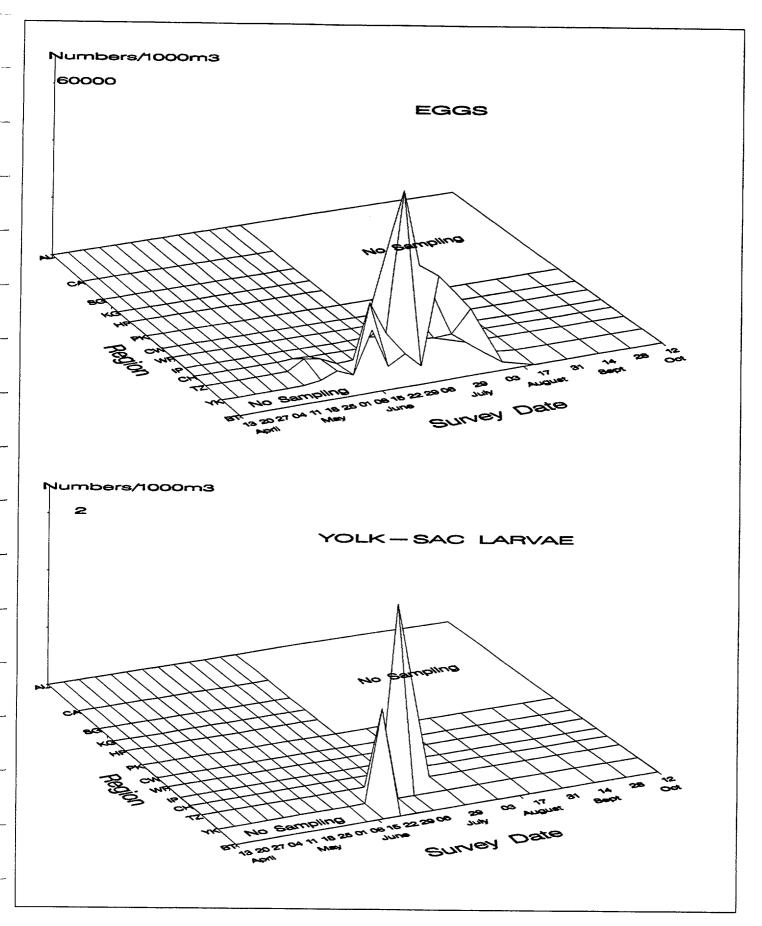


Figure 4-24. Spatiotemporal distribution of egg and yolk-sac stages of bay anchovy in the the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

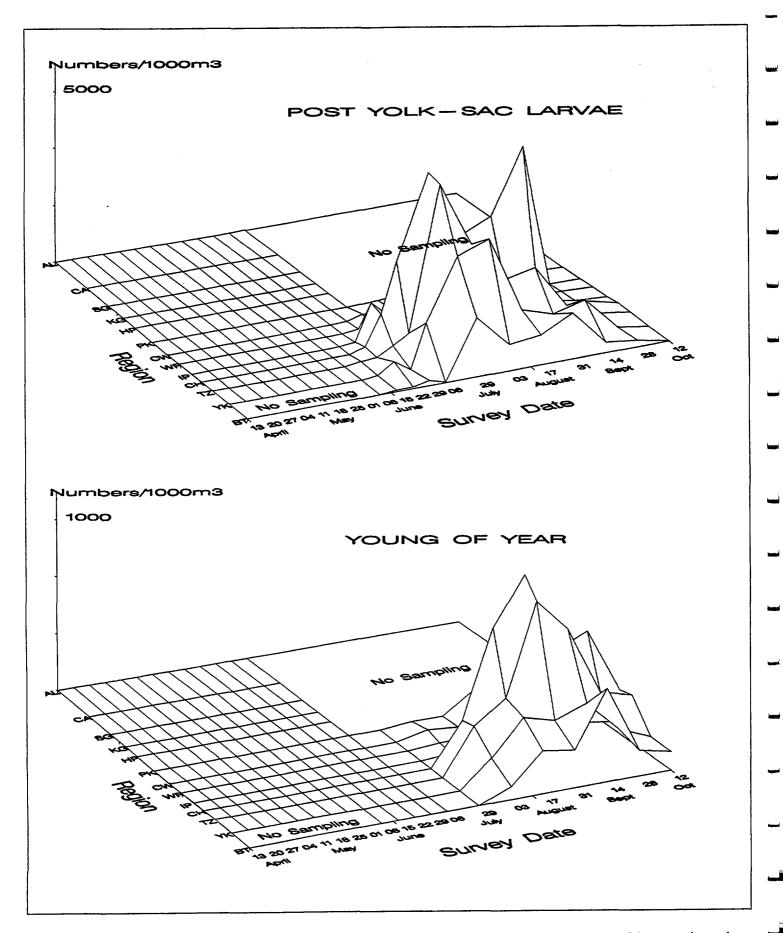


Figure 4-25. Spatiotemporal distribution of post yolk-sac and young-of-year stages of bay anchovy in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

Bay anchovies are about ½ in. long at the beginning of the juvenile stage. Juvenile anchovies are found in the Hudson River estuary from mid-August through October and as far upriver as Albany (Schmidt 1992). During 1992, most of the juvenile population was located downstream of the West Point region (Figures 4-25 and 4-26). Yearling and older Atlantic tomcod were much less abundant than juveniles and they were more abundant early in the summer, compared to juveniles whose abundance was relatively constant throughout the summer and early fall (Figure 4-27).

Comparing the temporal distribution of early life stages of bay anchovy in 1992 with the prior four year period (1988-1991) when LRS sampling included the Battery region (River Miles 0-12), it is apparent that in 1992 bay anchovy egg distribution generally coincided with the long term trend where peak egg distribution was in mid June to early July (Figure 4-28). Peak post yolk-sac occurrence was somewhat later than normal with the peak distribution between late July and mid August. Peak juvenile distribution in the 1992 LRS also occurred later than seen over the four years that LRS sampling has been conducted in the Battery region and extended to mid October (Figure 4-28).

The geographical distribution of bay anchovy eggs in 1992 was consistent with the distribution pattern seen over the 1988-1991 period (Figure 4-29). The proportions of both post yolk-sac and young-of-the-year in the Croton-Haverstraw region during the 1992 LRS were somewhat higher than in the long term period.

The 1992 geographical distribution of young-of-the-year anchovy in the BSS was not consistent with the 1974-1991 long term trend, since the main distribution was not centered in the Tappan Zee but located a little further south in the Yonkers region. The long term trend in yearling and older fish indicated that over 80 % of these life stages are expected to be located in Yonkers region, but in 1992 almost 80 % are found further north in the Tappan Zee region (Figure 4-30).

Weekly length statistics for bay anchovy juvenile life stages collected in 1992 show a steady growth throughout the BSS/FSS collection period, but a wide range in size (up to 60 mm) reflecting the protracted spawning period (Figure 4-31 and Appendix Tables D-16 and D-17).

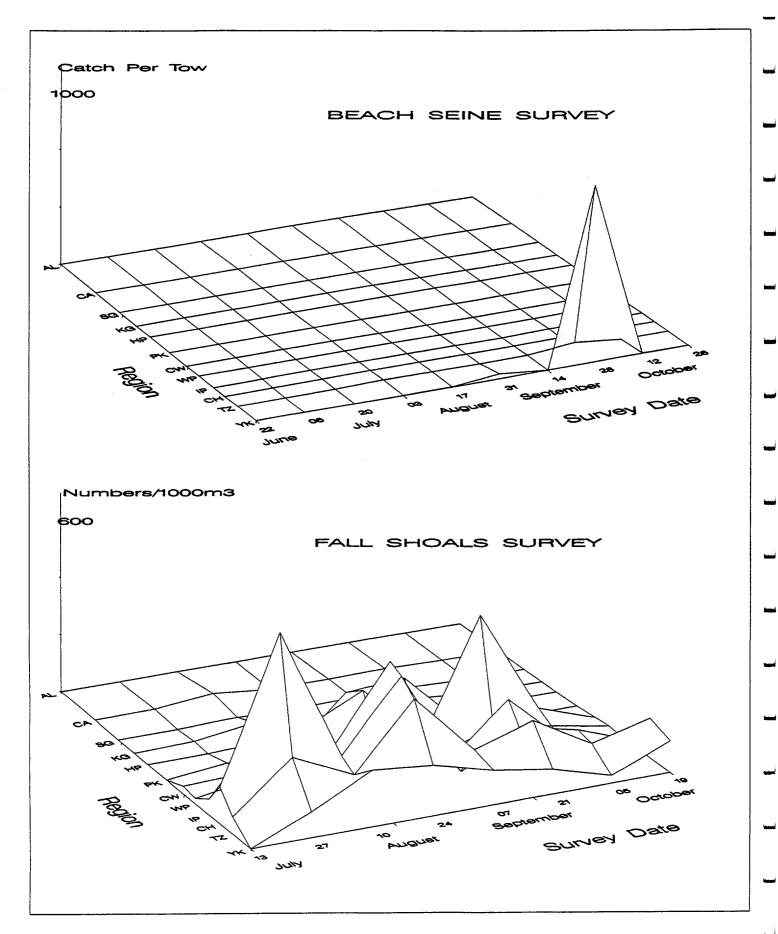


Figure 4-26. Spatiotemporal distribution of young-of-year bay anchovy in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

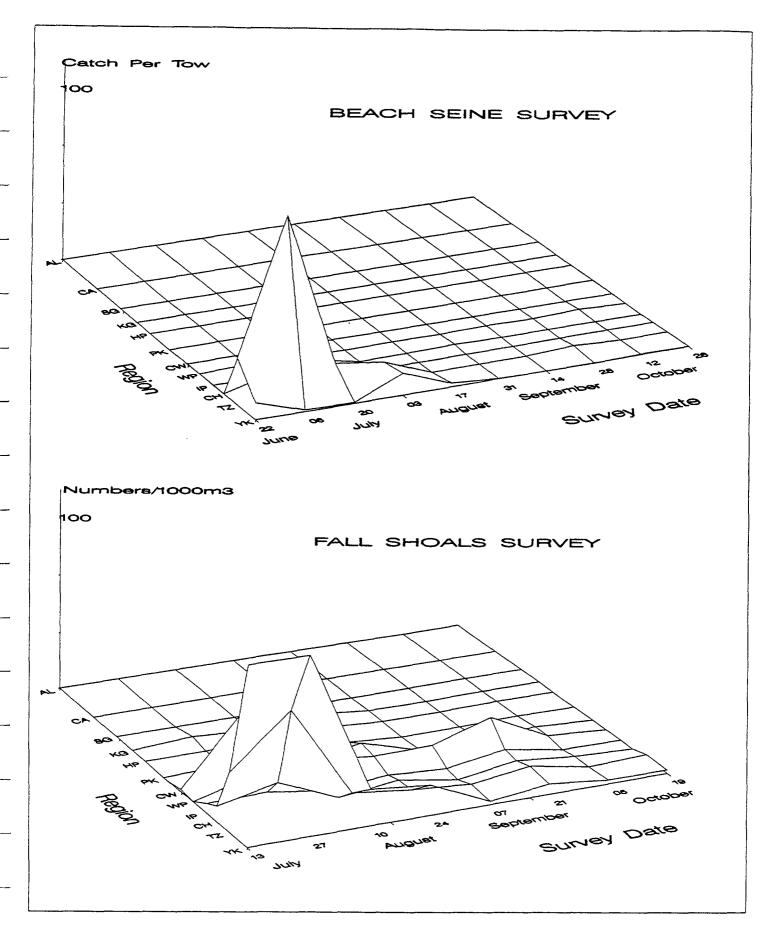
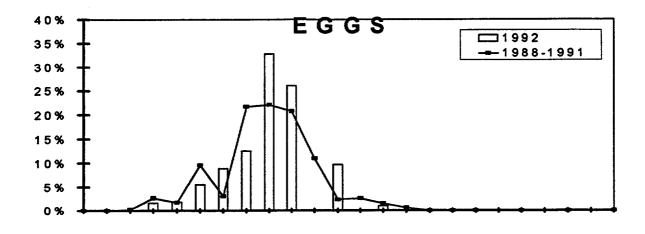
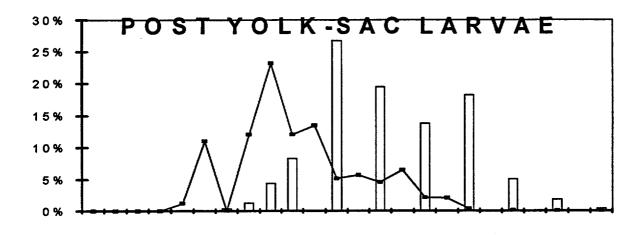


Figure 4-27. Spatiotemporal distribution of yearling and older bay anchovy in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.





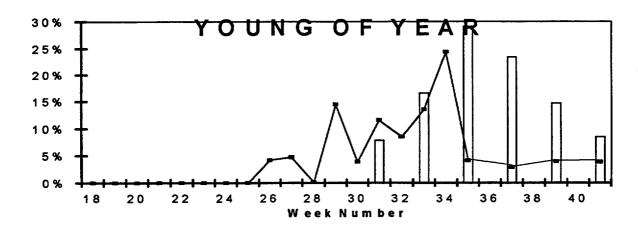
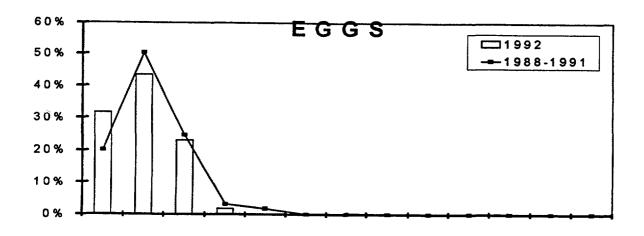
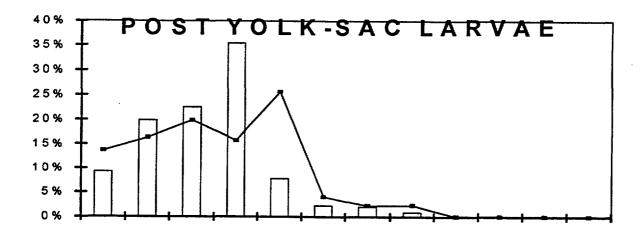


Figure 4-28 Temporal distribution indices for early lifestages of bay anchovy collected during Longitudinal Ichthyoplankton Surveys of the Hudson River Estuary, 1988 - 1992.





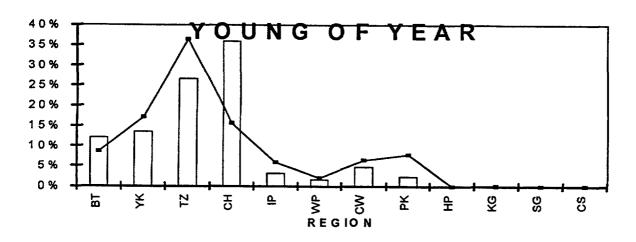
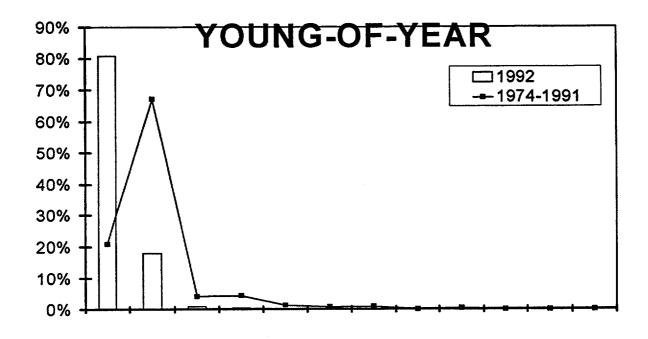


Figure 4-29 Geographical distribution indices for early lifestages of bay anchovy collected during Longitudinal Ichthyoplankton Surveys of the Hudson River Estuary, 1988 - 1992.



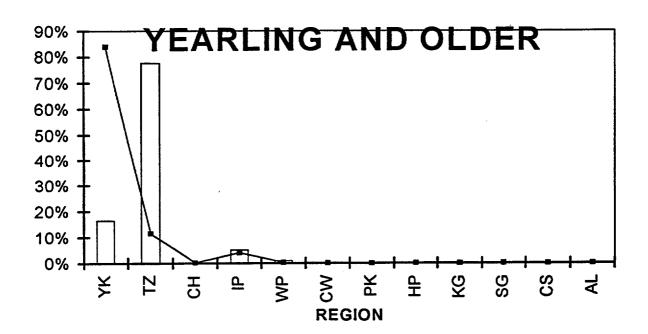


Figure 4-30 Geographical distribution indices for young-of-year and older bay anchovy collected during Beach Seine Surveys of the Hudson River Estuary, 1974 - 1992.

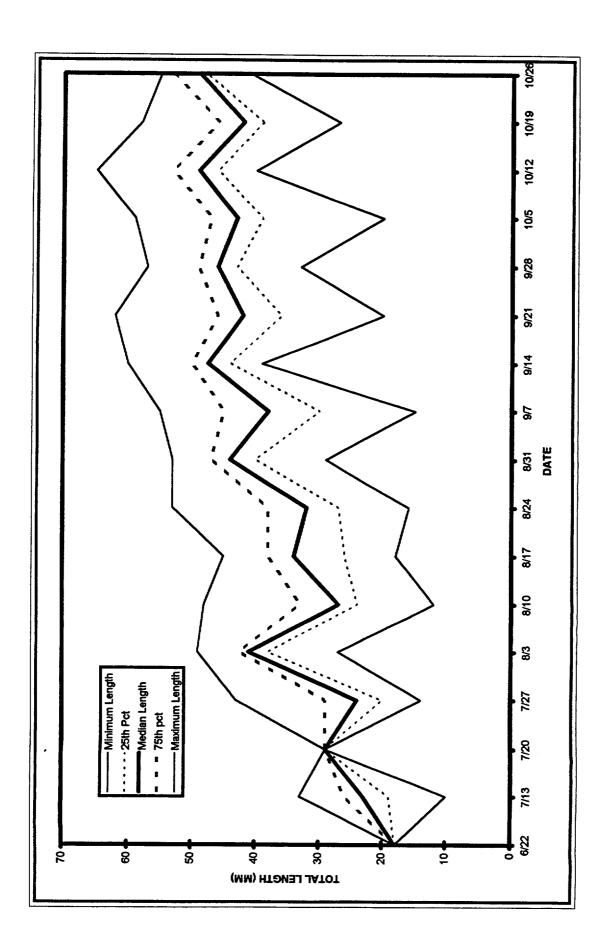


Figure 4-31 Weekly length statistics for bay anchovy young-of-the year in the Hudson River Estuary, 1992

4.6 AMERICAN SHAD

American shad (*Alosa sapidissima*) are the largest of the North American species of anadromous herrings. They range from Newfoundland to northern Florida along the Atlantic coast and over the continental shelf. They may live to 13 years, attain a length of 30 in., and weigh up to 12 lb. American shad usually become sexually mature after three to six years at sea, although some males may mature within two years. Most females mature by their fourth or fifth year.

Shad, like many anadromous herrings, have well-developed homing abilities and are capable of returning to their natal rivers and tributaries from far off the coast. After spawning, the adults soon return to the ocean. They can repeat their annual spawning sequence up to eight times. In more southerly rivers along the Atlantic coast increasing percentages of the adult population die after spawning; south of Cape Fear, North Carolina, all spawners die on their first run.

In the spring, American shad migrate north, and by summer they are feeding in the Gulf of Maine, the Bay of Fundy, Georges Bank, and the Gulf of the St. Lawrence (Neves and Depres 1979; Dadswell et al. 1987). In fall they move south again along the perimeter of the Gulf of Maine and Georges Bank at depths greater than 60 m (Neves and Depres 1979); by winter they may congregate along the edge of the continental shelf. Based on tagging experiments conducted in 1950 and 1951, Talbot (1954) reported that American shad of Hudson River origin were recaptured from Maine to North Carolina. Most recaptured fish were from the fishery along the New Jersey coast in spring. Prespawning adults move along the coast in the spring to their natal rivers (Dadswell et al. 1987), which they enter as river temperatures reach 50 to 60 °F.

Peak spawning activity for American shad in the Hudson River occurs during May in the upper estuary. Shad have been reported to spawn on dark afternoons or evening hours over shallow, broad flats washed by moderate currents in the main body of coastal rivers (Leggett 1976). At present shad are not known to utilize Hudson River tributaries, the Mohawk River, or the upper Hudson River for spawning (Schmidt et al. 1988), although historically the Mohawk and upper Hudson may have been part of the shad spawning and nursery range. During 1992, the bulk of American shad eggs were collected in the Catskill and Albany regions, primarily during May (Figure 4-32).

American shad produce 116,000 to 468,000 eggs per female. The eggs are 1/16 to 1/8 in. in diameter, semibuoyant, and nonadhesive. They hatch in three to 12 days, depending upon water temperature. Newly hatched YSL are approximately ½ in. long and grow very rapidly. They absorb the yolk sac within one week and are approximately ½ in. long at the beginning of the PYSL stage. Larval shad alternately swim toward the surface and passively sink (Chittenden 1969), but behavior has not been completely described.

Although some downriver dispersal is apparent during 1992, both YSL and PYSL American shad were found primarily in the upper estuary between Hyde Park and Albany (Figures 4-32 and 4-33). During 1992 juvenile shad appeared to have been fully recruited to the beach seine gear by early July with the highest catch effort evident in the Indian Point through Cornwall regions (Figure 4-34). Few yearling and older American shad were collected in 1992 (Figure 4-35), since adult spawning fish (three to six year-old fish) effectively avoid the BSS and FSS juvenile gear.

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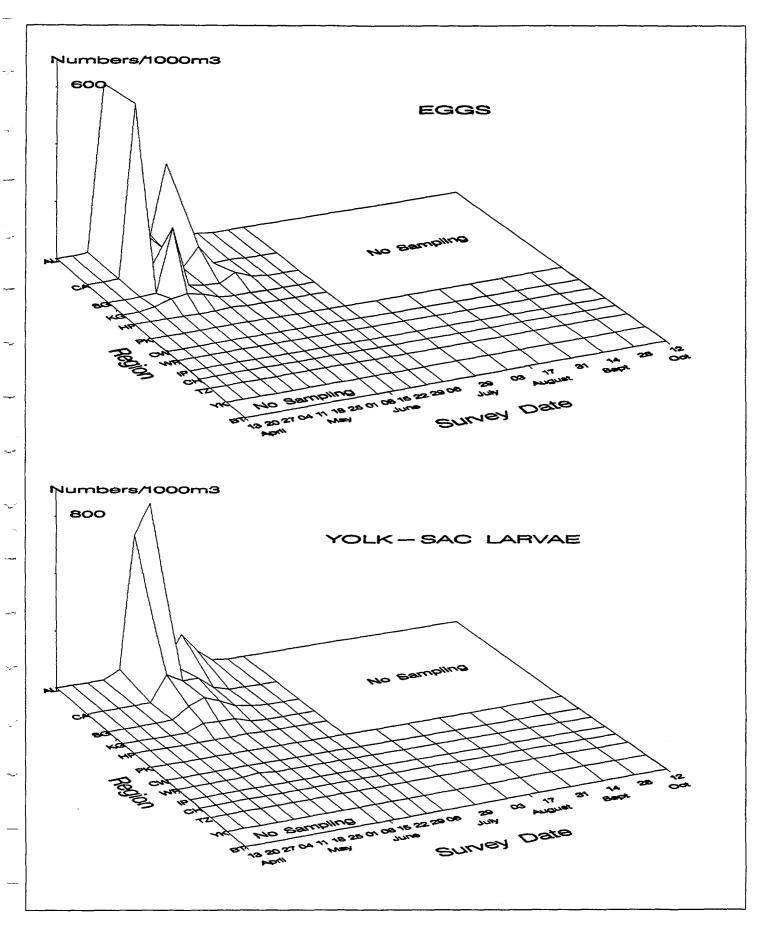


Figure 4-32. Spatiotemporal distribution of egg and yolk-sac stages of American shad in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

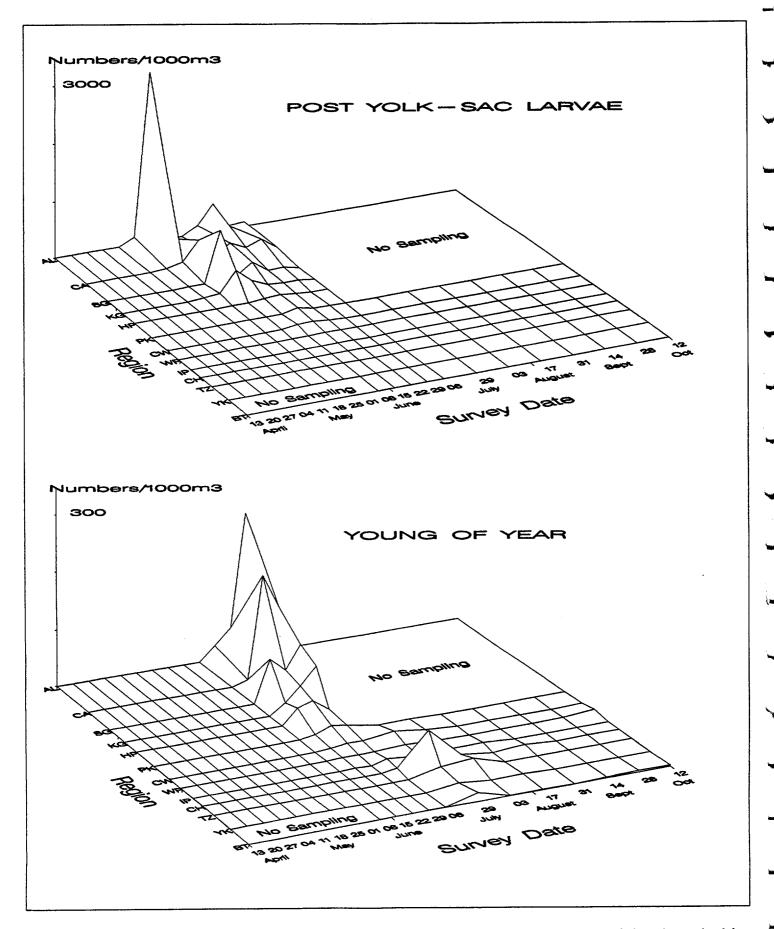


Figure 4-33. Spatiotemporal distribution of post yolk-sac and young-of-year stages of American shad in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

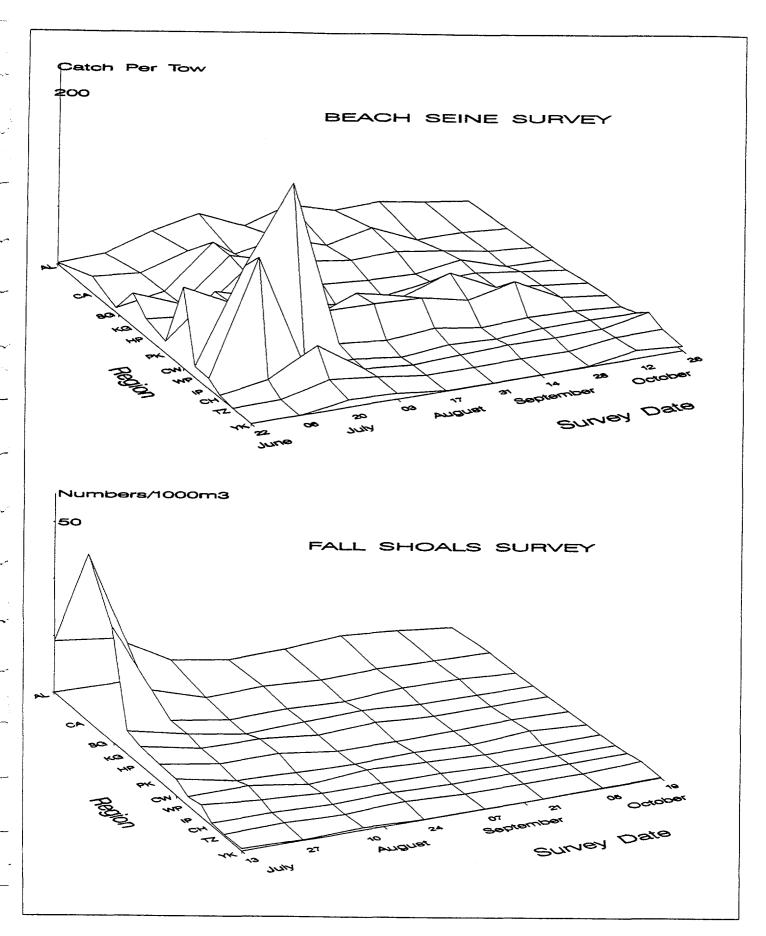


Figure 4-34. Spatiotemporal distribution of young-of-year American shad in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

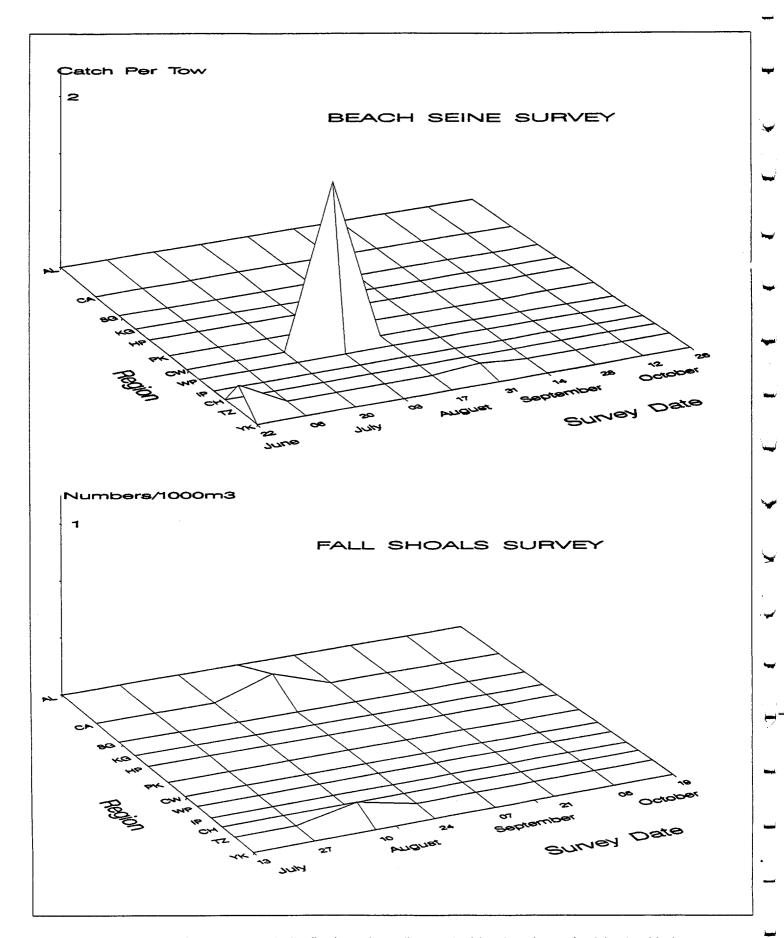


Figure 4-35. Spatiotemporal distribution of yearling and older American shad in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

Comparing the temporal distribution of early life stages of American shad in 1992 with previous years (1974-1991), it is apparent that in 1992 the distributions of early life stages were generally consistent with the long term record (Figure 4-36). However, in 1992 approximately 50 % of the egg distribution occurred in early May, whereas over the long term peak egg distribution occurred in late May.

The geographical distribution of American shad early life stages in 1992 is also consistent with the long term record, except that there were somewhat higher proportions of YSL, PYSL and juveniles in the Albany region than seen in the long term record (Figure 4-37).

The 1992 geographical distribution of young-of-the-year American shad in the BSS is also consistent with the long term trend, showing tri-modal peaks in the lower estuary (Tappan Zee and Croton-Haverstraw), mid estuary (Cornwall and Poughkeepsie) and upper estuary (Saugerties and Catskill) (Figure 4-38).

Weekly length statistics for American shad from yolk sac through juvenile life stages collected in 1992 show a rapid growth period from early June through early July and steady growth thereafter, through the end of BSS/FSS collections in mid October (Figure 4-39 and Appendix Tables D-9 through D-11). At the time they emigrate from the Hudson at the end of the summer, juvenile shad range from 3 to 4 in. long. This emigration is triggered by declining water temperatures and may be related to size (Schmidt et al. 1988): larger juveniles may tend to emigrate earlier. The shad emigration is a gradual movement of the population seaward over several months. Shad emigrate from the estuary earlier than either of the other two anadromous herrings commonly found in the Hudson River, alewives and blueback herring, and Schmidt et al. (1988) speculated that the earlier migration might be a behavioral adaptation that reduces competition with juveniles of the other two herring species.

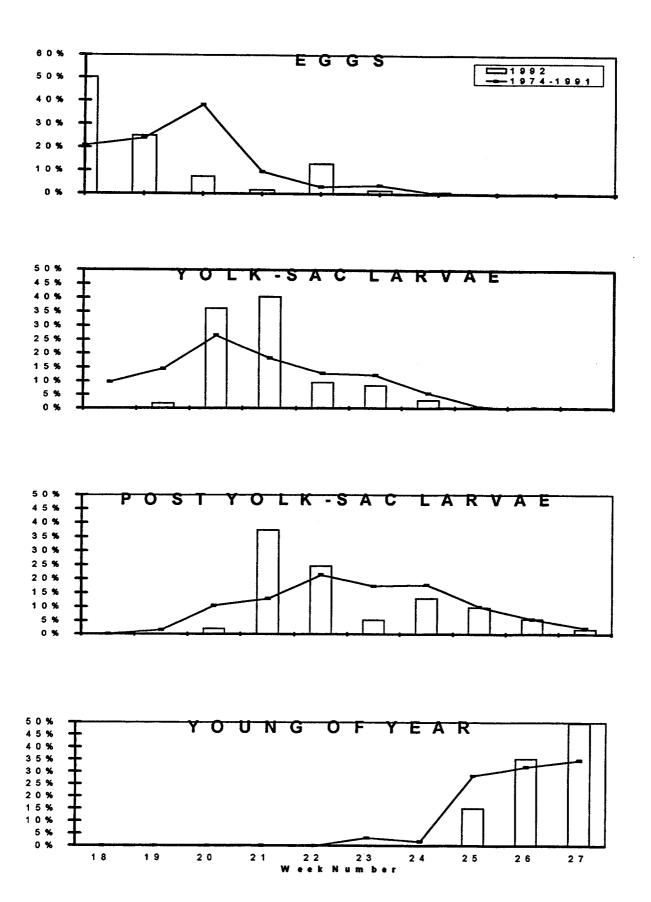


Figure 4-36 Temporal distribution indices for American shad collected during Longitudinal Ichthyoptankton Surveys of the Hudson River Estuary, 1974 - 1992.

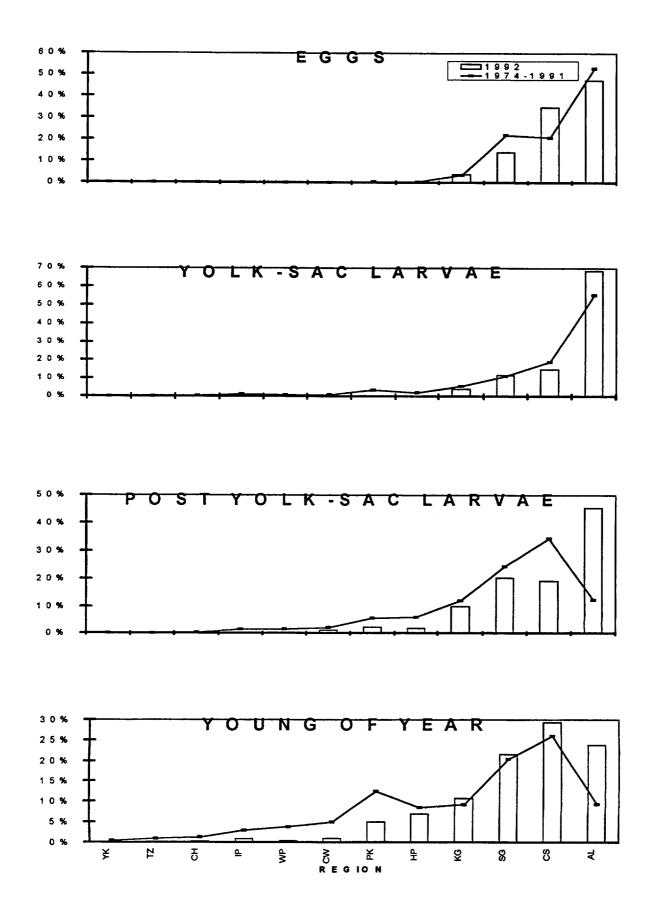
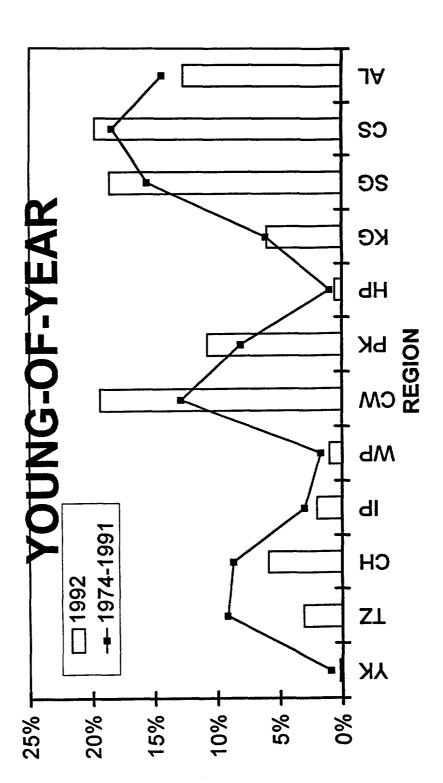


Figure 4-37 Geographical distribution indices for early life stages of American shad collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.



Geographical distribution indices for young-of -the-year American shad collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1992. Figure 4-38.

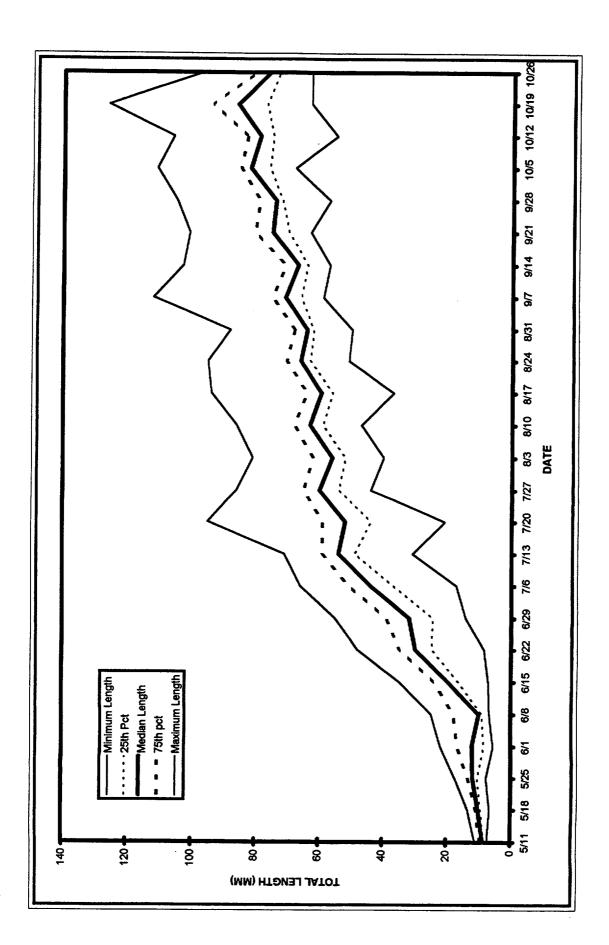


Figure 4-39 Weekly length statistics for American shad larvae and young-of-the year in the Hudson River Estuary, 1992

4.7 RIVER HERRINGS (Alosa spp.)

Blueback herring (*Alosa aestivalis*) and its congener alewife (*A. pseudoharengus*) are similar in general form to American shad, but are much smaller and not as deep bodied when adult. Blueback herring grow to a maximum length of 15 in. and a weight of about 1 lb and live for up to eight or nine years (Scott and Crossman 1973). Blueback herring and alewives are very much alike in external appearance, especially as larvae, but older alewives have proportionately larger eyes and deeper bodies than blueback herring.

Of the three anadromous herring species that spawn in the Hudson River estuary, blueback herring are the last to begin their spring spawning run, preferring warmer water than American shad or alewives. Their peak spawning activity occurs near the end of May. Spawning activity occurs within the river, but preferred spawning habitat is in fast-flowing tributaries, where eggs are released over hard substrates (Loesch and Lund 1977). In the Hudson blueback herring travel through the locks, and spawning occurs within the Mohawk River and upper Hudson River.

In Hudson River sampling, eggs and larvae of alewives and blueback herring are not differentiated. Any references in this document to eggs and larvae pertain to the combined numbers from both species. Juveniles of these two species are differentiated by the size of the eyes and the mouth morphology.

Male anadromous alewives reach maturity in about three years, females in about four years. Alewife eggs are semidemersal, slightly adhesive, but easily torn free and carried by currents. The egg diameter is about 1/16 in. Spawning activity is most intense when water temperatures are 51 to 71 °F, which results in slightly earlier spawning than that of blueback herring. Hatching takes two to 15 days depending upon temperature (Smith 1985).

Blueback herring produce 45,000 to 350,000 eggs per female. The eggs are 1/16 in. in diameter and adhesive upon release, but they may later become dislodged and be pelagic. In the Hudson River during 1992 peak abundance of herring eggs (combined alewife and blueback herring, or *Alosa* spp.) appeared to occur in the upper estuary in the Catskill region during mid-May (Figure 4-40). Development proceeds rapidly and hatching occurs in two to three days. Newly hatched blueback herring are 0.125 in. long and the yolk sac is absorbed in about four days. At the beginning of the post-yolk-sac stage the larvae are about 0.1875 in. long. In the Hudson River during 1992 PYSL appeared to be most abundant in the Kingston through Albany regions of the estuary during late May and early June (Figure 4-41).

Comparing the temporal distribution of early life stages of *Alosa* spp. in 1992 with previous years (1974-1991), it is apparent that in 1992 the distributions of eggs, YSL and PYSL were generally consistent with the long term record (Figure 4-42). However, in 1992 approximately 80 % of *Alosa* spp. egg distribution in 1992 occurred in early May, whereas over the long term peak egg distribution occurred in mid May.

The geographical distribution of *Alosa* spp. early life stages in 1992 is also consistent with the long term record, with the major proportions of eggs and YSL occurring in the Albany region (Figure 4-43).

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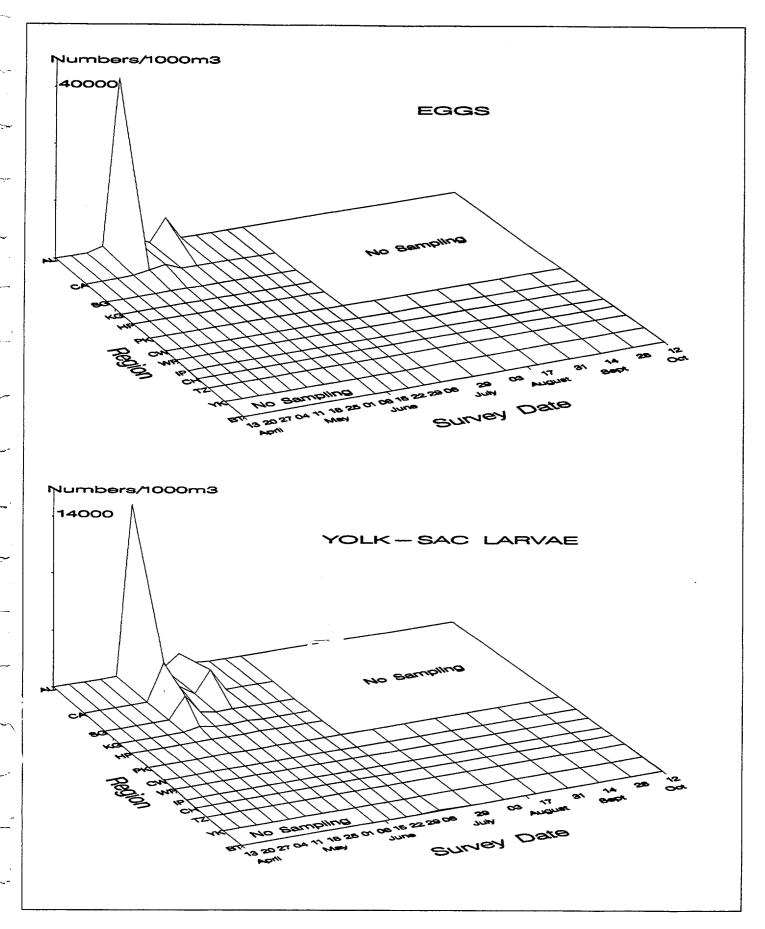


Figure 4-40. Spatiotemporal distribution of egg and yolk-sac stages of Alosa spp. in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

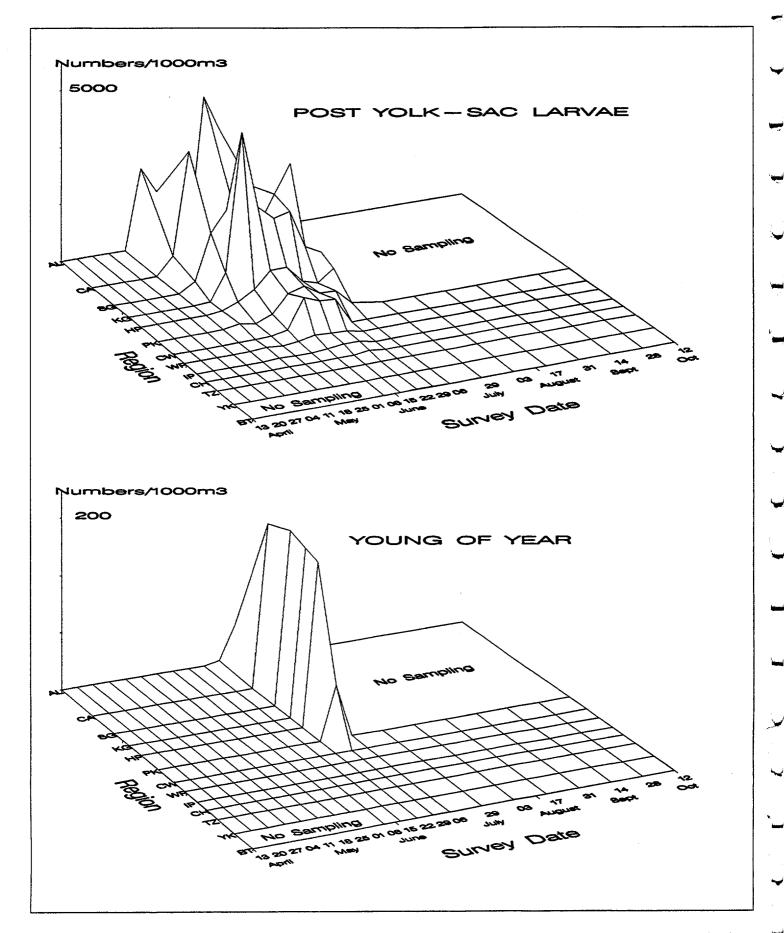


Figure 4-41. Spatiotemporal distribution of post yolk-sac and young-of-year stages of Alosa sp. in the the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

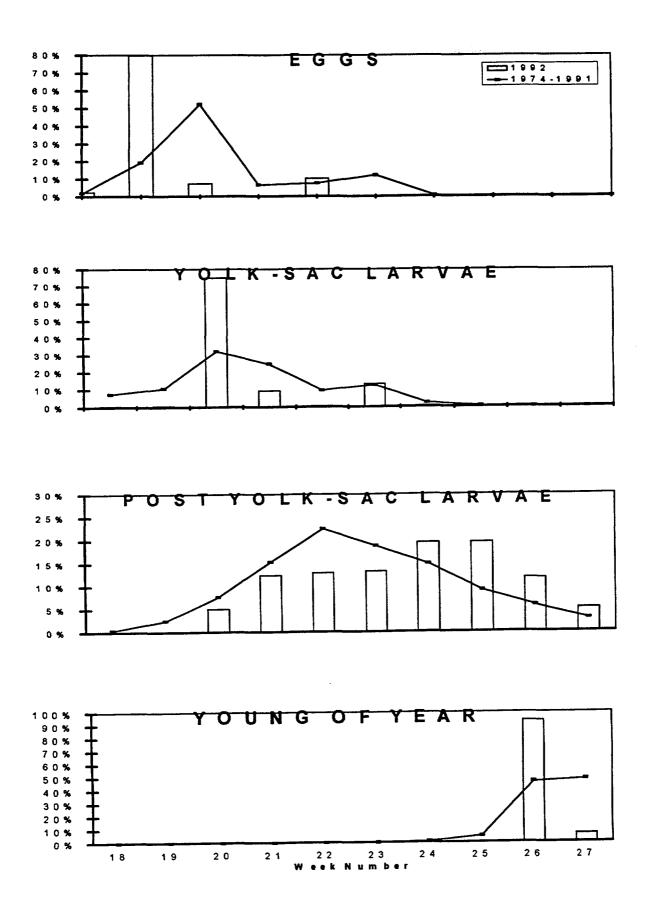


Figure 4-42 Temporal distribution indices for Alosa sp collected during Longitudinal Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.

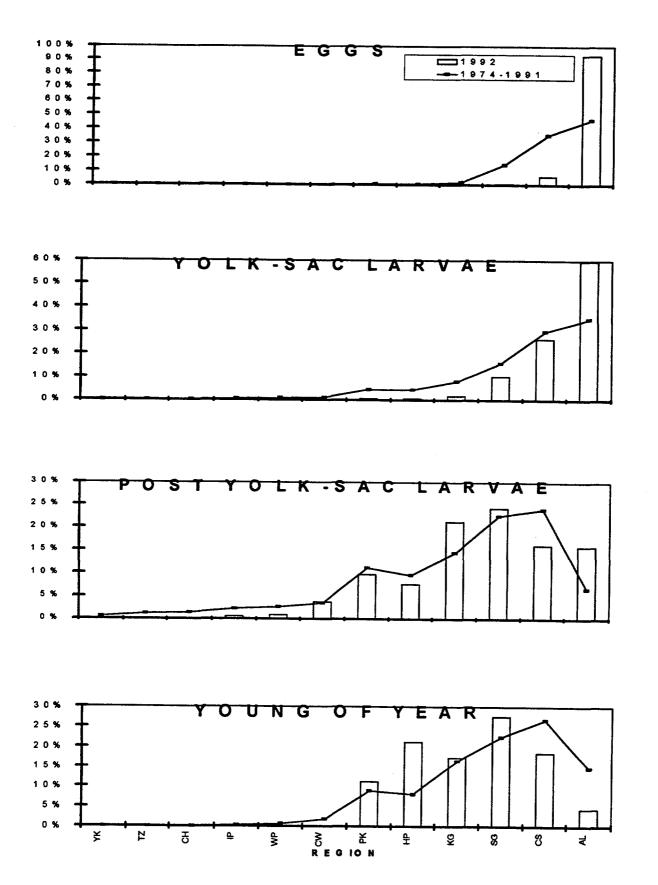


Figure 4-43 Geographical distribution indices for early life stages of Alosa sp. collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.

4.8 ALEWIFE

Alewives are physically similar to blueback herring and can be distinguished from blueback herring on the basis of the color of the lining of the body cavity, eye size, and body shape. Alewife are usually anadromous and inhabit coastal waters from Newfoundland to South Carolina but they have also been introduced into the upper Great Lakes and inland lakes in Rhode Island, Maine, New Hampshire, Virginia, Ontario, and New York, where they provide forage for large predatory species. Anadromous alewives spend most of their lives in salt water and return to fresh water to spawn in lakes and quiet stretches of rivers (Scott and Crossman 1973). They are capable of homing to their natal rivers after they mature at ages 3 or 4, even though substantial numbers may not return and considerable mixing of river stocks may occur (reviewed in Fay et al. 1983). Adults are typically about 10 to 12 in. long and have a maximum life span of about nine years.

The alewife is chiefly a plankton feeder; copepods, amphipods, shrimps, and appendicularians are the chief diet. However, they also take small fish, such as herring, eels, lance, cunners, and their own species, as well as fish eggs. After returning to the lower estuary after spawning, alewife feed heavily on shrimp (Bigelow and Schroeder 1953).

Like young blueback herring, alewife assume adult characteristics at about one month of age and about ½ in. long. At this stage they tend to move inshore during the day and offshore into deeper waters at night. They remain in estuaries until water temperatures begin declining in the fall, when they move into coastal waters. Their emigration pattern is prolonged, like that of American shad. Timing of migration may also be related to size, and larger juveniles migrate earlier (Schmidt et al. 1988). Little is known about the migration patterns at sea. The presence of alewives and blueback herring in the Bay of Fundy has led to speculation that these species have an oceanic migratory pattern similar to American shad, although that has not been confirmed (Harris and Rulifson 1989).

Juvenile alewives began appearing in the 1992 LRS in late June and highest densities were found in the Saugerties and Kingston regions (Figure 4-44). Spatiotemporal distribution of juvenile alewives based on the 1992 BSS shows peak CPUE in the Cornwall region in early July; however, peak densities of juveniles in the FSS occurred further upriver in the Kingston and Saugerties regions (Figure 4-45). Few yearling and older alewives were collected in the BSS and FSS gear (Figure 4-46).

Comparing the geographical distribution of juvenile alewives based on beach seine surveys in 1992 with previous years (1974-1991), it is apparent that in 1992 the distributions of juveniles were generally consistent with the long term record (Figure 4-47). However, in 1992 a bi-modal pattern in the distribution was apparent, with peaks in Cornwall and Saugerties. Only a small portion of the population wqs found in the Tappan Zee region, which historically has contributed to about 20 % of the population.

Weekly length statistics for alewife juveniles collected in 1992 show steady growth from early July through the end of BSS/FSS collections in mid October (Figure 4-48 and Appendix Tables D-12 and D-13).

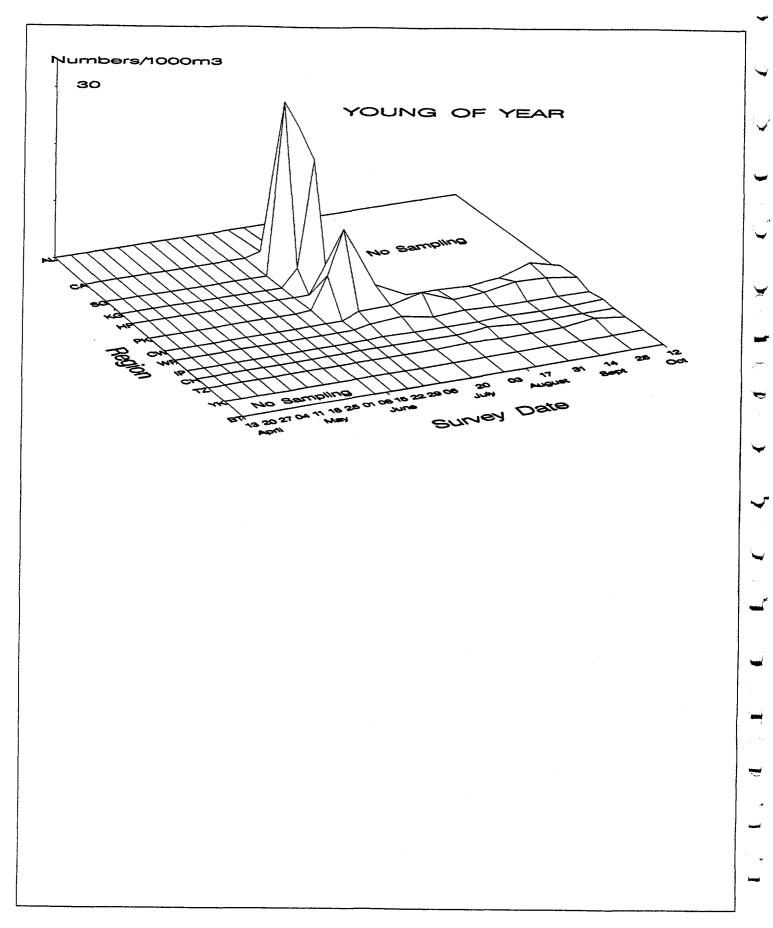


Figure 4-44. Spatiotemporal distribution of young-of-year alewife in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

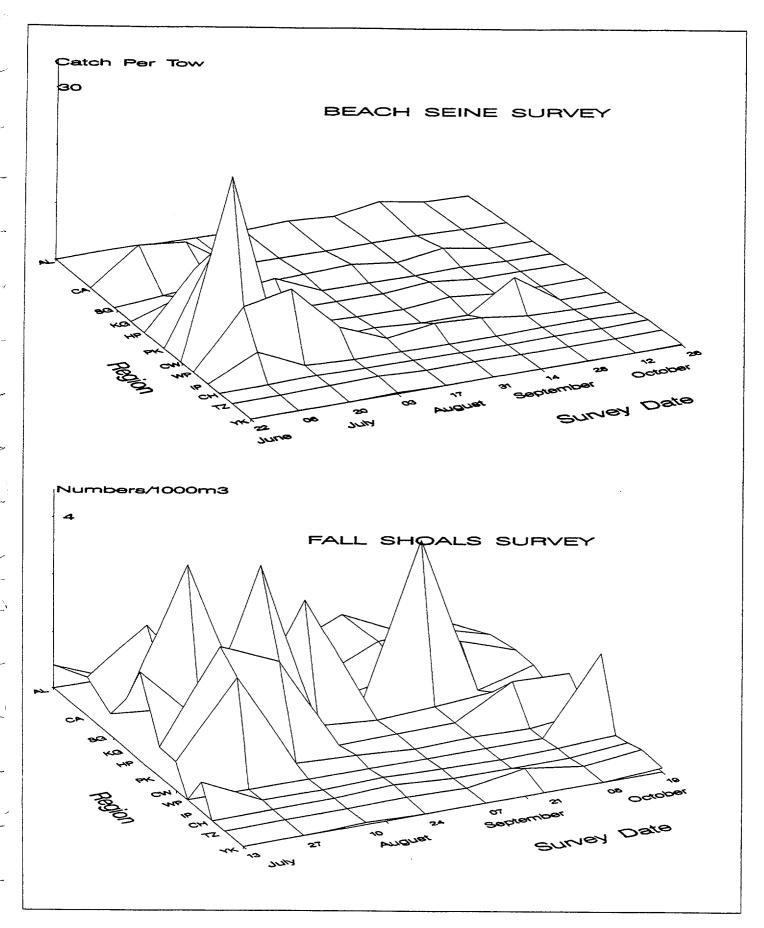


Figure 4-45. Spatiotemporal distribution of young-of-year alewife in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

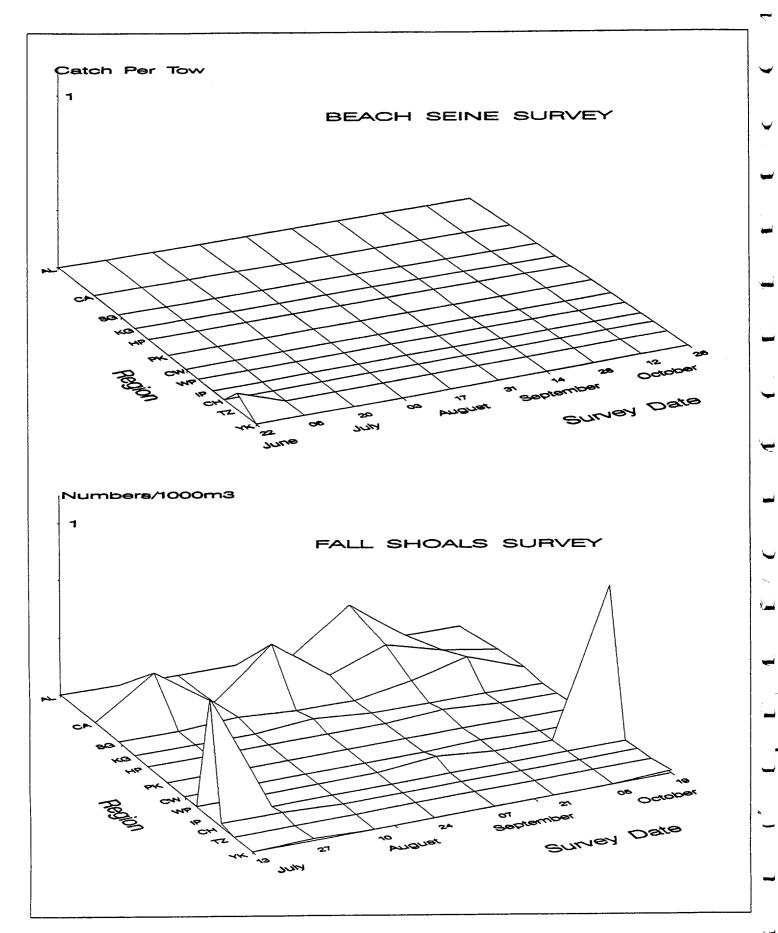
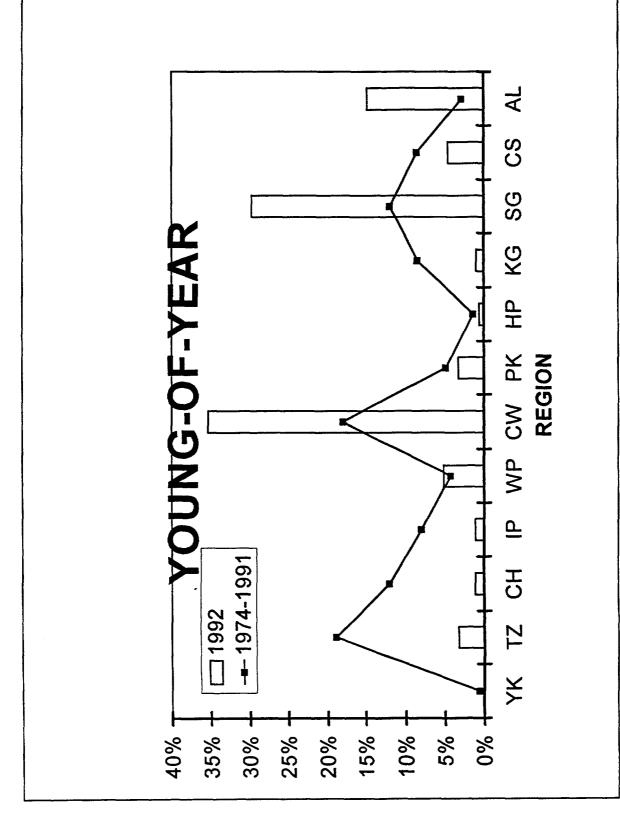


Figure 4-46. Spatiotemporal distribution of yearling and older alewife in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



Geographical distribution indices for young-of -the-year alewife collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1992. Figure 4-47

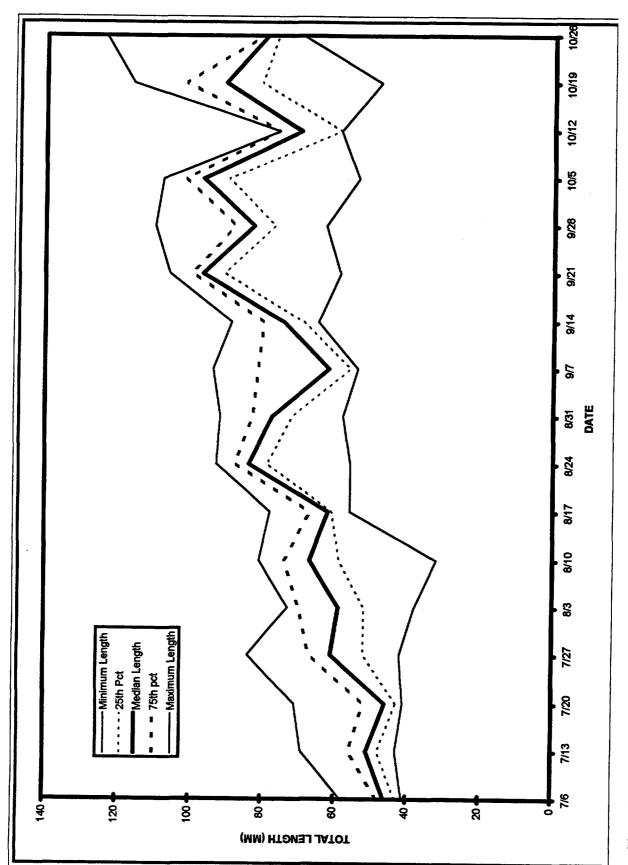


Figure 4-48 Weekly length statistics for alewife young-of-the year in the Hudson River Estuary, 1992

4.9 BLUEBACK HERRING

Blueback herring range from southern New Brunswick and Nova Scotia southward to northern Florida. Although they are caught as far as 70 to 80 miles offshore, little is known about the oceanic migration patterns. The presence of alewives and blueback herring in the Bay of Fundy has led to speculation that these species have an oceanic migratory pattern similar to that of American shad, although that has not been confirmed (Harris and Rulifson 1989). The degree to which river herring of Hudson River origin return to the Hudson River is not known nor is the degree to which spawning stocks from different river systems mix.

Within a month of hatching the young blueback herring assume adult characteristics and are about 0.5 in. long. In the Hudson River during 1992 the peak abundance of early juveniles collected in the LRS occurred in the upper estuary in the Albany region during early July (Figure 4-49). Juvenile blueback herring remain in the upper estuary throughout the summer. During this period they are about 10 times more abundant than juvenile alewives. Juvenile blueback herring grow more slowly than juvenile alewives and begin their downriver migration later than the other herring species. It has been reported that blueback herring exhibit a tendency to spend their first year or two in the lower reaches of estuaries (Hildebrand 1963).

Juvenile blueback began appearing in the 1992 BSS and FSS in early July, with CPUE gradually increasing downriver into October, reflecting downriver migration (Figure 4-50). Few yearling and older alewives were collected in the BSS and FSS gear (Figure 4-51).

Comparing the geographical distribution of juvenile blueback herring based on beach seine surveys in 1992 with previous years (1974-1991), it is apparent that in 1992 the distribution of juveniles was not consistent with the long term record, with a large portion of the population in the Cornwall region rather than being more evenly distributed further upriver (Figure 4-52).

Weekly length statistics for juvenile blueback herring collected in 1992 show slow but steady growth from early July through the end of BSS/FSS collections in mid October (Figure 4-53 and Appendix Tables D-14 and D-15).

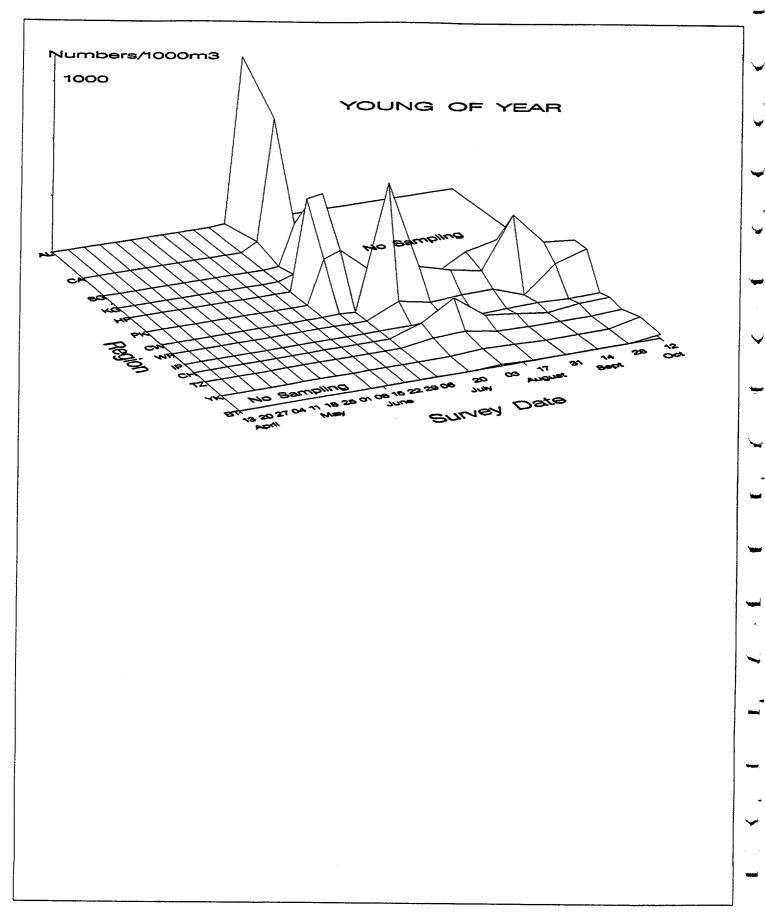


Figure 4-49. Spatiotemporal distribution of young-of-year blueback herring in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

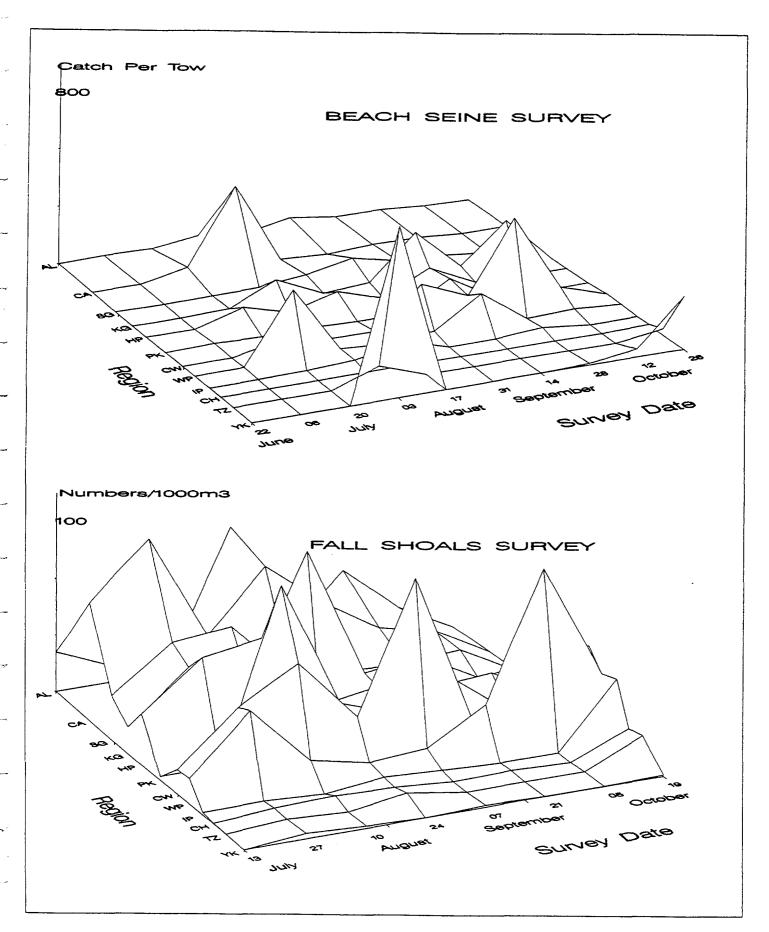


Figure 4-50. Spatiotemporal distribution of young-of-year blueback herring in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

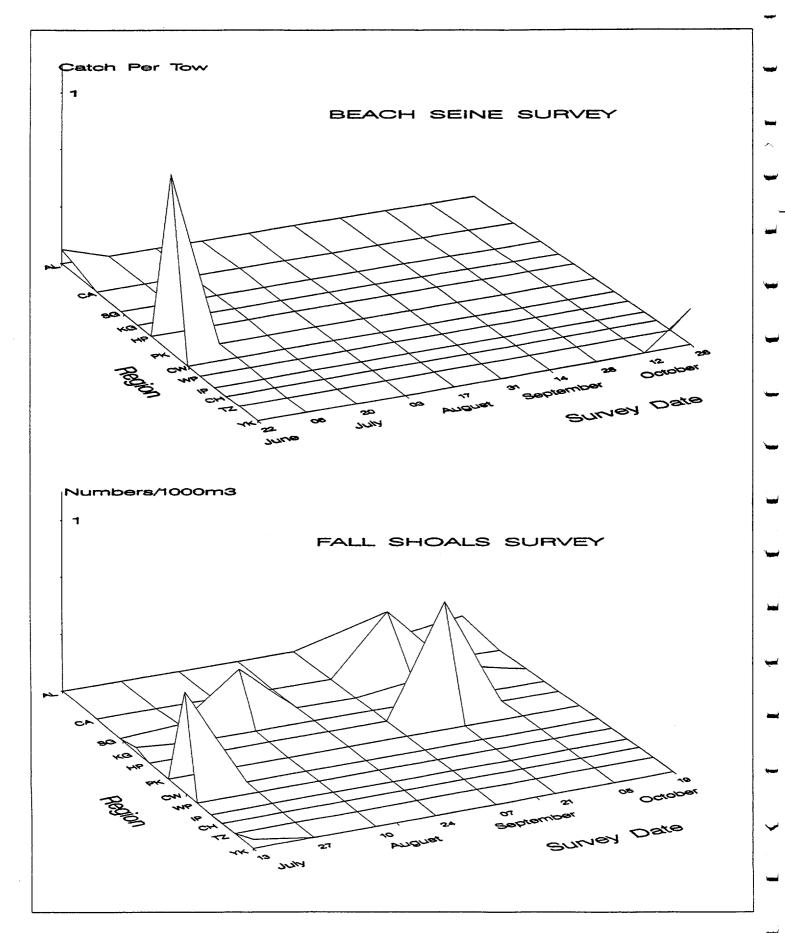
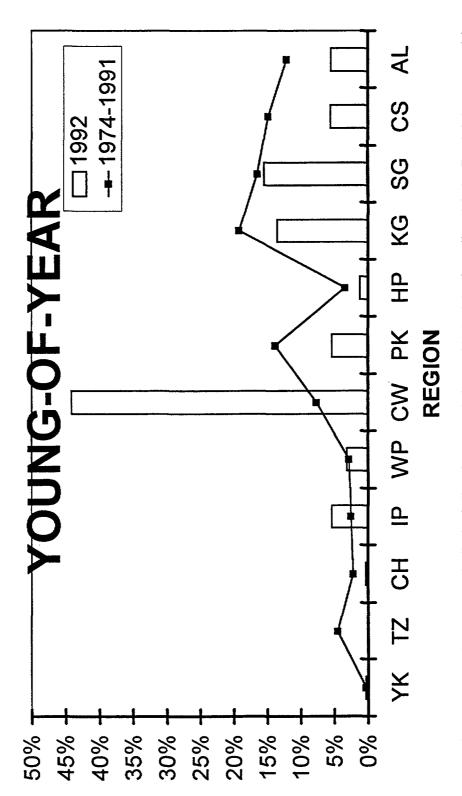


Figure 4-51. Spatiotemporal distribution of yearling and older blueback herring in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



Geographical distribution indices for young-of -the-year blueback herring collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1992. **Figure 4-52**

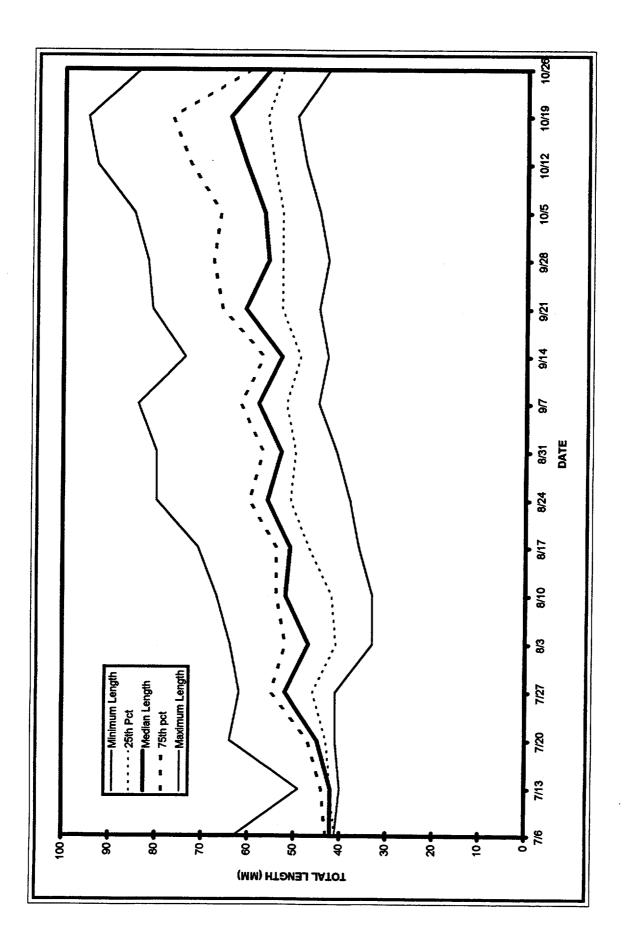


Figure 4-53 Weekly length statistics for blueback herring young-of-the year in the Hudson River Estuary, 1992

4.10 GIZZARD SHAD

The gizzard shad (*Dorosoma cepedianum*) is a freshwater herring that sometimes ranges into brackish water and seawater along the coast. It is an open-water species, usually living at or near the surface, and is found in large rivers, reservoirs, lakes, swamps, bays, borrow pits, bayous, estuaries, temporary floodwater pools along large river courses, sloughs, and similar quiet open waters. The geographic range of the gizzard shad includes the Great Lakes, except Lake Superior; the Hudson River south to the U.S. Gulf Coast and west to the Dakotas, Texas, and New Mexico; and along the Gulf Coast south to Rio Panuco in eastern Mexico (Figure V-80). The northern extent of the range along the Atlantic coast is Sandy Hook, the Hudson River, and Long Island (Smith 1985). Gizzard shad can grow to a length of 19 in., but the usual adult size is 10 to 14 in. and 1 to 3 lb in weight (Miller 1960).

Gizzard shad spawn when the water temperature reaches 50 to 70 °F (April to June, depending upon the location). Adults mill near the surface and spawning sometimes takes place in water less than a foot deep. The eggs sink slowly and adhere to the bottom. The eggs are less than 1/16 in. in diameter and the number of eggs produced by adult females ranges from 59,000 to almost 400,000. Hatching occurs in one and a half to seven days, depending upon the temperature.

Gizzard shad larvae are generally pelagic and widely distributed in many types of habitat. They begin to eat by the fifth day after hatching and feed on microzooplankton until they are about 1 in. long. At that point the digestive system begins to change and the young shad become herbivorous and eat phytoplankton, algae, and microscopic bottom plants (Scott and Crossman 1973).

Growth during the first five or six weeks is typically rapid, but then slows. By the end of the first summer, gizzard shad are generally between 4 and 5 in. long. Young gizzard shad tend to school and prefer clear, slow-moving water. They sometimes move into small streams and can tolerate high turbidity. However, they do not usually move into brackish waters.

Gizzard shad typically mature at age 2 or 3, and the life span is about seven years in northern populations and less in southern ones. In estuarine populations gizzard shad move into waters of higher salinities as they age; spring spawning runs have been reported in some instances (Miller 1960), but adults are generally too large to be eaten easily. Young gizzard shad are eaten by most predatory fish.

Gizzard shad occur primarily in the Mohawk River drainage. The early life stages of this species have been caught only occasionally in the utilities' river surveys. Few juvenile gizzard shad were collected in the 1992 BSS and FSS, except during mid August beach seine collections in the Poughkeepsie and Cornwall regions (Figure 4-54). However, adult gizzard shad appear regularly in winter impingement samples at all of the power plants. These fish may be emigrants from established populations located in the Mohawk River (Smith 1985) or there may be a small resident population in the lower Hudson. The few yearling and older gizzard shad recorded in river surveys in 1992 were collected in beach seines in the Cornwall and West Point regions (Figure 4-55). Comparing both juvenile and yearling and older distributions of gizzard shad during 1992 with the long term record (1974-1991) it is apparent that in 1992 gizzard were primarily distributed in the middle Hudson River (Cornwall and Poughkeepsie) as compared to primarily an upriver (Kingston through Albany regions) distribution in the long term record.

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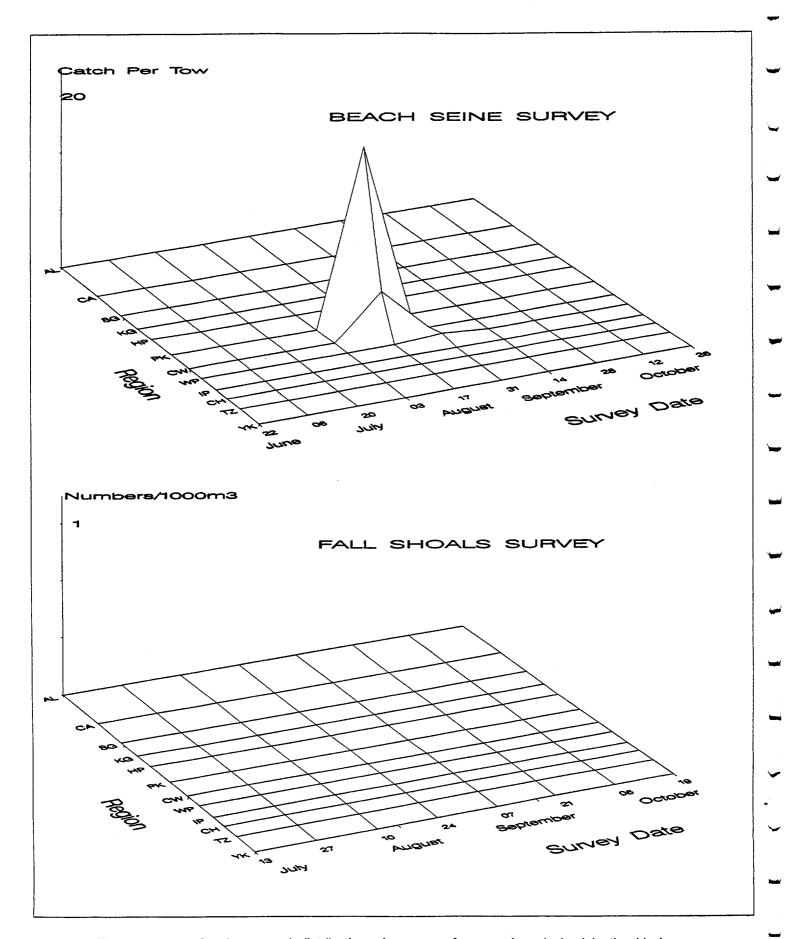


Figure 4-54. Spatiotemporal distribution of young-of-year gizzard shad in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

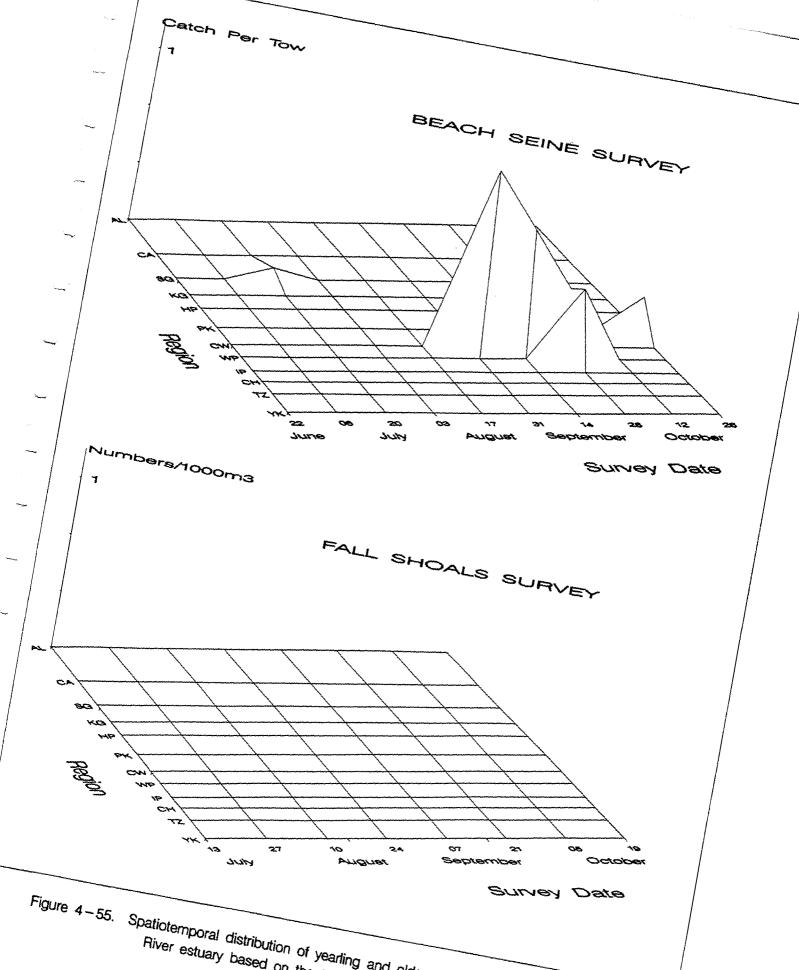
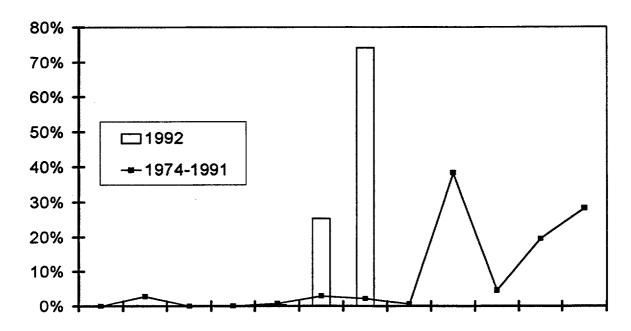


Figure 4-55. Spatiotemporal distribution of yearling and older gizzard shad in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

YOUNG-OF-YEAR



YEARLING AND OLDER

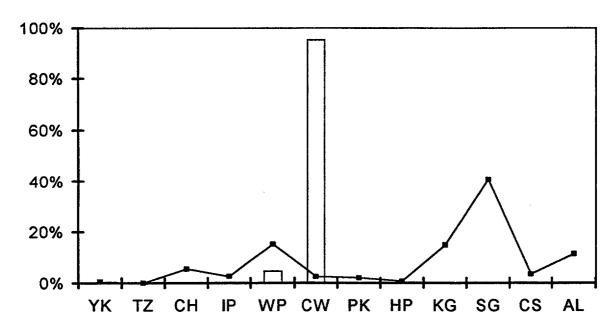


Figure 4-56 Geographical distribution indices for gizzard shad collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1992.

4.11 RAINBOW SMELT

The rainbow smelt are greenish, slender, salmon-like fish with deeply forked tails. They occur along the Atlantic coast from Labrador to the Delaware River, along the Arctic Coast, and along the coasts of Alaska and British Columbia. They are landlocked naturally in many lakes and ponds in Canada, Maine and New Hampshire and have been introduced to other landlocked freshwaters. Within New York State rainbow smelt are found in the Hudson River, Long Island streams, several Adirondac lakes, and the Great Lakes (Smith 1985).

Anadromous rainbow smelt may spend the whole year in or near estuaries. In the fall they move into the bays and estuaries. Rainbow smelt spawn in tributaries in spring when the water temperature reaches 48 °F. Even landlocked populations continue to migrate from their lake habitats to tributary streams to spawn. Spawners move into the lower reaches of streams in the evening, spawn at night, and move out in the day. Adult smelt leave the tributaries immediately after spawning. They spawn where water velocities are high, and larval survival decreases where water velocities are low (Buckley 1989). In the summer adults move to deeper, cooler water just outside bays and estuaries.

Adult smelt usually average 7 to 8 in. in total length, but occasionally reach lengths of 13 to 14 in. Female smelt grow faster than males and may reach maturity as early as age 1 along the southern edge of their range. However, maturity occurs more commonly at ages 2 through 5. The number of eggs produced by an adult smelt may range from 7000 to 70,000.

The eggs are approximately 1/16 in. or less in diameter and sink to the bottom, where they stick in clusters to pebbles or whatever they happen to touch (Bigelow and Schroeder 1953). In the Hudson River during 1992 rainbow smelt eggs were most abundant in the ichthyoplankton catches from the upper estuary in the Saugerties region (Figure 4-57). They hatch in about a week to almost a month, depending on temperature, and eggs are present in the Hudson River ichthyoplankton catches for about two weeks, which suggests a short spawning period.

Newly hatched larvae are about 1/5 in. long. These larvae are carried downstream and out of the tributaries by current flows. During 1992, YSL were abundant in early May and were found from the Catskill through West Point regions (Figure 4-57). The yolk sac is absorbed when the fish are about ¼ in. in length. In 1992 PYSL were commonly found from the Saugerties through Tappan Zee regions (Figure 5-58), and were abundant from mid-May through mid-June. As rainbow smelt larvae grow, they move closer to the bottom during the day and move back toward the surface at night, probably to feed on zooplankton, which exhibit similar vertical migrations in the water column.

Juvenile rainbow smelt were abundant in the 1992 LRS catches from late June through September (Figure 4-58). Juvenile smelt are exceedingly slender and nearly transparent. At about ¾ in. they begin to school. Juvenile rainbow smelt move into shallow water at night and back to deep channels during the day (Buckley 1989). These movement patterns are reflected in the 1992 BSS and FSS collections where beach seines conducted during the day did not collect any rainbow smelt and fall shoals sampling conducted at night collected juveniles primarily in the West Point and Cornwall regions (Figure 4-59). By late summer the young smelt leave the estuary. Few yearling and older rainbow smelt were collected in the FSS during 1992 (Figure 4-60).

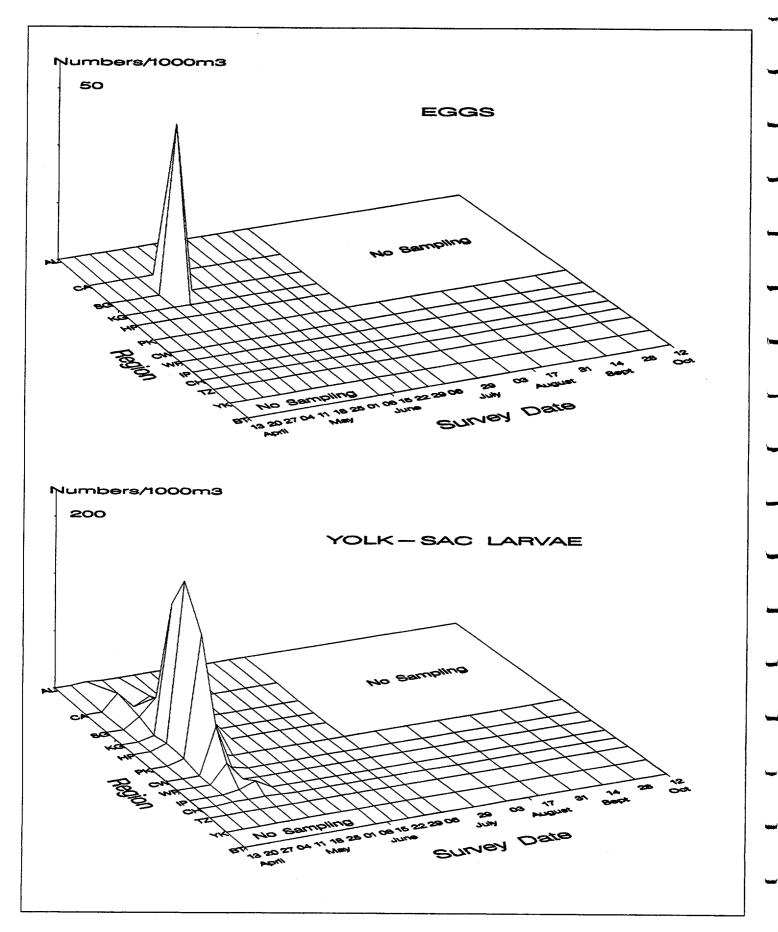


Figure 4-57. Spatiotemporal distribution of egg and yolk-sac stages of rainbow smelt in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

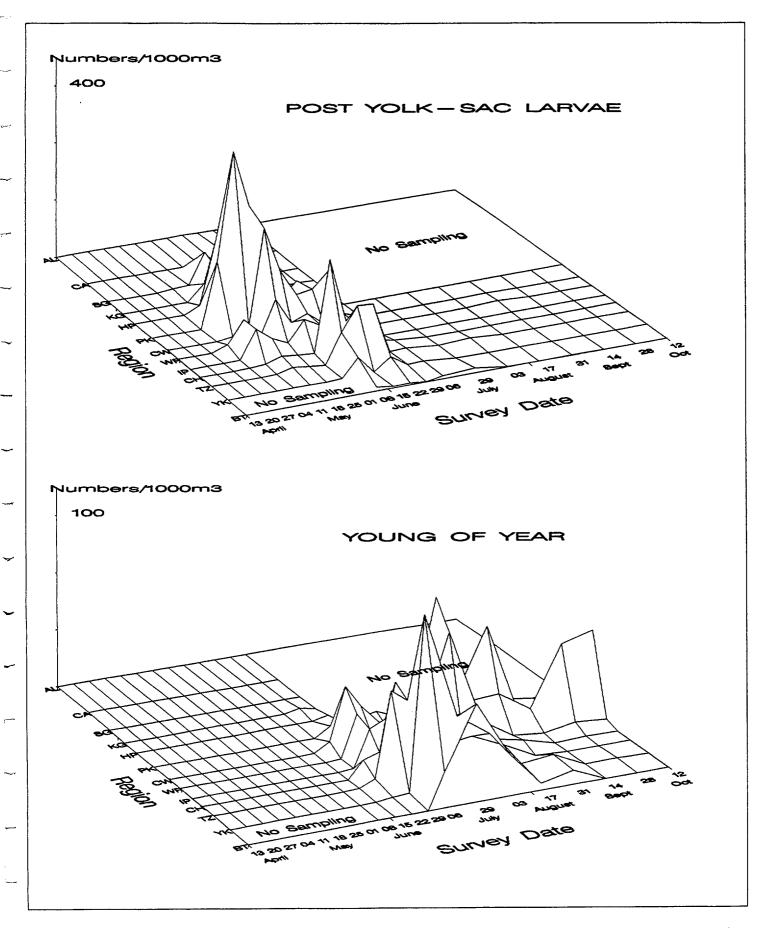


Figure 4-58. Spatiotemporal distribution of post yolk-sac and young-of-year stages of rainbow smelt in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

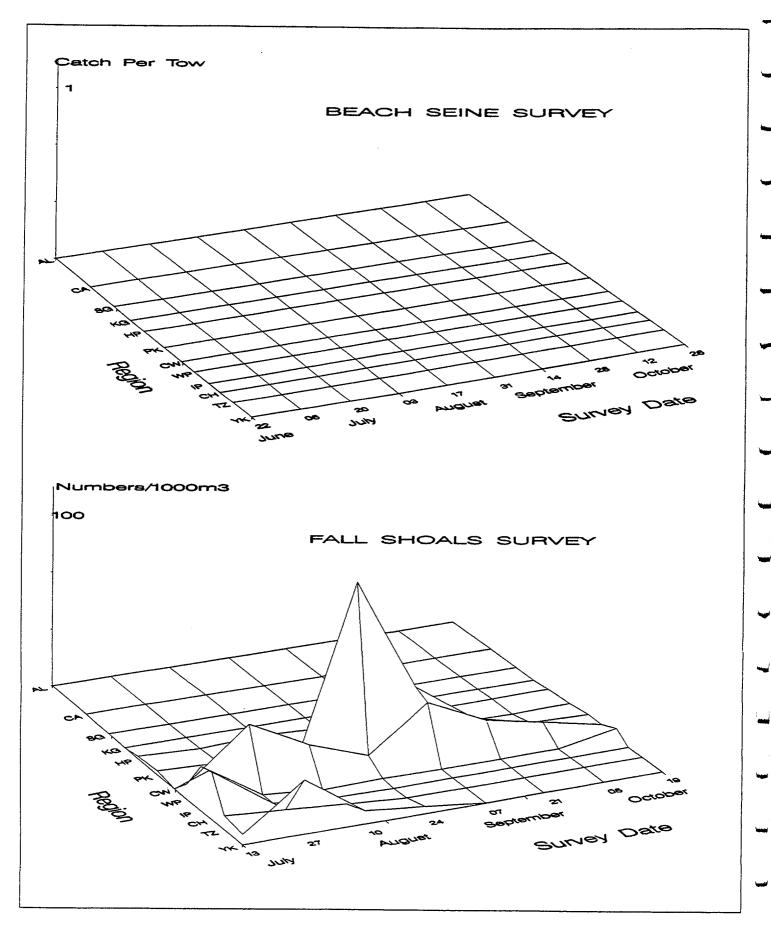


Figure 4-59. Spatiotemporal distribution of young-of-year rainbow smelt in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

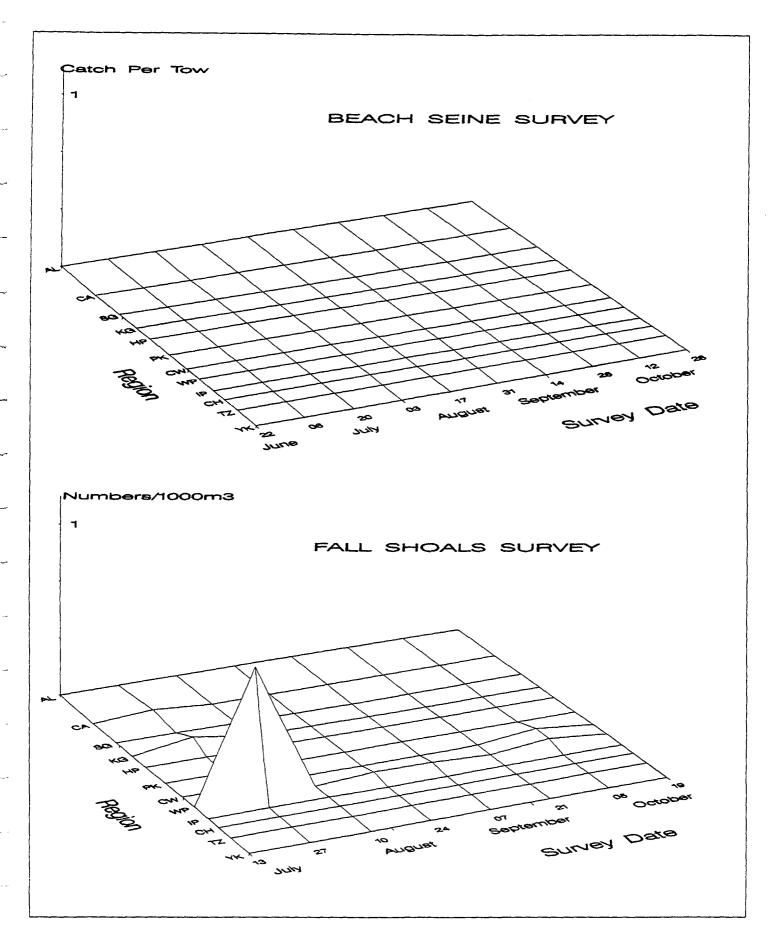


Figure 4-60. Spatiotemporal distribution of yearling and older rainbow smelt in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

Comparing the temporal distribution of early life stages of rainbow smelt in 1992 with previous years (1974-1991), it is apparent that in 1992 the distributions of early life stages were generally consistent with the long term record (Figure 4-61). However, in 1992 over 50 % of the juvenile distribution occurred in early July, whereas over the long term juveniles were more evenly distributed from mid June through early July.

The geographical distribution of rainbow smelt early stages during 1992 was somewhat further downriver than seen in the long term record (Figure 4-62). Eggs were found only in the Saugerties region, rather than in the Saugerties through Albany regions and YSL were primarily found in the Poughkeepsie through Kingston rather than being more evenly distributed between the Hyde Park and Catskill regions. PYSL rainbow smelt were not as abundant above Hyde Park in 1992 and juveniles were more abundant in the Yonkers and Tappan Zee regions as evident in the long term record (Figure 4-62).

The 1992 geographical distribution of young-of-the-year and yearling and older rainbow smelt in the BSS is generally consistent with the long term trend, except that the peak of juveniles occurred in the Cornwall region compared to the long term record where peak juvenile occurrence was further downriver in the West Point region (Figure 4-63).

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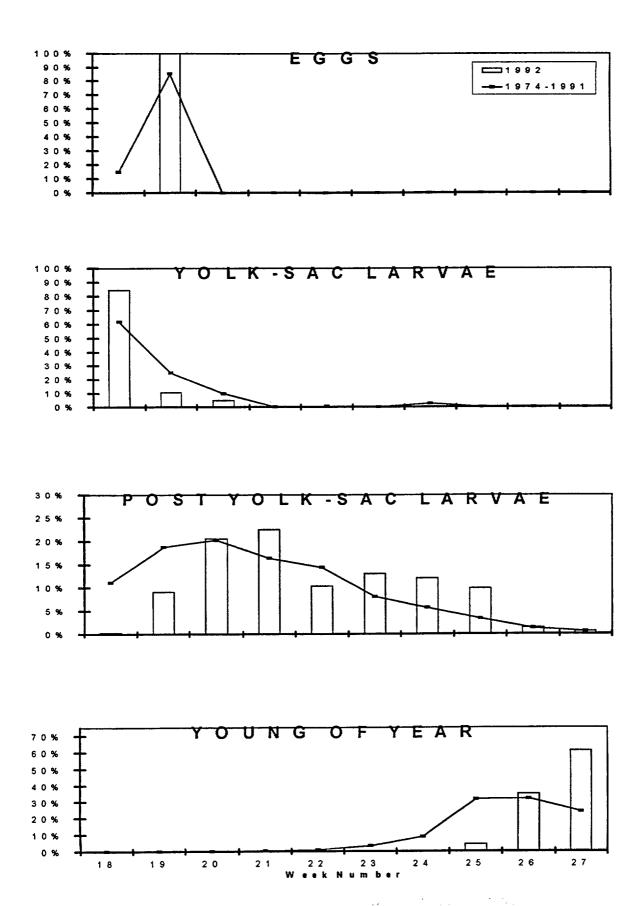


Figure 4-61 Temporal distribution indices for early life stages of rainbow smelt collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.

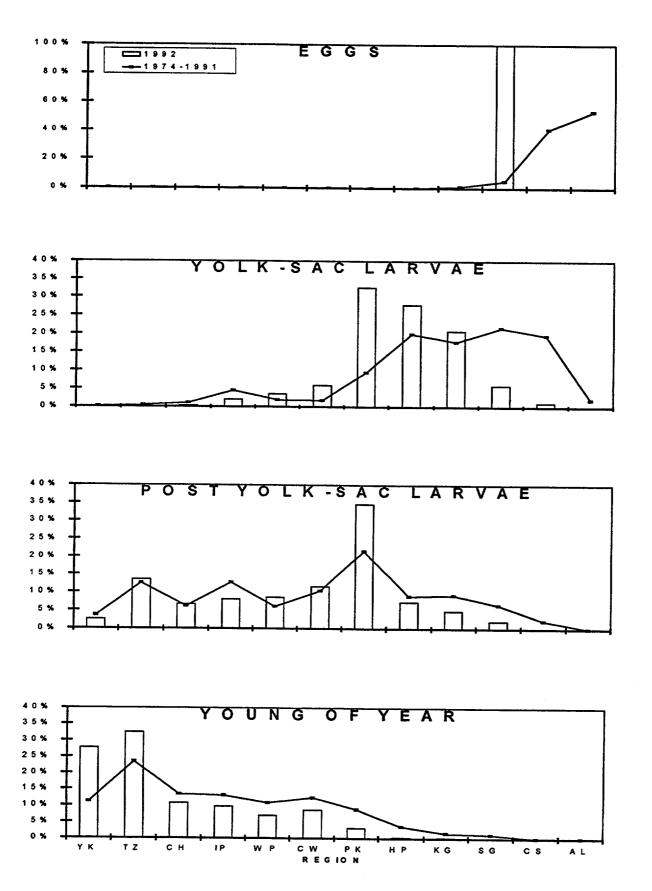
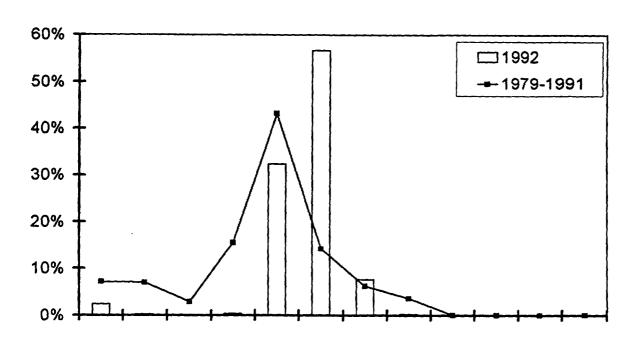


Figure 4-62 Geographical distribution indices for early life stages of rainbow smelt collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1992.



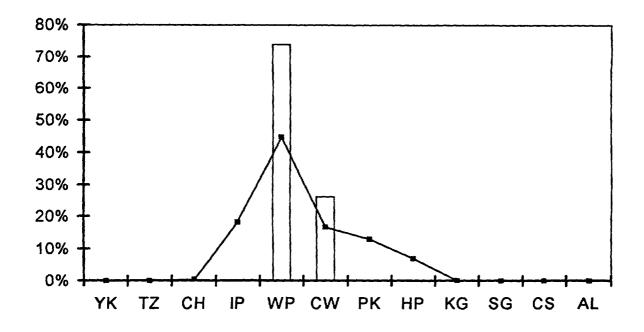


Figure 4-63 Geographical distribution indices for rainbow smelt collected during Fall Shoals surveys of the Hudson River Estuary, 1979 - 1992.

4.12 HOGCHOKER

Hogchokers (*Trinectes maculatus*) inhabit estuaries and nearshore coastal waters and range from Massachusetts Bay to the Atlantic coast of Panama. They can tolerate a wide range of salinities and are found from marine waters up into fresh water, although older individuals tend to be found in more saline waters. Hogchokers reach a length of 2 to 3 in. in their first year, mature at about 4.5 in., and obtain a maximum size of about 8 in. (Bigelow and Schroeder 1953). This small flatfish is very abundant in the Hudson River estuary and its adjacent bays and coastal waters.

Adult hogchokers overwinter in low salinity regions of estuaries (Koski 1973) and spawn in the lower regions of estuaries and offshore from estuary mouths during the spring and summer. In some areas (eastern Chesapeake Bay) spawning appears to be restricted to sandy substrates. Dovel et al. (1969) reported that the hogchoker population in the Patuxent River was a resident population confined for the most part to that estuary in the Chesapeake Bay complex and concluded that the hogchoker population in the Chesapeake Bay system was probably composed of subpopulations that were generally confined to the bay and various tributaries. The relationship of Hudson River hogchokers to Atlantic coastal populations is unknown.

Individual hogchokers produce from 11,000 to 54,000 eggs, depending upon the size of the female. In the Hudson River estuary hogchoker spawning occurs from May to October although eggs are more commonly collected during the period from the last week in May through July, in the more saline areas of the lower estuary, such as the Battery and Yonkers regions. During 1992 hogchoker eggs were collected primarily in the Yonkers and Battery regions between early June and mid-August (Figure 4-64).

After hatching, the yolk-sac larvae move upstream from the spawning areas and may use the net upstream flows in the deeper saline waters of the estuary. No YSL and few PYSL hogchokers were recorded in the LRS during 1992 (Figure 4-65). Generally low numbers of juvenile hogchokers were collected in the catches of the monitoring program from mid-July through late October (Figure 4-66). However, during 1992 yearling and older hogchokers were abundant, particularly in FSS collections from Yonkers through West Point (Figure 4-67).

The 1992 geographical distribution of young-of-the-year and yearling and older hogchokers in the FSS is generally consistent with the long term trend (1979-1991), except that the peak of juveniles occurred in the Tappan Zee region compared to the long term record where peak juvenile occurrence is further upriver in the Indian Point and West Point regions (Figure 4-68).

In the Hudson hogchokers generally reached sexual maturity at age 2, although some males were mature at age 1 (about 3 in. long). The oldest males in the Hudson were age 4 while the oldest females were age 6. Hogchokers feed near the bottom on a variety of benthic invertebrates, including annelid worms and smaller crustaceans.

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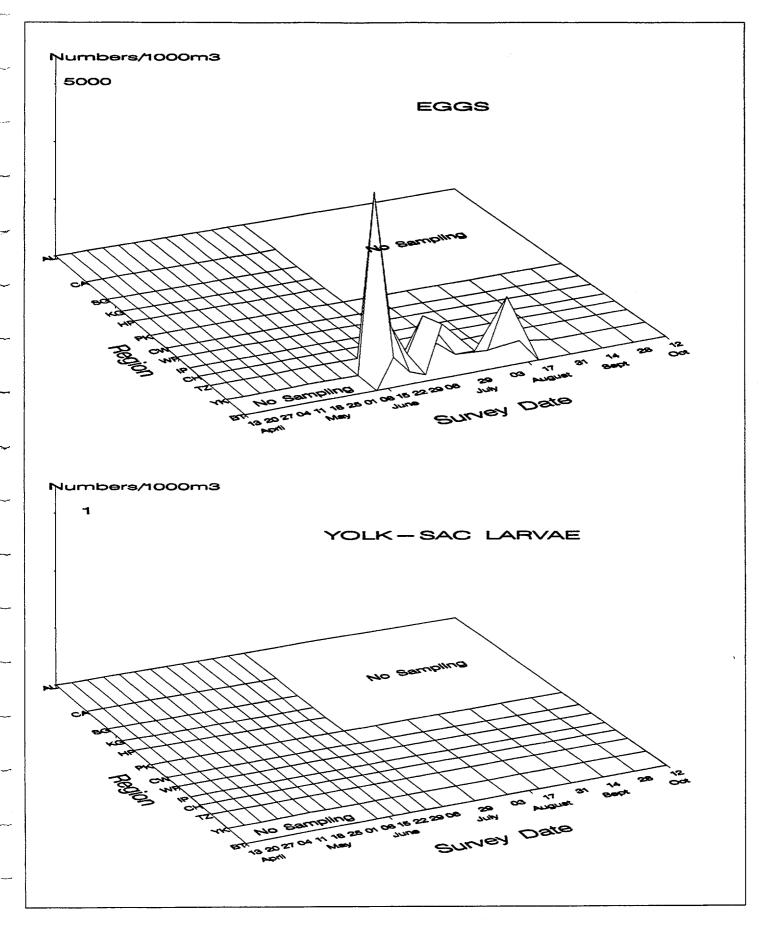


Figure 4-64. Spatiotemporal distribution of egg and yolk-sac stages of hogchoker in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

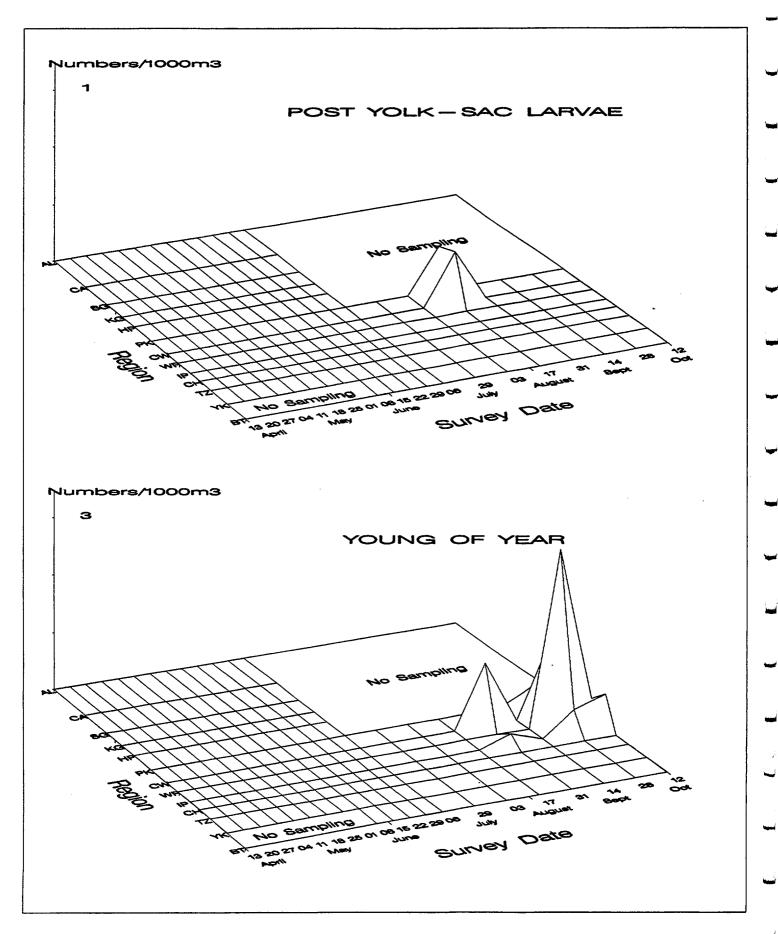


Figure 4-65. Spatiotemporal distribution of post yolk-sac and young-of-year stages of hogchoker in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

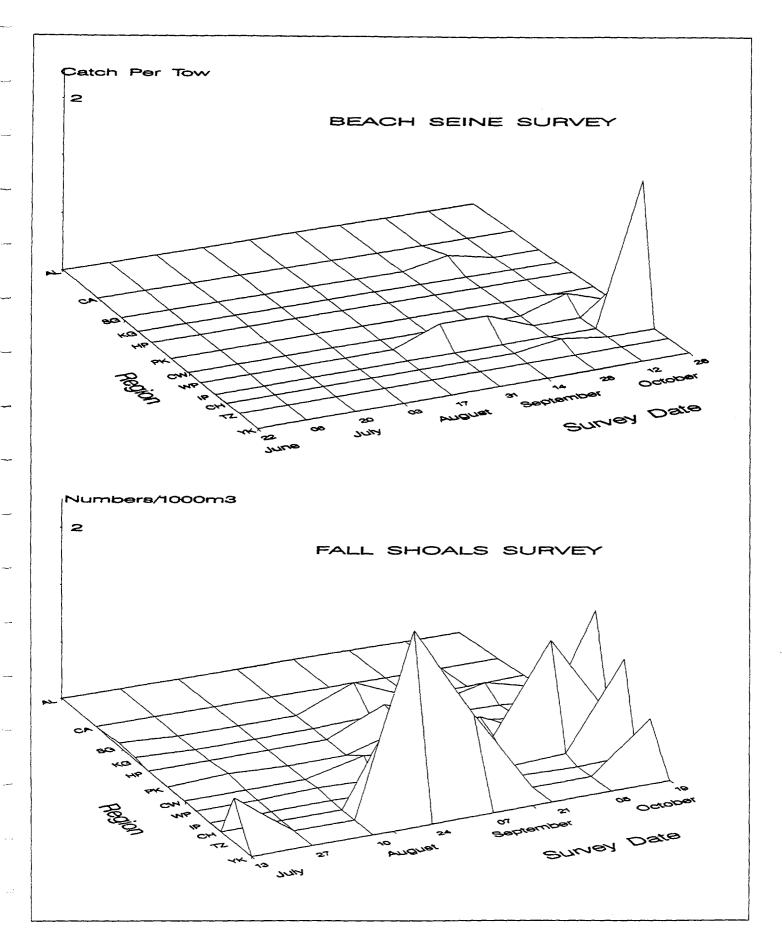


Figure 4-66. Spatiotemporal distribution of young-of-year hogchoker in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

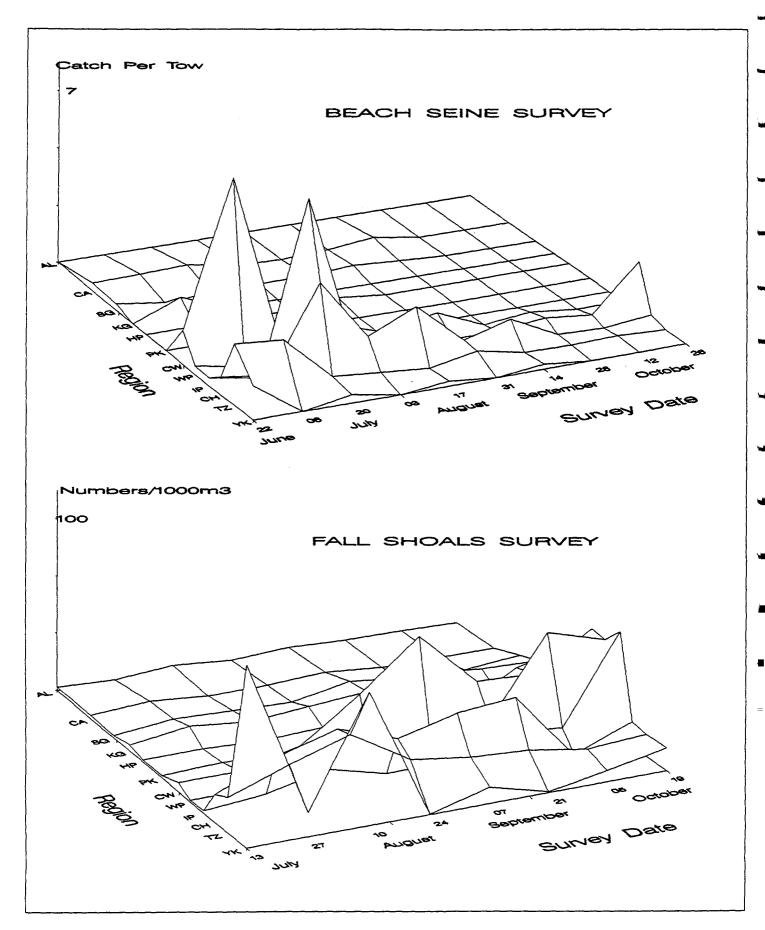
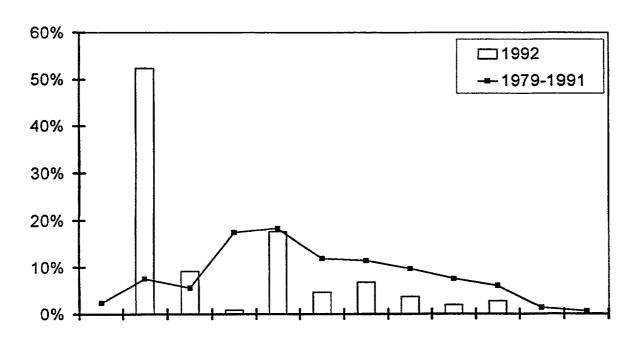


Figure 4-67. Spatiotemporal distribution of yearling and older hogchoker in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



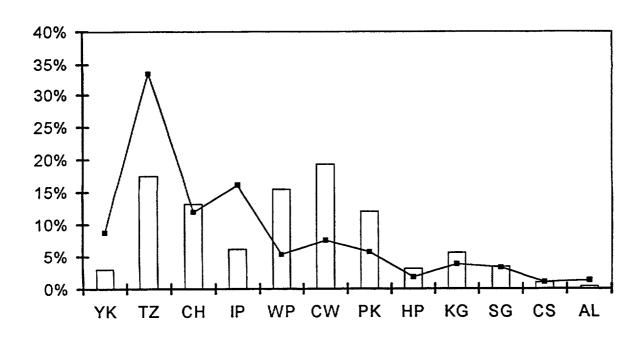


Figure 4-68 Geographical distribution indices for hogchoker collected during Fall Shoals surveys of the Hudson River Estuary, 1979 - 1992.

4.13 SPOTTAIL SHINER

The spottail shiner (*Notropis hudsonius*) is a small, silvery, freshwater minnow that reaches a maximum total length of over 5 in. in the Hudson River. It is usually recognizable by a large oval spot at the base of the tail, but in large individuals the spot is sometimes small and somewhat masked by silvery pigment. It occurs in a variety of freshwater habitats from large lakes and rivers to small streams and is widely distributed in Canada and the United States (Smith 1985).

The spottail shiner is a freshwater species and does not enter marine coastal waters. Thus, the Hudson River population is probably isolated from those in other coastal rivers along the east coast of the United States.

Adult spottail shiners may form large spawning aggregations over sand or gravel substrates in shallow water or at the mouths of tributaries. In the Hudson River adult spottail shiners appear in the ichthyoplankton samples from the upper, freshwater regions of the estuary during May. Spottail shiners produce from 100 to 2600 eggs, depending upon the age and size of the female. Very few eggs and larvae have been collected during the Long River Surveys, which is probably a reflection of the fact that this species spawns in shallow-water habitats that are not sampled efficiently during the ichthyoplankton surveys.

During 1992 no eggs or YSL and few PYSL and juveniles were collected in the LRS (Figures 4-69 and 4-70). Juvenile spottail shiners first appeared in the BSS during early July and were most abundant in the shore zone above the Cornwall region (Figure 4-71), which is also the portion of the estuary with the greatest number of tributaries. Yearling and older spottail shiners were also found throughout the upper Hudson above Cornwall (Figure 4-72).

Comparing the geographical distribution of juvenile and yearling and older spottail shiners based on beach seine surveys in 1992 with previous years (1974-1991), it is apparent that in 1992 the distribution of these life stages was generally consistent with the long term record (Figure 4-73). However, in 1992 the peak in juveniles occurred further downriver in Kingston and Saugerties rather than in the Albany region as seen in the long term record.

Weekly length statistics for juvenile spottail shiners collected in 1992 show steady growth from late June through the end of BSS/FSS collections in mid October (Figure 4-74 and Appendix Tables D-18 and D-19).

In general, spottail shiners are opportunistic predators that feed on aquatic insect larvae, zooplankton, benthic invertebrates, and the eggs and larvae of fish, including their own species. The smaller fish eat the smaller organisms and zooplankton (Scott and Crossman 1973).

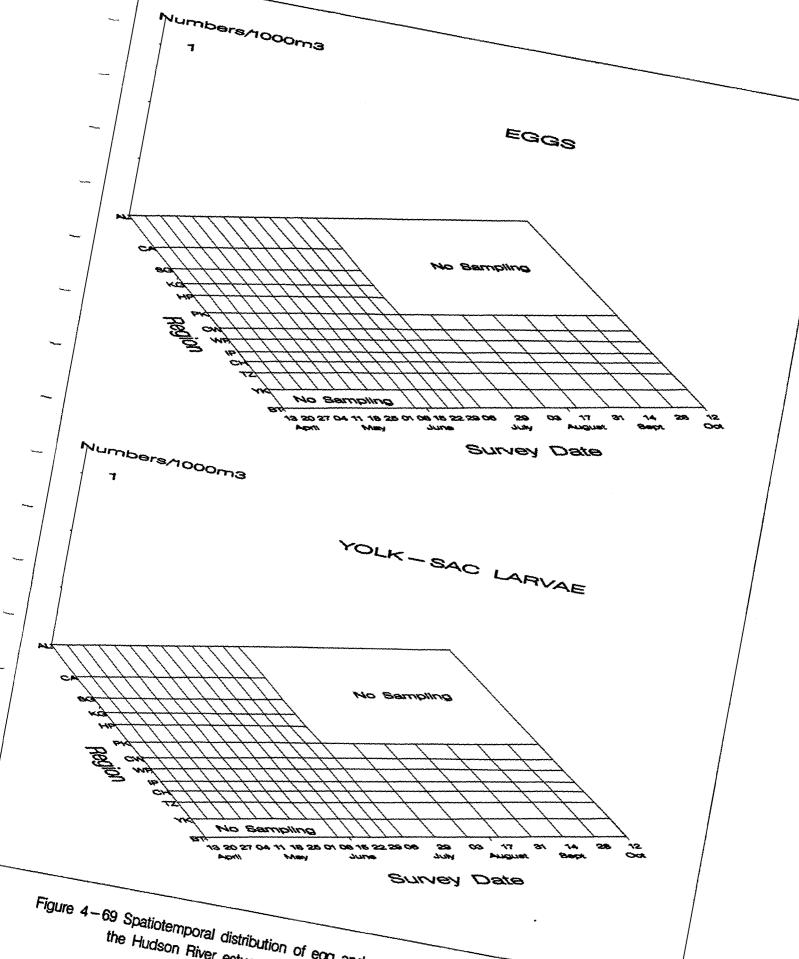


Figure 4-69 Spatiotemporal distribution of egg and yolk-sac stages of spottail shiner in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

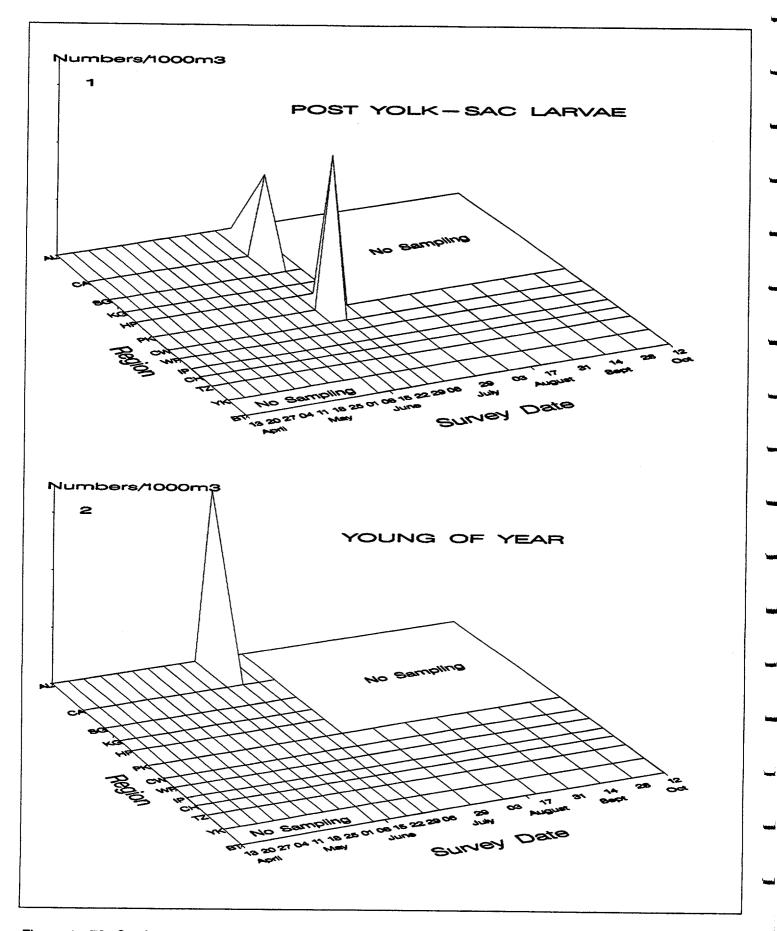


Figure 4-70. Spatiotemporal distribution of post yolk-sac and young-of-year stages of spottail shiner in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

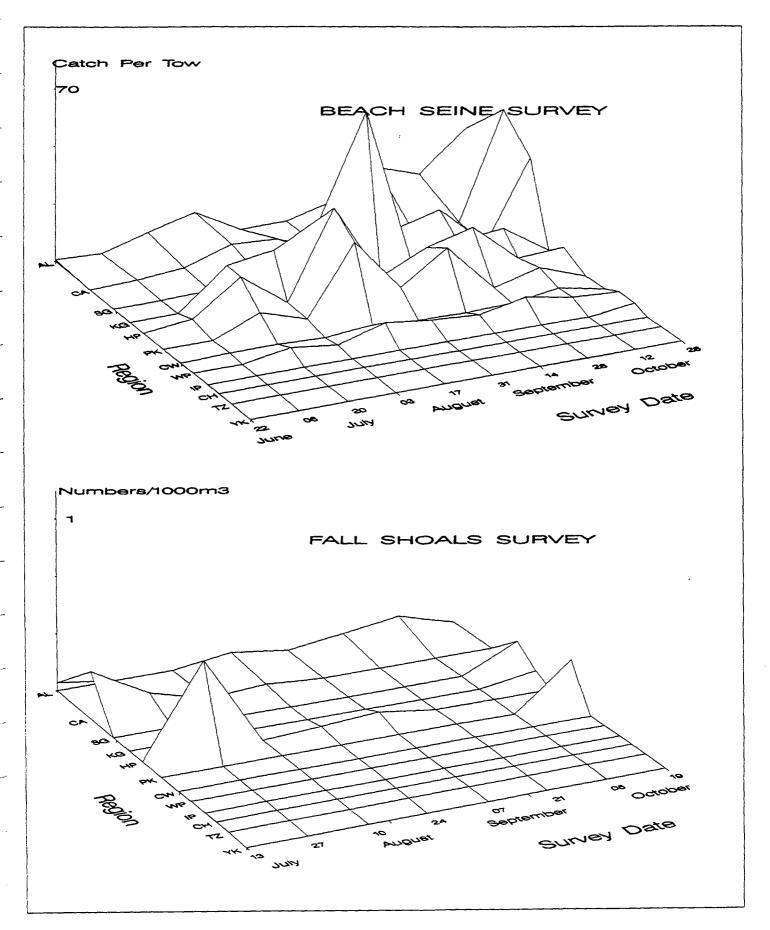


Figure 4-71. Spatiotemporal distribution of young-of-year spottail shiner in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

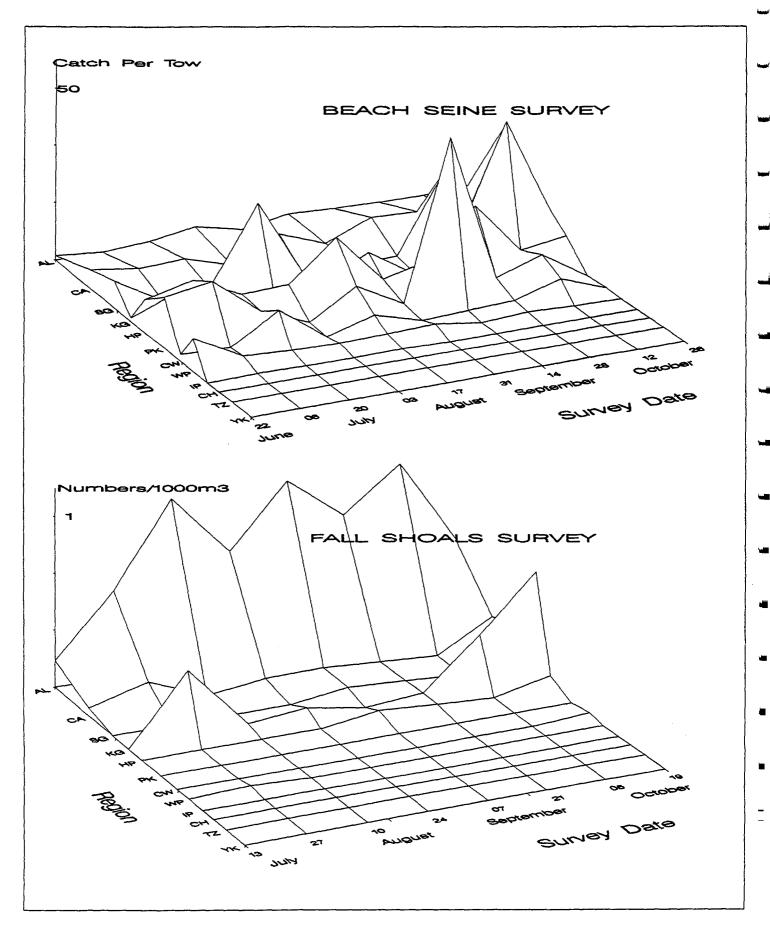
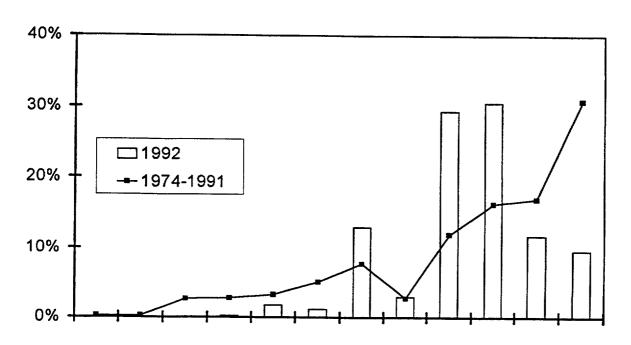


Figure 4-72. Spatiotemporal distribution of yearling and older spottail shiner in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



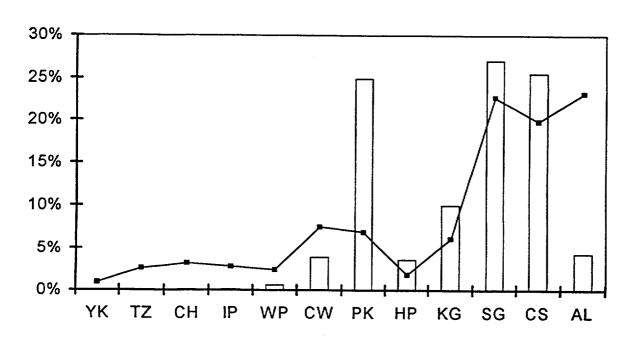


Figure 4-73 Geographical distribution indices for spottail shiner collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1992.

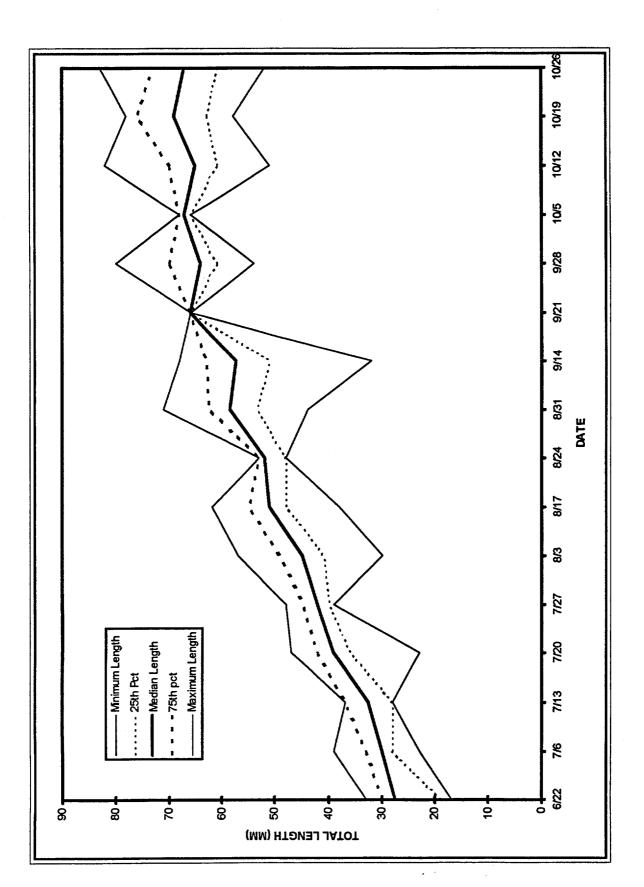


Figure 4-74 Weekly length statistics for spottail shiner young-of-the year in the Hudson River Estuary, 1992

4.14 ATLANTIC STURGEON

The Atlantic sturgeon, Acipenser oxyrhynchus, has two recognized subspecies, A. o. oxyrhynchus and A. o. desotoi. The former ranges from Hamilton River, Labrador, and George River, Ungava Bay, to northeastern Florida, while the latter is confined to the northeastern Gulf of Mexico (Gruchy and Parker 1980a). Adults are large fishes with barbels extending across most of the width of the snout, heavy bony plates (called scutes) covering the body, and an extended upper lobe of the tail fin. Dovel and Berggren (1983) reported that by age 29, Atlantic sturgeon averaged 7.8 ft. The largest Atlantic sturgeon reported by Dovel (1977) was an 8.5-ft specimen weighing 245 lb.

Atlantic sturgeon are long-lived, slow-maturing fishes. Although in the Hudson River the maximum reported age is 29, the oldest known Atlantic sturgeon is a 60-year-old individual from the St. Lawrence River (Gilbert 1989). Male Atlantic sturgeon reach maturity at about 12 years and females at 18-19 years (Dovel and Berggren 1983). They are believed to spawn at intervals of about 3 years.

Tagging studies reported by Dovel and Berggren (1983) indicate that Atlantic sturgeon disperse over great distances and spend at least part of their lives in other estuary systems. Atlantic sturgeon tagged in the Hudson River have been recaptured as far north as Marblehead, Massachusetts, and as far south as Ocracoke. Many of the tags were returned by Delaware Bay and Chesapeake Bay commercial fisherman. Presumably, Atlantic sturgeon that spawned in other rivers and estuaries find their way into the Hudson River.

Mature male Atlantic sturgeon enter the Hudson estuary by early April, before water temperatures rise above 43 °F, while mature females do not arrive until several weeks later (Dovel and Berggren 1983). Spawning begins when gravid females appear in upper Haverstraw Bay (RM 38), about mid-May, when temperatures are approximately 55 °F. At this time the salt front is typically in this vicinity. As the season progresses and the salt front moves upriver, spawning also appears to move progressively upriver, but no farther than about Catskill (RM 113). Most spawning occurs between Croton Point (RM 35) and Hyde Park (RM 76) from May to August, usually in water over 25 ft deep. After spawning, females may remain in the estuary for four to six weeks before moving back to the ocean, while males may remain in the lower estuary for up to eight months (April through November).

Eggs are presumably broadcast into flowing water, becoming widely dispersed after fertilization. There is no evidence of parental care. The eggs are demersal and become strongly adhesive after about 20 min and attach to rocks, weeds, and other submerged objects (Gilbert 1989).

Based on the capture locations of larval and juvenile sturgeon, the nursery area appears to be in the middle estuary (Hoff et al. 1988). Most, if not all, of the Atlantic sturgeon found in the estuary from December through March are immature individuals that congregate in the deep water (>25 ft) between the Bear Mountain Bridge and the George Washington Bridge.

Sturgeon feed by rooting along the bottom and "vacuuming" with their protrusible mouths. This leads to a large amount of nonfood matter, mostly mud, in the stomach. Actual food items include mollusks, polychaete worms, gastropods, shrimp, isopods, amphipods, and small benthic fishes.

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Fisheries surveys conducted during 1992 resulted in a total of eleven yearling and older Atlantic sturgeon collected in the FSS between the Indian Point and Catskill regions from mid July though October (Figure 4-75 and Table 4-3).

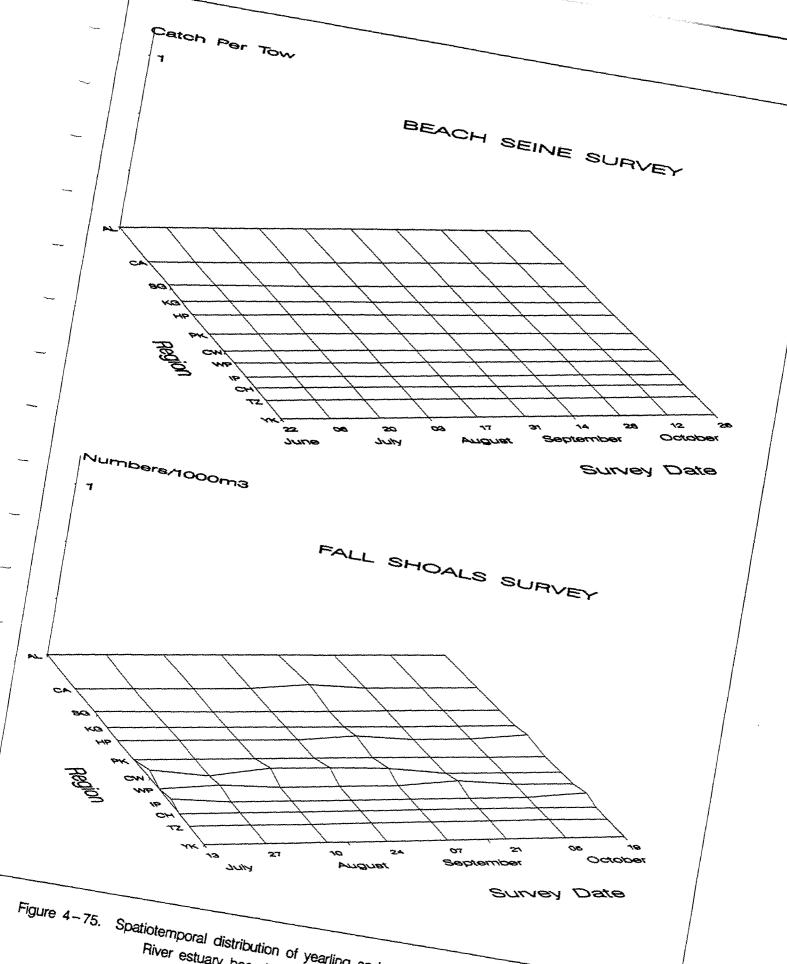


Figure 4-75. Spatiotemporal distribution of yearling and older Atlantic sturgeon in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

TABLE 4-3 COLLECTIONS OF ATLANTIC STURGEON DURING THE 1992 HUDSON RIVER SURVEYS

DATE	SURVEY	REGION	STRATA	NUMBER COLLECTED	TOTAL LENGTH (mm)
17 July	FSS	Cornwall	Bottom	1	102
18 July	FSS	Indian Point	Bottom	1	613
31 July	FSS	Cornwall	Bottom	1	695
12 August	FSS	Cornwall	Bottom	1	498
26 August	FSS	Cornwall	Bottom	1	533
8 September	FSS	Catskill	Bottom	1	414
9 September	FSS	Hyde Park	Bottom	. 1	645
10 September	FSS	Cornwall	Bottom	1	222
23 September	FSS	West Point	Bottom	1	497
21 October	FSS	Indian Point	Bottom	1	690
23 October	FSS	Hyde Park	Bottom	1	452

4.15 SHORTNOSE STURGEON

The shortnose sturgeon, Acipenser brevirostrum, is less widespread, ranging from the St. John River, New Brunswick, to the St. Johns River, Florida (Gruchy and Parker 1980b). Both the Atlantic and the shortnose sturgeons are similar in appearance. As adults, shortnose sturgeon can be distinguished from the Atlantic sturgeon by a shorter and blunter snout, wider mouth, and smaller size of the anal fin. Individuals over 4 ft long are invariably Atlantic sturgeon. Small sturgeon, under 2 ft, and especially larvae, are difficult to distinguish.

Although numerous studies summarized the life history of Atlantic sturgeon since the late 1800s, little attention was paid to shortnose sturgeon, likely because of its limited commercial importance. With the listing of shortnose sturgeon as an endangered species in the United States and its classification as rare in Canada (Gorham and McAllister 1974), more effort has been directed toward understanding this species. The early life histories of these species remain relatively unknown due to the difficulty in distinguishing between the eggs, larvae, and YOY of the two species coupled with the infrequency of their capture.

Like Atlantic sturgeon, shortnose sturgeon are long-lived, slow-maturing fishes. In the Hudson River the maximum reported age for shortnose sturgeon is 37 years but the oldest known shortnose sturgeon is a 67-year-old female from St. John River, Canada (Gilbert 1989). Shortnose sturgeon do not reach sexual maturity until age 8-10 (Dovel and Berggren 1983) and appear to be nonannual spawners.

Shortnose sturgeon apparently are closely linked to the estuary. Greeley (1937) stated that shortnose sturgeon were permanent residents of the freshwater portion of the river, with some movement into brackish waters. However, Dovel (1977), on the basis of barnacles found on the tags of three individuals, postulated that they did venture into marine waters. During their spawning migrations, shortnose sturgeon move upriver as far as accessible habitat permits (Dovel et al. 1992). Adult shortnose sturgeon reach the spawning grounds between Coeymans and Troy (RM 124-153) as early as the first week of April. After spawning, they move downriver to feed, some as far south as the Tappan Zee. From October through March they concentrate near Esopus Meadows (RM 87) and in deeper, warmer channel locations in Haverstraw Bay and the Tappan Zee.

Early growth is rapid. For shortnose sturgeon, larvae are approximately 0.7 in. in total length at the end of May and 4.9 to 5.1 in. by the end of July. By the end of their second summer, they average approximately 11.5 in. (Dovel et al. 1992). Dovel and Berggren (1983) reported that by the end of their second summer average size is 12.8 in. After about the third year of life, growth slows considerably. Greeley (1937) reported a maximum size of about 34 in. at 15 years for shortnose sturgeon while Dadswell et al. (1984) reported a maximum of approximately 35 in. at age 40. The largest shortnose sturgeon reported by Dovel et al. (1992) was a 3.5-ft specimen that weighed 23.6 lb.

Juvenile shortnose sturgeon appear to overwinter in the Esopus Meadows region. Dovel et al. (1992) also reported collecting a few Atlantic sturgeon from this location. Juvenile shortnose sturgeon typically prey on benthic crustaceans and insect larvae.

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Dadswell et al. (1984) reported that whether each river population of shortnose sturgeon is distinct from the others must await future studies. He noted, however, that southern populations may mix in the sea while northern populations appear confined to their separate drainage systems. Shortnose sturgeon move considerable distances within the Hudson River, but appear rarely to migrate to the ocean or to neighboring systems. Although a century ago, shortnose sturgeon were harvested along with Atlantic sturgeon, they are no longer harvested due to their protected status as an endangered or threatened species.

Fisheries surveys conducted during 1992 resulted in a total of 81 shortnose sturgeon collected primarily in the FSS. Although shortnose sturgeon were caught between the Tappan Zee and Albany regions, the majority of fish were collected between the Poughkeepsie and Kingston regions from mid July though October (Figure 4-76 and Table 4-4).

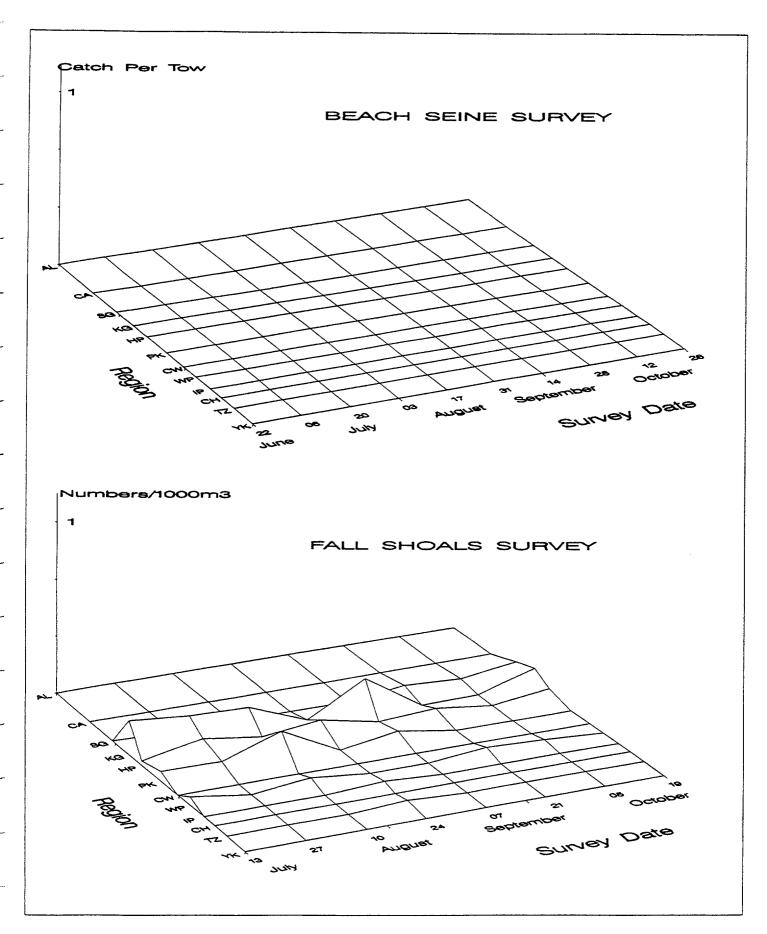


Figure 4-76. Spatiotemporal distribution of yearling and older shortnose sturgeon in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

TABLE 4-4 COLLECTIONS OF SHORTNOSE STURGEON DURING THE 1992 HUDSON RIVER SURVEYS

DATE	SURVEY	REGION	STRATA	NUMBER COLLECTED	TOTAL LENGTH (mm)
15 April	LRS	Albany	Bottom	1	681
22 April	LRS	Albany	Bottom	1	739
28 April	LRS	Albany	Bottom	1	740
26 May	LRS	Albany	Bottom	1	800
14 July	FSS	Kingston	Bottom	7	667,630,737,735, 663,532,612
15 July	FSS	Poughkeepsie	Bottom	2	630,733
15 July	FSS	Hyde Park	Bottom	1	628
17 July	FSS	West Point	Bottom	3	710,812,643
28 July	FSS	Kingston	Bottom	6	611,686,705,672, 709,581
29 July	FSS	Hyde Park	Bottom	4	698,670,727,622
29 July	FSS	Poughkeepsie	Bottom	2	715,705
11 August	FSS	Kingston	Bottom	6	682,651,770,685, 585,572
12 August	FSS	Hyde Park	Bottom	2	715,544
12 August	FSS	Poughkeepsie	Bottom	6	649,635,555,776, 642,640
14 August	FSS	West Point	Bottom	2	551,671
25 August	FSS	Kingston	Bottom	1	705
25 August	FSS	Hyde Park	Bottom	3	772,770,815
26 August	FSS	Hyde Park	Bottom	1	718
27 August	FSS	Tappan Zee	Bottom	1	718
27 August	FSS	Indian Point	Bottom	1	677
9 September	FSS	Kingston	Bottom	8	642,722,655,740, 828,780,595,672
9 September	FSS	Hyde Park	Bottom	1	692
9 September	FSS	Poughkeepsie	Bottom	1	656
10 September	FSS	Poughkeepsie	Bottom	1	792
22 September	FSS	Saugerties	Bottom	2	702,628

TABLE 4-4 (CONT'D) COLLECTIONS OF SHORTNOSE STURGEON DURING THE 1992
HUDSON RIVER SURVEYS

22 September	FSS	Hyde Park	Bottom	2	650,610
23 September	FSS	West Point	Bottom	2	610,493
29 September	LRS	Poughkeepsie	Bottom	1	610
6 October	FSS	Saugetries	Bottom	1	581
7 October	FSS	West Point	Bottom	1	575
22 October	FSS	Kingston	Bottom	4	591,751,597,605
22 October	FSS	Saugerties	Bottom	3	639,718,663
23 October	FSS	Hyde Park	Bottom	2	692,709

4.16 WHITE CATFISH

White catfish occur in freshwater lakes and ponds and have been introduced widely on the west coast and into the Northeast. The natural distribution was originally from the Chesapeake Bay region in coastal streams southward to Texas. It is found in estuaries all along the Atlantic coast from the Hudson River to Florida and west along the Gulf of Mexico to Mobile Bay. It prefers fresh and slightly brackish waters and moderate water currents. White catfish do not tolerate high salinity, so estuarine populations generally remain in their natal systems.

In southern waters young white catfish are about 3 in. long at the end of the first growing season. White catfish generally do not mature until they are three to four years old and 7 to 8 in. long. They continue to grow slowly, attaining lengths of 17 in. at age 8 and 22 in. at age 11. This species seldom exceeds 3 lb in weight.

White catfish move upstream to spawn. In spring white catfish have been reported in tidal creeks and shallow marsh habitats. Like the other members of the catfish family, the white catfish is a nest builder, and the male guards the young for some time after they hatch. Both parents participate in the construction of a nest up to 3 ft in diameter on sand and gravel bars. White catfish spawn when water temperatures reach about 70 °F, i.e., in late June and early July in the Hudson River. An 11- to 12-in. female carries only 3200 to 3500 eggs, but the eggs are large, approximately ¼ in. in diameter. The male (or less often both parents) protects and fans water over the eggs in the nest.

White catfish eggs, larvae, and early juveniles were rarely collected during the utilities' ichthyoplankton surveys. However, the 1992 BSS and FSS consistently captured low numbers of juveniles, yearlings and older white catfish (Figures 4-77 and 4-78). The 1992 geographical distribution of young-of-the-year and yearling and older white catfish in the FSS is generally consistent with the 1979-1991 long term trend (Figure 4-79). Juveniles tend to occur in the mid to upper Hudson with the bulk of the distribution in the Catskill and Albany regions. Yearling and older white catfish are found throughout the river and their distribution tends to be bimodal with peaks in the Croton-Haverstraw and Catskill regions (Figure 4-79). After moving into the deeper river strata during September and October, yearling and older white catfish migrate downstream to overwinter in the lower estuary when temperatures in the upper estuary drop below 59 °F (NAI 1985).

Small white catfish feed on midge larvae until they become large enough to eat fish. Larger white catfish have a diverse diet that includes midge larvae, crustaceans, algae, fish eggs, and a variety of fish (Smith 1985).

Weekly length statistics for juvenile white catfish collected in 1992 show steady growth from mid July through the end of BSS/FSS collections in mid October (Figure 4-80 and Appendix Table D-20).

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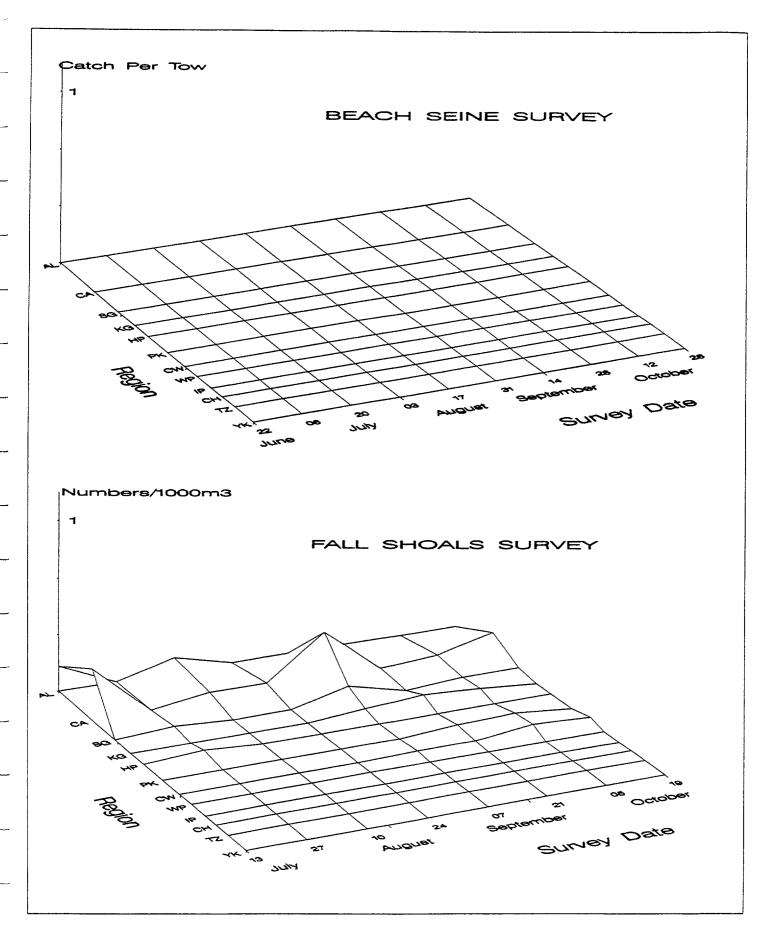


Figure 4-77. Spatiotemporal distribution of young-of-year white catfish in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

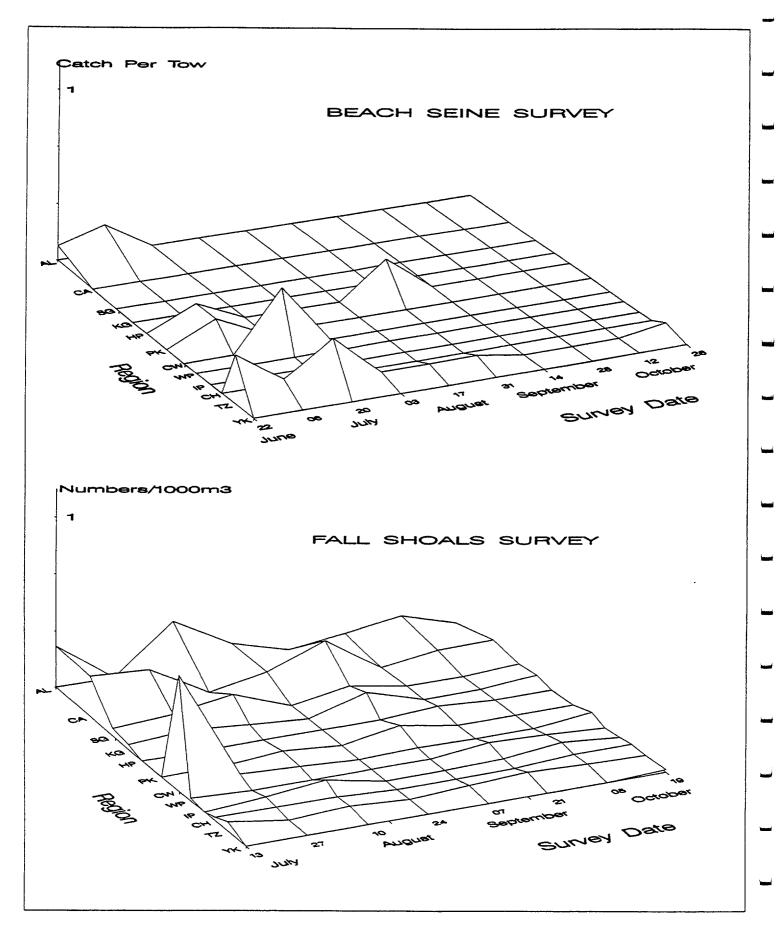
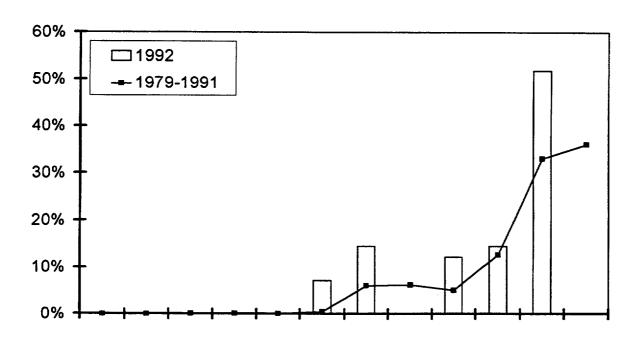


Figure 4-78. Spatiotemporal distribution of yearling and older white catfish in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



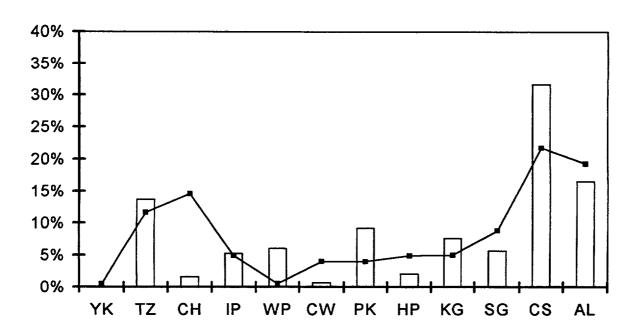


Figure 4-79 Geographical distribution indices for white catfish collected during Fall Shoals surveys of the Hudson River Estuary, 1979 - 1992.

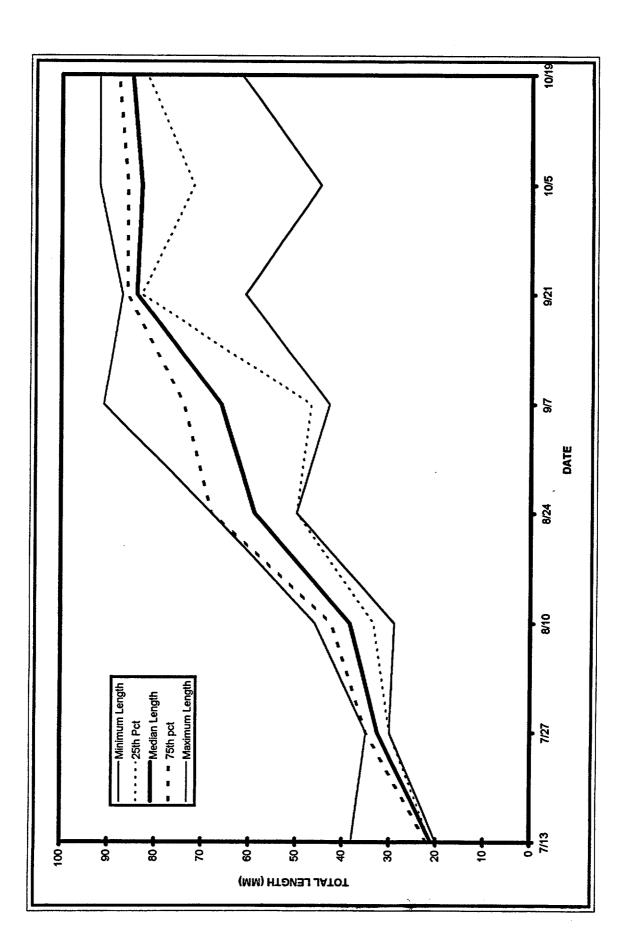


Figure 4-80 Weekly length statistics for white catfish young-of-the year in the Hudson River Estuary, 1992

4.17 WEAKFISH

Weakfish (*Cynoscion regalis*) is a member of the drum family commonly inhabiting near-shore waters from North Carolina to New York and occasionally straying as far as Nova Scotia or the eastern Gulf of Mexico. Weakfish overwinter in deeper waters of the continental shelf, generally between Chesapeake Bay and Cape Fear, North Carolina. When inshore waters begin to warm each spring, older weakfish begin to move toward shore and then head north along the coast. These older individuals are followed by successively younger groups of adult weakfish. During warmer months of the year, weakfish are found throughout inshore waters in their geographic range, with larger individuals the most abundant in northern areas. As water temperatures decline in the fall, weakfish begin to migrate southward and return to offshore overwintering areas.

Spawning occurs in near-shore coastal and marine waters in spring and summer, depending upon geographic location. Extensive spawning occurs in the south and in the New York Bight. Weakfish eggs are buoyant and hatch in about two days. The newly hatched larvae, which are less than 1/8 in. long, are weak swimmers and move shoreward up into the bays and estuaries. Duration of the larval stage appears to depend partially on prey density. In the nursery areas young weakfish feed on invertebrates and grow rapidly. They reach a length of 3 to 6 in. by the end of the first summer. Young weakfish can be found throughout the saline and brackish areas of estuaries but tend to be most common in areas where salinities are over 10 ppt. As water temperatures decline in fall, juvenile weakfish begin to leave these nursery areas and move toward southern overwintering areas.

In the New York Bight spawning typically occurs from May to mid-July, and there are two spawning peaks. Weakfish larvae are rarely encountered north of the George Washington Bridge, preferring more saline waters. Weakfish juveniles (YOY) typically first enter the areas north of the George Washington Bridge during July and most have emigrated from the estuary by mid-August. During the 1992 LRS weakfish juveniles peaked in mid-September and were most abundant in the Battery and Yonkers regions (Figure 4-81). In the 1992 FSS juvenile weakfish were found from the Yonkers through Indian Point regions, beginning in late July (Figure 4-82). They peaked in the Tappan Zee region in early September and gradually emigrated from the Yonkers region by mid-October (Figure 4-82). Very low numbers of yearling and older weakfish were collected in the FSS, indicating that few of these life stages enter the Hudson above Yonkers (Figure 4-83).

The 1992 geographical distribution of young-of-the-year and yearling and older weakfish in the FSS is generally consistent with the 1979-1991 long term trend (Figure 4-84). During 1992 it was apparent that juveniles and yearling and older weakfish were generally absent from the West Point and Cornwall regions, as compared to the long term record where these regions record from 10 to 20 % of Hudson River juvenile and yearling and older life stages.

Weekly length statistics for juvenile weakfish collected in 1992 show steady growth from late July through the end of BSS/FSS collections in mid October (Figure 4-85 and Appendix Table D-21).

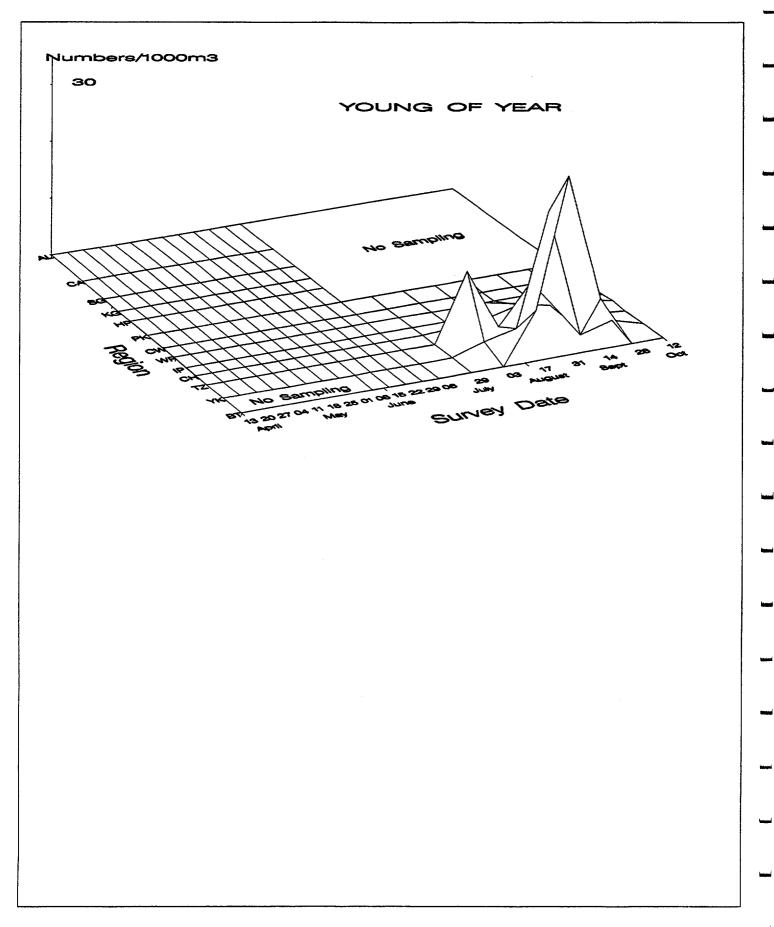


Figure 4-81. Spatiotemporal distribution of young-of-year stage of weakfish in the Hudson River estuary based on the 1992 Long River Ichthyoplankton Survey.

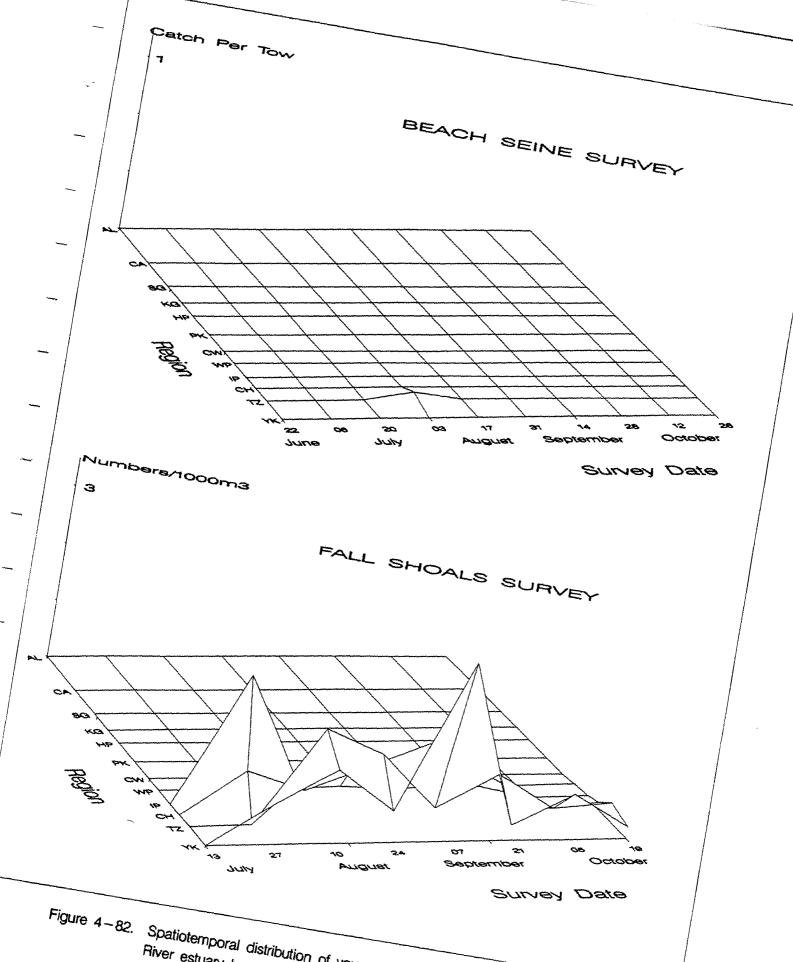


Figure 4-82. Spatiotemporal distribution of young-of-year weakfish in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

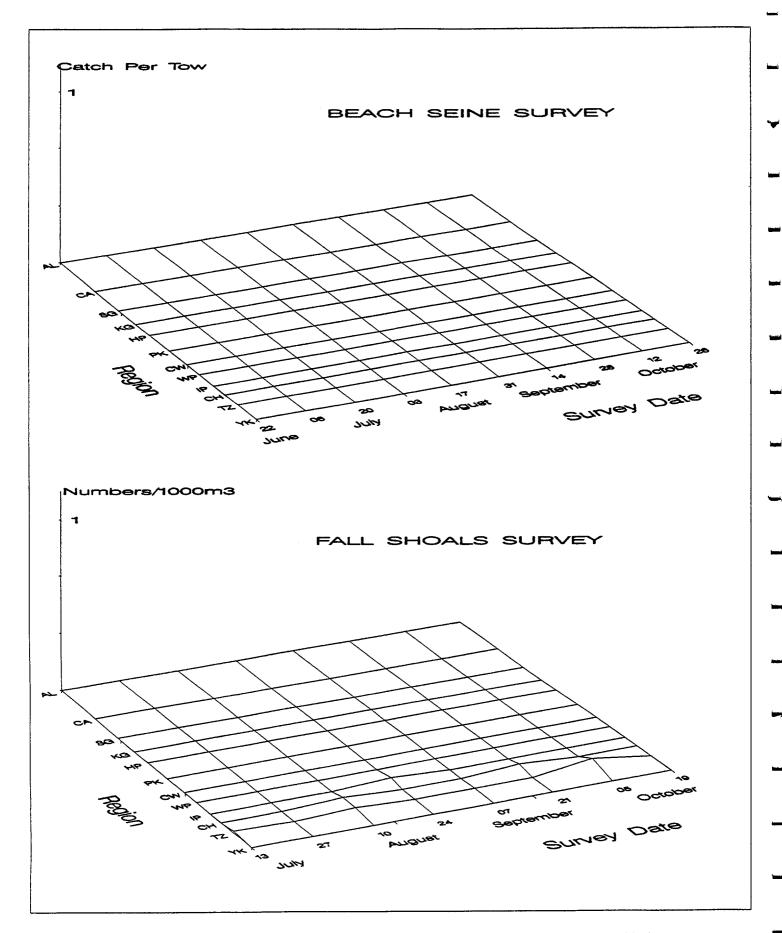
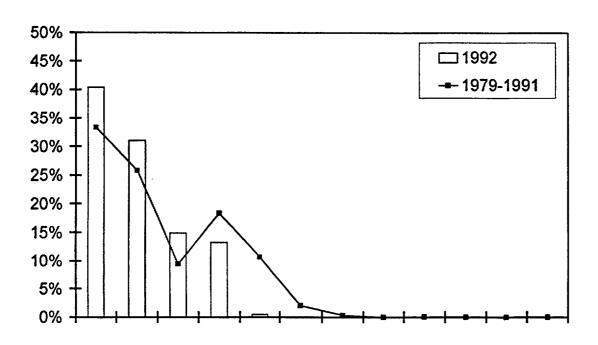


Figure 4-83. Spatiotemporal distribution of yearling and older weakfish in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.

YOUNG-OF-YEAR



YEARLING AND OLDER

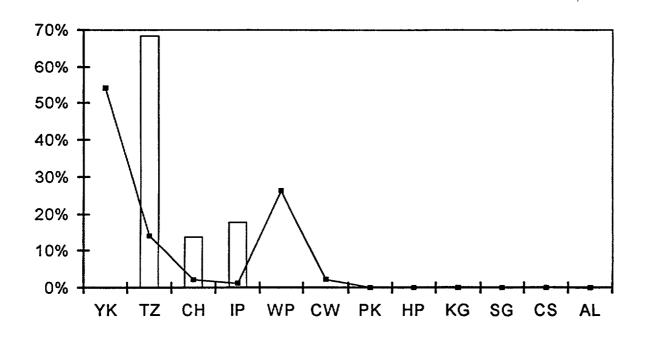


Figure 4-84 Geographical distribution indices for weakfish collected during Fall Shoals surveys of the Hudson River Estuary, 1979 - 1992.

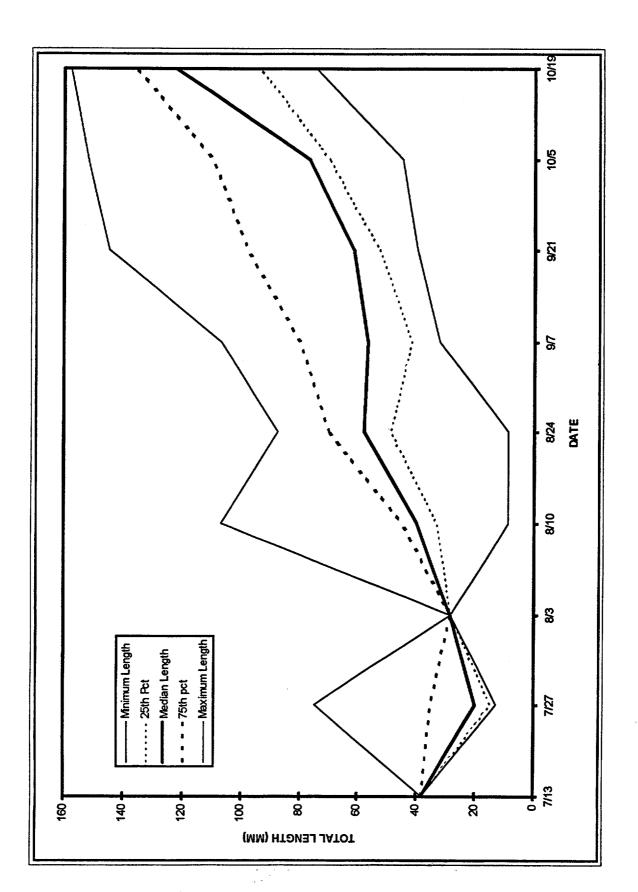


Figure 4-85 Weekly length statistics for weakfish young-of-the year in the Hudson River Estuary, 1992

4.18 BLUEFISH

Bluefish (*Pomatomus saltatrix*) is a predaceous oceanic fish species; in the western Atlantic Ocean its range is from Argentina to Maine and occasionally to Nova Scotia. In the New York Bight bluefish is a common inshore inhabitant that arrives in May and usually departs by November. North Atlantic bluefish migrate from New England to Cape Hatteras, North Carolina, in summer and to the Florida area and the southern Gulf Stream in winter, but migration patterns have not been positively identified. During migrations, smaller fish migrate closer to shore than larger fish. There are two major spawning aggregations in the mid-Atlantic: a spring spawning stock and a summer spawning stock. The degree to which the stocks are isolated is not known, but consistent morphological differences suggest some isolation of the stocks (Pottern et al. 1989).

Most of the bluefish population in the New York Bight probably originates from the spring-spawning stock (Chiarella and Conover 1990). The spring spawners move into the waters where the Gulf Stream and the continental shelf water meet between northern Florida and Cape Hatteras. Bluefish spawn as they migrate northward. North of Cape Hatteras the adults move shoreward. The smaller spent bluefish may spend summers in the Chesapeake and Delaware bays and Albemarle Sound. Larger fish move north longer than the smaller bluefish and migrate farther. Some move into Long Island Sound and more northern areas. In autumn, bluefish migrate back to the wintering areas off south Florida and the south Atlantic (Pottern et al. 1989).

The juvenile bluefish produced in the spring travel north with the Gulf Stream and migrate across the continental shelf to the mid-Atlantic bays and estuaries, which act as productive nursery areas. Spring-spawned juveniles spend most of their first summer in estuaries (Kendall and Walford 1979). In fall they migrate southward along the coast to winter off south Florida. The following spring, yearlings migrate north along the coast and return to the mid-Atlantic bays and estuaries and, to a lesser extent, the sounds of North Carolina (Pottern et al. 1989). The spring-spawning bluefish stock that contributes most to Hudson River fish ranges along most of the Atlantic coast.

Some summer-spawned larvae have also been reported in the more saline parts of estuaries in the mid-Atlantic Bight. Summer-spawned juveniles may spend only about a month in estuaries, but most are found along the shore (Kendall and Walford 1979). The summer-spawning adults start from the southern wintering areas, but they migrate north to the outer half of the continental shelf between Cape Hatteras and Cape Cod and spawn there. Spent spawners then move west, and show up in coastal waters, particularly along Long Island. Most of the juveniles from the summer spawn remain offshore during the summer. In fall the adults and juveniles migrate south. Juveniles from the summer spawn may spend the winter farther out to sea than juveniles from the spring spawning. Juveniles from the summer spawn migrate north the next spring and most of these juveniles may spend the summer in the sounds of North Carolina and may not return to their original nursery areas (Pottern et al. 1989).

Bluefish eggs are buoyant and pelagic and hatch in about two days. The newly hatched larvae are also pelagic and remain in offshore waters for one to two months before migrating shoreward toward shallow-water nursery areas. In the New York Bight YOY bluefish enter the shallow-water nursery areas as two groups. The first, from the spring spawning in the south Atlantic, are about 1 to 2 in. long when they enter the nursery areas in June or early July to feed and grow rapidly. The second, from the summer spawning in the mid-Atlantic Bight, are larger when they arrive in September.

1992 Year Class Report 4-125

YOY bluefish typically first enter areas north of the George Washington Bridge in early June and remain at least until early October. They are most common in shallow, more saline areas of the estuary, including the Tappan Zee and Haverstraw Bay, but typically range as far upriver as the Cornwall region. During 1992 juvenile bluefish were collected as far north as the Cornwall region and had emigrated from the Hudson River above the George Washington Bridge by late September (Figure 4-86). Salinity intrusions into the estuary appear to be a major determinant of geographic distribution within the estuary. YOY bluefish are also abundant in areas of the estuary south of the George Washington Bridge and adjacent waterways, which are part of the larger, coastal distribution.

The 1992 geographical distribution of young-of-the-year bluefish in the BSS is generally consistent with the 1974-1991 long term trend (Figure 4-87). However, the proportion of juveniles in the Tappan Zee region was substantially higher than seen in the long term trend where the bulk of the juvenile population is more evenly distributed between the Tappan Zee and Croton-Haverstraw regions.

In the Hudson River YOY bluefish aggressively feed on a variety of macroinvertebrates and fish and grow rapidly to a size of 3 to 6 in. by the time they begin to leave the estuary in late summer. Older bluefish, including adults, occasionally enter the lower estuary during summer and feed on available forage fish such as bay anchovy, Atlantic silversides, and young menhaden and river herrings. Bluefish reach sexual maturity during their second year of life. Annual fecundities range from 600,000 to 1,400,000 eggs per female, depending upon size. The maximum size of bluefish has been reported to be 45 in. and 30 lb. All ages of bluefish often travel in schools and are voracious feeders that commonly destroy more than they can eat.

1992 Year Class Report 4-126

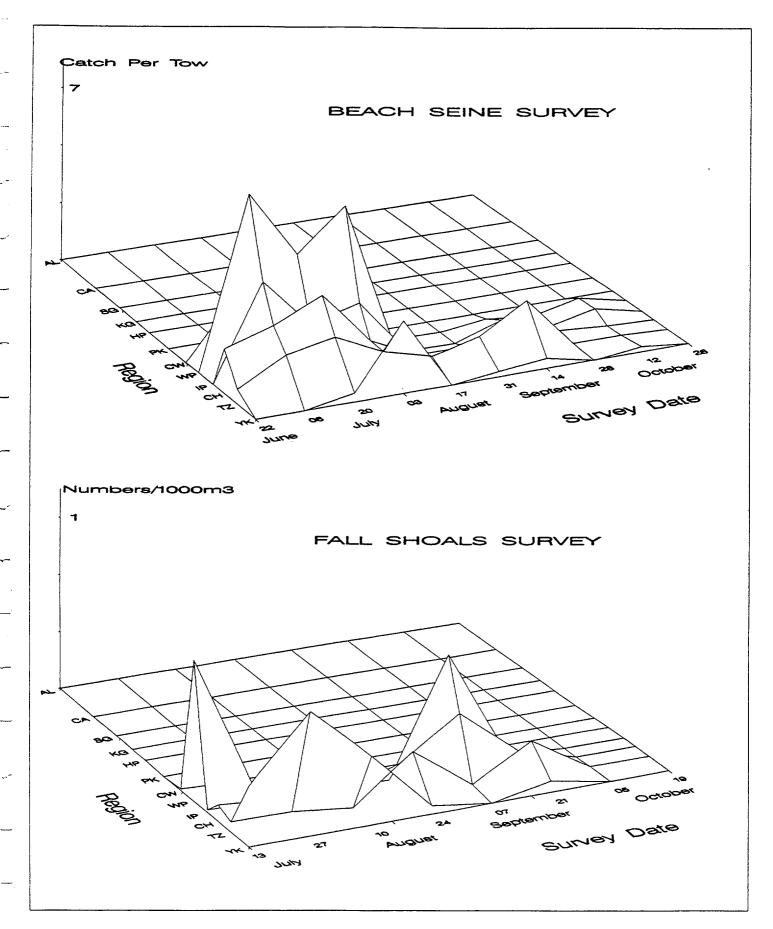
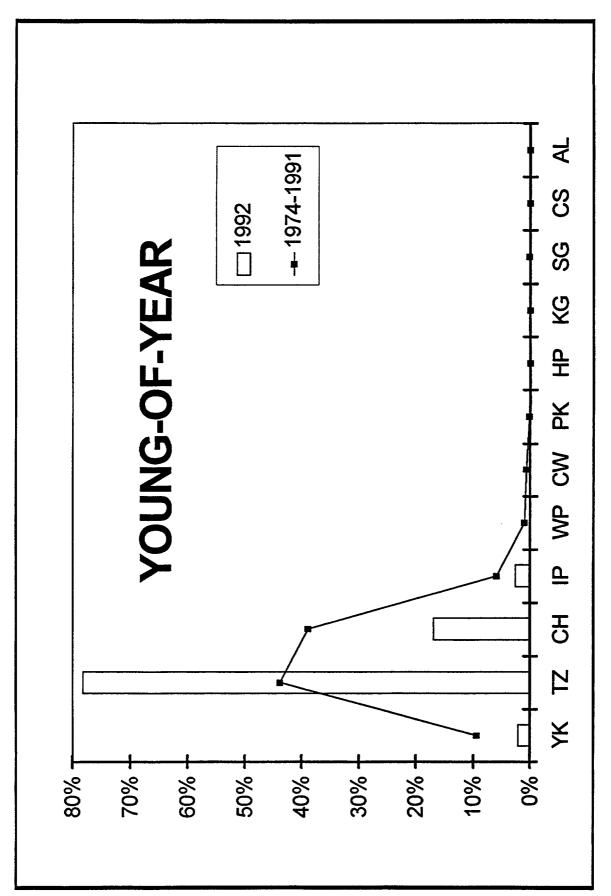


Figure 4-86. Spatiotemporal distribution of young-of-year bluefish in the Hudson River estuary based on the 1992 Fall Shoals and Beach Seine Surveys.



Geographical distribution indices for young-of -the-year bluefish collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1992. Figure 4-87.

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APPENDIX A

QUALITY ASSURANCE PROGRAM 1992 ICHTHYOPLANKTON AND FALL JUVENILE LABORATORY

QUALITY ASSURANCE REPORT FOR THE 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM AND 1992 FALL JUVENILE SURVEY

Prepared for

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
4 Irving Place
New York, New York 10003

Prepared by

NORMANDEAU ASSOCIATES INC. 25 Nashua Road Bedford, New Hampshire 03110-5500

QA-12607.51

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QUALITY ASSURANCE REPORT FOR THE 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM AND 1992 FALL JUVENILE SURVEY

1.0 INTRODUCTION

This quality assurance report for the laboratory tasks of the 1992 Hudson River Ichthyoplankton Survey and the 1992 Fall Juvenile Survey was prepared for Con Edison by Normandeau Associates Inc. (NAI).

To comply with Consolidated Edison's requirements for valid and reliable data on the Hudson River Ichthyoplankton Laboratory Program and the Fall Juvenile Survey, NAI implemented a Quality Assurance Plan that provides a 10% Average Outgoing Quality Limit (AOQL) for all measurement parameters collected. The Quality Assurance Plan consists of two systems: a quality control (QC) system and a quality assurance (QA) system. The QC system is managed by the program manager and conducted by operational personnel. The system monitors and documents the reliability and validity (accuracy, precision, completeness) of daily operations. The specific features of the QC system are determined by the Quality Assurance Department to insure that all procedures conform to Consolidated Edison's data requirements. The QA system is managed by NAI's Quality Assurance Director and utilizes project independent personnel familiar with the work or activities under evaluation to conduct performance and systems audits. These audits are designed to provide objective evidence that the quality control program and technical requirements, methods, and procedures as outlined in the program Standard Operating Procedures are being implemented. The outcomes of the QA system activities are

- · verification of the effectiveness of the QC system,
- assignment of corrective actions to resolve nonconforming procedures or data deficiencies,
- communication of audit results to project and staff managers for follow-up, and

 objective validation or improvement of project operations.

This report provides a compilation of QC system data verifying the results of the 1992 Hudson River Ichthyoplankton Laboratory Program and 1992 Fall Juvenile Survey activities. Determinations of the fraction inspected, process average (percent nonconforming), and average outgoing quality are presented for both programs. In addition, for the 1992 Hudson River Ichthyoplankton Laboratory Program the results include percent measurement error, a summary of the number of each taxon-life stage found during sorting QA, and cumulative error rates for each taxon-life stage.

2.0 QUALITY CONTROL/QUALITY ASSURANCE METHODS

2.1 QUALITY CONTROL PROGRAMS

For sorting and identification of samples from the 1992 Hudson River Ichthyoplankton Laboratory Program, NAI used a continuous sampling plan designed to provide a 10% Average Outgoing Quality Limit (U.S. Department of Defense 1981). A flow diagram of how the sampling plan was applied is presented in Figure 1. A summary of the sampling plan, tolerances and QC sample definitions used for each measurement parameter is presented in Table 1. Quality control inspection was applied on a laboratory-wide basis for the sorting task and to each individual processor for the identification task. Quality control samples were selected in a random manner utilizing random number tables. As determined from the sampling plan outlined in Table 1, a given number of quality control samples were reprocessed by QC inspectors with expertise in the task being inspected. In cases where a sample was subdivided and counted, counts for all subdivisions were combined before calculating percent error for that sample. If the difference between the quality control value and the original value exceeded acceptable tolerances (Table 1), a third measurement could be obtained to verify one of the

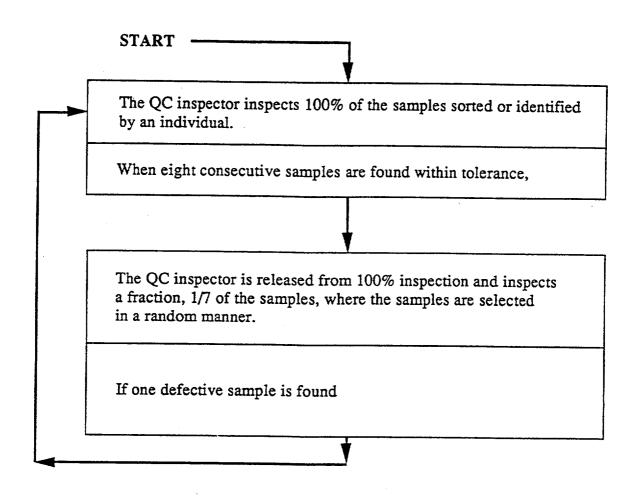


Figure 1. Quality control inspection plan for ichthyoplankton sorting and identification tasks.

measurements. If a sample was found to have exceeded acceptable tolerances, all subsequent samples processed by the laboratory (for sorting) or by the same technician (for identification) were subjected to 100% quality control until an appropriate number of consecutive samples (i) were found within tolerance as determined by the continuous sampling plan (Table 1 and Figure 1). The Quality Assurance Plan for the 1991 and 1992 Hudson River Ichthyoplankton Laboratory Programs (Rev. 3, Change 0, 31 Dec 92) documents specific QA/QC methods utilized for this program.

TABLE 1. TASK SPECIFIC APPLICATIONS OF CONTINUOUS SAMPLING PLANS FOR THE 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

LABORATORY TASK	CSP-1 AOQL-10% i f		SAMPLE TOLERANCE	QC SAMPLE DEFINITION	
Sorting	8	1/7	± 2 if ≤20 organisms ± 10% if > 20 organisms	one sample	
Identification	8	1/7	<pre>± 2 if ≤ 20 ± 10% if > 20 for every taxon in the sample (in identifying, assigning a life stage, or counting any species, errors are cumulative by life stage within each taxon)</pre>	one sample	

For laboratory identification and length measurements of young-of-the-year fishes in the 1992 Fall Juvenile Survey, NAI used a continuous sampling plan designed to provide a 10% Average Outgoing Quality Limit (U.S. Department of Defense, 1981). A flow diagram of how the plan was applied is presented in Figure 2. A summary of the sampling plan, tolerances, and QC sample definitions used for each task is shown in Table 2. QC samples were selected as specified by the appropriate plan in Table 2, using random numbers, and reprocessed by QC

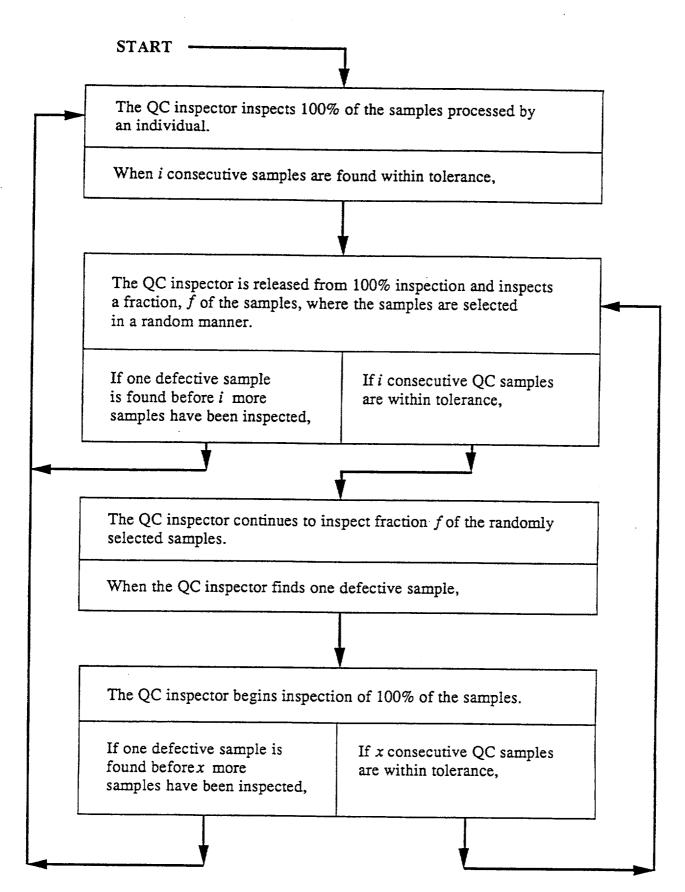


Figure 2. Quality control inspection plan for identification and length measurement of young-of-the-year fishes.

inspectors. If the difference between original and QC values exceeded the acceptable tolerance, a third value was obtained as a resolution. The QC methods are documented in the 1992 Hudson River Fall Juvenile and Beach Seine Surveys Standard Operating Procedures (Rev. 9, Change 1, 6/26/92). Young-of-the-year fishes were identified in the laboratory for the first two Fall Shoals river runs and the first three Beach Seine Survey river runs. Young-of-the-year fishes were identified in the field starting with Fall Shoals river run 3 and Beach Seine Survey river run 4. The same quality control procedures applied to both field and laboratory identifications. All length measurements of young-of-the-year fishes occurred in the laboratory.

TABLE 2. TASK SPECIFIC APPLICATIONS OF CONTINUOUS SAMPLING PLANS FOR THE 1992 FALL JUVENILE SURVEY.

TASK	QC PLAN	YOOT	i	f	х	TOLERANCE	OC SAMPLE DEFINITION
Identification	CSP-V	7%	21	1/15	7	±10% of total count or ±2 individuals when <25 fish	One taxon
Length	CSP-V	7%	30	1/50	10	±1 mm when <34 mm TL ±3% when >34mm TL	One fish

2.2 QUALITY CONTROL REPORTING METHODS

The 1992 Hudson River Ichthyoplankton Laboratory Program Sort and Identification Quality Control Logs were keyed, verified, and error-checked to produce SAS data sets. From these data, fraction inspected, process average (percent nonconforming), and percent measurement error (precision) were determined for each river run and for the entire study. For the 1992 Fall Juvenile Survey, QC data were used to determine fraction inspected and process average (percent nonconforming) for the entire study (combining all river runs of both the Fall Shoals Survey and the Beach Seine Survey).

2.2.1 Fraction Inspected

Fraction Inspected

= <u>Number of Samples Inspected</u> x 100 (Equation 1)
Total Number of Samples

River Run: Fraction inspected for a river run (Equation 1) was one hundred times the number of samples inspected divided by the total number of samples analyzed for that river run. For the ichthyoplankton identification task, the total number of samples excludes empty ("no catch") samples that did not require processing by an identifier.

Entire Study: Fraction inspected for the entire study was one hundred times the number of samples inspected divided by the total number of samples analyzed during the study.

2.2.2 <u>Process Average (Percent Nonconforming)</u>

Process Average (Percent Nonconforming)

= <u>Number Nonconforming Samples Inspected</u> x 100 (Equation 2) Number of Samples Inspected

River Run: Process average for a river run (Equation 2) was one hundred times the number of nonconforming quality control samples found for that river run divided by the total number of quality control samples inspected for that river run.

Entire Study: Process average for the entire study was one hundred times the total number of nonconforming quality control samples for the study divided by the total number of quality control samples inspected for the study. The results of this analysis was a determination of the actual incoming quality level of each measurement parameter. (Note that because samples checked by QC found to be defective were rectified during QC, the average outgoing quality of the final data set differed from the percent nonconforming.)

2.2.3 Percent Measurement Error

2.2.3.1 Sorting Task

Sorting Percent Measurement Error =

Quality Control Value x 100 (Equation 3) (Original Value + Quality Control Value)

<u>Sample</u>: Percent measurement error for a sorted sample (Equation 3) was one hundred times the quality control value divided by the sum of the original value and the quality control value. If the total count (original value plus quality control value) was less than or equal to 20, and the quality control value (i.e., the number of organisms missed by the sorter and found during sort QC inspection) was one or two, the percent measurement error for the sorted sample was defined as zero.

River Run: Mean percent measurement error for sorted samples for a river run was the sum of the percent measurement errors for each sample inspected during the river run divided by the total number of samples inspected for the river run.

Entire Study: Mean percent measurement error for sorted samples for the entire study was the sum of the percent measurement errors for each sample inspected during the study divided by the total number of samples inspected for the study. (Note: this method of averaging gives equal weight to each sample, regardless of the number of organisms present).

2.2.3.2 Identification Task

Life Stage Percent Measurement Error =

(Original Value - Quality Control Value) x 100 (Equation 4) Quality Control Value

Life Stage: Percent measurement error for a life stage (Equation 4) was one hundred times the difference between the original value and the quality control value divided by the quality control value. For life stages where the quality control value was 20 or less, if the original and quality control values differed by less than or equal to two organisms the percent measurement error was defined as zero. For life stages where the quality control value was 20 or less and the original and quality control values differed by more than two organisms, the percent measurement error was calculated utilizing Equation 4. In the latter case, if the quality control value was zero, the percent measurement error was calculated by multiplying the difference between the original and quality control values by 100. This results in percent measurement error values which are at times extremely large (e.g. possibly several hundred percent for a life stage of a taxon in a sample) and not truly indicative of the actual proportion of specimens misidentified, mis-staged, or miscounted in a sample.

Taxon: Percent measurement error for an identified taxon was the sum of the absolute values of percent measurement error for each life stage within the taxon. Refer to Figure 3 for an example of taxon percent measurement error calculations.

River Run: Mean percent measurement error for the identification task for a river run was the sum of the percent measurement errors for all taxa inspected during the river run divided by the total number of taxa inspected for the river run. This statistic was computed by averaging taxa rather than samples because even though complete samples were inspected and reworked for identification quality control, the pass/fail criterion was whether any taxon in the sample individually exceeded the 10% tolerance.

		<u>EGGS</u>	POST YOLK-SAC <u>LARVAE</u>	UNDETERMINED	TOTAL
Taxon 1					
	Original Value Quality Control Value	103 100	176 194	25 26	
	% Measurement Error Life Stage	3.0	-9.3	-3.8	16.1
Taxon 2					
	Original Value Quality Control Value		2		
	% Measurement Error Life Stage		0		o
Taxon 3					
	Original Value Quality Control Value		8 2		
	% Measurement Error Life Stage		300		300

Figure 3. Example of percent measurement error calculations for individual taxa during the identification task.

Entire Study: Mean percent measurement error for identified taxa for the entire study was the sum of the percent measurement errors for all taxa inspected during the study divided by the total number of taxa inspected for the study.

2.2.4 Average Outgoing Quality

At the completion of these studies, the Average Outgoing Quality (AOQ) was calculated for each measurement parameter inspected. Continuous sampling plans were used for all tasks. Continuous sampling plans are devised for processes involving a continuous or nearly continuous flow of products or other entities. For these types of processes, it is extremely difficult to organize units into discrete groups commonly referred to as lots. As a result, inspection must be performed on individual units drawn from a continuous flow of products and a decision made concerning the quality of units produced based on the inspection results. Rectification is performed on any nonconforming unit found during inspection, followed by 100% screening of a number of subsequent units depending on the sampling plan. Average Outgoing Quality for each laboratory task was calculated as a function of the process average (percent nonconforming) and the fraction of total units inspected (Stephens 1979). This calculation applies to continuous sampling plans when nonconforming units found are rectified:

$$AOQ = \frac{p'(1-f)q^{i}}{f+(1-f)q^{i}} \times 100$$
 (Equation 5)

where

- p' = Process average (percent nonconforming) as a decimal
 fraction
- f = Fraction of units inspected. This is a parameter of the sampling plan.
- q = 1-p' = Process fraction conforming
- i = Clearing interval. This is a parameter of the sampling plan.

Example:

$$p' = 0.0689$$

$$f = 1/7 = 0.1429$$

$$q = 1-0.0689 = 0.9311$$

$$i = 8$$

$$AOQ = \frac{0.0689 (1-0.1429)(0.9311)^8}{0.1429 + (1-0.1429) (0.9311)^8} \times 100 = 5.32\%$$

The above equation for calculating AOQ was formulated specifically for CSP-1 sampling plans such as those used for the ichthyoplankton sorting and identification (Table 1). The same equation was used to calculate AOQ for young-of-the-year identifications and measurements, which used CSP-V plans (Table 2). When Equation 5 is used for CSP-V plans, the calculated AOQ is conservatively high, because the equation does not take into account the times when the number of consecutive reinspection following a failure is x (which is smaller than i).

2.2.5 <u>Cumulative Error Rates</u>

Due to the non-independence of identification errors across taxa and life stages, and to the cumulation of errors within taxa, a relatively high fraction of samples may fail QC inspection even though only a small fraction of organisms are incorrectly identified or counted. In order to present the error frequencies more realistically for particular taxa-life stages, two additional statistics were calculated for each taxon-life stage for the identification/counting process.

Absolute Error Rate =

Net Error Rate =

$$\begin{array}{cccc}
n & & & \\
\Sigma & & (I_i - Q_i) / & \sum_{i=1}^{n} Q_i \\
& & & \end{array}$$

Equation 7

where

 I_i = initial count for taxon-life stage in sample i Q_i = QC count for taxon-life stage in sample i n = number of samples in the entire study

if the sum of Q_i for the entire study was zero for the taxon-life stage, then the sum of Q_i was set equal to one for the purpose of calculating absolute and net error rate.

The absolute error rate is the approximate fraction of the taxon-life stage that was originally identified or counted incorrectly. This is an estimate of the fraction of erroneous countable items in the uninspected samples.

Net error rate is the approximate relative error in the total counts for the taxon-life stage. For this index, positive (original count too high) and negative (original count too low) errors cancel each other so that the index reflects the relative net bias to the taxon-life stage abundance.

3.0 RESULTS

3.1 <u>HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM</u>

The Average Outgoing Quality (AOQ) for the sorting and identification tasks of the 1992 Hudson River Ichthyoplankton Laboratory Program was 4.62% and 4.31% respectively. These AOQ levels represent the actual or achieved quality for measurement parameters and were well within the 10% AOQL requirement of Con Edison. The Average Fraction

Inspected (AFI) was 19.74% for sorting and 14.73% for identification (Table 3).

TABLE 3. FRACTION INSPECTED, PROCESS AVERAGE, MEAN PERCENT MEASUREMENT ERROR, AND AVERAGE OUTGOING QUALITY OF TASKS PERFORMED BY NAI FOR THE 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

TASK	FRACTION INSPECTED(%)	PROCESS AVERAGE(%)	MEAN PERCENT MEASUREMENT ERROR(%)	A0Q(%)
Sorting	19.74	5.87	3.16	4.62
Identification	14.73	5.43	3.81	4.31

The AFI for the sorting task as calculated here is conservatively low, because samples used as "training QCs" were not entered into the formal QC inspection plan. Each training QC sample was reprocessed by the Sorting Supervisor during the training process, so these do not represent the independent performance of the sorter. Only after a new sorter demonstrated proficiency in the training program were subsequent samples processed by that sorter entered into the laboratory-wide QC plan.

Sorting and identification tasks were also evaluated on a sampling week basis representing river runs (sampling weeks) 1 through 20. Sorted samples were inspected at a rate of 10.96% to 28.21% for individual river runs (Table 4). River run nonconformities for the sorting task among the inspected samples ranged from 0% to 19.35% and was 5.87% overall (Table 5). Sorting measurement error was between 0% and 7.76% and averaged 3.16% for the study (Table 6). For the task of sample identification, 11.97% to 19.33% of samples were inspected from individual river runs (Table 7). Percent nonconforming for the identification task ranged among river runs from 0% to 29.41% (Table 8) and measurement error from 0.16% to 22.06% (Table 9). Overall percent nonconformance (Table 8) and measurement error (Table 9) for the identification task of this study were 5.43% and 3.81%, respectively.

TABLE 4. SAMPLE SORTING FRACTION INSPECTED RESULTS, 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

	FRACTION INSPEC SORTING QC	TED	
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	TOTAL # OF SAMPLES SORTED	FRACTION INSPECTED
04/13/92	13	106	12.26
04/20/92	14	108	12.96
04/27/92	22	108	20.37
05/04/92	31	115	26.96
05/11/92	31	118	26.27
05/18/92	26	110	23.64
05/25/92	23	110	20.91
06/01/92	26	110	23.64
06/08/92	28	119	23.53
06/15/92	33	117	28.21
06/22/92	31	118	26.27
06/29/92	16	118	13.56
07/06/92	27	119	22.69
07/20/92	11	72	15.28
08/03/92	11	73	15.07
08/17/92	10	73	13.70
08/31/92	10	73	13.70
09/14/92	8	73	10.96
09/28/92	11	73	15.07
10/12/92	10	73	13.70
STUDY	392	1986	19.74

TABLE 5. SAMPLE SORTING PERCENT NONCONFORMANCE RESULTS, 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

% NONCONFORMANCE SORTING QC				
SAMPLING WEEK (BEGINNING MONDAY)	# OF NONCON- FORMITIES	TOTAL # OF SAMPLES INSPECTED	% NON- CONFORMANCE (WEEK)	% NON- CONFORMANCE (STUDY)
04/13/92	0	13	0.00	0.00
04/20/92	0	14	0.00	0.00
04/27/92	1	22	4.55	2.04
05/04/92	2	31	6.45	3.75
05/11/92	6	31	19.35	8.11
05/18/92	3	26	11.54	8.76
05/25/92	4	23	17.39	10.00
06/01/92	1	26	3.85	9.14
06/08/92	2	28	7.14	8.88
06/15/92	1	33	3.03	8.10
06/22/92	2	31	6.45	7.91
06/29/92	0	16	0.00	7.48
07/06/92	1	27	3.70	7.17
07/20/92	0	11	0.00	6.93
08/03/92	0	11	0.00	6.71
08/17/92	0	10	0.00	6.52
08/31/92	0	10	0.00	6.34
09/14/92	0	8	0.00	6.20
09/28/92	0	11	0.00	6.02
10/14/92	0	10	0.00	5.87
STUDY	23	392		

TABLE 6. SAMPLE SORTING MEAN PERCENT MEASUREMENT ERROR RESULTS, 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

	MEAN PERCENT MEASUREMENT ERROR SORTING QC	
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	MEAN PERCENT MEASUREMENT ERROR
04/13/92	13	0.63
04/20/92	14	0.32
04/27/92	22	2.12
05/04/92	31	3.27
05/11/92	31	7.76
05/18/92	26	6.20
05/25/92	23	6.15
06/01/92	26	2.84
06/08/92	28	3.11
06/15/92	33	2.34
06/22/92	31	2.92
06/29/92	16	1.96
07/06/92	27	3.03
07/20/92	11	2.07
08/03/92	11	1.72
08/17/92	10	2.16
08/31/92	10	0.55
09/14/92	8	2.15
09/28/92	11	0.45
10/12/92	10	0.00
STUDY	392	3.16

TABLE 7. SAMPLE IDENTIFICATION FRACTION INSPECTED RESULTS, 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

FRACTION INSPECTED IDENTIFICATION QC			
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	TOTAL # OF SAMPLES IDENTIFIED	FRACTION INSPECTED
04/13/92	10	67	14.93
04/20/92	7	49	14.29
04/27/92	14	96	14.58
05/04/92	22	115	19.13
05/11/92	17	117	14.53
05/18/92	14	109	12.84
05/25/92	15	110	13.64
06/01/92	16	110	14.55
06/08/92	17	119	14.29
06/15/92	14	117	11.97
06/22/92	17	118	14.41
06/29/92	16	118	13.56
07/06/92	23	119	19.33
07/20/92	13	72	18.06
08/03/92	10	73	13.70
08/17/92	11	73	15.07
08/31/92	9	73	12.33
09/14/92	10	73	13.70
09/28/92	. 11	73	15.07
10/12/92	10	73	13.70
STUDY	276	1874	14.73

TABLE 8. SAMPLE IDENTIFICATION PERCENT NONCONFORMANCE RESULTS, 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

% NONCONFORMANCE IDENTIFICATION QC				
SAMPLING WEEK (BEGINNING MONDAY)	# OF NONCON- FORMITIES	TOTAL # OF SAMPLES INSPECTED	% NON- CONFORMANCE (WEEK)	% NON- CONFORMANCE (STUDY)
04/13/92	0	10	0.00	0.00
04/20/92	0	7	0.00	0.00
04/27/92	0	14	0.00	0.00
05/04/92	0	22	0.00	0.00
05/11/92	3	17	17.65	4.29
05/18/92	0	14	0.00	3.57
05/25/92	4	15	26.67	7.07
06/01/92	1	16	6.25	6.96
06/08/92	5	17	29.41	9.85
06/15/92	0	14	0.00	8.90
06/22/92	0	17	0.00	7.98
06/29/92	0	16	0.00	7.26
07/06/92	2	23	8.70	7.43
07/20/92	0	13	0.00	6.98
08/03/92	0	10	0.00	6.67
08/17/92	0	11	0.00	6.36
08/31/92	0	9	0.00	6.12
09/14/92	0	10	0.00	5.88
09/28/92	Ō	11	0.00	5.64
10/12/92	Ō	10	0.00	5.43
STUDY	15	276		

TABLE 9. SAMPLE IDENTIFICATION MEAN PERCENT MEASUREMENT ERROR RESULTS, 1992 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

MEAN PERCENT MEASUREMENT ERROR IDENTIFICATION QC

		IDDINITE	ONITON QO	
SAMPLING WE		TOTAL # OF SAMPLES INSPECTED	MEAN PERCENT MEASUREMENT ERROR	NUMBER OF TAXA INSPECTED
04/13/92	2	10	0.18	18
04/20/92		7	0.31	9
04/27/92		14	0.25	37
05/04/92		22	0.23	90
05/11/92		17	12.02	82
05/18/92		14	1.47	63
05/25/92		15	22.06	82
06/01/92		16	1.52	94
06/08/92		17	12.40	104
06/15/92		14	0.84	82
06/22/92		17	0.91	102
06/29/92		16	0.71	108
07/06/92		23	1.01	145
07/20/92		13	0.35	61
08/03/92		10	0.58	39
08/17/92		11	0.97	43
08/31/92		9	0.90	42
09/14/92		10	0.69	26
09/28/92		11	0.92	34
10/12/92		10	0.16	29
STUDY		276	3.81	1290

Measurement error results are skewed towards high values as a result of the method of computation at the life stage level. In addition, measurement errors are summed over life stages within each taxon, which then amplifies the already skewed life stage values. These data are not indicative of actual measurement error and should only be compared to other measurement error results that are calculated using exactly the same methods.

Additional organisms found during the sort QC were identified independently to determine the frequency of species and life stages missed during the initial sort. Four taxa accounted for 88% of the additional organisms found during sort QC: white perch, striped bass, bay anchovy, and clupeids (Table 10).

For the six taxa most commonly encountered during sort QC the total number of each life stage found in the sort QC was low compared to the total number sorted (Table 11). For most taxa-life stages the percentage missed by the original sorter was well under 2%.

The dominant life stage for the taxa commonly found during the sort QC was post-yolk-sac larvae (Table 11). For bay anchovy, eggs found during sort QC were also prevalent. Eggs and yolk-sac larvae of striped bass and white perch were also found in moderate numbers.

Absolute error rates of the identification process for commonly encountered taxa ranged from 0 to greater than 1, but most taxa-life stages had rates less than 0.05. Generally, only those taxa-life stages with total counts under 25 had absolute error rates above 0.05 (Table 12). The taxon *Morone* sp. had high absolute errors compared to most other taxa, indicating discrepancies in counts resulting from the more experienced QC inspectors being able to identify specimens in poor condition to the species level when the original identifier had been more conservative.

TABLE 10. RANKING OF SPECIES MISSED DURING INITIAL SORT AND FOUND DURING SORT QC.

TAXON	NUMBER OF ORGANISMS FOUND IN SORT OC	PERCENT
WHITE PERCH	1382	33.78
STRIPED BASS	1241	30.33
BAY ANCHOVY	667	16.30
CLUPEID UNID.	304	7.43
UNIDENTIFIED	111	2.71
GOBIID UNID.	94	2.30
MORONE SP.	72	1.76
RAINBOW SMELT	55	1.34
TESSELLATED DARTER	28	0.68
WINDOWPANE	28	0.68
CYPRINID UNID.	17	0.42
AMERICAN SHAD	16	0.39
COMMON CARP	15	0.37
CUNNER	15	0.37
ATLANTIC TOMCOD	10	0.24
WINTER FLOUNDER	9	0.22
HOGCHOKER	8	0.20
GRUBBY	7	0.17
YELLOW PERCH	3	0.07
CENTRARCHID UNID.	2	0.05
TAUTOG	2	0.05
TIDEWATER SILVERSIDE	2	0.05
BLUEBACK HERRING	1	0.02
GIZZARD SHAD	1	0.02
NORTHERN PIPEFISH	1	0.02
TOTAL	4091	100.00

TABLE 11. SUMMARY BY LIFE STAGE OF THE SIX HIGHEST RANKED TAXA MISSED DURING ORIGINAL SORT AND FOUND DURING SORT QC COMPARED TO TOTAL COUNT.

TAXON	LIFESTAGE	NUMBER MISSED	PERCENT IN EACH STAGE	PERCENT OF TOTAL FOUND	TOTAL ORGANISMS FOUND ^a
BAY ANCHOVY	EGGS	379	56.82	0.51	74047
	YOLK-SAC LARVAE	0	0.00	0.00	7
	POST YOLK-SAC LARVAE	288	43.18	0.48	60335
	YOUNG-OF-THE-YEAR	0	0.00	0.00	16207
	UNIDENTIFIED	0	0.00	0.00	33
CLUPEID UNID.	EGGS	43	14.14	0.42	10174
	YOLK-SAC LARVAE	50	16.45	0.87	5752
	POST YOLK-SAC LARVAE	211	69.41	0.72	29228
	YOUNG-OF-THE-YEAR	0	0.00	0.00	796
	UNIDENTIFIED	0	0.00	0.00	146
GOBIID UNID.	POST YOLK-SAC LARVAE	94	100.00	1.45	6489
	YOUNG-OF-THE-YEAR	0	0.00	0.00	21
MORONE SP.	YOLK-SAC LARVAE	2	2.78	1.06	188
	POST YOLK-SAC LARVAE	29	40.28	1.01	2884
	UNIDENTIFIED	41	56.94	4.54	903
STRIPED BASS	EGGS	412	33.20	3.06	13452
	YOLK-SAC LARVAE	434	34.97	1.17	37178
	POST YOLK-SAC LARVAE	390	31.43	0.45	86213
	YOUNG-OF-THE-YEAR	3	0.24	1.24	242
	UNIDENTIFIED	2	0.16	1.41	142
WHITE PERCH	EGGS	238	17.22	1.64	14497
	YOLK-SAC LARVAE	382	27.64	2.47	15467
	POST YOLK-SAC LARVAE	762	55.14	0.73	104347
	YOUNG-OF-THE-YEAR	0	0.00	0.00	71
	UNIDENTIFIED	0	0.00	0.00	16

^aIncludes both original count and additional organisms found during sort QC.

TABLE 12. CUMULATIVE NET AND ABSOLUTE ERROR RATES FOR COMMONLY ENCOUNTERED TAXA IN SAMPLES SELECTED FOR QC INSPECTION OF IDENTIFICATION AND COUNTING PROCESS.

TAXON	LIFESTAGE	TOTAL COUNT	NET ERROR RATE	ABSOLUTE ERROR RATE	·N
BAY ANCHOVY	UNIDENTIFIED	7	0.28571	0.85714	6
	EGGS	12553	0.00008	0.01681	51
	POST YOLK-SAC LARVAE	9715	0.00412	0.02038	110
	YOUNG-OF-THE-YEAR	2156	-0.00186	0.02226	58
AMERICAN SHAD	UNIDENTIFIED	0	1.00000	1.00000	1
	EGGS	245	-0.01224	0.02041	17
	YOLK-SAC LARVAE	125	0.00000	0.03200	18
	POST YOLK-SAC LARVAE	258	-0.01938	0.03488	26
	YOUNG-OF-THE-YEAR	134	0.00000	0.01493	38
HOGCHOKER	EGGS	966	-0.00725	0.02381	15
	YOUNG-OF-THE-YEAR	4	0.00000	0.00000	3
BLUEBACK HERRING	YOUNG-OF-THE-YEAR	1699	0.00353	0.00942	51
RAINBOW SMELT	UNIDENTIFIED	3	-0.66667	0.66667	3
	YOLK-SAC LARVAE	271	-0.00369	0.04059	26
	POST YOLK-SAC LARVAE	840	-0.00595	0.02738	77
	YOUNG-OF-THE-YEAR	595	0.00672	0.02017	50
STRIPED BASS	UNIDENTIFIED	25	0.04000	0.04000	1
	EGGS	2078	0.01877	0.02551	31
	YOLK-SAC LARVAE	3833	-0.00913	0.03731	57
	POST YOLK-SAC LARVAE	9575	-0.00292	0.01796	102
	YOUNG-OF-THE-YEAR	20	0.15000	0.15000	8
ATLANTIC TOMCOD	UNIDENTIFIED	2	0.00000	0.00000	2
	POST YOLK-SAC LARVAE	431	-0.02320	0.03248	29
	YOUNG-OF-THE-YEAR	941	0.00850	0.01488	68
WHITE PERCH	UNIDENTIFIED	0	1.00000	1.00000	1
	EGGS	1223	0.00491	0.02289	48
	YOLK-SAC LARVAE	2219	0.00451	0.03064	55
	POST YOLK-SAC LARVAE	10725	0.00261	0.02219	104
	YOUNG-OF-THE-YEAR	11	-0.36364	0.36364	4
CLUPEID UNID.	UNIDENTIFIED	22	0.27273	0.36364	8
	EGGS	1773	0.02369	0.03610	22
	YOLK-SAC LARVAE	1422	0.00914	0.03305	42
	POST YOLK-SAC LARVAE	3863	0.00104	0.01864	85
MODONE CD	YOUNG-OF-THE-YEAR	16 56	0.12500 0.14286	0.12500	4
MORONE SP.	UNIDENTIFIED YOLK-SAC LARVAE	0	7.00000	0.17857 7.00000	8 1
	POST YOLK-SAC LARVAE	158	0.11392	0.53165	34
MINTED ELOIMBED	UNIDENTIFIED	120	1.00000	1.00000	1
WINTER FLOUNDER	YOLK-SAC LARVAE	5	0.00000	0.00000	1
			0.00000	0.00361	23
	POST YOLK-SAC LARVAE YOUNG-OF-THE-YEAR	277 2	0.00000	0.00000	23
LITATIONIO A APE					
WINDOWPANE	EGGS	518 76	0.01158 0.01351	0.01544	8
	POST YOLK-SAC LARVAE	74 16		0.01351	9
מחודה והידי	YOUNG-OF-THE-YEAR	16	0.00000	0.00000	8
GOBIID UNID.	POST YOLK-SAC LARVAE	1022	0.00587	0.01566	59

Net error rates were substantially lower than the absolute error rates in most cases, demonstrating that errors often tended to cancel each other out. This was noticeable for many of the more abundant taxa-life stages, such as bay anchovy eggs, post yolk-sac larvae and young-of-the-year, as well as post yolk-sac larvae of striped bass, white perch, and clupeids.

3.2 FALL JUYENILE SURVEY

Results of the laboratory quality control program for the 1992 Fall Juvenile Survey (consisting of the Bench Seine Survey and the Fall Shoals Survey) were summarized by the same methods as the QC results for the 1992 Hudson River Ichthyoplankton Laboratory Program (Section 2.2) and are presented in Table 13.

TABLE 13. FRACTION INSPECTED, PROCESS AVERAGE, AND AVERAGE OUT-GOING QUALITY OF LABORATORY TASKS PERFORMED BY NAI FOR THE 1992 FALL JUVENILE SURVEY.

TASK	AVERAGE FRACTION INSPECTED(%)	PROCESS AVERAGE(%)	AVERAGE OUTGOING QUALITY(%)
Identification	19.79	0.18	0.16
Measurement	3.14	0.00	0.00

A total of 1,793 and 941 young-of-the-year fish identification records were made in the laboratory for the Fall Shoals and Beach Seine surveys respectively and 6,402 and 6,452 young-of-the-year fish length measurement records were made for the Fall Shoals and Beach Seine surveys respectively.

4.0 BIBLIOGRAPHY

- Stephens, K.S. 1979. Volume 2: How to perform continuous sampling (CSP). American Society for Quality Control. 70 pp.
- U.S. Department of Defense. 1981. Military standard. Single- and multi-level continuous sampling procedures and table for inspection by attributes. MIL-STD-1235B.

APPENDIX B

PHYSICAL/CHEMICAL PARAMETERS

APPENDIX B

LIST OF TABLES

Number	<u>Title</u>
B-1	Daily freshwater flow (m³/s) at Green Island, NY - 1992.
B-2	Long-term (1947-1991) and 1992 monthly mean freshwater flow (m³/sec) recorded at Green Island, New York.
B-3	Monthly mean freshwater flow (m³/sec) recorded at Green Island, New York from 1974 to 1992.
B-4	Poughkeepsie water works data, mean, minimum, and maximum temperature (C°) for each day of the year, 1951-1992.
B-5	1992 Long River/Fall Shoals water quality data weighted mean temperature (C°) by region and week.
В-6	Mean temperature (C°) by region and week from Beach Seine Survey, 1992.
В-7	1992 Long River/Fall Shoals water quality data weighted mean salinity (ppt) by region and week.
B-8	Mean salinity (ppt) by region and week from Beach Seine Survey, 1992.
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B-10	Mean dissolved oxygen (mg/l) by region and week from Beach Seine Survey, 1992.
B-11	1992 Long River/Fall Shoals water quality data weighted mean percent oxygen saturation by region and week.
B-12	Mean percent oxygen saturation by region and week from Beach Seine Survey, 1992.
B-13	1992 Long River/Fall Shoals water quality data weighted mean conductivity (ms/cm @ 25° C) by region and week.
B-14	Mean conductivity (ms/cm @ 25° C) by region and week from Beach Seine Survey, 1992.

Table B-1. Daily freshwater flow (m3/s) at Green Island, NY,1992

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day of Month												
1	362	235	235	453	501	857	148	382	153	164	308	526
2	317	216	208	416	467	880	170	351	162	184	286	487
3	291	200	212	359	1545	713	127	216	146	190	427	458
4	286	177	215	331	1534	577	155	219	233	187	583	470
5	317	185	226	297	1186	410	172	235	247	190	481	430
6	393	194	222	283	999	614	255	211	237	170	521	393
7	379	185	266	271	863	662	212	198	199	167	532	340
8	348	186	359	264	804	603	161	150	190	161	464	374
9	311	184	447	342	668	600	212	159	188	167	385	478
10	278	179	458	379	623	478	242	242	193	286	325	453
11	291	171	674	419	558	385	229	245	320	422	337	348
12	241	159	1115	671	507	368	179	158	289	385	396	354
13	223	171	733	863	504	306	184	167	241	368	515	359
14	286	153	591	693	422	227	256	189	205	286	566	391
15	484	175	495	526	419	210	458	268	209	280	591	385
16	402	236	396	464	354	189	617	187	141	294	529	345
17	306	300	340	617	365	154	396	188	179	345	444	354
18	308	311	297	991	354	163	308	212	156	311	416	541
19	244	320	289	937	311	157	308	283	174	334	391	597
20	259	374	267	849	286	149	276	187	169	328	348	566
21	263	391	232	758	229	134	248	181	172	331	323	625
22	263	331	216	841	225	143	255	157	155	314	444	532
23	247	280	211	1007	188	113	314	155	376	297	968	473
24	300	281	222	1121	198	146	410	170	371	289	920	427
25	382	262	215	1132	189	174	317	146	294	405	880	345
26	325	252	203	1163	206	180	246	148	275	410	860	340
27	286	256	512	996	175	165	241	142	198	408	764	334
28	261	243	1070	753	214	161	218	139	224	272	710	317
29	249	238	671	662	215	173	189	186	230	323	668	351
30	258		566	591	162	164	180	223	195	308	558	413
31	254		492		274		183	205		306		784

TABLE B-2 LONG-TERM (1947-1991) AND 1992 MONTHLY MEAN FRESHWATER FLOW (m³/sec) RECORDED AT GREEN ISLAND, NEW YORK

	Flow (m ³ /sec)								
Month	1992	Long-Term	Long-Term	Long-Term					
Month	Average	Average	<u>Minimum</u> ^b	<u>Maximum</u> ^b					
JAN	304	366	118	961					
FEB	236	401	128	885					
MAR	408	620	258	1,077					
APR	648	856	384	1,462					
MAY	501	530	156	1,147					
JUN	342	281	101	839					
JUL	254	182	87	520					
AUG	203	159	48	414					
SEP	217	181	58	482					
OCT	286	250	71	853					
NOV	531	355	93	740					
DEC	438	414	173	764					
Annual Average ^a	364	383							

a. Mean of monthly means weighted by number of days/month.

b. Monthly average.

TABLE B-3 MONTHLY MEAN FRESHWATER FLOW (m³/sec) RECORDED AT GREEN ISLAND, NEW YORK FROM 1974 TO 1992

304	236	408	648	201	342	254	203	217	286	531	438	364
1991 512	496	969	655	346	144	112	123	136	216	301	364	341
383	703	994	894	066	250	157	248	159	477	653	289	549
981	256	332	248	620	389	92	19	120	256	\$65	180	301
1988	349	461	476	357	123	131	139	164	211	\$65	330	298
1987 263	201	969	897	122	175	162	118	341	466	415	412	347
308	358	1,011	683	342	404	228	307	218	337	545	\$24	439
1985 440	319	581	456	232	157	133	104	171	203	419	330	295
308	742	465	940	844	418	588	176	190	181	77.7	448	438
1983	352	581	1,063	1,037	358	127	155	133	154	339	799	447
1982 321	361	620	1,085	354	432	182	124	122	124	196	233	345
1981	851	349	385	328	169	140	134	233	457	395	321	322
1980 256	128	634	748	274	192	144	130	118	158	242	273	275
979 172	336	1,253	1,080	554	236	132	149	221	314	465	430	479
1978 745	400	619	950	\$30	282	131	169	175	244	727	303	398
225	727	1,233	1,149	454	207	162	154	408	854	664	750	543
1 <u>976</u> 417	800	897	1,041	901	431	433	414	271	658	208	399	603
1975 540												516
1974 623	528	587	854	089	249	334	180	294	256	487	549	465
Month	FEB	MAR	APR	MAY	N.S.	JUL	AUG	SEP	OCT	NOV	DEC	Annual

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
	-	1.0	0.6	4.4	1.2
1	1	1.6			
1	2	1.5	0.0	4.4	1.0
1	3	1.6	0.6	4.4	1.3
1	4	1.5	0.6	3.3	1.3
1	5	1.5	0.0	3.3	1.2
1	6	1.3	0.0	3.3	0.8
1	7	1.3	0.0	3.3	0.9
1	8	1.2	0.0	3.3	1.3
1	9	1.2	0.0	3.3	1.3
1	10	1.1	0.0	2.8	1.3
ī	11	1.1	0.0	2.8	1.3
1	12	1.1	0.6	2.8	1.2
1	13	1.1	0.0	2.8	1.1
1	14	1.1	0.0	2.8	1.1
1				2.8	1.8
	15	1.1	0.0		1.3
1	16	1.1	0.5	2.8	
1	17	1.1	0.6	2.8	1.2
1	18	1.1	0.6	3.3	1.1
1	19	1.0	0.6	2.8	1.1
1	20	1.0	0.5	2.2	1.1
1	21	1.0	0.0	2.4	0.7
1	22	1.0	0.6	2.2	0.8
1	23	1.0	0.6	2.2	1.1
1	24	1.0	0.0	2.2	0.8
1	25	1.0	0.0	3.1	0.9
1	26	0.9	0.0	2.2	0.9
1	27	1.0	0.0	2.2	0.8
i	28	1.0	0.6	2.2	0.8
1	29	1.0	0.6	2.2	0.7
				2.2	0.9
1	30	1.0	0.6		
1	31	1.0	0.6	2.2	1.1
2	1	1.0	0.6	2.2	0.9
2 2 2 2 2 2 2	2	1.0	0.6	2.2	0.9
2	3	1.0	0.6	2.2	0.8
2	4	0.9	0.6	1.8	0.7
2	5	0.9	0.6	1.7	0.9
2	6	1.0	0.5	2.0	0.9
2	7	1.0	0.6	2.2	0.9
2	8	1.0	0.6	2.2	0.9
2	9	1.0	0.6	2.2	0.8
2 2	10	1.1	0.6	3.3	0.8
2	11	1.0	0.0	2.2	0.8
2		1.0	0.6	2.3	0.8
2 2	12			2.2	0.8
2	13	1.1	0.6	۷.۷	0.0

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
_					
2	14	1.2	0.6	2.8	0.9
2	15	1.1	0.6	2.8	1.0
2	16	1.1	0.0	2.8	0.9
2	17	1.2	0.6	2.8	0.9
2	18	1.1	0.0	2.8	0.9
2	19	1.2	0.6	2.8	1.1
2	20	1.2	0.6	2.8	1.2
2	21	1.2	0.6	2.8	1.3
2	22	1.2	0.0	3.9	1.3
2	23	1.3	0.0	2.8	0.8
2	24	1.3	0.0	3.9	0.8
2	25	1.3	0.6	3.9	1.2
2 2 2 2	26	1.5	0.0	3.9	0.9
2	27	1.5	0.0	4.4	1.1
2 2	28	1.5	0.0	5.0	1.1
2	29	1.8	0.6	4.4	1.0
3	1	1.5	0.6	4.4	0.9
3	2	1.5	0.6	4.4	0.9
3	3	1.5	0.6	4.4	0.9
3	4	1.6	0.6	4.4	1.3
3 3 3 3	5	1.6	0.6	3.3	0.9
3	6	1.6	0.6	3.7	1.3
3 3	7	1.7	0.6	4.7	1.7
3	8	1.7	0.0	4.9	1.9
3	9	1.8	0.6	4.5	2.2
3	10	1.9	0.6	4.8	2.2
3	11	2.0	0.6	4.4	3.3
3	12	2.1	0.6	4.4	3.3
3	13	2.1	0.6	4.4	4.3
3 3 3 3 3 3 3 3 3 3 3 3 3 3	14	2.2	0.6	4.4	3.9
3	15	2.3	0.6	5.0	3.7
3	16	2.5	0.6	5.6	3.4
3	17	2.6	0.6	5.7	3.4
3	18	2.6	0.6	5.9	3.2
3	19	2.7	0.6	7.7	2.9
3	20	2.9	0.6	7.5	3.2
3	21	3.0	0.6	7.3	3.0
3 3 3 3 3	22	3.1	0.6	7.2	2.9
3	23	3.4	0.6	7.1	2.9
3	24	3.5	0.6	7.1	2.8
3	25	3.6	0.6	5.9	2.9
3	26	3.8	0.6	6.1	3.0
3	27	4.1	1.1	6.7	3.0
3	28	4.3	1.1	6.7	3.3

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
3	29	4.5	1.1	6.7	2.5
3					3.5
	30	4.6	1.1	7.8	3.7
3	31	5.0	1.1	8.3	3.9
4	1	5.2	1.7	9.4	4.1
4	2	5.4	2.2	8.3	4.4
4	3	5.5	2.8	8.9	4.9
4	4	5.8	2.8	8.9	5.0
4	5	6.0	2.8	8.9	5.3
4	6	6.1	3.3	8.9	5.5
4	7	6.2	2.8	9.4	5.8
4	8	6.4	2.8	9.4	5.6
4	9	6.4	2.8	9.2	5.9
4	10	6.5	2.8	10.2	6.2
4	11	6.8	2.8	11.2	6.3
4	12	7.0	2.8	11.4	6.5
4	13	7.2	2.8	11.4	6.9
4	14	7.3	2.8	11.4	6.9
4	15	7.5	2.8	11.5	7.1
4	16	7.7	3.3	11.8	
4	17				7.5
		7.9	3.9	11.7	7.5
4	18	8.2	5.6	11.8	7.8
4	19	8.4	5.6	12.2	8.0
4	20	8.7	6.1	12.2	8.3
4	21	9.0	6.1	12.2	8.2
4	22	9.2	6.7	12.8	8.5
4	23	9.4	6.7	12.8	8.7
4	24	9.6	6.7	13.3	9.0
4	25	9.7	6.7	13.3	9.3
4	26	10.0	6.7	13.3	10.0
4	27	10.1	7.2	13.3	10.4
4	28	10.4	7.8	13.3	11.0
4	29	10.6	8.3	13.9	11.7
4	30	10.9	8.9	13.9	11.9
5	1	11.1	8.9	14.4	12.0
5	2	11.4	8.9	14.4	12.2
5	3	11.6	8.9	14.4	12.4
5	4	11.9	8.9	15.0	12.5
5 5	5	12.0	8.9	15.0	13.3
5	6	12.2	8.9	15.0	12.4
5	7	12.5	8.9	15.0	12.6
5	8	12.6	8.9	15.1	13.2
5	9	12.7	8.9	15.6	13.4
5	10	12.9	8.9	16.1	13.4
5	11	13.0	9.4	16.1	13.8
•		10.0	2.2	TO. T	13.0

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
_			• •		10.0
5	12	13.1	9.4	16.1	13.9
5	13	13.3	10.0	16.2	14.1
5	14	13.5	10.6	16.7	14.6
5	15	13.7	11.1	16.7	14.8
5	16	14.1	11.1	17.2	15.0
5 5 5 5	17	14.3	11.7	17.2	15.5
5	18	14.5	12.2	17.3	15.7
5	19	14.7	12.2	17.5	15.9
5	20	15.0	12.2	17.8	16.0
5	21	15.2	12.8	18.0	16.3
5	22	15.5	12.8	18.5	16.5
5	23	15.7	12.8	18.9	16.7
5	24	15.9	12.8	19.0	16.6
5 5 5 5 5	25	16.1	12.8	19.3	16.0
5	26	16.3	12.2	19.4	15.3
5	27	16.5	12.2	20.6	16.9
5	28	16.8	12.2	20.6	17.0
5	29	17.0	12.8	20.7	17.4
5	30	17.2	12.8	21.5	17.5
5 6	31	17.3	13.3	21.3	17.8
6	1	17.7	13.3	22.0	17.8
6	2	17.9	13.3	22.2	17.8
6	3	18.1	14.4	22.1	17.6
6	4	18.3	13.9	22.5	17.9
6	5	18.5	15.0	22.2	18.2
6	6	18.6	15.6	22.4	18.5
6	7	18.8	15.0	22.4	19.0
6	8	19.1	16.1	22.5	19.3
6	9	19.2	16.1	23.0	19.4
6	10	19.5	16.1	23.2	19.6
6	11	19.7	17.2	23.4	19.9
6	12	19.8	17.2	23.3	20.0
6	13	20.0	17.8	23.4	20.5
6	14	20.1	17.8	23.3	20.9
6	15	20.2	17.8	23.5	21.0
6	16	20.4	17.8	23.8	21.0
6	17	20.4	17.8	23.8	21.1
6	18	20.7	17.8	24.2	21.3
6	19	20.7	17.8	24.1	21.3
6	20	20.9	17.8	24.0	21.1
6	21	21.2	17.8	24.3	21.0
6	22	21.4	17.2	24.3	21.1
6	23	21.5	17.2	24.1	21.0
6	24	21.6	17.8	24.1	21.4
v	47	21.0	17.0	5-3 · T	

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
6	25	21.7	17 0	24.0	01.0
6			17.8	24.2	21.3
	26	21.9	17.8	24.5	21.4
6	27	22.0	17.8	24.4	21.6
6	28	22.1	17.8	24.4	20.1
6	29	22.3	17.8	25.0	21.9
6	30	22.4	17.8	25.0	22.1
7	1	22.5	18.9	25.4	22.2
7	2	22.7	18.9	25.0	22.2
7	3	22.8	19.4	25.0	22.2
7	4	22.8	19.4	25.0	22.2
7	5	23.0	20.0	25.6	22.2
7	6	23.1	20.0	25.6	22.3
7	7	23.2	20.0	25.6	
7	8	23.2			22.4
			20.0	25.6	22.7
7	9	23.4	20.0	25.6	22.6
7	10	23.4	20.6	25.6	23.2
7	11	23.6	20.6	25.6	23.2
7	12	23.7	21.1	26.1	23.5
7	13	23.9	21.7	26.7	23.6
7	14	23.9	21.7	26.7	23.8
7	15	24.1	21.7	26.7	23.9
7	16	24.2	22.2	26.7	23.9
7	17	24.3	22.2	26.1	23.9
7	18	24.3	22.2	26.1	24.0
7	19	24.5	22.2	26.1	24.5
7	20	24.6	22.2	26.7	24.3
7	21	24.6	22.8	26.1	24.6
7	22	24.7	22.2		
7				26.7	24.5
	23	24.8	22.2	26.7	24.5
7	24	24.8	22.8	26.7	24.2
7	25	24.8	22.8	26.7	24.3
7	26	24.9	22.8	26.7	24.5
7	27	25.1	22.8	27.2	24.2
7	28	25.1	22.8	27.2	24.1
7	29	25.2	22.8	26.7	24.1
7	30	25.2	23.3	26.7	24.4
7	31	25.2	23.3	26.7	24.5
8	1	25.2	23.3	26.7	24.2
8	2	25.3	22.8	26.7	24.2
8	3	25.3	23.3	26.8	24.2
8	4	25.3	23.3	26.9	
					24.4
8	5	25.3	23.3	27.2	24.1
8	6	25.3	23.3	27.2	23.9
8	7	25.3	23.3	27.4	23.9

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
8	8	25.3	23.3	27.4	23.8
8	9	25.3	23.3	27.8	23.9
8	10	25.3	23.3	27.8	24.1
8	11	25.3	22.8	27.8	24.1
8	12	25.3	22.8	28.1	24.1
8	13	25.2	22.2	28.0	24.2
8	14	25.1	22.2	28.4	23.9
8	15	25.0	22.2	28.4	23.8
8	16	25.0	22.2	28.4	23.6
8	17	25.0	22.2	28.1	23.6
8	18	24.9	22.8	28.0	23.3
8	19	24.9	22.2	27.7	23.5
8	20	24.9	22.8	27.6	23.4
8	21	24.8	22.2	27.5	22.9
8	22	24.8	22.2	27.1	23.0
8	23	24.7	22.8	26.9	23.2
8	24	24.7	22.2	26.7	23.4
8	25	24.5	21.7	26.2	23.4
8	26	24.5	21.7	26.1	23.5
8	27	24.5	22.2	26.2	23.5
8	28	24.4	22.2	25.8	23.9
· 8	29	24.3	22.2	26.7	23.8
8	30	24.3	22.2	26.1	23.7
8	31	24.2	22.2	26.1	23.5
9	1	24.2	22.2	26.1	23.6
9	2	24.1	22.2	26.7	23.2
9	3	24.0	22.2	26.1	23.5
9	4	23.9	22.2	25.6	23.0
g	5	23.8	21.7	25.6	23.1
9 9 9	6	23.8	22.2	25.6	23.0
á	7	23.6	21.7	25.6	22.8
9 9 9 9 9 9	8	23.5	21.7	25.6	23.0
9	9	23.4	21.7	25.6	22.8
9	10	23.3	21.1	25.6	23.1
9	11	23.2	21.1	25.6	23.1
9	12	23.2	21.1	25.6	22.8
9	13	22.9	20.0	25.6	22.5
9	14	22.7	18.9	25.0	22.6
9	15	22.5	17.8	25.0	22.7
9	15 16	22.3	17.2	25.0	22.6
9 9 9			17.2	25.0	22.6
9	17	22.2		25.0	22.7
9	18	22.0	16.7		22.9
9	19	21.9	16.7	23.9	
9	20	21.8	17.2	23.9	22.6

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperature	(1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
•					
9	21	21.5	16.7	23.3	22.8
9	22	21.3	16.1	23.3	22.8
9	23	21.0	16.1	22.8	22.1
9	24	20.8	15.6	22.8	21.4
9	25	20.7	15.6	22.8	21.1
9	26	20.5	15.6	22.2	20.9
9	27	20.3	16.1	22.2	20.7
9	28	20.2	15.6	22.2	20.7
9	29	19.9	15.6	22.2	20.4
9	30	19.7	15.6	22.2	20.0
10	1	19.6	16.1	22.2	19.6
10	2	19.4	15.6	22.2	19.4
10	3	19.3	15.6	22.2	19.0
10	4	19.0	15.6	21.7	19.1
10	5	18.7	15.0	21.1	18.7
10	6	18.6	15.0	21.1	18.2
10	7	18.5	15.0	21.1	18.1
10	8	18.2	14.4	21.1	17.4
10	9	18.0	14.4	21.1	17.5
10	10	17.9	14.4	21.1	17.4
10	11	17.7	13.9	21.1	17.2
10	12	17.4	13.3	21.1	17.0
10	13	17.2	13.3	20.0	16.9
10	14	17.0	12.8	21.1	16.4
10	15	16.8	12.2	20.0	16.4
10	16	16.6	12.2	20.0	16.6
10	17	16.3	12.2	20.0	16.3
10	18	16.1	12.2	20.0	
10	19	15.9	11.7	20.0	16.0
10	20	15.7	10.6		16.1
10	21	15.7	10.6	19.4 18.9	15.4
10	22	15.3	10.0		15.2
10	23	15.1	10.0	18.9	14.4
10	23 24	14.7	10.0	18.9	14.0
10	24 25	14.7	10.0	18.3	13.8
10	25 26	14.3		18.3	13.7
10	20 27	14.3	10.0	17.8	13.0
			9.4	17.8	12.7
10	28	14.0	8.9	17.8	12.5
10	29	13.7	8.3	17.8	12.7
10	30	13.5	7.8	16.7	12.4
10	31	13.2	7.2	16.7	12.2
11	1	13.0	7.2	16.7	12.0
11	2	12.8	7.2	16.1	11.4
11	3	12.7	7.2	16.1	11.4

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperatu	re (1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
	_				
11	4	12.5	7.2	16.1	10.7
11	5	12.2	7.2	15.6	10.5
11	6	12.0	6.7	15.6	10.1
11	7	11.7	6.1	15.0	9.7
11	8	11.4	6.1	15.0	9.1
11	9	11.2	5.6	15.0	9.0
11	10	11.0	5.0	15.0	9.0
11	11	10.7	5.0	15.0	9.0
11	12	10.5	5.0	15.0	8.8
11	13	10.3	5.0	13.3	8.7
11	14	10.0	5.0	13.3	8.6
11	15	9.8	5.0	12.8	7.6
11	16	9.6	5.0	12.8	7.4
11	17	9.5	5.0	12.8	7.4
11	18	9.3	5.0	12.8	7.3
11	19	8.9	5.0	12.2	6.9
11	20	8.7	5.0	11.1	6.8
11	21	8.5	3.9	11.1	6.6
11	22	8.3	3.9	11.1	6.5
11	23	8.1	3.9	11.1	7.3
11	24	7.8	3.9	10.6	6.7
11	25	7.6	3.9	10.6	6.3
11	26	7.4	3.3	10.0	6.3
11	27	7.1	3.3	10.0	6.3
11	28	7.0	3.3	10.0	6.1
11	29	6.8	3.3	10.0	6.0
11	30	6.5	2.8	10.0	5.8
12	1	6.3	2.2	9.4	6.0
12	2	6.1	3.0	8.9	6.1
12	3	5.8	2.2	8.9	6.1
12	4	5.6	1.3	8.3	6.0
12	5	5.4	2.8	7.8	6.3
12	6	5.2	2.6	7.8	6.1
12	7	5.0	2.0	7.8	6.5
12	8	4.8	2.0	7.8	6.2
12	9	4.6	1.7	7.2	5.3
12	10	4.3	1.1	7.2	4.9
12	11	4.1	1.1	7.2	5.6
12	12	3.9	0.6	7.2	4.5
12	13	3.7	0.6	6.7	4.5
12	14	3.6	0.6	6.7	3.9
12	15	3.4	0.6	6.7	3.8
12	16	3.2	0.6	6.7	3.0
12	17	3.1	0.6	5.6	2.7

TABLE B-4 POUGHKEEPSIE WATER WORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1992

		Long Te	rm Temperature	(1951-1991)	1992 Actual
Month	Day	Mean	Minimum	Maximum	Temperatures
12	18	2.9	0.6	5.6	2.6
12	19	2.7	0.6	5.0	2.5
12	20	2.7	0.6	5.0	2.5
12	21	2.4	0.6	4.4	2.5
12	22	2.2	0.6	4.4	2.3
12	23	2.1	0.6	5.0	2.5
12	24	2.1	0.6	5.6	1.9
12	25	2.0	0.6	5.6	1.5
12	26	2.0	0.0	6.1	1.4
12	27	1.9	0.0	6.1	1.2
12	28	1.8	0.0	6.1	1.1
12	29	1.8	0.0	6.1	1.5
12	30	1.7	0.6	6.1	1.5
12	31	1.7	0.0	5.0	1.3

Table B-5. 1992 LONG RIVER/FALL SHOALS WATER QUALITY DATA WEIGHTED MEAN TEMPERATURE (C) BY REGION AND WEEK

WEEK	REGIONS											
BEGINNING MONDAY	YK	TZ	СН	IP	WP	CW	PK	HP	KG	SG	cs	AL
13APR92	7.4	7.4	7.5	7.1	6.3	6.4	6.4	6.7	7.2	7.9	6.6	5.8
20APR92	8.8	9.3	9.2	8.8	9.2	8.9	8.3	8.5	8.0	8.2	8.4	8.5
27APR92	10.6	10.5	10.3	10.2	9.9	10.4	11.3	11.4	10.9	10.1	8.8	8.3 🛶
04MAY92	12.7	12.3	11.7	12.0	12.6	12.3	12.2	12.3	12.1	12.1	11.7	11.2
11MAY92	13.2	13.8	14.2	14.0	14.7	14.8	14.4	14.5	14.8	14.1	14.2	15.1
18MAY92	15.7	15.9	16.0	16.9	15.8	15.9	15.9	16.2	16.0	16.8	17.4	17.2
25MAY92	16.2	16.5	16.8	17.0	16.6	16.9	16.5	17.0	17.1	17.4	17.9	18.3
01JUN92	17.0	17.2	17.6	17.3	17.6	18.0	18.0	17.7	17.3	17.9	18.0	17.2
08JUN92	19.9	20.2	19.8	19.7	20.0	20.1	19.7	19.6	19.5	19.6	19.7	19.6
15JUN92	21.8	21.7	23.4	22.2	21.3	21.4	21.4	21.4	21.4	21.9	22.1	22.5
22JUN92	20.4	20.6	22.2	21.9	21.5	21.4	21.7	21.2	21.1	21.1	21.2	21.8
29JUN92	20.0	21.2	21.3	22.0	22.3	22.8	22.9	22.5	22.6	22.7	23.1	22.9 🛶
06JUL92	21.6	22.5	23.5	23.5	23.6	23.6	23.1	22.9	22.8	22.8	22.8	22.9
13JUL92	24.0	24.6	25.2	25.0	24.3	24.6	24.4	24.0	24.3	23.9	24.1	24.1
20JUL92	24.8	25.7	26.3	25.6	25.0	25.2	25.2	•	•	•	•	• ~
27JUL92	23.8	24.6	25.3	25.2	24.1	24.2	24.6	24.2	24.0	23.7	23.9	23.6
03AUG92	23.2	23.9	24.5	24.2	23.9	24.1	24.4	•	•	•	•	. •
10AUG92	23.8	24.1	24.5	24.7	24.1	24.7	24.6	23.9	24.0	23.7	23.5	23.2
17AUG92	22.3	22.9	23.9	24.1	23.3	23.2	23.4	•	•	•	•	. ``
24AUG92	23.5	23.9	25.3	25.4	23.6	23.4	23.4	22.3	22.3	22.2	22.1	21.6
31AUG92	22.7	22.7	23.5	24.1	22.9	22.8	23.0	•	•	•	•	
07SEP92	22.4	22.7	24.2	24.1	22.9	23.0	22.8	21.8	21.6	21.3	21.7	21.3
14SEP92	21.5	21.8	22.9	23.8	23.0	23.2	22.9	•	•	•	•	• 🔾
21\$EP92	21.3	21.1	21.7	22.4	22.8	22.8	23.2	22.1	21.4	20.9	21.1	21.2
28SEP92	19.3	19.6	20.3	20.6	20.0	20.2	20.1	•	•	•	•	
050CT92	16.0	16.4	17.2	17.7	17.5	17.4	17.7	16.7	15.5	15.2	15.4	14.4
120CT92	16.4	16.6	17.2	17.6	17.1	17.1	16.4	•	•	•	•	•
190CT92	14.9	14.6	14.8	15.9	14.8	13.8	13.3	12.6	11.7	10.7	10.3	9.4

NOTE: (.) indicates no sampling.

TABLE B-6 MEAN TEMPERATURE (C) BY REGION AND WEEK FROM BEACH SEINE SURVEY, 1992

Wee k	Regions													
Beginning Monday	YK	TZ	СН	IP	WP	CM	PK	HP	KG	SG	cs	AL		
22JUN92	21.9	22.6	21.1	23.1	21.8	23.1	21.6	20.6	20.2	21.2	21.0	20.5		
06JUL92	22.2	22.2	24.2	24.2	23.9	25.1	23.2	23.2	22.9	22.1	23.1	21.6		
20JUL92	26.0	26.1	26.0	25.7	25.4	26.1	25.6	24.6	23.6	24.6	24.5	23.2		
17AUG92	23.7	23.1	23.8	25.1	24.0	25.8	24.8	23.9	23.6	23.6	22.8	22.2		
31AUG92	23.9	23.7	23.1	24.0	24.5	24.6	23.2	22.8	22.8	23.4	23.1	22.6		
14SEP92	22.6	22.1	22.1	24.0	23.3	23.7	22.8	22.0	22.0	22.1	21.5	19.9		
28SEP92	19.3	19.4	18.4	20.6	18.6	18.0	18.7	18.5	18.5	18.6	17.1	17.1		
120CT92	16.4	16.0	17.1	17.9	17.7	17.1	16.0	15.2	15.1	14.5	13.3	13.2		
260CT92	12.1	11.7	13.1	14.1	12.9	12.0	12.7	11.2	10.3	9.7	8.2	8.0		

Table B-7. 1992 LONG RIVER/FALL SHOALS WATER QUALITY DATA WEIGHTED MEAN SALINITY (PPT) BY REGION AND WEEK

WEEK BEGINNING	REGIONS											
MONDAY	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	cs	AL
13APR92	7.8	3.8	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
20APR92	2.7	2.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
27APR92	7.1	6.8	2.1	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
04MAY92	3.0	1.4	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
11HAY92	8.5	2.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
18MAY92	3.2	1.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25MAY92	12.1	7.9	4.1	5.5	2.7	1.2	0.1	0.1	0.1	0.1	0.1	0.1
01JUN92	9.8	7.9	5.8	3.9	1.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
08JUN92	5.9	1.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15JUN92	5.5	3.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
22JUN92	9.3	6.2	3.1	1.9	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1
29JUN92	13.0	9.4	6.0	4.2	1.6	0.6	0.1	0.1	0.1	0.1	0.1	0.1
06JUL92	11.5	7.6	5.1	3.3	1.0	0.4	0.1	0.1	0.1	0.1	0.1	0.1
13JUL92	11.6	7.7	4.8	2.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1
20JUL92	10.7	6.2	3.1	1.3	0.2	0.1	0.1	•		•	•	•
27JUL92	11.1	6.7	4.8	3.0	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1
03AUG92	10.6	4.0	3.3	1.1	0.2	0.2	0.2	•	•	•	•	•
10AUG92	9.9	7.4	3.9	3.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
17AUG92	10.9	8.0	4.5	2.4	0.4	0.1	0.1	•	•	•	•	•
24AUG92	12.3	8.2	5.4	4.5	1.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1
31AUG92	9.6	6.6	4.4	2.3	0.7	0.4	0.2	•	•	•	•	
07SEP92	12.6	9.5	5.1	4.3	1.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1
14SEP92	10.9	7.6	4.5	2.8	0.7	0.2	0.1	•	•	•	•	•
21SEP92	12.6	7.2	4.6	2.8	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1
28SEP92	10.6	7.0	3.7	1.7	0.3	0.1	0.1	•	•	•	•	•
050CT92	13.0	10.6	7.3	5.3	1.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1
120CT92	13.9	9.4	6.8	4.4	1.3	0.3	0.1	•	•	•	•	•
190CT92	11.2	5.6	5.2	2.6	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1

NOTE: (.) indicates no sampling.

TABLE B-8 MEAN SALINITY (PPT) BY REGION AND WEEK FROM BEACH SEINE SURVEY, 1992

Week	Regions													
Beginning Monday	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	cs	AL		
22JUN92	5.0	1.7	3.3	1.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
06JUL92	9.3	7.3	4.2	2.9	0.9	0.4	0.1	0.1	0.1	0.1	0.1	0.1		
20JUL92	6.1	4.4	2.6	2.0	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2		
03AUG92	6.7	4.7	2.5	1.0	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1		
17AUG92	7.3	4.3	3.4	1.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
31AUG92	11.9	6.7	3.8	1.9	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2		
14SEP92	9.1	6.6	4.2	2.8	0.8	0.3	0.2	0.2	0.2	0.2	0.2	0.2		
28SEP92	9.4	6.2	2.6	1.9	0.8	0.1	0.2	0.2	0.2	0.2	0.2	0.2		
120CT92	9.0	6.2	5.3	4.6	1.0	0.3	0.2	0.2	0.2	0.2	0.2	0.2		
260CT92	8.5	4.4	2.2	1.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		

TABLE B-9 1992 LONG RIVER/FALL SHOALS WATER QUALITY DATA WEIGHTED MEAN DISSOLVED OXYGEN (MG/L) BY REGION AND WEEK

WEEK				REGIONS													
BEGINNING MONDAY	YK	TZ	CH	ΙP	WP	CM	PK	HP	KG	SG	cs	AL					
13APR92	10.2	10.7	11.7	11.3	10.9	11.0	10.8	11.1	11.3	•	11.4	12.1					
20APR92	11.0	11.0	11.8	11.0	11.0	11.1	11.4	11.8	11.7	12.1	12.2	12.3					
27APR92	10.3	10.2	10.2	10.3	11.0	10.6	10.1	10.0	10.2	10.7	11.6	11.8					
04MAY92	10.1	10.3	10.5	10.3	9.7	9.7	9.9	9.9	9.7	9.8	10.3	11.0					
11MAY92	8.3	9.1	9.4	9.4	9.6	9.1	8.9	9.0	9.5	9.6	9.7	9.4					
18MAY92	8.6	9.0	9.5	8.9	8.6	8.6	8.3	9.0	9.3	9.5	8.7	8.8					
25MAY92	8.6	8.8	8.9	8.0	7.7	8.1	8.4	9.4	9.9	10.3	10.0	7.5					
01JUN92	8.1	8.3	8.1	7.8	8.1	8.6	8.7	8.9	8.7	8.2	8.3	9.4					
08JUN92	7.4	7.8	8.1	8.1	7.9	9.4	9.5	9.6	10.1	9.9	9.3	9.5					
15JUN92	7.6	7.5	7.7	8.1	8.3	8.6	8.2	8.5	8.5	9.3	9.4	7.5					
22JUN92	7.6	7.2	7.7	6.9	7.2	8.2	8.1	8.2	9.0	8.9	8.9	7.0					
29JUN92	7.5	8.2	7.3	6.9	6.6	7.3	7.7	8.4	8.9	9.0	9.8	7.4					
06JUL92	4.4	4.5	5.1	5.8	7.0	7.3	6.8	7.2	7.9	8.7	9.1	7.9					
13JUL92	6.1	6.6	6.3	5.9	6.3	6.5	6.5	6.7	8.0	8.1	7.7	7.2					
20JUL92	5.9	6.1	5.9	6.0	6.6	6.7	6.6	•	•	•	•	•					
27JUL92	5.5	6.5	6.4	5.9	6.0	6.5	6.4	6.4	8.1	8.6	8.4	7.6					
03AUG92	5.4	6.8	6.8	6.3	6.9	7.2	6.9	•	•	•	•	•					
10AUG92	6.2	6.1	6.6	6.3	6.3	6.8	6.6	6.8	7.7	8.3	8.8	6.8					
17AUG92	5.7	5.7	5.3	5.5	5.8	5.9	6.0	•	•	•	•	•					
24AUG92	6.2	6.9	6.5	6.5	7.2	8.0	7.8	7.7	9.4	10.3	11.3	9.4					
31AUG92	6.3	7.0	6.9	6.2	6.6	7.0	6.8	•	•	•	•	•					
07SEP92	5.9	5.8	6.3	6.0	6.7	7.0	6.7	6.7	7.2	7.5	7.6	7.4					
14SEP92	5.6	6.6	6.5	6.5	6.8	7.4	7.2	•	•	•	•	•					
21SEP92	6.9	7.3	10.4	8.2	6.6	6.8	6.7	6.6	7.5	7.8	8.4	7.2					
28SEP92	5.8	6.1	6.6	6.7	7.3	7.1	7.7	•	•	•	•	•					
05OCT92	7.9	7.5	7.4	7.2	8.0	8.5	8.3	8.3	8.8	9.7	10.6	9.3					
120CT92	7.0	7.3	7.0	7.6	8.1	8.3	8.7	•	•	•	•	•					
190СТ92	7.8	8.2	8.6	8.0	8.3	7.5	7.4	7.8	8.1	8.1	8.2	9.4					

(.) indicates no sampling.

TABLE B-10 MEAN DISSOLVED OXYGEN (mg/L) BY REGION AND WEEK FROM BEACH SEINE SURVEY, 1992

Week Beginning	Regions												
Monday	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	cs	AL	
22JUN92	9.6	11.4	7.6	7.5	8.1	9.2	8.3	8.1	8.0	9.2	8.9	6.6	
06JUL92	6.8	7.1	7.9	7.1	7.4	8.2	7.1	8.0	8.2	8.2	9.9	7.8	
20JUL92	7.8	8.1	9.4	6.4	7.6	7.7	8.1	7.5	7.5	8.0	9.5	7.5	
03AUG92	7.0	9.0	10.1	7.2	7.8	8.6	7.5	7.7	8.9	9.4	9.9	8.5	
17AUG92	6.4	7.3	7.3	6.6	6.5	7.7	7.2	6.8	7.1	7.7	8.0	7.3	
31AUG92	8.3	9.3	7.6	7.7	8.1	8.1	8.6	9.9	9.2	9.7	8.8	8.0	
14SEP92	8.4	9.0	8.7	9.6	8.9	9.0	8.7	8.9	9.2	10.5	10.4	9.1	
28SEP92	10.4	10.5	8.5	7.5	7.3	7.9	10.0	9.9	8.2	7.9	7.6	7.7	
1200792	7.7	8.0	9.1	10.0	7.9	8.7	9.0	10.1	10.2	10.3	9.9	10.2	
260CT92	9.0	10.0	9.5	9.0	9.5	9.8	9.9	7.9	8.4	8.6	9.3	9.6	

TABLE 8-11. 1992 LONG RIVER/FALL SHOALS WATER QUALITY DATA WEIGHTED MEAN PERCENT OXYGEN SATURATION BY REGION AND WEEK

WEEK	REGIONS											
BEGINNING MONDAY	YK	TZ	СН	IP	WP	CW	PK	HP	KG	SG	cs	AL
13APR92	89.6	91.1	97.8	93.7	88.6	88.9	88.1	90.8	92.9	•	91.6	97.1
20APR92	96.5	97.6	102.4	94.4	95.8	95.6	97.0	100.7	99.2	102.5	104.1	105.5
27APR92	97.7	96.0	92.8	92.1	97.1	94.5	92.6	91.7	91.9	94.9	99.9	100.3
04MAY92	97.0	97.4	97.0	95.4	90.9	91.2	92.3	92.3	89.9	90.9	94.9	100.6
11MAY92	84.3	89.4	91.5	90.9	94.5	90.2	86.7	88.7	94.1	93.9	94.3	93.9
18HAY92	88.4	91.7	96.4	92.3	86.4	86.6	84.3	91.8	94.7	97.5	90.2	91.1
25HAY92	94.1	94.6	93.8	85.9	80.6	84.2	85.9	97.0	102.3	107.5	105.4	79.6
01JUN92	89.7	91.1	87.9	83.4	85.5	91.2	91.9	93.7	90.3	86.1	87.3	97.5
08JUN92	84.2	87.4	89.3	88.5	86.8	103.2	103.3	105.4	109.7	108.3	101.7	103.2
15JUN92	89.7	87.6	90.8	92.7	93.7	96.7	92.5	96.5	95.5	106.4	108.0	86.1
22JUN92	89.1	82.5	90.2	80.0	81.5	92.8	91.6	92.7	101.1	99.8	99.8	80.3
29JUN92	89.5	98.4	85.4	80.6	77.0	85.6	89.3	96.4	102.9	104.1	114.4	85.7
06JUL92	53.7	54.8	61.5	69.6	82.5	86.7	79.7	83.5	91.2	101.2	106.2	91.6
13JUL92	77.8	83.0	78.9	72.4	75.6	78.5	77.5	79.9	95.1	96.2	91.8	85.2
20JUL92	75.7	77.2	74.8	73.9	79.6	81.5	80.2	•	•	•	•	•
27JUL92	69.7	81.7	80.7	73.0	72.1	77.8	76.6	75.8	96.6	101.8	99.9	89.2
03AUG92	68.0	82.1	82.6	75.8	82.2	86.0	82.8	•	•	•	•	•
10AUG92	77.7	75.4	81.4	77.0	74.5	82.3	79.1	80.9	92.0	98.1	103.1	79.6
17AUG92	70.7	70.0	64.2	66.3	68.4	69.3	70.8	•	•	•	•	•
24AUG92	78.4	86.3	81.6	82.0	85.8	94.2	91.1	88.3	108.1	118.5	129.9	107.2
31AUG92	78.1	85.1	83.4	75.3	77.6	81.0	79.6	•	•	•	•	•
07SEP92	74.3	70.9	77.4	73.3	78.5	81.2	78.0	76.8	81.3	85.1	86.0	83.6
14SEP92	68.7	78.6	77.6	77.9	79.3	86.5	83.6	•	•	•	•	•
21SEP92	83.9	86.5	121.6	96.5	76.7	78.6	78.9	75.6	84.9	87.8	94.6	80.8
28SEP92	68.0	69.9	74.4	75.8	80.0	79.0	84.4	-	•	•	•	•
0500192	87.1	82.3	81.1	78.8	84.6	89.3	87.7	85.8	88.2	97.1	106.0	91.0
120CT92	78.7	79.6	76.6	82.2	85.1	86.6	88.8	•	•	•	•	•
190CT92	83.3	83.6	87.7	82.7	82.6	72.9	70.7	73.7	75.0	73.4	73.3	82.0

NOTE: (.) indicates no sampling.

TABLE 8-12 MEAN PERCENT OXYGEN SATURATION BY REGION AND WEEK FROM BEACH SEINE SURVEY, 1992

Week	Regions												
Beginning Monday	YK	TZ	СН	IP	WP	CM	PK	HP	KG	SG	cs	AL	
22JUN92	113.4	133.8	87.5	88.4	92.8	107.5	94.0	90.2	87.9	103.2	99.4	73.7	
06JUL92	83.4	85.7	96.1	86.7	87.6	99.2	82. 7	94.1	95.4	94.2	115.1	88.1	
20JUL92	99.3	103.2	118.2	79.5	93.1	95.2	99.5	90.3	88.2	96.3	114.2	87.3	
03AUG92	87.6	113.9	127.3	88.4	93.9	103.7	89.3	90.2	105.3	111.8	117.6	99.4	
17AUG92	79.4	87.1	87.9	81.1	77.0	94.6	87.3	80.6	83.9	91.0	92.6	83.8	
31AUG92	106.6	115.0	90.4	92.2	96.9	97.9	100.7	114.3	107.2	113.8	102.8	92.4	
14SEP92	102.6	108.2	102.6	116.5	104.6	106.7	100.7	101.7	104.7	119.9	118.3	99.7	
28SEP92	120.1	118.7	92.7	84.7	78.7	83.8	107.4	105.7	88.0	84.1	78.6	79.9	
120CT92	83.5	85.1	98.0	108.7	84.0	90.1	91.5	100.3	101.9	100.7	94.8	97.0	
260CT92	89.0	94.9	91.9	87.9	90.3	91.4	93.2	72.4	75.0	75.3	79.1	81.3	

TABLE B-13. 1992 LONG RIVER/FALL SHOALS WATER QUALITY DATA WEIGHTED MEAN CONDUCTIVITY (MS/CM @ 25 C) BY REGION AND WEEK

WEEK	REGIONS											
BEGINNING MONDAY	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
13APR92	13.3	6.6	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
20APR92	4.6	4.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
27APR92	11.9	11.4	3.7	1.8	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
04MAY92	5.2	2.5	0.9	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
11MAY92	14.4	4.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
18MAY92	5.6	2.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25MAY92	20.0	13.3	7.1	9.5	4.8	2.1	0.2	0.2	0.2	0.2	0.2	0.2
01JUN92	16.7	13.5	10.1	6.8	1.8	0.2	0.2	0.2	0.2	0.2	0.3	0.3
08JUN92	10.2	2.7	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15JUN92	9.4	6.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
22JUN92	15.6	10.6	5.4	3.3	1.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2
29JUN92	21.8	16.1	10.3	7.4	2.9	1.0	0.3	0.2	0.2	0.2	0.2	0.2
06JUL92	19.4	13.0	8.9	5.8	1.8	0.7	0.2	0.2	0.2	0.2	0.2	0.2
13JUL92	19.5	13.2	8.4	3.9	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2
20JUL92	18.0	10.8	5.5	2.3	0.3	0.2	0.2	•	•	•	•	•
27JUL92	18.7	11.6	8.4	5.2	1.1	0.3	0.2	0.2	0.3	0.3	0.2	0.2
03AUG92	17.9	7.0	5.7	1.9	0.5	0.4	0.3	•	•	•	•	•
10AUG92	16.8	12.6	6.9	5.5	0.6	0.3	0.3	0.3	0.2	0.2	0.2	0.2
17AUG92	18.3	13.8	7.9	4.3	0.7	0.3	0.3	•	•	•	•	•
24AUG92	20.6	14.0	9.3	7.9	2.0	0.5	0.3	0.3	0.2	0.2	0.2	0.2
31AUG92	16.3	11.4	7.7	4.1	1.2	0.6	0.3	•	•	•	•	•
07SEP92	21.0	16.2	8.9	7.5	2.3	0.7	0.3	0.3	0.2	0.2	0.2	0.2
14SEP92	18.4	13.0	7.8	4.9	1.2	0.3	0.3	•	•	•	•	•
21SEP92	21.1	12.5	8.0	5.0	1.1	0.5	0.3	0.3	0.3	0.2	0.3	0.2
28SEP92	17.9	12.1	6.5	3.0	0.5	0.3	0.3	•	•	•	•	•
050CT92	21.6	17.7	12.5	9.1	2.9	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1200792	23.1	16.0	11.7	7.6	2.3	0.5	0.3	•	•	•	•	•
190CT92	18.7	9.7	9.0	4.6	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2

NOTE: (.) indicates no sampling

TABLE B-14 MEAN CONDUCTIVITY (mS/cm AT 25 C) BY REGION AND WEEK FROM BEACH SEINE SURVEY, 1992

Week	Regions												
Beginning Monday	YK	TZ	СН	IP	WP	CW	PK	HP	KG	SG	cs	AL	
22JUN92	8.7	3.0	5.7	3.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
06JUL92	15.9	12.5	7.3	5.1	1.6	0.6	0.3	0.2	0.2	0.2	0.2	0.2	
20JUL92	10.4	7.7	4.6	3.5	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	
03AUG92	11.6	8.1	4.3	1.7	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	
17AUG92	12.5	7.6	5.9	2.9	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
31AUG92	20.0	11.5	6.6	3.3	1.0	0.5	0.3	0.3	0.3	0.3	0.3	0.3	
14SEP92	15.5	11.4	7.3	5.0	1.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	
28SEP92	16.0	10.7	4.7	3.3	1.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
1200192	15.3	10.7	9.2	8.0	1.9	0.5	0.3	0.3	0.3	0.3	0.3	0.3	
260CT92	14.5	7.7	3.9	1.9	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	

DENSITY AND STANDING CROP ESTIMATES

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C-155	Regional density (no./1,000 m ³) of spottail shiner young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-156	Regional standing crop (in thousands) of spottail shiner young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-157	Regional density (no./1,000 m ³) of spottail shiner young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-158	Regional standing crop (in thousands) of spottail shiner young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-159	Regional Catch-Per-Unit-Effort (CPUE) of spottail shiner young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C -160	Regional standing crop (in thousands) of spottail shiner young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.
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C-172	Regional standing crop (in thousands) of shortnose sturgeon yearling and older in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-173	Regional density (no./1,000 m³) of white catfish young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-174	Regional standing crop (in thousands) of white catfish young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-175	Regional density (no./1,000 m ³) of white catfish young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-176	Regional standing crop (in thousands) of white catfish young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-177	Regional Catch-Per-Unit-Effort (CPUE) of white catfish young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-178	Regional standing crop (in thousands) of white catfish young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.

Number	<u>Title</u>
C-179	Regional density (no./1,000 m³) of white catfish yearling and older in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-180	Regional standing crop (in thousands) of white catfish yearling and older in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-181	Regional Catch-Per-Unit-Effort (CPUE) of white catfish yearling and older in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-182	Regional standing crop (in thousands) of white catfish yearling and older in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-183	Regional density (no./1,000 m ³) of weakfish young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-184	Regional standing crop (in thousands) of weakfish young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-185	Regional density (no./1,000 m ³) of weakfish young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-186	Regional standing crop (in thousands) of weakfish young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-187	Regional Catch-Per-Unit-Effort (CPUE) of weakfish young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-188	Regional standing crop (in thousands) of weakfish young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-189	Regional density (no./1,000 m ³) of weakfish yearling and older in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-190	Regional standing crop (in thousands) of weakfish yearling and older in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-191	Regional Catch-Per-Unit-Effort (CPUE) of weakfish yearling and older in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-192	Regional standing crop (in thousands) of weakfish yearling and older in the Hudson River estuary determined from the Beach Seine Survey, 1992.

Num	<u>ber</u> <u>Title</u>
C-19	Regional density (no./1,000 m³) of bluefish young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C-19	Regional standing crop (in thousands) of bluefish young-of-year in the Hudson River estuary determined from the Longitudinal River Icthyoplankton Survey, 1992.
C -19:	Regional density (no./1,000 m³) of bluefish young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-196	Regional standing crop (in thousands) of bluefish young-of-year in the Hudson River estuary determined from the Fall Juvenile Survey, 1992.
C-19	Regional Catch-Per-Unit-Effort (CPUE) of bluefish young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.
C-198	Regional standing crop (in thousands) of bluefish young-of-year in the Hudson River estuary determined from the Beach Seine Survey, 1992.

Regional Density (No./1,000m3) of Striped Bass Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-1

Combined	0.00 108	0.00	0.02 0.30 108	7.08 39.39 115	362.61 1238.66 118	449.32 1688.49 110	129.22 1068.66 110	3.46 9.90 110	8.04 22.68 119	1.15 11.09 117	0.00 0.00 118
¥ ₩	0.00	0.00	0.30	54.48 33.74 9	0.00 0.00 10	0.00 0.00 161 6	0.00 0.00 6	0.00	2.50 2.50 6	0.00	0.00
S	0.0 10 0.00	0.00	0.00	19.17 19.17 5	0.00	1.54 0.73 6	65.76 41.45 6	0.00	3.39 1.74 6	0.53 0.53 5	0.00
SG	0.0 8	0.00 8	0.0 0.0 8	0.00	0.00	404.48 404.48 8	102.16 49.03 8	2.88 1.44 8	3.49 2.65 6	10.98 10.98 6	0.00
χ	0.00	0.00	0.00	7.04 6.56 7	196.17 52.85 7	3571.71 1590.06 7	60.44 26.52 7	26.90 8.54 7	47.94 15.42 7	0.28 0.28 7	0.00
₹	0.00	0.00	0.00	2.11	487.33 129.90 11	438.25 273.44 10	1251.29 1065.96 10	8.26 4.58 10	35.15 14.95 10	0.83 0.83	0.00 10
¥	0.00	0.00	0.00	0.61	27.69 15.16 10	512.78 266.11 7	11.02 9.82 7	0.81 0.62 7	3.16 2.98 7	0.40	0.00
3	0.00	0.00	0.00	0.60 0.28 16	2428.23 1161.29 16	364.78 97.72 15	55.87 29.03 15	1.42	3.87 3.63 13	0.83 0.71	0.00
d.	0.00	0.00	0.00	0.95	1196.41 407.06 10	86.33 62.79 9	2.91 1.53 9	0.37	3.90	0.00	0.00
4	0.00	0.00	0.00	0.00	15.23 9.36 14	11.81 3.92 9	0.06	0.00	0.89 0.55 13	0.69	0.00
5	0.00	0.00	0.00	0.00	0.32	0.21 0.21 13	0.35 0.25 13	0.00	0.00	0.47	0.00
12	0.00	0.00	0.00 12	0.00	0.00	0.00	0.17	0.00	0.29	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.92	0.00	0.00	0.00
BT	S. N.	SN	SN	S	S	S	S.	ā	0.00	0.00	0.00
	DENSITY SE NO. TOWS										
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY - 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Eggs Table C-1 Regional Density (No./1,000m3) of Striped Bass

	_									•
	Regions Combined	0.28 2.48 118	0.00	0.00	0.00 0.00 73	0.00	0.00	0.00 2000 2000	0.0 0.0 20 0.0 0.0	0.00 25
	AL.	0.00	0.00	SE	S X	S	SN SN	X S	X S	SS SS
	ន	0.00	0.00	SX.	SS	SZ SZ	SZ SZ	SX	SS	S
~	S	0.00	0.00	×	S	S	N.	N.	S S	S
vey, 199	S S	0.00	0.00	SX	S	NS	SN SN	NS	SS	SS
kton Sur	€	0.0 0.00 100	0.00	SE	S	S	SZ Z	S	SS	SS
Eggs River Ichthyoplankton Survey, 1992	¥	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ggs iver Ichi	3	0.00	0.00	0.00	0.00	0.00 0.00	0.00	0.00 0.00 10	0.00	0.00
udinal	\$	2.43 2.16 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ped bass m Longit	<u>a</u>	0.00	0.00	0.00	90.00	0.00	0.00 1000	90.0	90.0	9.00
Regional Density (No.//,Uumb) of Striped Bass in Hudson River Estuary Determined From Longitudinal	5	0.00	0.00	0.00	0.00	0.00	0.00 0.00 12	0.00 0.00 12	0.00	0.00
, cooms) y Determ	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	90.0
ry (No./ r Estuar	¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
kegionat Densit in Hudson River	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS							
spie C-1	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

	Regions Combined	0 0 901	0 0 80	38 38 108	11866 5396 115	707520 184465 118	873641 253740 110	256150 176848 110	6408 1478 110	16651 3601 119	2646 1955 117	0 0 118
	Ą	000	000	38 88	6977 4321 9	၀၀ဥ	000	009	009	320 320 6	0010	000
1992	ន	005	000	000	3082 3082 5	000	248 117 6	10570 6662 6	000	545 279 6	స్ట్రాజ్లు కార్యాలు	000
Survey, '	98	000	000	000	000	000	71307 71307 8	18011 8644 8	507 254 8	616 467 6	1937 1937 6	000
lankton	KG	400	400	001	996 929 7	27752 7476 7	505290 224946 7	8550 3752 7	3805 1209 7	6782 2182 7	40 40 40 40	400
tanding Crop (In Thousands) of Striped Bass Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	000	00 ~	400	348 242 11	80645 21496 11	72524 45250 10	207070 176400 10	1367 759 10	5816 2474 10	138 138 10	005
Eggs nal River	¥	000	000	000	182 86 10	8254 4519 10	152877 79336 7	3285 2928 7	243 185 7	943 889 7	118 118 7	400
E gitudina	3	005	005	005	39 16	339444 162338 16	50993 13660 15	7810 4058 15	198 142 15	541 508 13	58 E	0 0 1
Regional Standing Crop (In Thousands) of Striped Bass in Hudson River Estuary Determined From Lon	ŝ	000	009	009	196 112 10	248203 84447 10	17910 13027 9	603 318 9	£ E °	810 788 9	000	000
of Stri ermined	≙	000	000	000	0 O E	3174 1950 14	2461 817 9	ឯឯទ	000	185 115 13	143 124 13	005
ousands) uary Det	₹	00E	0 0 £	០០ឆ្	000	84 84 84	31 12 13	52 37 13	0012	001	282	005
o (In The iver Estu	12	002	002	005	005	000	005	233	005	282	002	004
ding Crop Audson R	¥	005	005	005	000	000	000	132 132 9	211 154 9	005	005	001
Stand in h	B	SZ SZ	SX SX	X X	S S	N N	SX SX	X S	S X	000	000	000
Regiona		Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TONS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TONS	Crop TOWS
C-5		St. Se. NO.	SE. SE.	SE.	St. SE.	St. NO.	st. 86.	% st. ₹6.	St. No.	S 8 5.	St. No.	St.
Table C-2	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Eggs Table C-2 Regional Standing Crop (In Thousands) of Striped Bass

	Regions Combined	868 577 118	1006	999	00K	00E	ook	ook	00%	ook
	¥ 0	000	000	S.	SX	S	S	Š	S	S
1992	S	000	00%	S	S	S.	S	ž	ž	ž
rvey, 19	SG	000	000	S	SK.	SZ Z	SN	S	S	S
nkton Su	9X	400	۸٥٥	S.	S	S.	S	æ	æ	S S
Estuary Determined From Longitudinal River Ichthyoplankton Survey,	윺	005	005	S	S	S.	S	æ	S S	S.
River 1cl	¥	365 365 7	۸٥٥	000	009	00,0	009	000	000	009
cys tudinal R	3	០០ជ	0 0 E	000	000	005	005	၀၀ဥ	005	000
om Longi	ŝ	504 447 9	000	000	000	000	000	000	000	000
nined From Lon	4	001	០០ជ	005	005	005	005	005	005	005
in Hudson River Estuary Determ	₹	005	°°5	០០ជ	០០ជ	005	0012	002	002	០០ជ
er Estual	21	004	004	005	005	005	005	005	005	005
son Riv	¥	005	°°5	005	005	°°=	005	005	005	00=
	T8	000	0 0 0	001	400	400	400	400	۸٥٥	906
regional		Crop	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOMS	Crop TONS
,		5 % S.	St. NO.	8 S.	SE SE.	SE.	SE SE.	S & .	S 8 5.	SE SE
7-0 alge:	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Regional Density (No./1,000m3) of Striped Bass Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-3

Regions Combined	0.00	0.00	0.00	0.15 0.86 115	25.57 50.44 118	1235.23 1815.44 110	949.24 1454.10 110	694.42 959.65 110	317.12 678.24 119	25.45 38.23 117	0.94 5.51 118
AL	0.00	9.0	9.0	0.00	0.00	0.00	0.0	0.0	0.55 0.55 6	0.00	0.00
ន	0.00	0.00	0.00	0.00	0.00	16.24 16.24 6	105.16 49.92 6	0.00	8.75 5.29 6	10.50 1.04 5	0.00
SG	0.00 0.00 8	0.00 0.00 8	0.0 0.0 8	0.67 0.67 6	2.19 1.10 6	2.4 2.95 8	838.02 543.38 8	40.29 37.06 8	21.15 2.38 6	24.26 10.27 6	0.00
κ 8	0.00	0.00	0.00	0.00	26.52 4.91 7	27.17 9.63 7	1465.94 243.62 7	375.10 96.09 7	191.11 39.88 7	50.61 24.59 7	0.00
윺	0.00	0.00	0.00	0.00	36.74 12.32 11	412.75 86.43 10	3073.86 309.42 10	911.18 254.63 10	1719.86 619.45 10	53.34 11.27 10	0.9 0.73
¥	0.00	0.00	0.0	0.00	125.31 44.14 10	1895.78 294.01 7	973.80 258.87 7	2754.22 599.32 7	241.51 50.26 7	44.88 11.89	7.69 5.11 7
3	0.00	0.00	0.0	0.95 0.52 16	20.84 9.50 16	2643.24 454.72 15	1227.45 3692.79 249.99 1237.75 9 15	1293.28 2957.80 3 438.29 542.41 9 15	196.88 46.35 13	52.95 13.33 13	0.60 0.60 13
à	0.00	0.00	0.00	0.00	27.34 9.86 10	5092.13 1192.88 9	1227.45 249.99 9	1293.28 438.29 9	312.94 89.66 9	73.67 16.66 9	1.40 0.93 9
9	0.0	9.00	0.0	0.13 0.13	58.26 14.78 14	4569.72 1252.86	3.13 1.52 9	1.14 0.81 9	715.64 110.35 13	16.97 4.96 13	1.57 1.53 12
5	0.00	0.00	0.00	0.00	8.70 3.56 9	136.10 43.54 13	6.96 1.92 13	0.00 0.00 13	668.62 221.70 11	3.66 1.52 11	0.00
12	0.00	0.00	0.00	0.00	0.89	24.37 15.38 11	3.76 2.98 11	0.00	44.62 24.93 14	0.00	0.00
¥	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.98	0.0 1.00	0.00
BT	S.	SX SX	N.S.	S.	S.	S	S.	N	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS						
DATE	13APR- 18APR	20APR- 25APR	27APR- 01may	04MAY- 08MAY	11MAY- 15MAY	18MAY - 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Yolk-Sac Larvae Regional Density (No./1,000m3) of Striped Bass Table C-3

The purpose of Five Facture of Profit Configurational River Entity polarity consists of Five Facture of Profit Configurational River Entity polarity (1992) 1.00 1.0											
The following of the factor of the following involved in the following of the factor of the following involved in the following involved in the factor of the factor		Regions Combined	0.23	0.00	0.00	288	388	388	9.00	99.0	0.00
The property of the property			0.00	0.00	SE	S	SZ Z	S.	SX	SN SN	SX
The sequence of the control of the		ន	0.47	0.00	S	S.	SE SE	N.	NS.	×	SE SE
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	2	80	0.00	0.00	S	S.	ž.	SN N	S	SZ SZ	XX XX
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	vey, 199	8 9	0.60	0.00	ž	S	S.	S.	NS S	SX SX	SZ.
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	ikton Sur	윺	1.07	0.00	SZ.	X S	N.	X.	SZ	SN SN	×
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	thyoplar	¥	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	iver Ich	3	5.0 51.0	0.00 0.00 13	0.00	0.00	0.00 100 100	0.00	0.00 1000	0.00	0.00
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	udinal F	\$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	m Longit	<u>a</u>	0.00	0.00 13	0.0 0.0 0.0 0.0	0.0 0.0 0.0	0.00 0.00 10	0.0 0.0 0.0	0.00 0.00 10	0.00	0.00
DENSITY 0.00 SE NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 6 NO. TOMS 7 DENSITY 0.00 SE NO. TOMS 7 DENSITY 0.00	ined Fro	5	9.00	9.00	0.00	0.00 0.00 12	0.00 0.00 12	0.00	0.00	0.00	0.00
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		X	0.0 1.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	son Rive	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
'			DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS				
		DATE				04AUG- 06AUG		01SEP- 03SEP	15SEP- 17SEP	288EP- 308EP	120CT- 140CT

Regional Standing Crop (In Thousands) of Striped Bass Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-4

	Regions Combined	567 217 118	0 119	002	00K	00%	0 0 E	00K	00K	00 K
	AL CC	009	000	SS	SN	NS S	S	SN SN	X S	SN SN
992	S	κκ _ν	000	N.	SN SN	SN S	NS.	S	S	Š
Survey, 1	20	000	000	SX	S	S	S	S	S.	S
ankton	χ	85 7	007	XX XX	SN SN	N S	NS	S.	NS	N S
chthyop	웊	771 109 51	000	N.	NS	S	S	SN	S	S S
River	¥	206 147 7	002	000	000	000	009	000	000	009
tudinal	3	222	0011	000	005	005	000	0 0 0	0 0 0	005
om Longi	ş	000	000	000	000	000	000	000	000	009
rmined Fr	9	001	005	000	005	005	000	000	000	005
ry Dete	5	005	005	0 0 22	002	002	0 0 2	002	0 0 2	0 0 21
er Estu	12	002	0 0 2	005	001	001	005	001	005	005
in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	¥	200	005	001	٠٠٤	001	001	005	001	001
5	18	000	000	001	001	001	007	400	400	400
		St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS						
	DATE	29JUN- 03JUL	06 JUL - 10 JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-4 Regional Standing Crop (In Thousands) of Striped Bass Yolk-Sac Larvae

		j :	in Kud	son Riv	er Estua	ıry Deter	mined F	rom Long	itudinal	River 1	chthyopl	ankton t	in Hudson River Estuary Determined from Longitudinal River Ichthyoplankton Survey, 1992	266			
DATE			18	¥	21	5	₽	S	₹	¥	윺	KG	SG	ន	A F	Regions Combined	
13APR- 18APR	St.	Crop TOWS	S	000	0 0 2	0 0 E	000	000	000	009	009	400	000	000	000	0 106	
20APR- 25APR	St. SE NO.	Crop TOWS	Sx	005	0 0 21	0 5 1	000	00%	005	000	400	0 0 4	008	000	000	0 108	
27APR- 01MAY	St. Se.	Crop TOWS	NS	000	0 0 2	0 0 E	000	000	005	000	006	7 0 0	008	000	000	0 108	
04MAY- 08MAY	St.	Crop TOWS	S	000	000	000	27 27 13	000	133 72 16	000	001	00 ~	119	0010	000	279 142 115	
11MAY- 15MAY	St. NO.	Crop TOWS	S	000	285 203 10	1285 525 9	12138 3079 14	5673 2046 10	2914 1327 16	37360 13161 10	6079 2039 11	3751 695 7	386 194 6	000	000	69870 13915 118	
18MAY- 22MAY	SE.	Crop TOWS	S	886	7841 4949 11	20108 9 6433 2 13	952037 1 261016 9	1056391 247470 9	369501 63566 15	565196 87655 7	68304 14303 10	3843 1363 7	872 872 8	2611 2611 6	000	3046768 375998 110	
25MAY- 30MAY	SE.	Crop TOWS	S	000	1209 959 11	1029 284 13	652 317 9	254642 51862 9	516219 173027 15	290323 77179 7	508676 51205 10	207387 34464 7	147739 95796 8	16903 8024 6	000	1944779 227237 110	
01JUN- 05JUN	SE SE.	Crop TOWS	SZ	000	005	0012	237 169 9	268298 90925 9	413473 75825 15	821126 178676 7	150786 42138 10	53066 13594 7	7103 6533 8	000	000	1714089 218963 110	
08JUN- 12JUN	St. 86.	Crop TOWS	009	224 205 11	14361 8022 14	98780 32754 11	149094 22990 13	64922 18601 9	27522 6479 13	72002 14984 7	284610 102510 10	27036 5641 7	3729 419 6	1406 850 6	۲ ۲ °	743757 113222 119	
15 JUN- 19 JUN	St. NO.	Crop TOWS	009	005	0 0 4	540 224 11	3536 1034 13	15283 3457 9	7402 1864 13	13381 3544 7	8827 1866 10	7159 3478 7	4277 1811 6	1688 167 5	0010	62093 6927 117	
22JUN- 26JUN	St. NO.	Crop TOWS	000	00=	004	00[326 319 12	290 192 9	382	2293 1524 7	150 131 10	400	000	000	000	3144 1577 118	

Regional Density (No./1,000m3) of Striped Bass Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-5

ons	0.00	9.0	0.00	0.00	0.00 0.00 118	30.70 130.86 110	.01 110	.20 110	.50 17 19	.93 117	5.2.8 12.2.8
Regions Combined						•	1130 1572	1319.20 1397.82 110	2144 5020	360.93 475.82 117	191.16 234.24 118
¥.	0.00	0.00	0.0	0.00	999	0.00	0.00	9.0	2.33 2.33 6	0.00	9.83 4.96 6
S	0.00	0.00	0.00	0.00	0.00	4.25	5.24 2.51 6	0.00	1.97 0.99 6	6.51 2.32 5	7.10 2.93 6
SG	0.00	0.00	0.0 8.00 8	0.00	0.00	0.0	28.28 13.61 8	7.64 6.98 8	0.00	62.09 51.37 6	30.39 3.99 6
KG	0.00	0.00	0.00	0.00	0.00	2.30 2.30 7	135.97 38.38 7	207.59 44.21 7	32.62 7.74 7	135.72 14.09 7	49.23 8.94 7
윺	0.00	0.00	0.00	0.00	0.00	6.15 3.11 10	1843.69 520.15 10	641.90 82.31 10	58.33 16.15 10	187.63 45.36 10	134.44 47.47 10
¥	0.00	0.00	0.00	0.00	9.00	0.00	2187.93 407.49 7	1805.44 511.28 7	488.03 59.16	539.33 269.42 7	160.37 35.60 7
3	0.0 0.0 0.0	9.0	0.00	0.00 0.00 54	0.0 0.03 5.03	110.37 21.69 15	2783.61 609.05 15	4426.61 677.23 15	1260.05 263.28 13	972.54 243.76 13	792.50 198.88 13
\$	0.00	0.00	0.00	0.00	0.0 0.00 0.00	163.30 123.24 9	5658.74 1276.03 9	5403.92 936.77 9	2496.06 687.33 9	684.88 132.92 9	608.04 84.82 9
4	0.0	9.0	0.00	0.00 0.00 13	0.00	64.31 37.00 9	552.40 152.68 9	2642.50 513.03 9	7654.91 842.81 13	834.71 160.91 13	346.02 51.37 12
5	0.00	0.00 13	0.00	0.00	0.00	5.88 2.15 13	349.99 105.63 13	688.80 290.38 13	4773.23 11	795.38 165.72 11	292.91 41.63 11
12	0.00	0.00 0.00 12	0.00 0.00 12	0.0 0.00 0.00	0.00	11.88 7.79 11	14.23 5.50 11	3.57 2.60 11	3888.28° 1047.08	417.05 135.05 14	45.84 9.12 14
*	0.0 0.00 0.00	0.00	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	2.44	763.27 250.56 11	39.83 14.79 11	8.46 4.06 11
18	SN	S.	S.	X S	X.	NS NS	S.	X X	123.56 42.09 6	16.35 4.08 6	0.00
	DENSITY SE NO. TOWS										
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Regional Density (No./1,000m3) of Striped Bass Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-5

•	Regions Combined	72.03 92.76 118	22.94 30.80 119	1.91 1.83 72	0.03 0.15 73	0.00	3.68	0.0 7.00 7.00	388	9.6 2.88
	4	9.00	4.61 2.30 6	X X	X X	X X	S.	SN N	SZ SZ	X S
	S	0.00	8.76 4.24 6	æ	æ	S.	N.	S	ž	SE SE
	86	11.12 10.28 6	4.27 0.88 6	S	æ	SN	S	S.	\$	S
	S S	24.40 3.84 7	12.53 4.95 7	S	S.	8	X.	S.	S.	S
	£	45.90 11.19	27.46 10.73	S	S S	S	S.	NS.	S.	S.
	¥	102.47 30.87	28.43 5.50	2.26 0.73 6	0.00 0.00 6	0.00	0.00	0.0 6.00 6.00	0.0 0.0 6	0.00
	3	422.31 22.29 13	86.82 18.46 13	8.60 1.16 9	0.09	0.14 0.14	0.00 0.00 0.00	0.00	0.00	0.00 0.00 0.00
	£	227.66 75.54 9	39.46 10.62 9	3.17	0.12 0.13 6	0.15 0.15	0.00	0.00	0.00	0.00
	2	84.69 34.48 13	46.93 12.96 13	1.2% 0.73 10	 6.00 5.00	0.00	9.00	0.00	0.00	0.00
	5	15.56 3.43 11	34.76 11.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12	2.00 0.91 14	4.15 2.24 14	0.00	0.00	0.00	9.00	0.00	0.00	0.00
	×	0.29	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00 ± 000
	B T	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
:		DENSITY SE NO. TOWS								
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	285EP- 305EP	120CT- 140CT

Regional Standing Crop (In Thousands) of Striped Bass Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-6

Regions Combined	0 0 90	0 0 801	0 0 108	0 115	0 0 8 1	69423 27009 110	2716891 317469 110	3069074 288888 110	5542593 816728 119	939247 110181 117	453764 37703 118
¥	000	000	000	000	005	000	000	000	298 5 298 6	002	1259 635 6
S	005	000	000	0010	000	888 883 8	842 404 6	000	317 159 6	1046 372 5	1141 471 6
SG	○○∞ .	000	008	000	000	000	4986 2399 8	1347 1230 8	000	10946 9056 6	5358 704 6
KG	007	001	001	001	001	326 326 7	19236 5430 7	29368 6254 7	4614 1096 7	19200 1993 7	6964 1264 7
윺	00%	001	001	005	005	1017 215 01	305103 86077 10	106224 13621 10	9653 2673 10	31050 7506 10	22248 7856 10
¥	000	000	000	000	000	001	652295 121486 7	538263 152430 7	145497 17637 7	160794 80322 7	47811 10614 7
3	000	00#	005	002	002	15429 3032 15	389123 85139 15	618800 94671 15	176143 36805 13	135953 34075 13	110785 27802 13
d'A	000	000	000	000	005	33878 25566 9	1173938 264719 9	1121073 194339 9	517823 142590 9	142082 27575 9	126142 17596 9
<u>a</u>	000	000	000	00E	002	13399 7709 9	115085 31808 9	550528 106883 9	1594795 175589 13	173901 33524 13	72089 10702 12
₹	០០ស	001	001	000	000	868 317 13	\$1706 15605 13	101761 42899 13	1641224 ' 705182 11	117507 24483 11	43273 6150 11
12	002	005	002	000	000	3823 2507 11	4578 1770 11	1149 837 11	1251294 ' 336962 14	134213 43460 14	14752 2934 14
¥	005	000	000	000	000	000	000	560 376 9	175110 57483 11	9138 3393 11	1942 932 11
BT	SN	S X	S	S	S	S	SZ SZ	SS.	25826 8797 6	3418 853 6	000
	Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS
	SE .	SE SE	% % %.	SE SE	SE.	S 8.	S 8 5.	st. 86.	st. 86.	St. 86	St.
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Regional Standing Crop (In Thousands) of Striped Bass Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-6

Regions Combined	170474 19975 118	54113 5387 119	2792 369 72	388	238	00E	00K	00K	00K
4	000	591 294 6	S	SZ	SE	S	SN	SZ	SZ
S	0010	1407 681 6	S	S	S	S	S.	S	S.
98	1960 1812 6	753 156 6	9	S	SH.	SZ Z	SS	SX.	SX
KG	3451 543 7	2771 201 7	SZ.	SZ	SZ.	SZ.	SE	NS NS	SX
을	7595 1853 10	4544 1776 10	S 2	SZ	SZ Z	SZ Z	SE SE	SX SX	SZ Z
¥	30551 9204 7	8476 1640 7	675 218 6	000	000	000	000	000	000
3	59035 3116 13	12137 2581 13	1203 162 9	525	555	005	005	005	000
\$	47230 15672 9	8186 2203 9	658 198 6	223	22.4	000	000	000	000
<u>e</u>	17644 7182 13	9777 2700 13	257 153 10	000	005	000	000	005	005
5	2299 507 11	5135 1671 11	002	00%	002	002	002	005	០០ជ
12	643 14 14	1336 720 14	00=	005	00=	005	005	005	005
¥	88=	005	005	00 <u>÷</u>	005	005	005	005	005
B	000	000	996	۸٥٥	001	400	001	400	400
	Crop TOVS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS
•	S & S.	S # 5	se.	8 8 £	S 등 당	S 8 5.	St. 86.	S 8 6.	S 8 5.
DATE	29 JUN- 03 JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	285EP- 30SEP	120CT- 140CT

Regional Density (No./1,000m3) of Striped Bass Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-7

Regions Combined	0.00 0.00 106	0.00 0.00 108	0.00	0.00 0.00 115	0.00	0.00	0.00 110	0.00 110	0.00	0.00	0.00 0.00 118
Ą	90.0	0.00	0.00	0.00	0.0 0.0 0.0 0.0	0.0 6.0 6.0	9.09	0.0	0.00 6.00 6	0.00	0.00
S	0.0 0.0 1.00	999	9.9	0.0 0.00 5.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.0 0.00 5	9.09
S	0.0 8	0.0 8	0.00	0.00	0.00	0.00	0.00 0.00 8	0.0 8	0.0 0.09 6	9.0	9.0.9
KG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00	0.00	0.00	0.00	0.00	9.0	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00 0.00 6	0.00	0.0 0.00 0.00	0.00 10 10	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00 0.00 16	0.0 0.0 5	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00	0.00	0.00
3	0.00	0.00	0.00	0.0 0.00 10	0.00	0.00	0.00	0.00	999	999	0.00
<u>-</u>	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00 13	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.0 0.00 £1	0.00	995	0.00
71	0.00 0.00 12	0.00	0.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	9.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	NS	N	N.	N	S.	S	SZ .	S#	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE No. TOUS	DENSITY SE NO. TOWS								
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Regional Density (No./1,000m3) of Striped Bass Young of Year in Hudson River Estuary Determined From Londitudinal Diver Johthwanians Table C-7

	Regions Combined	0.34 1.38 118	0.82 3.29 119	0.30 1.43 72	0.69 2.29 73	0.59 1.95 73	1.32 3.23 73	0.06 0.33 73	0.39 1.24 73	0.00 0.00 73
	¥	0.00	0.0 0.00 6	S	SZ	S	SE	SZ Z	SZ.	S X
	ន	0.00	0.03 9.03 9.03	S	S	SZ.	¥	S	S	SZ
~	98	0.00 0.00 6	0.00	S	S	SZ.	SE SE	S	SZ.	S
vey, 199	æ	0.25	0.00	SZ.	S Z	SE	S	S.	SN	S.
kton Sur	₽	0.43	0.0 0.85 5	S#	SH.	S	S.	S	SN	ž
thyoplan	꽃	0.17 0.17	0.35	0.23 0.23 6	0.00 0.00 6	0.0 0.00 6	0.00	0.00	0.85 0.85 6	0.00
Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	3	0.74 0.38 13	0.92 0.71 13	1.17	0.76 0.58 10	0.13 0.13	0.35 0.28 10	0.00	0.00	0.00 1000
udinal R	\$	0.46 0.46 9	0.00	0.88 0.88 6	0.00	3.14 1.33 6	0.47	0.27 0.27 6	0.00	0.00
m Longit	2	1.00 0.74 13	4.67 2.53 13	0.0 0.04 10	1.98 1.29 10	1.46 1.42 10	0.46 0.42 10	0.00	0.29 0.22 10	0.00 0.00 10
nined Fro	3	9.6 8.8 1	3.35 1.78 11	0.00 0.00 12	1.7 2.7 2.7	0.00	7.31 2.99 12	0.00	1.72 0.85 12	0.00
'y Detern	12	0.75 0.54 14	0.00	9.00	1.06 0.58 11	9.00	1.13 0.81 11	0.19	0.00	0.00
	¥	0.00	0.45	0.08 1.1	9.0	99.5	0.15 1.15	0.00	0.23	0.00
in Hudson River	B	0.00 0.00 6	0.00	0.00	0.00	0.00	0.67 0.67 7	0.00	0.00	0.00
ë Ž		DENSITY SE NO. TOWS								
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	288EP- 308EP	120CT- 140CT

Regional Standing Crop (In Thousands) of Striped Bass Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-8

Regions Combined	0 0 90	0 0 80	0 0 80	0 011	0 0 12 0 0 8 1	100	0 0 0 0 0	9001	1300	1100	0 0 81
7	000	000	000	000	၀၀ဥ	000	000	000	000	000	000
S	000	000	000	00v	000	000	000	000	004	00 N	000
98	ဝဝလ	000	000	000		000		000	000	000	000
8	001	906	001	400	400	400	001	001	001	001	901
윺	000	001	901	005	005	000	000	၀၀ဝ	000	000	000
¥	000	000	000	000	005	001	001	001	006	001	۸٥٥
3	002	005	00=	002	002	00 %	၀၀နာ	ంంగ	001	0015	00£
S	00%	000	000	000	000	000	000	000	000	000	000
٩	000	005	005	001	002	000	000	000	00E	ဝဝည	004
3	0 0 t	០០ជ	၀၀ည်	000	000	001	00 <u>m</u>	0 £	00=	005	001
12	002	002	004	005	005	°°5	°°=	005	002	004	0 0 71
¥	000	005	005	000	000	000	000	000	001	005	001
8	S	S	SZ SZ	S	S.	SE SE	SZ Z	N.	000	000	000
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS
	St. C	St. c SE NO. 1	St. C SE NO. T	St. C SE NO. T	St. C	St. C. SE NO. 10	St. C. NO. 10				
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Young of Year Table C-8 Regional Standing Crop (In Thousands) of Striped Bass

	Regions Combined	290 118	1954 625 119	443 249 72	1112 421 73	974 405 73	1860 544 73	5 % K	622 290 73	00K
	4	009	000	S.	SE SE	S	SZ	NS NS	S	S Z
365	ន	00 M	149 106 6	S S	S	S	S	S	S.	%
urvey, 19	98	000	000	SZ	S.	S	S	N.	N	S.
inkton Si	ă	33.	400	S.	SS	S	S	SX	S.	S.
ing Crop (in Incusancs) of Striped bass udson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	222	000	SN	S	X	\$2	S	S	S
River 1	¥	7 22	104 104 7	880	000	00%	000	000	252 252 6	000
itudinal	3	50 E2 E1	55 55 51	45 55 9	108 101	885	9 60	000	005	005
rom Long	9	880	000	181 6	000	652 277 6	94 58 6	5 5 6	000	000
rmined F	٩	208 154 13	973 527 13	9 9 5	413 269 10	305 296 10	882	000	236	005
usanas) ary Dete	5	98 11	495 264 11	002	252 12 12	002	1080 442 12	002	255 125 12	007
ver Estu	72	242 174 14	004	00=	340 186 11	005	364 260 11	1 62	005	005
udson Ri	¥	005	\$5 12 12	222	005	005	= 44	005	35 11	005
Regional Standi	8	000	000	00 ~	400	001	140 140 7	400	400	400
20 20 20		. Crop	. Crop	. Crop	. Crop	. Crop	St. Crop SE NO. TOWS	. Crop	. Crop	. Crop
,		St.	S SE.	St.	St.	SE .	2 2 2	St. 86.	St. SE.	st. 86.
Table C-8	DATE	29JUN- 03JUL	06JUL- 10JUL	2010L - 22JUL -	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-9 Regional Density (No./1,000m3) of Striped Bass Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

		;
2.42 0.24 1.06 0.20 21 13		1.20 2.98 0.05 0.58 0.70 0.05 18 21 13
	1.20 0.58 18	!
		0.57 1. 0.53 0.
		2.21 1.14 8
		4.32 1.10
		2.92 1.78
:	2.73 1.29 14	3.28 2.17 14
5	2.57 0.51 27	4.65 1.34 27
21	2.56 0.47 46	1.46 0.48 46
¥	0.09	0.06
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13.UL - 18.JUL	27 JUL - 01 AUG

Table C-10 Regional Standing Crops (in Thousands) of Striped Bass Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

	Regions COMBINED	4783 915 210	769 760 210	848 475 210	407 402 210	412 112 210	129 170 210	499 147 210	844 127 210
		·	•						
	AL	33	จงนิ	វិតស	995	995	E & £	52 8 25	0012
	S	389 171 21	478 113 21	322	322	200	945	74 8 12 21 8 12	233
	SG	363 158 18	211 102 18	77 81	25 28 28 28	832	448	445	448
	χ 9	24 tc	256 70 15	41 19 15	38 15	~ ខក	4 4 N	445	5
	윺	178 170 10	88 0 1	385	8 1 1 1 2 8	4 4 0	446	005	000
7, 1992	¥	122 51 8	659 339 8	373 311 8	න න න	80 80 80	000	000	000
ls Survey,	3	958 677 13	604 154 13	3% £	163 85 Et	23 11	108 138 13	172	35 13
att Shoa	ş	874 437 8	605 369 8	1,58	165 165 8	000	000	mme	000
d From F	<u>~</u>	568 268 14	684 451 14	822	571 333 14	824	117 37 14	222	282
Estuary Determined From Fall Shoals	5	378 278 278	687 198 27	504 119 27	202 93 27	158 88 27	449 89 27	2442	328 72 27
stuary D	72	825 150 46	471 156 46	1269 304 46	54 50 70 70 70 70 70 70 70 70 70 70 70 70 70	67 76 76	95 95 97	311 138 46	\$2.3
Ver	¥	t, 7	15 17	13	0 0 71	10 17	mm t	0 0 71	106 59 17
in Mudson R		Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TONS
:		8 8 5.	S S .	S S S	St.	SE.	st. No.	St. NO.	S SE.
	DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	OBSEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-11 Regional Catch-Per-Unit-Effort (CPUE) of Striped Bass Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

s de la composición dela composición de la composición dela composición de la compos							٠			
Regions COMBINED	2.44 11.04 100	12.26 51.85 100	8.73 13.00 100	11.80 20.25 100	5.82 7.07 100	4.73 100 100	3.73	1.94 2.41 100	1.35 2.63 100	1.80 2.82 100
¥	0.00 0.00 12	0.58 0.42 12	1.58 0.51 12	8.43 4.83	0.29	0.86 0.70 7	0.00	0.43	0.00	0.14 0.14 7
ន	0.00	10.16 6.43 19	3.72 19	4.00 1.92 10	2.80 0.92 10	5.40 1.76 10	3.50 1.33	0.0 0.60 10	0.20	999
SG	0.00 0.00 15	5.00 2.83 15	4.00 0.86 15	5.44	3.78 1.18 9	1.78 0.52 9	0.79	1.0 1.8 0.0	0.11 9.11	0.00
2	0.00 0.00 8	8.25 3.91 8	6.25 3.29 8	0.60	0.20	2.80 1.32 5	0.40	0.60	0.00	0.00
₽	0.13 8	13.63 5.87 8	13.63 4.83 8	2.40 1.29 5	4.80 2.40 5	1.00 0.77 5	1.80 1.11 5	0.40	0.20 0.20 5	1.00 5.77
¥	0.13 0.13 8	6.00 1.70 8	3.75 1.06 8	3.00 1.48 5	3.00	2.20 1.96 5	2.20 1.96 5	1.40 0.87 5	0.60	0.60
3	3.67 2.19 3	19.67 8.09 3	2.67 0.88 3	12.67 3.20 6	8.33 2.09 6	4.50 1.67 6	1.67 0.49 6	2.83 0.40 6	0.33 0.21 6	0.33
ş	5.00 4.51	60.33 49.28 3	5.33 2.91 3	22.60 7.28 5	3.40 1.03 5	2.80 0.73 5	1.20 0.37 5	0.80	0.80 0.80 5	1.00 0.45 5
4	8.33 3.33 3	15.67 9.28 3	17.00 8.14 3	32.00 16.60 5	2.80 0.86 5	7.40 1.99 5	1.20 0.58 5	3.80 0.80 5	3.00 1.64 5	5.60 2.20 5
5	10.57 5.07	4.29 2.31	18.43 4.22 7	23.29 5.53 14	20.29 3.18	16.93 2.19 14	12.21 1.87 14	6.43 1.19 14	7.00 1.54 14	6.43 0.82 14
12	1.45	3.27	11.27 3.02 11	15.75 2.28 24	8.58 1.58 24	8.71 1.30 24	5.63 1.50 24	2.% 0.77	2.73 0.44 24	2.50 0.62 24
¥	0.00 0.00	0.33	9.00 4.04 3	10.40 1.50 5	11.60 4.71 5	2.40 0.73 5	0.80 0.37 5	1.60 0.68 5	1.20 0.73	1.05
	CPUE Se No. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE No. Tows	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS
DATE	23JUN- CP 26JUN SE NO	ON - CE 10600 - CE 106000 - CE	20JUL - CP 22JUL SE NO	O3AUG- CP O6AUG SE NO	17AUG- CP 20AUG SE NO	31AUG- CP 02SEP SE NO	14SEP- CP 16SEP SE NO	28SEP- CP 30SEP SE	120CT - CP 150CT SE NO	260CT - CP 280CT SE NO

Young of Year Table C-12 Regional Standing Crops (in Thousands) of Striped Bass

	Regions SG CS AL COMBINED	0 0 0 480 0 0 0 169 15 19 12 100	88 200 8 1205 50 127 6 237 15 19 12 100 70 233 22 1697	79 17 12 12 15 15 15 15 15 15 15 15 15 15 15 15 15	55 18 10 7 7	31 106 12 1183 9 35 10 96 9 10 7 100	37 69 0 749 14 26 0 91 9 10 7 100	20 18 6 445 17 12 3 53 9 10 7 100	2 4 0 366 2 3 0 49 9 10 7 100	0 0 2 382
	HP KG	05 8 0 8	17 71 7 34 8 8 8 4 17 54		0 M W	1 24 24 24 24 24 24 24 24 24 24 24 24 24	S1 — R2 B1 S2 S4	55 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	55.5	1 0
(in incusance, of attimed base found of real Determined From Beach Seine Survey, 1992	¥	1 <0.005 1 <0.005 8	27 8 72°	oe 25.	2 ~ 2	5 7 s	52°	10 <0.005 6 <0.005 5	4 <0.005 4 <0.005 5 5	4
ine Survey	3	8 K m	203 3 28 3 3 3 3	135 34 6	6 23 89 6 23 89	48 6 6	စ်း က လ	0°44	400	4
or stripe Beach Se	£	£ 57 E	130 130 44		0 M III	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	— ic ic	10 − 10	21.010	8
nousands) mined From	≙ 3	284 77 136 77 7 3	·	114 /3 7 3 626 295 149 153 14 5	546 26 86 8 14 5	455 68 59 18 14 5	328 11 50 5 14 5	173 35 32 7 14 5	188 28 42 15 14 5	173 52
itanding trops (in incusands) of striped base River Estuary Determined from Beach Seine Su	12	57 12	149 30 11 512 4		390 5	396 59 24	256 68 24	*3 # # * * * * * * * * * * * * * * * * *	125 26 24 1	114
al Standing L son River Est	¥	00m	พพพ ซูรู	Sw &±n	35	<u>इ</u> ७ ४	0 M W	ភិឌិ	o o ro	30
in Hudson		crop	Crop 5. TOUS	St. Crop SE. Crop SE. NO. TOUS	:. Crop	t. Crop 5. TOWS	St. Crop SE NO. TOWS	t. Crop	t. Crop	St. Crop
ZI-3 alger	DATE	23JUN- St. 26JUN SE NO.	06JUL SE 09JUL SE NO.		17AUG- St. 20AUG SE NO.	31AUG- St. 02SEP SE NO.	14SEP- St 16SEP SE	28SEP- St. 30SEP SE NO.	120CT- St. 150CT SE NO.	260CT- St

Table C-13 Regional Density (No./1,000m3) of Striped Bass Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

8 G								
Regions COMBINED	0.04 0.10 210	0.05 0.25 210	0.05 0.27 210	0.12 1.28 210	0.04 0.30 210	0.07 0.64 210	0.04 0.16 210	0.08 0.19 210
AL	0.00	0.09	0.25 0.25 13	0.00	0.00	0.00 0.00 13	0.00	0.00 13
ន	0.02 0.02 21	0.30 0.24 21	0.00	0.02 0.02 21	0.00 2.00 21	0.04	0.00	0.00 21
SG	0.00	0.02	0.00 18	0.00 0.00 18	0.02 0.02 18	0.00 18	0.00 18	0.00 18
ă	0.03 0.03 15	0.03	0.00	0.00	0.35 0.30 15	0.00	0.00 0.00 15	0.00 0.00 15
윺	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
꿆	0.00	0.00	0.03	0.03 0.03 8	0.03 0.03 8	0.00	0.00	0.03 0.03 8
3	0.00	0.02	0.00	1.32	0.00 0.00 13	0.64 0.64 13	0.00	0.04
≘	0.00	0.00	80.0	0.00	0.00 0.00 8	0.00	0.02 0.02 8	0.00 8
<u>a</u>	0.02	0.05	0.00	0.01	0.00	0.01 0.01 14	0.05 0.02 14	0.07 0.02 14
중	0.08	0.04	0.11 0.06 27	0.02	0.02 0.02 27	0.09	0.11 0.09 27	0.46 0.16 27
12	0.34 0.08 46	0.02	0.21 0.07 46	0.01	0.02 0.02 46	0.09	0.36 0.13 46	0.35 0.10 46
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	DENSITY SE NO. TOWS							
DATE	13JUL - 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-14

Table C-14	-14	Regional Sta in Hudson Ri	혈호		(in Thousands) of Striped Bass Determined From Fall Shoals Su	rds) of § From Fal	Striped	iped Bass Shoats Survey,	Yearli 1992	Yearling and Older 1992	lder				
DATE			¥	77	5	<u> </u>	ş	3	¥	윺	ξ.	98	ន	4	Regions COMBINED
13JUL- 18JUL	St.	Crop	005	110 27 44	5 %	404	00	00 ដ		005	44 ħ	ဝဝဋ	44,	00 5	£1 82 65
27JUL- 01AUG	S 8 5		. 005	6 4 4	3 4 2	0 0 2	၁ ၁၁ ဆ	i ∽£	၁ ဝဝဆ	. .	<u>3</u> 44ቪ	448	236 5	. T ~ E	210 210
10AUG- 14AUG	St.	Crop	005	64 48	17 9 72	002	000	០០ស	550	005	၀၀ ည	ဝဝဆ	200	32 13	125 42 210
24AUG- 28AUG	SE SE	Crop	005	ww3	2333	2	000	185 178 13	80 80 80	ထ ဆ င်	0 0 T	ဝဝရာ	5 7 7 Z	0 0 15	213 179 210
OBSEP- 12SEP	St.	Crop TOWS	0 0 21	r & 3	27.3	002	000	០០ជ	ස ස ස	005	65 S E	448	0 0 12	001	71 44 210
21SEP- 25SEP	st. SE.	Crop TOUS	0 0 1	\$23	13 6 27	w w 2	000	89 89 13	000	005	0 0 17	002	24 6	0 o £	140 90 210
050CT- 090CT	SE.	Crop TOUS	0 0 7	115 42 46	16 13 27	644	m m so	០០ជ	000	005	o o ក្	005	2700	០០ជ	144 44 210
190CT- 230CT	St. SE.	Crop	ww 	114 33 46	68 23	4 ≈ 4		u m ដែ	55 x	005	၀၀က်	002	2100	០០ឆ្	215 42 210

Table C-15 Regional Catch-Per-Unit-Effort (CPUE) of Striped Bass Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

8E 0										
Regions COMBINED	0.46 1.53	2.10 100	3.13	0.54 2.09 100	5.43 100	0.37 1.95 100	0.32 1.27 100	0.63 2.46 100	3.62 100	0.14
Ą	0.50 0.23 12	0.92 0.61 12	0.33 0.26 12	0.29	0.30	0.29	0.14 0.14 7	0.00	0.14 0.14 7	0.00
S	1.11 0.41 19	2.74 1.69 19	1.26 0.70 19	0.60 0.27 10	0.80 0.80 10	0.30 0.21 10	0.00	0.20 0.13	9.00	0.00
SG	2.00 1.21 15	1.60 0.83 15	0.47	1.44 0.56 9	5.00 4.76 9	0.11	1.89	0.22 0.15 9	0.33 0.17 9	0.00
8	0.00 0.00 8	0.0 8	0.25 0.16 8	1.20 1.20 5	0.00	1.00 0.63 5	0.00	1.40 0.60 5	3.40 3.40 5	0.00
훞	0.88 0.64 8	0.13 8	0.63 0.38 8	0.80 0.80 5	1.00 0.77 5	0.40	0.00	0.20	0.20	0.00
¥	0.88 0.44 8	0.75 0.31 8	4.50 2.90 8	2.20 1.36	2.80 2.33 5	2.00 1.76 5	0.00	0.40	0.00	0.00 5.00
3	0.00	0.33	1.00 0.58 3	0.0 0.00 6	0.17 0.17 6	9.0	0.33	0.50	0.00	0.50
ŝ	0.00	0.33 0.33 3	0.00 0.00 x	0.00 0.00 5	0.20	0.20 0.20 5	0.20	2.20 2.20 5	0.20	0.20
<u>a</u>	0.00 3.00	0.33 0.33 3	0.00 0.00 3	0.00	0.00	0.00	0.00	6.1.6 5.0 5.0	1.20 0.97 5	0.40
5	0.00	0.57 0.20 7	0.00	0.00	0.07	0.07 0.07 14	0.57 0.40 14	0.21 0.15 14	0.57 0.23 14	0.07
12	0.18 0.18 11	0.09	0.18 0.18	0.00	0.50 0.24 24	0.0 2.04 2.04	0.13 0.07 24	0.38 0.13 24	1.04 0.27 24	0.33 0.10 24
¥	0.00	0.00 3.00	0.33	0.00	0.00	0.00	0.60	0.20 0.20 5	1.40 0.60 5	0.20
	တ	S	<u>v</u>	ý	s	ဟ	s	s	v	s
	CPUE SE NO. TOWS									
DATE	23JUN- 26JUN	09JUL -	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	285EP- 30SEP	120CT - 150CT	260CT- 280CT

Yearling and Older Table C-16 Regional Standing Crops (in Thousands) of Striped Bass

	Regions COMBINED	\$ £ 5	127 38 100	28 100 100	8 5 5	159 78 100	85 100 100	ឧដទ	6 45	122 34 100	28 7 100
	4	~ w 2	5 & 5	សសជ	441	. 440	4 M M	488	400	466	400
	ន	22 8 £	2 R 2	243	ជិសត	5 55	۵4 b	005	4 ki 5	000	000
	98	35 15	8 5 5 5	ထထည	25 0 0	88.0	000	8 € 0	4 M O	0 M O	000
	æ	000	000	α ↔ α	55 w	00 W	0 IN IN	00 w	ជិខិខ	2,62 5	0010
	4		<0.005 <0.005 8	1 <0.005 8	N	W	<0.005 <0.005 5	000	<0.005 <0.005 5	<0.005 <0.005 5	001
1992	¥	ø m ø	& W ₩	8 2 8	55 r	20 14 2	450	0010	N CO IO	000	00 W
ver Estuary Determined From Beach Seine Survey,	3	00m	44M	1.0 w	000	000	000	440	O W W	000	ru 4.0
ach Sein	ŝ	00M	4- 4- M	00M	0010	W	~ ← r V		40 W	N	v
From Be	<u>a</u>	00 M	m m m	00M	0010	0010	000	0010	₹.	Eon	4 W W
terminec	3	0 0 N	ដែល	00 r	004	44	00Z	517	0 44	চ ৹ ঽ	002
tuary De	12	∞∞=	445	∞∞=	00,8	8=%	200%	2 m %	7, 9, 2,	222	£ 4 %
	¥	00%	00M	mmm	0010	0010	001	*v 61 rv	W W IN	± 2 2	01 KN EN
in Hudson Ri		Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
		S SE.	SK.	St.	8 % .	S SE.	S & S.	S SE.	St.	SE.	St. NO.
	DATE	23.JUN- 26.JUN	70160 - 70180	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Part.

Table C-17 Regional Density (No./1,000m3) of White Perch Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

<u>چ</u> کو	888	288	288	882	288	288	288	388	288
Regions Combined		0.00	00			9.00	90.0	0.00 2.00	0.0 0.0 %
¥	0.00	0.00	¥	X X	X X	S S	S.	N.	X.
S	0.00	0.0 6.0 6	SS	NS.	SS	S	S	S	SZ
86	0.00	0.00	S.	S.	S	N.	SX.	SX SX	S S
KG	0.00	0.00	æ	æ	ž.	S.	S.	ž	S
윺	0.00	0.00	S	Ş	æ	S.	æ	ž	æ
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	90.0	9.00	9.00	9.00	0.00 100 100	9.00
ŝ	0.00	99.0	9.00	9.0	0.00	9.00	0.00	0.00	0.00
<u>-</u>	0.0 0.00 13	0.00 13	999	989	9.00	9.00	9.00	0.00	9.00
5	0.00	9.00	0.00	0.00 0.00 12	0.00	0.00	0.09	0.00	0.00
12	9.00	0.00	9.65	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	9.00	56.5	0.00	0.00	0.00	9.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 7
	DENSITY SE NO. TOWS								
DATE	29JUN-	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT - 140CT

Table C-17 Regional Density (No./1,000m3) of White Perch Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	73											
	Regions Combined	0.00	0.00	7.28 31.76 108	302.12 669.77 115	275.92 573.75 118	118.98 351.54 110	207.07 1045.98 110	228.72 806.61 110	18.96 56.52 119	12.07 66.56 117	0.00 118
	¥	0.00	0.00	5.32 2.07 9	925.47 162.10 9	419.00 145.21 10	311.68 106.56 6	147.53 75.92 6	2508.00 803.93 6	18.05 6.40 6	54.72 26.38 5	9.0
	ន	9.00	9.00	11.35 4.00 9	1511.34 303.93 5	334.59 103.87 6	838.35 328.53 6	183.45 135.02 6	85.90 39.57 6	32.56 18.56 6	84.23 60.58 5	0.00
	98	0.00 8	0.00	12.18 4.91 8	92.10 49.87 6	400.00 190.97 6	79.54 51.66 8	8.60 3.46 8	47.20 23.43 8	73.41 31.75 6	3.84 2.15 6	9.09
•	Ã	0.00	0.00	46.94 30.86 7	1032.17 571.80 7	2055.27 509.83 7	130.26 34.92 7	1830.71 1021.73	27.50 11.85 7	58.11 22.26 7	2.55 1.81 7	0.00
	윺	0.0 0.00 8	0.00	10.22 3.29	46.49 1 21.49 11	40.97 2 20.91 11	19.36 9.15	192.29 1 148.46 1	42.75 36.45 10	3.73 1.58 10	0.39 0.39	0.00
	¥	0.0 6.00 6.00	9.0	0.49 0.49 64.0	9.37 3.20 10	6.82 3.73	31.32 15.95 7	4.08 2.05 7	32.03 26.91 7	0.18 0.18 7	9.84 7.42 7	0.00
	3	0.0 0.0 0.0 0.0	9.00	0.74 0.71	6.4 6.60 75	47.21 21.30 16	15.57 8.35 15	115.29 64.00 15	0.54 0.54 15	54.96 36.00 13	0.69 0.69 13	0.00 13
	9	0.0 0.0 6.00	9.0	0.0 4.0 4.0	1.72 1.72 1	6.82 3.64 10	1.63 0.57 9	999	0.71	5.06 2.59 9	0.65 0.65 9	0.00
	4	0.00	0.00	0.00	0.31 0.18 13	0.37 0.23 14	0.00	2.30	0.00	0.39 0.10	0.00 0.00 13	0.00
	5	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 1.00	0.00
	12	0.00	0.00 0.00 12	0.00 0.00 12	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00
	¥	90.0	0.0 0.00 0.00	0.00 0.00 0.00	0.00	0.00	0.00	0.57 0.57 9	0.00	0.00	0.00	0.00
	18	S.	N	N	S.	S.	S.	S.	S	0.00	0.00 6.00 6	0.00 0.00 6
		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE. NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25HAY- 30HAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22 JUN- 26 JUN

Table C-18 Regional Standing Crop (In Thousands) of White Perch Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 118	100	002	002	00%	00 K	002	00E	00 K
A A A	000	00%	S	S =	S S	S S	S	Š	%
S	0010	000	S	S	S	SN	S	S.	S
SG	000	000	S	SS	S	S.	S	S	S
KG	001	001	S	Š	SN	Š	S.	S	SZ
욮	005	005	Š	S	S.	S	S	S	S Z
¥	002	001	000	00%	000	000	00%	000	000
3	ဝဝည	0 o t	000	005	005	005	002	000	005
£	000	000	000	000	000	000	000	000	000
₽.	០០៦	00E	005	၀၀၀	00 0	005	002	000	005
₹	005	°°‡	0 0 2	002	0 0 2	0 0 21	0 0 5	002	0 0 2
21	002	002	005	005	005	005	005	00 <u></u>	001
¥	°°;	005	005	°°=	005	00=	005	••=	00=
B 1	000	000	400	400	400	۸٥٥	001	001	400
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TONS	Crop
	S 등 .	SE.	St.	SE.	SE.	st. SE NO.	St. SE 80.	St. SE.	St. SE NO.
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Eggs Table C-18 Regional Standing Crop (In Thousands) of White Perch

Dusinos) of with the period of the problem ton Survey, 1992 CH IP WP CW PK HP KG SG CS AL Combined of the problem ton Survey, 1992 O		s de	003	0 0 80	378	510 224 115	620 563 118	523	652 805 110	138 138 10	8747 119	113 17	001
## Secretary Crop LTD IntoLeanacy of Amilia Perior Richtyop Lankton Survey, 1992 In Mudson River Estuary Determined From Longitudinal River Chithyop Lankton Survey, 1992 In Mudson River Estuary Determined From Longitudinal River Chithyop Lankton Survey, 1992 St. Crop NS		Region	=	7	13264 4542 108	535510 97224 115	485620 83563 118	222171 55751 110	358652 148805 110	364061 103738 110	38193 8747 119	24813 10553 117	•
St. Crop NS		4	000	000	265	118523 20760 9	53661 18597 10	39916 13647 6	18893 9722 6	321195 102958 6	2312 820 6	7008 3378 5	000
St. Crop NS	266	ន	005	000	1824 643 9	242920 48851 5	53779 16695 6	134750 52804 6	29486 21702 6	13807 6360 6	5233 2983 6	13539 9737 5	000
St. Crop	urvey, 1	SG	000	000	2148 866 8		70518 33668 6	14022 9108 8	1517 609 8	8322 4131 8	12942 5597 6	676 379 6	000
St. Crop	ankton S	æ	۸٥٥	۸٥٥	6641 4366 7	146022 80893 7	290758 72125 7	18427 4941 7	258990 144544 7	3890 1676 7	8221 3150 7	361 257	400
St. Crop	chthyopl	윺	000	400	1691 545 7	7693 3557 11		3204 1514 10	31822 24567 10	7074 6031 10	618 262 10	885	006
St. Crop	gs River 1	¥	000	000	145 145 6	2792 954 10	2032 1112 10	9337 4754 7	1216 611 7	9550 8022 7	25.5	2933 2212 7	400
St. Crop	Eg itudinal	3	005	005	\$ 2 8 =	901 643 16	6600 2977 16	2176 1168 15	16117 8946 15	885	7683 5033 13	97 13	០០ជ
St. Crop	rem Long	\$	000	000	8 8 9	357 357 10	1414 756 10	338 119 9		147 102 9	1049 537 9	45 45 9	000
St. Crop	or white rmined F	٩	000	000	000	38 13 13	7	000	479 307 9	000	13 821	0012	002
St. Crop	usands) (ary Dete	5	០០ឯ	០០ឯ	០០ជ		000	0015	០០ជ	0010	001	005	0°E
St. Crop	(In Indi Ver Estu	12	002	005	002	005	005	005	002	005	004	004	004
St. Crop	ng crop	¥	005	005	005	000	000	000	132 132 9	000	00=	005	00=
SE S	SO.	B	SE SE	S S	S	S.	S	S	SN .	S	00%	000	000
· ·	Regiona												Crop TOWS
13APR-13APR-13APR-25APR-25APR-25APR-11MAY-11MAY-15MAY-25MAY-25MAY-25MAY-15JUN-	8		S S.	St.	SE.	SE.	S 8 5.	SE.					SE. NO.
	Table C	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	O1JUN- O5JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-19 Regional Density (No./1,000m3) of White Perch Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	1.16	0.05	0.00	998	998	998	0.00 2000 2000	9.9. 8.8.5	33.00
4	15.06 7.99 6	0.00	X X	SN	SS	SX	NS.	NS.	SZ Z
S	0.00	0.00	8	S Z	S	S	S.	ž	S.
SG	0.00	0.00	SS	ž	æ	Ş	Z.	S S	S
KG	0.00	0.65	Ş	SS	S S	SS	ž	S S	S.
≙	0.00	0.00	SX SX	\$2	SS .	SS	SS	SS	SN
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6
3	0.00	0.00	0.00	0.00	90.0	0.00	0.00	9.00	0.00
ŝ	0.00	0.00	0.00	0.00	0.00	0.00	9.00	0.0 0.0 6	0.00
<u>-</u>	0.00	0.00	9.00	999	9.00	9.00	9.00	9.00	9.00
5	9.9.	9.0	0.00	9.0	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.0 1.00 1.00	0.00	0.00	0.0 0.0 11	0.00	0.00	0.00
¥	0.0 1.00 1.00	0.00	0.0 2.00 2.00	0.00	0.00 0.00 11	0.00	0.00	0.00	0.00
6	0.0 6.00 6.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 7	0.00	0.00
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Yolk-Sac Larvae Table C-19 Regional Density (No./1,000m3) of White Perch

	fn H	in Hudson River		uary Deteri	mined Fr	om Longi	tudinal	River 10	Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	inkton St	ırvey, 19	26			
DATE		18	¥	12	5	₽	\$	3	¥	윺	KG	98	S	¥	Regions Combined
13APR- 18APR	DENSITY SE NO. TOWS	S	0.00 1000 1000	0.00	0.00	0.0	0.0 0.0 6.00	 885	0.00	0.00	0.00 0.00 7	0.0 0.0 8	0.00 10	0.00	0.00
20APR- 25APR	DENSITY SE NO. TOWS	SZ.	0.00	0.00	0.00 13	0.0 5.85	0.0 0.0 6	0.00 11	0.00 0.00 6	0.00	0.00	0.0 0.0 8	0.0	0.0	0.00 108
27APR- 01MAY	DENSITY SE NO. TOWS	S	0.0 10 10	0.00	0.00	999	0.00	0.00	9.99	0.00	0.00 7.	0.00 8	999	0.00	00
04MAY- OBMAY	DENSITY SE NO. TOWS	SK .	0.00	0.0 0.0 t	0.22	0.05 0.05 13	0.65 0.45 10	5.33 2.92 16	14.87 3.47 10	18.12 6.28 11	6.89 1.36 7	3.95	3.50 2.62 5	0.00	40
11MAY-	DENSITY SE NO. TOUS	S S	66.0	9.00	1.48	12.72 4.92 14	20.67 6.64	49.40 16.87 16	187.27 69.70 10	204.46 26.62 11	316.09 45.14 7	123.01 17.34 6	242.59 56.23 6	108.82 18.24 10	105.54 108.41 118
18MAY- 22MAY	DENSITY SE NO. TOUS	S.	988	4.53 2.09 11	11.56 2.40 13	46.18 32.39 9	120.53 41.43 9	188.26 42.29 15	844.36 226.35 7	769.37 114.92 10	1958.53 445.82 7	825.95 167.62 8	694.76 534.00 6	282.65 121.64 6	478.89 771.89 110
25MAY - 30MAY	DENSITY SE NO. TOWS	£	0.29	0.00	0.68 0.37 13	1.08 0.80 9	14.57 7.83 9	437.62 228.77 15	445.56 129.30	825.09 112.21 10	262.25 16.95 7	256.83 87.95 8	241.83 78.94 6	152.31 51.60 6	219.84 314.05 110
01JUN- 05JUN	DENSITY SE NO. TOWS	S.	0.00	9.00	0.00	0.00	12.39 5.91 9	13.51 4.24 15	81.82 35.05 7	29.68 7.85 10	33.25 7.43 7	38.13 27.03 8	28.64 6.45 6	8.85 5.92 6	20.52 46.96 110
08JUN- 12JUN	DENSITY SE NO. TOWS	0.00	9.00	0.00	1.22 0.95	19.00 10.36 13	9.48 3.70 9	9.84 3.78 13	4.20 1.81 7	39.01 13.84 10	333.46 51.94 7	545.12 139.73 6	1926.35 270.82 6	329.82 62.66 6	247.50 315.94 119
15JUN- 19JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.25	0.45	1.87 1.28 9	3.08 2.77 13	4.96 1.57 7	2.3 10	5.01 2.51 7	33.39 17.21 6	26.35 5.73 5.73	25.79 25.79 5	15.76 31.49 117
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.12 0.12 13	0.70 0.70 7	0.0 21.0 51.0	0.00	0.00 0.00	1.25 0.71 6	3.95 1.58 6	0.47 1.87 118

Table C-20		Regional Star		Crop (1 n River	ding Crop (In Thousands) of White Perch Yolk-Sac Larvae Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	ds) of W Jetermin	Mite Perced	ch .ongitud	Yolk-Sac Larvae Iinal River Ichthy	ic Lar	zae thyoptankt	on Surve	.y, 1992			
DATE			8	¥	21	.	<u>.</u>	s S	3	¥	₹	S S	99	ន	AL Co	Regions Combine
29JUN- 03JUL	SE.	Crop TOWS	000	005	004	005	0 0 E	000	001	001	000	001	000	0010	1929 1023 6	1929 1023 118
06JUL- 10JUL	8 SF.	Crop TOWS	000	005	004	005	0012	000	0 o £	001	000	22,	000	000	000	225
20JUL - 22JUL	St. SE.	Crop TOWS	۸٥٥	00=	005	002	005	000	000	000	S.	SN.	S	SX	S	200
04AUG- 06AUG	St. NO.	St. Crop SE NO. TOWS	۸٥٥	005	005	002	000	000	005	000	S	SN SN	S	S	S	00K
18AUG- 20AUG	S S .	Crop	۸٥٥	00 <u>=</u>	005	002	005	000	000	000	S	S	S =	S	S	00K
O1SEP- O3SEP	St.	Crop TOWS	001	00=	005	002	005	000	000	000	S	S	SN	SE	S	00K
15SEP- 17SEP	S S S	Crop TOWS	001	°°=	005	002	000	000	005	000	NS NS	S	S	S#	SZ.	00K
28SEP- 30SEP	S S .	Crop TOWS	001	005	005	002	005		000	000	S.	S.	S	S.	S	0012
120CT - 140CT	% % %.	Crop TONS	400	00=	00=	002	000	000	000	000	S	S	SX	SN	SE	00K

Yolk-Sac Larvae Table C-20 Regional Standing Crop (In Thousands) of White Perch

OZ-O Algei	֚֚֚֚֚֚֚֝֝֝֝֝֝֝֝֟ ֓֡	vegrores.	in Hud	g crop (son Rive	in Inous F Estuar	ands) o y Deteri	T white mined Fr	Perch rom Long	Yc itudinal	River 1	arvae chthyopl	standing Lrop (in incusands) of white Perch in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	urvey, 1	266		
DATE			B	¥	72	3	٩	ş	3	¥	욮	KG	8	ន	7	Regions Combined
13APR-	St.	Crop	SN	00	0 0	00	0	0 (0 (0	0	0	0	0	0	0
<u> </u>		TONS		2	> <u>77</u>	⊃ £	- 0	9	9 2	o v	o •	o	- 6	e e	00	<u> </u>
20APR-	St.	Crop	SX SX	0	0 (0	0	0	0	0	0	0	0	0	0	0
ATACS		TOWS		- 2	2 2	. ti	- £	o •0	° =	0 •	o	o	- 	00	00	o 8
27APR-	St.	Crop	NS	06	0	0	0	0	0	0	0	0	0	0	0	0
		TOUS		2	2 C	<u>ہ</u> 5	- 5	0 •0	o <u>t</u>	0 %	o	o	- 6	-	- •	o 80
04MAY- 08MAY	S 8 5.	Crop TOWS	S	000	000	88 °	552	134 93 10	745 408 16	4432 1034 10	2999 1039 11	975 193 7	769 769	562 421 5	000	10654 1739 115
11MAY- 15MAY	S & S.	Crop TOWS	S	000	900	219 116 9	2650 1026 14	4288 1377 10	6905 2359 16	55830 20779 10	33835 4405 11	44717 6386 7	21686 3057 6	38992 9038 6	13937 2336 10	223059 24432 118
18MAY- 22MAY		St. Crop SE NO. TOWS	S	000	1458 1 672 11	1708 355 13	9621 6748 9	25005 8594 9	26317 5912 15	251732 67481 7	127318 19018 10	277073 63070 7	145612 29551 8	111669 85831 6	36199 15578 6	1013712 132405 110
25MAY- 30MAY	S S S	Crop TOWS	S S	\$ % °	005	101 54 13	225 167 9	3023 1625 9	61175 31980 15	132838 1 38550 7	136540 18569 10	37101 2398 7	45277 15504 8	38869 12688 6	19507 6609 6	474721 57507 110
OTJUN- OSJUN	8 SF.	Crop TOUS	SS	000	005	០០ ដ	000	2570 1227 9	1889 593 15	24394 10450 7	4912 1299 10	4704 1051 7	6722 4765 8	4604 1037 6	1133 758 6	50927 11756 110
08JUN- 12JUN	SE. SE.	Crop TOUS	000	00 =	002	180 141	3958 2158 13	1967 767 9	1376 529 13	1252 539 7	6455 2290 10	47175 7348 7	96103 3 24633 6	309626 43529 6	42240 8025 6	510331 51294 119
15 JUN- 19 JUN	St. SE.	Crop TOWS	000	00 <u>=</u>	002	137	825	387 265 9	431 388 13	1479 470 7	815 352 10	709 354 7	5887 3034 6	9057 448 5	12112 3302 5	31006 4583 117
22.5UN- 26.5UN	SE.	Crop TOWS	000	005	002	001	0.05	000	772	210 210 7	222	۸٥٥	000	201 113 6	506 202 6	954 313 118

Regional Density (No./1,000m3) of White Perch Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-21

Regions Combined	260.74 348.12 118	90.78 107.79 119	4.18 9.08 72	0.26 1.26 1.26	0.03 0.27 73	7.1 7.1 K	0.0 2.00 2.00	0.00 20.00	99.8
4	18.79 11.40 6	137.89 13.28 6	SN	SX.	X X	S X	X X	SZ.	S 2
S	307.76 95.04 5	275.99 78.87 6	S	8	S Z	S	S	#S	S
98	515.14 79.91 6	134.23 24.43 6	S	SZ.	¥	S	SZ.	SE	S.
KG	680.81 136.63	158.58 18.89 7	SE SE	SS.	S	S.	S	S	SZ.
욮	677.04 192.48 10	224.79 37.95 10	SE SE	S	S	S	¥.	S	S.
¥	425.31 141.33	85.89 44.97 7	11.80 6.98 6	0.00	0.00	0.00	0.00	0.00	0.00
3	661.79 171.98 13	79.12 17.58 13	. 10.71 2.95 9	1.20 0.85 10	0.0 0.00 0.00	11.5	0.0 0.00 0.00	0.00	0.00
£	86.32 17.56 9	59.37 21.73	8.11 4.82 6	0.90	0.00	0.0	9.0	0.00	0.00
9	15.50 7.87 13	22.44 5.00 13	2.83 1.32 10	0.00	0.00	9.00	9.6	0.0 0.8 5	0.00
5	0.89 11	1.78	0.00 0.00 12	0.00	0.00	0.00	0.00	0.00	0.00 12
72	0.0 4 4	0.00	0.00	0.00	0.27	0.00	9.0	0.0 1.88	0.00
¥	0.28 1.29	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.0	0.0 0.00 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS						
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Regional Density (No./1,000m3) of White Perch Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-21

Regions Combined	9.95	0.00	999	0.07 0.79 115	3.22 12.19 118	423.74 462.38 110	.54 110	685	7:85 <u>5</u>	26.5	r ₈
							-	769.40 1075.08	751		
¥	0.0	0.0		0.00	9.00	0.00	226.35 76.95 6	4.0° 7.0° 6.73°	0.00	1614.38 334.98 5	1551.25 464.36
S	0.00	0.00	0.0	0.79 0.79 5	1.46 0.85 6	35.53 15.49 6	816.06 193.41 6	24.75 13.45 6	IU M	2143.46 329.46 5	2693.47
98	0.00	0.00	0.0	0.0 0.0 6	2.1 8.0 9.0	520.19 92.35 8	1774.60 283.70 8	769.48 136.93 8	570.09 43.82 6	1989.23 972.66 6	1814.35 509.79
KG	0.00	0.00	0.00 7	0.00	0.49	1289.82 269.32 7	2091.95 281.38 7	2327.30 538.60 7	1243.40 240.13 7	2472.69 379.23 7	1304.72
- \$	0.00	0.00	0.00 7	0.00	0.78 0.25 11	1285.47 260.33 10	3102.72 2091.95 491.16 281.38	640.65 56.22 10	300.51 109.10	1210.00 135.41	890.33
¥	0.00	0.00	0.00	0.00	18.38 11.46 10	1204.52 233.39 7	1947.37 505.79 7	1737.50 802.39 7	934.34 388.66 7	1435.21 539.89 7	2%.21 74.99
3	9.00	0.00	0.00	0.00 0.00 14	4.49 2.15 16	330.09 47.33 15	1859.87 529.07 15	2548.14 295.45 15	1014.86 256.48 13	1071.99 306.62 13	885.63 186.34
£	0.00	0.00	0.00	0.0 0.0 0.0	7.34 3.06 10	279.94 77.11 9	560.33 122.05 9	1027.97 330.00 9	1019.14 312.33 9	995.89 364.10	171.53 21.54
4	0.00	9.00	0.00	0.00 0.00 13	3.96 0.86 14	114.20 45.16 9	51.50 6.31	144.39 59.81 9	1312.31 80.40 13	559.11 144.38 13	124.55 24.78 12
3	0.00	0.00 13	0.00 0.00 13	0.00	2.0 2.2.0	17.57 3.44 13	17.92 4.03 13	10.92 2.94 13	939.70 124.74 11	459.69 78.06 11	84.00 14.23
12	0.00 12	0.00 12	0.00	0.00	0.00	7.01 3.26 11	7.1. 2.1.	0.63	277.94 40.06 14	25.79 19.15 14	6.30 2.17 14
¥	0.00	0.00 0.00	0.0 0.0 0.0 0.0	0.00	9.00	0.54 0.54 9	0.00	0.00	25.37 10.17	0.0 5.5 1	2.18 1.24 11
8	SE SE	N.	S	S.	S	\$	S	S	0.51 0.51 6	0.00 0.00 6	0.00
	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE: NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-22 Regional Standing Crop (In Thousands) of White Perch Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

_ 7									
Regions Combined	591693 64742 118	199242 20878 119	7287 2361 72	355 222 73	87 87 73	155 25 25	00%	00%	00%
AL.	2407 1460 6	17659 1701 6	S	S	SX.	S Z	S Z	SN	S.
ន	49466 15275 5	44361 12677 6	NS.	S.	SX.	SN	SX XX	X.	S.
98	90817 14088 6	23665 4307 6	S.	S.	SS.	SS	SZ Z	Š	S
ã	96314 19329 7	22435 2672 7	S	S	SS	S	S	Š	S
£	112040 31853 10	37200 6280 10	X S	%	SZ.	NS NS	S Z	S	S
¥	126798 42136 7	25607 13406 7	3518 2080 6	000	000	000	000	000	000
8	92513 24041 13	11060 2457 13	1497 413 9	167 119 10	005	155 155 10	005	000	000
£	17909 3643 9	12316 4507 9	1682 1000 6	88 88 6	000	000	000	000	000
91	3230 1641 13	4676 1041 13	273 275 50	000	005	000	000	005	000
5	132 93 11	264 128 11	០០ជ	002	002	004	0 0 2	002	0 0 2
12	002	004	001	005	87 11	00=	00=	005	005
¥	88=	00=	005	005	005	00=	00=	005	001
8	000	000	۸٥٥	400	00×	400	۸٥٥	400	400
	Crop TOUS	Crop TOUS	Crop TONS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS
	St.	SE.	S 8 5.	SE.	St. 86.	St. SE NO.	St.	SE.	St. SE.
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-22 Regional Standing Crop (In Thousands) of White Perch Post Yolk-Sac Larvae in Hudson River Estuary Determined from Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 90	0 0 801	0 0 80	127 127 115	9173 3503 118	984710 93862 110	2253195 201513 110	1694400 265055 110	1559238 158926 119	2429077 268245 117	1571952 129375 118
4	000	000	000	000	000	004	28988 9855 6	134 96 6	000	206751 42900 5	198666 59470 6
S	000	000	000	127 127 5	234 137 6	5711 2490 6	131167 31087 6	3978 2162 6	93647 63369 6	344523 52955 5	432926 54189 6
98	000	000	00 0	000	<u>\$</u> 2,	91707 16282 8	312854 50015 8	135656 24140 8	100504 7726 6	350693 171475 6	319862 89873 6
KG	001	۸٥٥	400	400	%% ^	182471 38100 7	295947 39807 7	329244 76196 7	175904 33971 7	349810 53650 7	184578 17192 7
≘	000	001	001	005	129 41	212725 43081 10	513453 81280 10	106018 9304 10	49730 18055 10	200237 22408 10	147336 25729 10
*	009	009	000	005	5480 3416 10	359107 69582 7	580576 150792 7	518008 239220 7	278558 115873 7	427886 160959 7	88311 22358 7
3	005	001	005	005	627 301 16	46144 6616 15	25994 73959 15	356207 41302 15	141869 35854 13	149855 42863 13	123803 26049 13
<u>\$</u>	000	000	000	000	1522 636 10	58076 15996 9	116244 25320 9	213258 68460 9	211426 64794 9	206604 75535 9	35586 4469 9
4	000	005	005	០០ឯ	826 178 14	23793 9408 9	10730 1314 9	30081 12461 9	273401 16751 13	116483 30080 13	25948 5162 12
5	0012	០០ដ	០០៦	000	880	2596 508 13	2648 595 13	1614 434 13	138828 18428 11	67913 11533 11	12409 2102 11
21	004	002	0 0 21	000	005	2256 1048 11	593 372 11	203	89444 12892 14	8299 6164 14	2028 700 14
¥	000	000	000	000	000	124 124 9	000	000	5820 2333 11	7%=	284 11
18	NS.	SZ SZ	S	SZ	S S	XS.	SZ ·	S	108 108 6	000	
	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOMS	Crop TOWS
	5 % S.	8 St.	St. 86	St.	St. 정	8 SE.	SE.	St. SE.	St. SE.	% % % 8 % .	SE.
DATE	13APR- 18APR	20APR-25APR	27APR- 01MAY	04MAY- 08MAY	11HAY- 15HAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Regional Density (No./1,000m3) of White Perch in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-23

¥ 5
0.00 0.00 0.00 12 13 9
0.00 0.00 0.00 0.00 0.00 0.00 12 13 10
0.00 0.00 0.00 12 13
0.00 0.00 0.00 10 9
0.00 0.00 0.00 0.00 10 9
0.00 0.00 0.00 0.00 11 13
·
0.00 0.00 0.00 0.00 11 13
0.00 0.00 0.00 0.00 14 11
0.00 0.00 0.00 0.00 14 11
0.00 0.00

Table C-23 Regional Density (No./1,000m3) of White Perch Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	1.34	0.10 0.94 119	0.31 1.90 72	0.34 1.16 73	0.34 1.14 73	0.62 2.14 73	0.0 5.8 5.8	0.46 2.01 73	0.32 1.77 73
*	9.99	99.9	S	S	S	S	S .	S	SS SS
cs	0.00	0.0 6.00 6	8	SA	SE	SZ	SX	SX	S
SG	0.00	0.00 0.00 6	S	SZ	S	S	SN	SN	S
8	0.00	0.00	SN	S	SN	æ	SS	SS	S
윺	2.12 1.34 10	 6.65	S	S.	SX	S.	SS	SS	SZ Z
¥	0.00	0.00	0.00	0.0 6.0 6.0	0.00	0.00	0.95 0.95 6	1.05 0.80 6	0.29 0.29 6
ટ	0.0 40.0 13	0.00 0.00 13	2.36 1.89 9	0.58 0.58 10	0.95 0.54	3.07 1.76 10	0.0 0.00 0.00	0.00	0.67 0.67
£	0.00	0.48 0.48 9	0.14 0.14 6	1.72 0.90 6	1.76 1.01 6	1.85 1.21 6	0.28 0.28 6	2.54 1.84 6	1.61
<u>a</u>	0.0 0.90 13	0.81 0.81	0.00	0.00	0.00	0.04 0.04 10	0.0 0.00 0.00	0.09	0.0 0.00 0.00
₹	9.00	9.00	0.00 12	0.00	0.00	0.00 0.00 12	0.00 0.00 12	0.00	0.00
. 12	0.00 7.00	0.0 4.00	9.0	9.0	0.00	0.00	0.00	0.00	0.00
¥	0.00	9.00	9.0	0.43	9.0	0.00	0.00	0.00	0.00
19	0.00	0.00 0.00 •	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS
DATE	29JUK- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Young of Year Table C-24 Regional Standing Crop (In Thousands) of White Perch

	Regions Combined	0 0 5	0 0 80	0 0 00	0 115	0 0 811	100	110	100	110	0 0 117	0 118
	¥	000	000	000	000	005	000	000	000	000	0010	000
2661	ន	ဝဝဥ	000	000	0010	000	000	000	000	000	00 W	000
Year Ichthyoplankton Survey, 1992	SG	000	000	000	000	000	000	000		000	000	000
lankton	W.	۸٥٥	001	400	001	001	۸٥٥	400	001	001	400	001
Year Ichthyop	윺	000		001	00=	005	000	000	005	005	000	000
oung of River	¥	000	000	000	000	005	400	400	400	400	400	001
y gitudina	3	000	00=	005	၁၀၇	002	០០ស	០០ជ	៰៰ដ	០០ឯ	០០ជ	00E
e Perch From Lon	ŝ	000	000	000	000	000	000	000	000	900	000	000
of Whiter	4	000	000	005	0 0 M	004	000	000	000	០០ជ	0 0 E	002
ding Crop (In Thousands) of White Perch Young of Hudson River Estuary Determined From Longitudinal River	5	0012	00 M	០០ស	000	000	0 13 0	0 0 E	0011	005	005	005
p (In Th iver Est	12	005	1200	002	000	000	00=	00=	005	004	004	004
ding Cro Hudson R	¥	000	005	005	000	000	000	000	000	00=	00=	00=
Star in	18	S	S S	NS	SX X	S	SS	X X	SE SE	00%	000	000
Regional		Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOUS	Crop	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOVS	Crop
C-24		SE.		SE.	SE.	SE.	St. NO.	8 S.	SE.	SE.	SE.	St.
Table C-24	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Young of Year Table C-24 Regional Standing Crop (In Thousands) of White Perch

	71									
	Regions Combined	358 222 118	267 195 119	359 266 72	538 227 73	498 222 73	823 352 73	342 280 33	860 452 73	514 358 73
	4	000	000	SN.	S.	S	S	X S	S.	S
1992	S	00 W	000	S	S	S	S	SS	NS.	SE SE
ing trop (in incusands) of White Perch udson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	SG	000	000	S	S S	S.	S	S	\$	S
ankton	χ	001	001	SX.	SS	S S	SE SE	S	S X	SN
fear Ichthyopl	욮	351 222 10	005	S S	S .	S	S.	S	S.	S
Young of Year al River Icht	¥	001	400	000	000	000	000	78 7 78 7 78 7	314 239 6	889
y jitudina	3	<u> </u>	០០ជ	330 264 9	88 0	ដិសត	429 246 10	000	000	380
rom Long	ŝ	000	\$ \$°	2229	358 187 6	365 209 6	385 251 6	55 50 50 50	526 382 6	334 334 6
or white	<u>e</u>	០០ឯ	85 85 E1	000	002	000	005	000	282	005
wsands) wary Dete	5	005	005	0 0 2	0 0 2	002	0 0 2	0 0 2	002	002
Regional Standing Crop (in incusands) of White Perch in Hudson River Estuary Determined From Lo	12	00%	004	005		005	°°E	٥٠٤	005	005
udson Ri	¥	00#	00=	005	00t 100t	005	00=	005	005	00=
	18	000	000	001	400	۸٥٥	901	400	400	400
		Crop TOMS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS
\$		S 유.	S & .	S 8 5.	S 8 5.	S & S.	S 8 5.	SE.	5 % S	St. SE.
47.7 algar	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	O4AUG- O6AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-25 Regional Density (No./1,000m3) of White Perch Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

er ED								
Regions COMBINED	1.25 5.65 210	2.65 5.52 210	0.96 1.80 210	0.71 2.63 210	0.66 3.96 210	0.23 0.78 210	0.30 0.73 210	0.46 1.20 210
4	0.10 13	0.00 0.00 13	0.00	0.09	0.19 0.14 13	0.00 0.00 13	0.18 0.10	0.05
ន	0.70 0.49 21	0.07 0.05 21	0.02 0.02 21	0.00	0.00 0.00 21	0.02 0.02 21	0.23 0.10 21	0.07 0.05 21
S	0.56 0.34 18	0.00 0.00 18	0.02 0.02 18	0.0 0.08 81	0.02 0.02 18	0.00 18	0.47	0.42 0.11
8 8	5. 5. 5.	9.17 2.30 15	0.00	0.44 0.17 15	0.17	0.15 0.07 15	0.33 0.08 15	0.74 0.09 15
뢒	6.70 4.92 10	6.97 2.00 10	1.90 0.85	5.88 2.57 10	0.38 0.23 10	1.87 0.72 10	0.72	0.63 0.21 10
품	0.90 0.30 8	1.16 0.68 8	0.14 0.04 8	0.43 0.18 8	0.42 0.24 8	0.0 0.00 8	0.24 0.13 8	1.02 0.74 8
3	2.12 1.78 13	6.80 3.59 13	8.70 1.53	1.17 0.29 13	6.68 3.94 13	0.59 0.29 13	1.20 0.59 13	1.91 0.87 13
ş	2.20 1.66	5.46 1.80 8	0.73 0.41 8	0.40 0.40 8	0.03 0.02 8	0.06 0.03 8	0.23 0.06 8	0.25 0.11 8
ď	0.03	2.20 2.13 14	0.03 0.02 14	0.11	0.01	0.05	0.03 0.02 14	0.39
5	0.00	0.00	0.02 0.02 27	0.00	0.00	0.04	0.00 0.00 27	0.00
12	0.00	0.01	0.00	0.00 0.00 46	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT - 090CT	190CT- 230CT

Table C-26 Regional Standing Crops (in Thousands) of White Perch Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

" Ω								
Regions COMBINED	2604 942 210	5348 919 210	1741 271 210	1442 440 210	1183 557 210	447 127 210	603 114 210	1003 261 210
A.	ឯឯឯ	00E	0012	555	24 13	0015	ដដដ	৯ ១ជ
ន	113 28 21	± 8 72	445	200	200	2 a a	23 23	2 ° 2
SG	8 9 8 8 0 8 8	002	4 4 8	ဝဝဆ	ოო დ	ဝဝရွာ	33 18	£ 8 \$
K	244 159 15	1297 325 15	ဝဝည်	62 15	825	2005	45 15 15	104 13
욮	1109 815 10	1153 331 10	315 141 10	973 425 10	936	310 119 10	119 55 01	104 35 0
¥	268 90 8	345 202 8	24.52	127 55 8	125 7.1 8	008	72 38 8	304 222 8
3	296 249 13	950 502 13	1216 214 13	163 40 13	934 551 13	82 40 13	168 82 13	267 122 13
Š	456 345 8	1132 373 8	151 88 8	88 88 88 88	~ 4 8	រីក	48 12 8	22.22
<u>a</u>	. 6 10 4	458 445 14	244	22 14	w w 4	152	r m 4	45 47 47
5	0 0 27	0 0 27	24 mm	0 0 27	0 0 27	24 6	0 0 27	0 0 27
72	00%	ти .ð	00%	009	004	004	003	004
¥	001	004	001	001	0 0 7	0 0 7	0 0 1	0 0 7
	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TONS
	St. Cr SE NO. 10	St. C 등	St. Cr 86. 70	ક્ષાં ક	8 St. C.	St. Cr 86. 70	St. Cr 86. 10	St. Cr No. 10
DATE	13.UL 18.UL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-27 Regional Catch-Per-Unit-Effort (CPUE) of White Perch Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	0.00	3.14 21.05 100	7.48 20.58 100	4.07 9.61 100	6.14 18.22 100	3.19 9.96 100	3.85 12.04 100	3.38 10.92 100	3.34 16.88 100	2.21 10.47 100
Ą	0.00	0.00	0.42 0.19 12	0.43	0.00	0.00	0.00	0.00	0.71 7.0	0.57 0.37 7
ន	0.00	1.32 0.89 19	2.32 0.78 19	2.50 1.90 10	0.0 0.0 0.0	1.90 1.40	10.10 8.56 10	0.90 0.41 10	5.5 5.8 5.8	4.00 10 10
98	0.00 0.00 15	0.00 0.00 15	6.0 5.75	1.89 0.73 9	4.67	2.89 9	0.67 0.67 9	15.33 8.22 9	0.56	0.00
KG	0.00 8	0.88 0.58 8	10.75 6.28 8	1.60 0.81 5	0.60	1.80 0.92 5	0.00	0.60	0.40	0.00
표	0.00	10.38 3.43 8	28.50 8.99 8	8.40 3.50	17.40 9.27 5	0.40	7.40 1.89 5	7.60 6.11 5	1.00 2.00 2	1.20 1.20 5
¥	0.00	2.63 1.58 8	26.00 14.81 8	2.60 1.89 5	28.20 13.42 5	8.00 3.78	10.00 6.89 5	1.71	3.20 2.18 5	0.20
3	0.00	1.33 0.67 3	2.33 1.45	7.50 2.70 6	5.83 2.14 6	2.50 1.57 6	0.50	5.67 2.14 6	2.00	0.33
å	0.00	20.67 20.67 3	8.33 6.01	16.40 7.63	11.80 6.20 5	14.20 8.27 5	8.80 3.54	6.00 2.51 5	23.60 15.77 5	6.80 3.99 5
2	0.00	0.00	7.00 6.51 3	2.40 1.91 5	1.80 1.36	1.40	2.20 1.96	0.20	3.50	12.40 8.70 5
3	0.00	0.43	0.00	1.29 0.69 14	0.57 0.25 14	0.86 0.31 14	2.64 1.31	0.71 0.24 14	0.29 0.22 14	0.86 0.43 14
12	0.00	0.09	2.36 1.63	3.67 1.37 24	2.75 1.18 24	3.21 1.21 24	3.83 1.34 24	0.71 0.37 24	0.63 0.27 24	0.13 0.09 24
¥	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00
	CPUE SE NO. TOWS	CPUE SE NO. TOMS	CPUE SE NO. TOWS							
DATE	23.JUN- 26.JUN	70°60 - 10°60	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- O2SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT-

Table C-28		Regional S in Hudson	Standing River Eg	Crops Stuary	(in Thous Determine	tanding Crops (in Thousands) of White Perch River Estuary Determined From Beach Seine Survey,	White Pe sach Sein	rch e Survey		Young of Year 1992					
DATE			¥	12	5	e	ŝ	3	¥	욮	KG	SG	S	¥	Regions COMBINED
23JUN- 26JUN	SE.	Crop TOWS	00M	005	400	00%	00M	00M	000	000	008	ဝဝည	000	00ជ	0.06
06JUL- 09JUL	S & S & S	Crop TOWS	00m 6	445	55r	00m	77 m	4 r r r	\$ 5 5	<u> </u>	ლ	០០ឯ ដ	28 t ;	00%	64 60 60 60 60 60 60 60 60 60 60 60 60 60
22JUL -		Crop TOUS		124	9 0	88m (25 to 1	ខ្មែក	\$ 50 \$ 50 \$ 50 \$ 50	8 = ≈	2 % S	82E	ቆ ቪዮ :	owā .	255 255 100 100
03AUG- 06AUG	8 SE .	Crop 10WS	ผพพ	<u> </u>	35	25 8 2	20 S	° % &	សិប៊ីស	5 4 rv	\$ r r	ម្តីក្នុ	49 10	400	679 100 100
17AUG- 20AUG	S & S.	Crop TOUS	00 W	ភិន្តន	₹ 2 7	₽ ₽°	25.2	8 K 9	200 50 50 50 50	27 E re	n w n	82 9 8	~~£	001	561 138 100
31AUG- 02SEP	St. 86.	Crop .	00 W	\$55.2 2	23 8 4	ដ ដ	25 24	27 17 6	27.2	<0.005 <0.005 5	ည်း လေး	51.6	37 10	400	426 100 100
14SEP- 16SEP	St. NO.	Crop TOWS	0010	¥2%	33	20 18 5	Б 0 г	N 4 40	£ 4 2	0 N W	000	550	<u> </u>	400	585 191 100
285EP-	SE SE	Crop TOUS	00 w	32 44 44	67.4	W W W	5 ← z	88.4	8 2 2	φ જ ι Λ	พพพ	269 144 9	නි ස ච	002	451 148 100
120CT - 150CT	St. NO.	Crop TOUS	00v	28 24 24	804	8 E 70	62 5 5	54 44 6	25 to 15	~~W	www	ဂ် ဆ ဇ	2 8.6	55,	280 99 100
260CT- 280CT	S SE.	Crop TOWS	000	246	23	114 80 5	하는 v	440	W	← ← FV	001	000	222	∞ w ~	254 114 100

Table C-29 Regional Density (No./1,000m3) of White Perch Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

۵								
Regions COMBINED	3.29 3.41 210	3.22 4.59 210	3.26 3.98 210	1.98 3.16 210	3.47 6.54 210	2.97 5.34 210	2.30 2.94 210	2.40 3.25 210
¥	3.71	2.53	7.52	5.85	9.45	5.50	3.64	1.28
	1.03	0.84	2.27	1.89	3.88	2.26	1.20	0.57
	13	13	13	13	13	13	13	13
ន	3.19	6.19	6.25	4.34	4.13	3.33	3.08	4.46
	0.82	1.39	1.52	0.95	0.74	0.97	0.67	1.30
	21	21	21	21	21	21	21	21
SG	2.89	5.20	4.40	2.10	6.17	2.22	4.32	3.77
	1.15	2.04	0.72	0.49	1.41	0.75	1.01	0.77
	18	18	18	18	18	18	18	18
S S	3.44 0.77 15	8.01 1.52 15	7.16 2.12 15	5.44 2.13 15	11.80 4.69 15	13.93 4.25 15	8.97 2.10 15	7.65 2.49 15
윺	2.10 0.61	4.99 2.15	0.79 0.18 10	1.34 0.59 10	0.89 0.33 10	0.45 0.16	0.64 0.0	0.77 0.18 10
¥	1.23	1.42	2.48	0.54	0.28	0.20	0.0	0.52
	0.95	0.46	1.33	0.11	0.14	0.12	0.0	0.27
	8	8	8	8	8	8	8	8
3	3.60 0.95 13	3.42 2.33 13	0.99	1.09 0.22 13	2.69	1.56 1.28 13	1.73 0.43 13	2.71 0.83 13
£	0.85	1.09	0.87	0.00	0.07	0.77	0.80	0.02
	0.21	0.87	0.75	0.00	0.04	0.74	0.73	0.02
	8	8	8	8	8	8	8	8
≙	1.78 0.46 14	1.40 0.34 14	2.62 0.53 14	0.61 0.35 14	1.83 1.29 14	0.73	0.93 0.33 14	0.66
픙	7.94	2.42	2.64	1.03	2.12	3.94	0.75	2.51
	2.03	0.76	0.55	0.22	0.41	0.43	0.11	0.48
	27	27	27	27	27	27	27	27
12		1.92 0.51 46	2.69 0.54 46	1.44 0.40 46	2.05 0.41 46	2.95 1.17 46	1.50 0.23 46	3.11 0.69 46
¥	0.60	0.01	0.69 0.18 17	0.00	0.19 0.08 17	0.00	0.05 0.05 17	1.38 0.42 17
	DENSITY							
	SE							
	NO. TOWS							
DATE	13JUL -	27JUL-	10AUG-	24AUG-	08SEP-	21SEP-	050CT-	190CT -
	18JUL	01AUG	14AUG	28AUG	12SEP	25SEP	090CT	230CT

Table C-30 Regional Standing Crops (in Thousands) of White Perch Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

_								
Regions COMBINED	7673 665 210	6590 752 210	6903 696 210	3866 463 210	6648 939 210	5798 833 210	4523 452 210	5115 528 210
At.	475 132 13	324 108 13	963 13	749 242 13	1210 497 13	704 289 13	466 154 13	163 74 13
ន	512 132 21	994 223 21	1004 244 21	697 153 21	20 120 21	535 156 21	495 108 21	717 209 21
SG	509 202 18	916 359 18	775 127 18	370 86 18	1088 249 18	391 133 18	762 178 18	664 136 18
KG	487 109 15	1133 215 15	1013 299 15	770 301 15	1670 664 15	1971 601 15	1269 298 15	1083 352 15
윺	347 100 10	826 356 10	15 30 50	222 98 10	147 10 10	74 10	2% 106 10	127 31 10
¥	367 284 8	423 138 8	3% 8 8	162 32 8	8 4 8	35.8	8 23	154 80 8
3	503 132 13	478 325 13	138 41 13	153 13	376 141 13	219 178 13	242 60 13	378 116
ŝ	£ಚಿ &	227 181 8	180 155 8	000	7 & &	160 154 8	166 152 8	440
4	370 14	291 72 14	545 110 14	និជន	380 268 14	151 60 14	78 88 7	137 46 14
3	1173 299 27	358 113 27	390 81 27	153 27	314 60 27	582 63 27	11 72	370 27 27
12	2616 374 46	617 163 46	865 175 84	462 129 46	659 131 46	950 378 46	£23 83	1002 223 46
¥	138 172 1	£ ₩ ₽	158 42 17	001	365	005	444	316 97 17
	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop
	St.	S SE.	SE.	SE.	St. SE.		S & .	
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-31 Regional Catch-Per-Unit-Effort (CPUE) of White Perch rearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

NEO				• • •						
Regions COMBINED	13.65 24.35 100	10.76 14.87 100	8.7.01 20.01	5.05 100	4.28 9.71 100	3.03 7.79 100	2.39 5.16 100	3.05 5.42 100	1.36 5.52 100	2.95 21.35 100
¥	13.17 6.92 12	1.33 0.78 12	5.08 1.56 12	2.00 1.53 7	1.57 0.75	0.29	1.14 0.83 7	0.43	0.00	0.00
S	9.53 1.87 19	35.26 8.54 19	32.16 7.13 19	11.30 4.60 10	11.90 4.49 10	2.00 0.97 10	7.80 2.73 10	1.90 0.98 10	0.30	0.00
S	13.53 3.75 15	14.73 5.26 15	15.73 3.10 15	9.00 2.67 9	3.33 1.76 9	1.22 0.70	0.11	3.33 1.05	0.00	0.00
KG	3.50 1.69 8	18.13 5.83 8	4.88 1.76 8	2.60 1.66 5	0.20 0.20 5	3.20 1.83 5	0.00 0.00 5	5.00 1.58 5	0.20 0.20 5	0.00
윺	9.75 4.21 8	10.63 2.50 8	5.63 1.31 8	2.60 1.69 5	10.60 6.35 5	0.60 0.60 5	4.20 1.20 5	4.40 1.33 5	0.60 0.60 5	1.20 0.73 5
¥	7.38 2.31 8	11.88 1.52 8	7.50 2.59 8	2.40 1.50 5	7.80 4.13	7.80 5.69 5	1.13	2.40 1.60 5	0.20 0.20 5	21.20 20.70 5
3	23.33 8.09 3	12.00 6.24 3	3.67 2.19 3	4.67 4.10 6	3.00 1.10 6	3.17 1.87 6	1.17	2.50 1.52 6	1.83 0.87 6	0.17
\$	4.33 3.38 3	10.33 4.81 3	11.67 4.63	3.60 1.60 5	3.60 1.36 5	6.00 3.21 5	2.20 1.16	5.60 2.25 5	1.60 0.68 5	0.40
9	5.67 1.45	1.67 1.20 3	6.00 3.06 3.06	6.40 3.28 5	0.40	3.00 2.02 5	3.30	7.40	7.00 5.07 5	8.40 4.88 5
5	30.43 16.43	3.29 1.55	5.86 1.40 7	2.50 0.64 14	6.7 2.7 7	5.57 1.98 14	3.74 0.94 14	1.64 0.55 14	3.7 1.68 7.	1.71
21	42.55 12.41 11	9.55 3.37	6.64 1.77	13.58 4.26 24	3.96 1.54 24	3.50 1.12 24	2.21 1.08 24	0.83 0.44 24	0.42	0.71 0.24 24
¥	0.67 0.67 3	0.33	0.00	0.40	0.20	0.00	0.40	1.20 0.73 5	0.40	1.60 0.93 5
	ONS	SMS	SMO	SMO	. SMS	. %	ons.	OMS.	OMS	S k S
	CPUE SE NO. TOVS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. 1	CPUE SE NO. TOWS					
DATE	23.JUN- 26.JUN	. 06JUL -	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

	Regions COMBINED	3767 732 100	1919 263 100	1664 182 100	1256 228 100	739 142 100	534 93 100	437 85 100	368 55 100	222 67 100	322 158 100
	¥	5 2 25	812	55 12 12 13	27 27	21 10 7	446	15 7	400	400	400
	ន	187 37 19	694 168 19	633 140 19	222 91 10	234 88 10	860	153 54 10	750	۵45	005
	SG	238 45 45	259 15	276 54 15	. 158 47 9	33.59	21 9	000	94 6	000	000
Older	Æ	30 8 8	156 50 8	45 8	25 z	2120	28 5 7	0010	43 5	220	0010
Yearling and Older 1992	2	ភកខ	ឯសឆ	~~0	MNN	ည်းစားက		אי אי טו	10 KM 10	~~~	← ~ ₩
	¥	25 to as	\$ = °	22 to 8	₽ʰ	2002	25 gr	ည်းဆည	55°	~ ~ N	150 147 5
tanding Crops (in Thousands) of White Perch River Estuary Determined From Beach Seine Survey,	3	249 86 3	128 67 3	8 K M	02 4 9	32.50	\$0.9°	ឆ្គិស	27 16 6	200	000
white Peach Sei	£	tow	27 13 3	35 E	0.4 N	0.4 N	ဉ်ာစ⊪ က	40 W RV	হ ও ম	4 W W	
ands) of d From B	2	55 E E	51 E	~ 58 22	8 8 s	44 W	8 5 5	33	88 % %	65 5 5	£3°
in Thous etermine	3	818 442 7	88 42 7	158 38 7	24.4	\$2 2 2	150 85 44	\$ £ 2 \$	45 4	102 45 45	46 14 14
Crops (stuery D	12	1933 564 11	434 153	302 11 11	617 194 24	85%	52 53	52%	888	2 0 2	2= 23
Standing River E	¥	nnn	mmm	00m	MWW	0 in 10	00 in	m m w	0.40 to	M M M	5.00
Regional St in Hudson F		Crop TOWS	Crop TONS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TONS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS
-32		S S S	S 8 5.	S 8 5	SE. SE.	S 85.	S & .	St.	S 8 5.	S S 5.	8 8 S.
Table C-32	DATE	23JUN- 26JUN	06JUL-	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	288EP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-33 Regional Density (No./1,000m3) of Atlantic Tomcod Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

DATE		B	¥	12	3	4	4	3	¥	Ŧ	KG	SG	S	₽	Regions Combined
13APR- 18APR	DENSITY SE NO. TOWS	S	0.0 0.0 0.0 0.0 0.0	0.00 12 12	0.00 13	0.00	9.09	989	6.00	0.00	0.00	0.0 8.00 8	9.00	0.00	0.00 106
20APR- 25APR	DENSITY SE NO. TOWS	S S	9.00	0.00	0.00 130 130	9000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 108 0.00
27APR- 01MAY	DENSITY SE NO. TOWS	NS	0.00 10	0.00 12	0.00 13	9.00	0.00	9.00	9.00	0.00	0.00	0.0 0.0 8	0.00	0.00	0.00 108 0.00
04MAY- 08MAY	DENSITY SE NO. TOWS	S	0.00	9.00	0.00	0.00	0.00	0.00 16	0.00	0.00	0.00	0.00	0.00 5	0.00	0.00 0.00 115
11MAY- 15MAY	DENSITY SE NO. TOWS	S.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 10 10	0.00 0.00 118
18MAY- 22MAY	DENSITY. SE NO. TOWS	5	0.00	0.00	0.00	0.00	0.00	0.00 0.00 15	0.00	0.00 100 100	0.00	0.00 8	0.00	0.00	0.00
25MAY - 30MAY	DENSITY SE NO. TOWS	SS.	0.00	 	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 8 8	0.00	0.00	0.00 110
01 JUN- 05 JUN	DENSITY SE NO. TOWS	SS	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 8	0.00	0.00	0.00 110
12JUN-	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00
15 JUN- 19 JUN	DENSITY SE No. Tows	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00 0.00 10	0.00	0.00	0.00 0.00 5	0.00	0.00
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.0 0.0 0.0	0.00	0.00	0.00	0.00 0.00 6	0.00 118

Regional Density (No./1,000m3) of Atlantic Tomcod Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-33

						•			•						
DATE		18	¥	12	3	<u>a</u>	ŝ	3	¥	£	8 8	98	S	¥	Regions Combined
29JUN- 03JUL	DENSITY SE NO. TOWS	0.0 0.0 0.00	995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.00 7	0.00	0.00	0.00	0.00 118
06JUL - 10JUL		0.00	0.00	0.00	0.00	0.00	9.00	0.00 13	0.00	0.00 10	0.00 0.00 7	0.0 0.00 6	9.00	0.00	0.00
20JUL - 22JUL	DENSITY SE NO. TOWS	0.00	9.00	0.00	0.00	9.00	0.00	0.00	0.00	SS	S	S S	S	æ	0.00
04AUG- 06AUG		0.00	9.00	0.00	0.00 0.00 12	0.00	0.00	0.00	0.00	SS	S.	S	S	S	0.00
18AUG- 20AUG		0.00	9.05	0.00	0.00	90.0	0.00	0.00 0.00 0.00	0.00	SZ .	S	S.	S	S	388
01SEP- 03SEP	DENSITY SE NO. TOWS	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	S X	S.	SZ	S	S	385
15sep- 17sep	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SX	SZ Z	Z.	S	S	38.8
28sep- 30sep	DENSITY SE NO. TOUS	0.00	0.00	0.00	0.0 0.0 12	0.00	0.00	0.00 10 0.00	0.00	S	S.	S	S	S	388
120CT- 140CT	DENSITY SE NO. TOWS	0.00	0.00	9.00	0.00	0.00	0.00 6.00 6.00	0.0 0.0 0.0	0.00	S.	S.	S X	SN	SZ.	388

Table C-34 Regional Standing Crop (In Thousands) of Atlantic Tomcod Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 90	0 0 801	0 0 80	115	0 81 81	0 0 0	0 0 0	0 0 0 0	0 0 6	0 117	0 0 \$
AL CO	000	000	000		000	000	000	000	000	0010	000
S	000	000	000	00 M	000	000	000	00%	000	00 W	000
98	000	000		000	000	&	000	000	000	000	000
Ř	400	400	400	400	400	۸٥٥	001	400	400	400	001
윺	000	001	400	0.01	00=	000	000	005	000	000	000
폵	000	000	000	005	005	۸٥٥	001	400	002	۸٥٥	۸٥٥
3	005	00 <u></u>	005	002	003	၀၀ည	០០ជ	<u> </u>	0 0 N	001	002
ŝ	000	000	000	005	005	000	000	000	000	000	000
<u>a</u>	000	005	005	០០ជ	004	000	000	000	o o ដ	០០ជ	002
5	0012	០០ជ	០០ឯ	000	000	០០ជ	០០ជ	០០ជ	00=	005	005
21	002	005	002	000	005	0 0 =	00=	005	004	002	002
¥	005	005	005	000	000	000	000	000	0°=	°°E	005
B	S.	SN	SN	Š	SN	N.	SN	S	009	000	00%
	Crop TOUS	Crop	Crop	Crop	Crop TOVS	Crop TOWS	Crop .	Crop 10WS	Crop TOWS	Crop TOWS	Crop
	St. 6	St.	St. O	St. SE. NO.	St.	St. C	SE SE	SE. C	SE. C	8 St.	S S S S S S S S S S S S S S S S S S S
DATE	13APR- 18APR	25APR	27APR- 01may	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-34 Regional Standing Crop (In Thousands) of Atlantic Tomcod

	Regions Combined	0 0 811	119	902	00K	0012	00K	ook	00K	00%
	¥	000	000	S.	S.	\$	S	SZ Z	SZ .	SE
1992	S	0010	000	S	S	S.	S	S	S	S
	98	000	000	S	S	S	S	SZ.	S	S.
ankton S	Ø.	001	001	SE	N.	NS.	SN	SN	SK.	SZ .
Larvae Ichthyoplankton Survey,	±	005	005	S .	S.	S.	S	S	S.	S
Yolk-Sac Larvae nal River Ichthy	¥	001	400	000	000	000	000	000		000
.=	3	0012	0012	000	005	000	000	000	000	000
rtic Tom	£	000	000	000	000	000		000	000	000
of Atla	<u>e</u>	0012	00E	000	000	005	005	000	000	005
Ming Crop (in Incusands) of Atlantic Tomcod Yolk-Sac Hudson River Estuary Determined From Longitudinal River	5	005	00=	0 0 2	0 0 2	002	002	0 0 2	007	002
o (In The Iver Estu	12	004	004	005	005	005	00=	005	005	005
ung Cro	¥	00=	005	005	00=	00É		00=	005	005
	18	000	000	400	001	001	400	400	001	400
lable C-34 Regional Star in		. Crop	. Crop	Crop	Crop TOUS	Crop .	Crop TOMS	Crop TOVS	Crop TOWS	Crop TOMS
Š		SE. NO.	St. SE.	St. SE.	SE. NO.	SE.	SE.	S 8 5	S SE.	St. SE NO.
e labi	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Table C-35 Regional Density (No./1,000m3) of Atlantic Tomcod Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	31.89 77.12 106	34.86 237.23 108	39.77 144.53 108	8.06 35.17 115	2.34 16.98 118	0.08 0.37 110	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	9.69	9.69	9.00	999	0.0	0.00	0.00	0.00	 6.00 4
S	90.0	0.00	99.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.09 4
SG	0.00	0.0 0.00 8	0.00 0.00 8	0.00	0.00	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	999
줖	0.00	0.00	0.00	0.0 0.00 0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.7 1.7 1.7	0.41 0.41 16	0.00	0.00	0.00	0.00 0.00 15	0.00	0.00	0.0 0.90 £
ş	0.0 0.00 6	0.00	16.66 16.51 6	0.96 0.68 10	0.0 555	0.00	0.00	0.00	0.00	0.00	9.69
4	38.70 31.89	0.04 0.04 10	119.32 47.61 10	22.27 6.36 13	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00
3	129.57 53.04 13	1.70 0.68 13	53.46 30.88 13	20.78 8.17 9	0.00	0.17 0.13	0.00	0.00 0.00 13	0.00	0.00	0.00
12	130.19 17.41 12	225.51 157.16 12	230.28 129.10 12	10.08 3.66 10	22.17 16.76 10	0.16 0.16	0.00	0.00	0.00 0.00 14	0.00 44	0.00
¥	84.28 42.59 10	191.07 177.69 10	56.79 26.98 10	42.24 33.40 9	5.8% 2.71 9	0.58	9.00	9.00	9.00	9.0	9.9 2.8 2.8
18	X S	N	N.	X.	X S	NS N	X.	NS.	0.00	0.00	0.00
	DENSITY SE NO. TOWS										
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-35 Regional Density (No./1,000m3) of Atlantic Tomcod Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 118	0.00	0.00	0.00 73	0.00 73	9.00 7.00 7.00 7.00	0.00 7.00 7.00 7.00	0.00 73	0.00 73 73
A.	0.00	0.00	SX	SX	S	RS	S	SN	SN NS
S	0.00 0.00 5	0.00	S	SZ	S	SX SX	SZ	SH SH	SX
98	0.00	0.0 0.0 0.00	S.	S.	X.	N.	S	X.	SZ Z
ă	0.00 7	9.0	S.	S	SE	S.	S.	S.	N.
윺	9.00	0.00	S.	NS.	S	S.	S.	S.	S
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ક	0.00 13	0.00 130	9.0	9.00	9.9	0.0 0.0 1	9.0 6.0 6.0 6	9.92	9.00
\$	9.99	90.0	0.00	0.00	0.0 0.00 6	0.00	0.00	0.00	0.00
<u>a</u>	0.00	0.00 0.00 13	0.0 100 100 100	0.00	0.00 0.00 10	0.00 0.00 10	0.00 0.00 10	0.00	9.00
5	9.00	0.00 1.00	0.00 0.00 12	0.00 0.00 12	0.00	0.00	0.00 0.00 12	0.00	0.00
12	0.00	0.00	0.0 1.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00 1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS					
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-36 Regional Standing Crop (In Thousands) of Atlantic Tomcod Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	88437 15245 106	116667 64961 108	123447 43535 108	20901 7959 115	8495 5428 118	209 88 110	000	000	0 0 0 0 0 0 0 0	0 117	0 8 1
¥	000	000	000	000	000	000		004	004	000	000
S	005	000	000	00 W	000	000	000	000	000	001	000
98	000	008	000	000	000	000	000	008	009	004	000
¥G	400	901	400	400	901	001	400	400	400	400	001
윷	000	001	00 r	005	00=	၀၀ဥ	စဝင်	005	၀၀ဥ	စစ္	005
폴	000	004	000	၀၀ဥ	००६	400	400	400	400	001	400
3	000	005	288	57 57 54	003	០០ជ	០០ស	ဝဝည်	០០ជ	စစည်း	0 0 L
ŝ	000	00%	3426 3426 6	199 142 10	22.5	000	000	000	000	000	000
2	8063 6644 9	000	24859 9919 10	4639 1324 13	004	000	000	000	001	೦೦ಭ	៰៰ជ
3	19142 7835 13	251 101 13	7898 4562 13	3071 1208 9	000	ង់ខត	001	001	005	005	005
12	41896 5603 12	72573 50577 12	74107 41546 12	3244 1179 10	7135 5392 10	52 11	00=	005	004	002	004
¥	19336 9771 10	43835 40767 10	13028 6189 10	9692 7663 9	1339 623 9	£30	000	000	001	005	001
18	S	S	S	SZ .	S	S	S.	S#	000	004	000
	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOKS	Crop TOMS	Crop 104S	Crop TOUS
	st. No.	St. SE	SE.	St. SE.	St. SE NO.	St.	8 S.	S S S .	5 SF .	8 8.	St. NO.
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-36 Regional Standing Crop (In Thousands) of Atlantic Tomcod Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 81	119	200	00K	00K	00%	00K	00%	00K
AL C	000	00.0	S S	x	S.	X X	SX	X X	S Z
S	001	000	S	SE	SS	\$	S Z	S	S
S	000	000	SZ SZ	S S	S S	SZ SZ	SS	SS	SZ
KG	400	001	Ş	S S	ž	S.	Ø 2	S	SX
£	005	005	S	SS Z	NS.	S	\$	S.	S
¥	400	۸٥٥	000	000	000	000	000	000	000
3	០០ភ	0012	000	005	002	005	005	005	000
ŝ	000	000	000	004	000	• • •	000	000	000
٩	0 0 E	0 o £	005	002	000	005	005	005	005
5	00=	005	002	002	002	0 0 2	002	៰៰ឨ	002
12	004	004	005	0°=	005	005	005	005	005
¥	005	00=	0°=	005	oo=	00=	°°=	005	005
8	000	000	001	400	001	001	002	002	400
	Crop	Crop TOUS	Crop TOWS	Crop	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOUS
	St. C	St. C	St. (St. O	St. O		SE.	S 85.	S & S.
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	288EP- 308EP	120CT- 140CT

Table C-37 Regional Density (No./1,000m3) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Table C-37 Regional Density (No./1,000m3) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

							:			1		Regions
BT YK TZ	12	5	<u>e</u>	ŝ	3	*	윺	9	98	S	¥	Combine
0.00 0.00 0.24 0.00 0.00 0.14 6 11 14	0.24 0.14 14	0.00	3.98 2.19 13	6.45 3.28 9	1.83 0.62 13	0.00	9.00	0.00	0.00	0.00 2.00 2.00	0.00	0.96 4.00 118
8.98 5.14 9.96 3.29 2.31 4.33 6 11 14	9.96 4.33	2.49	10.67 5.36 13	1.82 0.51 9	4.68 1.81 13	0.90 0.55 7	0.25 0.16	0.00	0.00	9.00	0.00	3.45 8.36 119
31.39 0.00 0.66 22.33 0.00 0.66 7 11 11	9.0 3.2 1.1	0.53 0.27 12	10.45 3.55 10	3.58 1.87 6	5.27 3.71 9	0.65 0.35 6	SZ SZ	SZ SZ	S.	X.	S	6.57 23.01 72
5.36 3.22 1.63 1.36 0.62 0.46 7 11 11	1.63 0.46 11	2.15 1.53 12	11.20 5.08 10	 %	5.55 2.87 10	0.45 0.45 6	SZ SZ	X X	S.	S.	SX SX	3.94 6.34 73
0.00 0.75 0.00 0.00 0.41 0.00 7 11 11	0.00	1.54	1.14 0.60 10	13.39 3.85 6	5.31 1.33	2.29 1.17 6	SZ	SX SX	SN.	SX SX	SZ Z	3.05 4.57 73
3.56 0.45 1.56 2.37 0.45 0.81 7 11 11	1.56 0.81 11	0.80 0.80 12	3.07	10.86 1.46 6	16.28 5.05 10	3.86 2.55 6	X X	S .	S.	SZ Z	SZ SZ	5.03 6.58 73
0.00 0.00 0.00 0.00 0.00 0.00 7 11 11	0.00	0.00 0.00 12	2.7 0.95 10	4.42 2.83 6	3.69	1.93 1.58 6	S	8	X X	SX SX	SE SE	3.55 5.55 5.55
1.64 0.52 2.62 1.64 0.52 1.40 7 11 11	2.62 1.40 11	2.17 0.96 12	1.99 0.24 10	3.73	2.86 1.50 10	3.45 0.92 6	SS.	\$	SZ SZ	N N	SN SN	3.44
0.00 0.79 0.24 0.00 0.79 0.24 7 11 11	0.24 0.24 11	2.52 1.30 12	3.52 1.20 10	2.35 0.86 6	2.45 1.37 10	1.14 0.27 6	#S	S S	SE SE	¥.	SE	1.63 2.55 87

Table C-38 Regional Standing Crop (In Thousands) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0 0 90	496 234 108	6669 2167 108	38570 24771 115	71309 30368 118	51143 11462 110	35728 10258 110	20023 6861 110	23154 8151 119	20757 3758 117	11999 3058 118
	¥.	000	000	000	000	005	000	00%	004	000	000	000
1992	S	000	000	000	0010	000	000	000	000	000	005	000
River Ichthyoplankton Survey, 1992	SG	000	000	000	00%	000	008	000	000	000	000	004
lankton	χ	006	400	400	001	001	001	001	001	001	001	400
Ichthyop	윺	009	۸٥٥	400	005	00=	8 2 5 5	000	၀၀ <u>င</u>	005	005	000
	ጟ	00%	000	000	၀၀ဋ	000	222	147 147 7	147 74 7	72.4	118 88 7	55 7 7
gitudina	3	005	002	005	239 110 14	492 429 16	885	1080 600 51	% 4,4 15	119 53 13	359 288 13	308 310 13
From Lon	<u>G</u>	009	000	326 326 6	707 464 10	837 265 10	818 384 9	5386 2069 9	2771 2037 9	728 330 9	2190 871 9	324 87 9
ermined	2	000	000	1521 694 10	4044 1060 13	285 186 14	1276 386 9	906	6953 5157 9	408 196 13	1588 707 13	3356 868 12
uary Det	₹	00 1	0 O E	732 544 13	2056 960 9	497 182 9	1485 501 13	2822 1730 13	០០ឯ	1002 436 11	3238 541 11	312 193 11
dson River Estuary Determined From Longitudinal	12	002	429 224 12	798 433 12	2847 674 10	42396 26912 10	24123 6223 11	15149 9172 11	2259 929 11	4080 1088 14	4448 2137 14	2803 1091 14
Hudson R	¥	005	67 67 10	3292 1904 10	28678 24716 9	26802 14058 9	23178 9596 9	10237 3625 9	77% 3932 9	3892 1835	6537 2081 11	3198 2457 11
₹	18	SE SE	SX SX	N	N N	X S	X S	N	S	12872 7845 6	2280 1895 6	1444 1107 6
		Crop TOUS	Crop 1048	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOMS	Crop TOMS	Crop TOUS	Crop TOWS
		St. 86.	SE.	S 8 5.	St. SE.	St. 86	St. SE KO.	S & S.	St. SE.	S S .	St. SE.	St .
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-38 Regional Standing Crop (In Thousands) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	2498 825 118	10194 2024 119	10703 4777 72	6357 1234 73	4841 933 73	7783 1263 73	2585 794 73	4241 773 73	2533 462 73
4	000	000	SZ.	SZ	SE SE	SZ.	SX.	S R	S Z
S	0010	000	9	S	S	S	82	S	S
SG	000	000	SR .	SN	S	S X	S.	SZ.	S
W.	400	۸٥٥	S	S	S	S	S	S	S
鱼	000	282	SE SE	S	S	S .	S	S	S
¥	001	268 163 7	193 105 6	136 136 6	683 349 6	1150 761 6	574 472 6	1029 275 6	340 81 6
3	256 25 25	655 253 13	736 519 9	402 10	743 186 10	2275 706 10	516 149 10	3% 210 10	342 192 10
<u>a</u>	1338 680 9	377 105 9	743 389 6	412 215 6	2778 799 6	2252 304 6	918 588 6	774 348 6	487 179 6
<u>a</u>	828 457 13	2224 1117 13	2178 740 10	2334 1059 10	23 52 5	294 10	577 198 10	414 00 01	250 250 10
5	0°F	367 228 11	8 9 2 2	317 227 12	227 227 12	81 81 12	០០ជ	320 142 12	372 192 12
72	2 9 2	3205 1394 14	214 214 11	524 149 11	005	261 11	005	843 450 11	=33
¥	005	1180 531	00=	740 142 11	<u> </u>	£ £ £	00=	811 811	18E 12E
m	000	1877 687 6	6561 4668 7	1120 285 7	001	744 495 7	400	343	400
	Crop TOUS	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOUS
	St. C	St. (St. C	St. C	S SE . C	S S	S	St. C	SE. C
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	285EP- 30SEP	120CT - 140CT

Table C-39 Regional Density (No./1,000m3) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	7.14 22.91 210	1.61 4.76 210	1.96 5.86 210	0.91 1.13 210	2.42 7.40 210	1.14 1.86 210	1.30 1.29 210	1.76 1.83 210
AL	0.05 0.05 13	0.00	0.00 13	0.00 0.00 13	0.00 0.00 13	0.00 13	0.00 13	0.00 13
ន	0.00 2.00 2.00	0.00 0.00 21	0.00 2.00 2.00	0.00 0.00 21	0.02 0.02 21	0.00	0.0% 0.03 21	0.85 0.33 21
98	0.02 0.02 18	0.02 0.02 18	0.00 18	0.00 18	0.16 0.09 18	0.19 0.13 81	0.42	2.00 0.55 18
KG	0.00	0.03 0.03 15	0.08 0.04 15	0.19 0.09 15	0.31 0.14 15	1.78 0.82 15	1.14 0.28 15	2.95 0.65 15
₹	0.10 0.06 10	0.07 0.05 10	0.11	0.25	0.86 0.49 10	0.36 0.17 10	0.72 0.15	0.28 0.13
품	0.60	1.95 0.52 8	0.75 0.37 8	1.86 0.48 8	1.13 0.41 8	0.68	1.63 0.39 8	1.63 0.47 8
3	5.44 4.55 13	2.15 0.63 13	1.89 0.21 13	2.98 0.37 13	13.75 6.92 13	3.93 0.71 13	1.11 0.31 13	1.07 0.47 13
\$	3.11 1.40 8	6.35 4.41 8	14.87 5.82 8	3.17 0.63 8	10.75 2.52 8	1.89 0.46 8	2.34 0.57 8	1.45 0.62 8
4	30.47 21.83 14	1.23 0.37 14	0.57	1.17 0.64	0.32 0.05 14	2.73 1.35	2.79 0.61 14	2.52 0.81 14
5	7.89 2.30 27	1.19 0.36 27	1.37 0.14 27	0.54 0.16 27	0.14 0.05 27	0.84 0.18 27	0.44 0.10 27	2.08 0.37 27
12	3.90 1.59 46	3.71 0.77 46	1.66 0.37 46	0.54 0.18 46	0.32 0.17 46	0.03	3.56 0.69 46	3.69
¥	34.11 4.22 17	2.65 1.32 17	2.19 0.25 17	0.29	1.31 0.22 17	0.35	1.39 0.32 17	2.56 0.58 17
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13.JUL - 18.JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT - 090CT	190CT - 230CT

Table C-40 Regional Standing Crops (in Thousands) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

	Regions COMBINED	18209 4742 210	4453 1015 210	4958 1222 210	2258 252 210	5195 1112 210	2578 364 210	3597 321 210	4495 409 210
	¥Γ	7 7 51	0 0 £	0 0 E	001	001	001	០០ដ	00%
	S	200	2100	200	2,00	2 mm	2100	212	137 53 21
	SG	4 4 8 1	4 4 B	ဝဝဆို	ဝငာဆိ	82 18 18 18	888	K 8 8	353 98 18
	ΚG	၀ ၀ ည	4 4 T	£ 4 &	325	\$ 5 E	252 115 15	161 40 15	417 92 15
	욮	555	£ ^ £	505	2,45	142 81 10	8 8 9 8 9	5 22 0	44 10 10
, 1776	¥	80 80 8	580 155 8	224 109 8	554 142 8	335 123 8	204 117 8	485 115 8	486 141 8
() A () ()	3	761 635 13	301 87 13	264 30 13	417 52 13	1922 967 13	549 99 13	155 44 13	45 56 13
Thomas Tra	ş	291 8	1318 914 8	3084 1208 8	657 131 8	2230 523 8	391 8	486 117 8	302 128 8
	4	6349 4547 14	256 78 14	119 14 14	245 133 14	67 10 14	569 280 14	581 127 14	525 168 14
	충	1166 340 27	57 27	202 21 27	27.88	21 8 27	124 28 27	8 24 24	307 55 27
A 187167	21	1257 511 46	1195 249 46	533 118 46	174 59 46	101 55 46	317 74 46	1146 222 46	1186 238 46
5	¥	7827 968 17	609 303 17	502 56 17	138	300 51 17	98 44	3.5 7.5 7.5	587 133 17
		Crop TOUS	Crop	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS
		St. C SE NO. 1	St. C SE NO. 1	St. (SE NO. 1	St. (St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. 1
	DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG-	08SEP- 12SEP	21SEP- 25SEP	050CT - 090CT	190CT - 230CT

Table C-41 Regional Catch-Per-Unit-Effort (CPUE) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	0.25 1.05 100	0.42 2.30 100	0.05 0.37 100	0.05 0.35 100	0.22 1.22 100	0.10 0.52 100	0.08 100	0.04 100	0.11 0.42 100	5.53 100
₹	0.00 0.00 12	0.00	0.00	0.00			_			
S	0.00 19	0.0 19.00 19.00	0.0 190 190	0.0 100 100	0.00 10	0.00 10	0.00 1000	999	0.00 0.00 0.00	0.00
SG	0.00 0.00 15	0.0 5.00 5.00	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.0 9 9
2	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00 0.00 8	0.0 0.00 8	0.0 0.08 8	0.0 0.00 5	0.00	0.00	0.00	0.0 0.00 5	0.00	0.00 5.00
¥	0.00	0.00	0.0 0.0 8	0.00	0.00	0.0 0.00 5	0.00	0.00	0.00	0.00
3	0.00	0.00 0.00	0.00	0.00	0.0 0.0 6	0.0 0.00 6	0.00	0.00	0.00	0.00
ŝ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00 3.00	0.00	0.00	0.00	0.20 0.20 5	0.00	0.00	0.00	0.20	0.00
3	0.43	0.00	0.00	0.00	0.21 0.11 14	0.36 0.36 14	0.21 0.21 14	0.50 0.20 14	0.14 0.14	0.29 0.22 14
12	1.27 0.69 11	5.00 2.30 11	0.55 0.37 11	0.58 0.35 24	2.00 1.18 24	0.67 0.33 24	0.75 0.30 24	0.00	0.75 0.28 24	3.96 3.61 24
¥	1.33 0.67 3	0.00	0.00 0.00 3	0.00	0.20	0.20	0.00	0.00	0.20	0.40
	CPUE SE NO. TOWS	CPUE SE No. Tous								
DATE	23JUN- 26JUN	10690 10690	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-42 Regional Standing Crops (in Thousands) of Atlantic Tomcod Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

8 G										
Regions COMBINED	34 100	227 105 100	25 17 100	27 24 100	00 00 00 00 00 00 00 00 00 00 00 00 00	41 18 100	40 15 100	£1 2001	13	24 24 25 25 25 25 25 25 25 25 25 25 25 25 25
Ą	004	002	0 0 2	400	400	400	001	00h	00 ~	40,0
S	006	006	006	005	000	000	၀၀င္	005	005	000
98	០០ជ	0 0 2	002	000	000	000	000	000	000	000
KG	ဝဝလ	008	000	001	005	0010	0010	0010	0010	0010
슢	000	000	ဝဝဆ	001	001	001	000	0010	0010	0010
¥	000	008	00 80	0050	0010	001	00 M	001	0010	001
3	00m	00m	00m	000	000	000	000	000	000	000
\$	0 O M	00M	00 m	001	0011	00 W	0010	0011	001	00 M
4	00m	00m	00m	0010	01 01 ED	0010	00 W	000	200	00 in
5	52 <i>r</i>	۸٥٥	001	004	0 m 2	554	00 4	ឯកវ	444	804
21	31	227 105 11	22	27 16 24	22.2	25.33	%E%	00%	¥5.4	822
¥	ō n n	00 M	00M	001	N N N	W W W	0010	0010	200	10 W W
	0. 40	Q 14	a v	Q. W	Q ω	ō N	ō ñ	σ ñ	Š ā	& ≅
	. Crop	. Crop	. Crop	. Crop	. Crop	. Crop	. Crop	Crop	r. Crop 5. TOWS	St. Crop SE NO. TOWS
	St. SE	St.	R R S		88.95.	S S S S S S S S S S S S S S S S S S S	. S & S.	SE SE	se se.	
DATE	23JUN- 26JUN	06JUL-	20JUL-	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-43 Regional Density (No./1,000m3) of Atlantic Tomcod Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

∞ 🖺								
Regions COMBINED	0.03 0.19 210	0.01 0.04 210	<0.005 0.04 210	<0.005 0.02 210	0.04 0.20 210	0.01 0.07 210	0.07 0.21 210	0.10 0.21 210
¥	0.00 0.00 13	0.00	0.00 0.00 13	0.00 0.00 13	. 0.00 0.00 13	0.00 13	0.00	0.00
cs	0.0 0.0 21	0.00 212	0.00 21 21	0.00 21	0.00 21	0.00 0.00 21	0.00 0.00 21	0.09 0.09 21
90	0.00 81	0.00 0.00 18	0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18
X 9	0.00	0.00 0.00 15	0.00 0.00 15	0.00 0.00 75	0.00	0.00	0.00 15	0.00 0.00 15
윺	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00
¥	0.00 0.00 8	0.00 0.00 8	0.00	0.0 0.00 8	0.00	0.0 8	0.0 8	0.00
3	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	9.00	0.00
.	0.00 0.00 8	0.00 0.00 8	0.00 0.00 8	0.00 8	0.02	0.00	0.00 8	0.00 8
4	0.00	0.00	0.00	0.00	0.00	0.00	0.11 0.07 14	0.10 0.07 14
₹	0.00	0.00	0.00	0.00	0.00	0.02 0.02 27	0.00 0.00 27	0.08
12	0.07	0.03	0.00	0.02 0.02 46	0.12 0.08 46	0.11 0.06 46	0.10 0.05 46	0.12 0.05 46
¥	0.25 0.18 17	0.04 0.04 17	0.04	0.00	0.34 0.18 17	0.03	0.62 0.19 17	0.76 0.17 17
	_							
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS						
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Regional Standing Crops (in Thousands) of Atlantic Tomcod Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992 Table C-44

Regions COMBINED	80 45 210	11 210	10 210 012	7 210	120 49 210	47 22 210	196 49 210	262 47 210
AL.	0 0 E	០០ជ	0 0 E	0012	0 0 12	0 0 1	0 o £ī	0015
ន	200	0 0 12	200	2100	200	2100	200	2 55
SG	೦೦ಫ	၀ <u>၈</u>	ဝဝဆွ	ဝဝရွာ	00\$	ဝဝရာ	008	002
2	០០វ	០០ស្	001	០០ស្	001	0 0 T	0 0 2	0 0 2
욮	000	000	<u>၀၀</u> ဥ	005	002	005	002	005
¥	000	000	000	000	000	000	000	008
3	001	០០ជ	០០ជ	០០ជ	០០ជ	០០ជ	ဝဝည	០០ជ
ŝ	000	000	000	008	mme	000	000	ဝဝဆ
٩	0 0 4	004	0 0 4	004	004	004	25 24	222
₹	27 0	0 0 22	0 0 27	0 0 27	0 0 22	27 m m	0 0 27	11 6 27
72	25 4 4 8	0 ~ 4 6 ~ 4	00%	r r 94	40 46	36 20 46	31 46	40 44 46
¥	58 41 17	9 9 <u>F</u>	01 10 17	0 0 7	7 94	8 8 <u>F</u>	142 44 17	173 85 71
	ک	ð v	δ-	δ Ñ	ð v	ō ñ	ð v	ö v
	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS		St. Crop SE NO. TOWS		St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	
DATE	13JUL- 18JUL 9	27.JUL - 9	10AUG- 14AUG 1	24AUG- 9	08SEP- 1	21SEP- 9	050CT - 1	190CT - 8 230CT 8

Regional Catch-Per-Unit-Effort (CPUE) of Atlantic Tomcod Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992 Table C-45

e EO										
Regions COMBINED	86.6	9.00	9.00	0.00	0.00	0.00	<0.005 0.04 100	0.0 0.0 100 0.0	0.00 0.00 0.00	0.02 0.10 100
4	0.00	0.00 0.00 12	0.00 0.00 12	0.00	0.00	0.00	0.00 7	0.00 0.00 7	0.00 0.00 7	0.00 7
ន	0.00	0.00	0.00	0.0 0.0 0.0	0.0 0.00 0.00 0.00	9.0 6.86	999	9.00	9.00	0.00
SG	0.00	0.00 0.00 15	0.00 0.00 15	0.00	9.00	0.0	9.00	0.00	90.0	0.00
ă	0.00	0.00 8	0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 2
€	0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.0 0.0 8	0.0 8	0.00 8	0.00	0.00	0.00	0.00	0.00	0.00 0.00	0.00 0.00 \$
3	0.00 0.00 %	0.00	0.00 3	0.00	0.00	0.00	9.00	0.00	0.00	0.00
ş	0.00 3.00	0.00	0.00 3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00 3.00	0.00	0.00 200 200	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00 0.00 s
5	0.00	0.00	0.00 7	0.00	0.00	0.00	90.0	0.00	0.00	0.00
12	0.00	0.00	0.00 1.00 1.00	0.08	0.00	90.0	333	0.0	9.0	0.21 0.10 24
¥	0.00 0.00	0.00	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	CPUE SE NO. TOWS	CPUE SE NO. TOUS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS
DATE	23JUN- 26JUN	7060 -70190	20JUL- 22JUL	O3AUG- O6AUG	17AUG- 20AUG	31AUG- 02sep	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-46 Regional Standing Crops (in Thousands) of Atlantic Tomcod Yearling and Older in Budson River Estuary Determined From Beach Seine Survey, 1992

The Hudson Name Estrary Determined from Beach Serine Survey, 1992 Saluly St. Crop	Regions COMBINED		• =	,	2	0	0	9	0	0	6	0	0	100	0	0	100	0	0	100	~	~	5	0	0	5	0	0	9	0.1	5	20
The Hudsborn River Estutary Determined From Beach Seine Survey, 1992 11. Crop			, c	•	2	0	0	2	0	0	2	0	0	_	0	0	_	0	0	~	0	0	~	0	0	~	0	5 I		0	0	_
St. Crop NO. TONS St. Crop NO.	Š	3 =	-	•	<u> </u>	0	0	6	0	0	9	0	0	\$	0	0 ;	5	0	0	2	0	0	5	0	0	2	0	- :	2	0	0	2
The Nucleon River Eattuary Determined From Beach Selfre Survey, 1992 St. Crop 10. 1048 St. Crop 10. 104 10. 104 St. Crop 1	S	3 =	, c) ¥	ū	0	0	15	0	0	5	0	0	٥.	0	0	0	0	0	٥	0	0	Φ.	0	0	٥	0	5	٥.	0	0	<u>~</u>
The Hudson River Estuary Determined From Beach Serine Survey, 1992. St. Crop St. Cro	g	2 =	, c	•	0	0	0	· eo	•	. 0	∞	0	0	so.	0	0	ın.	0	0	ı,	0	0	sv.	0	0	٠.	0	0 1	1 0	0	0	'n
The Hudson River Estuary Determined From Beach Seine Survey, St. Crop	9	_ <	, c	•	D	0	0	. ∞	-		∞	0	0	'n	0	0	S.	0	0	'n	0	0	ın	0	0	so.	0	o (ın.	0	0	r
The Hudson River Estuary Determined From Beach Seine St. Crop No. TOMS St. Crop St. Crop No. TOMS St. Cro	ă	£ =	>	•	×o	0	0	∞	•		∞	0	0	iv.	0	0	sv.	0	0	•	0	0	ľ	0	0	sv.	0	0	ın	0	0	r
St. Crop	2	<u> </u>	>	> 1	n	0	0	ı ın	-		m	0	0	•	0	0	•	0	0	•	0	0	•	0	0	•	0	0	•	0	0	•
in Hudson River St. Crop	ŝ	<u> </u>	> <	> 1	•	0	0	m	c	. 0	m	0	0	IO.	0	0	'n	0	0	r.	0	0	'n	0	0	ın	0	0	S	0	0	'n
in Hudson River St. Crop	<u> </u>	<u>.</u> -	.	> 1	7	0	0	m	_	0	m	0	0	ιν	0	0	ξ.	0	0	ιν	0	0	ۍ.	0	0	'n	0	0	'n	0	0	s.
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in Hudson in Hudson St. Crop S	¥	<u> </u>	> <	> 1	n	0	· C	, 10	c	0	ю	0	0	ľ	0	0	N.	0	0	w	0	0	ī.	0	0	'n	0	0	ro.	0	0	'n
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23.JUN- 26.JUN- 26.JUL- 22.JUL- 22.JUL- 20.JUL		ŧ	ءَ ۾	ב ה	2																		•						2			9
	DATE	24 15	FORCS	NOTO2		-10F	100		20.88	22.JUL		O3AUG-	06AUG		17AUG-	20AUG		31AUG-	02SEP		14SEP-	16SEP		28SEP-	30SEP		120CT-	150CT		260CT-	280CT	

Table C:47 Regional Density (No./1,000m3) of Bay Anchovy Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

KG SG CS AL Combined 0.00 0.00 0.00 0.02 2.62 0.00 0.00 0.00 0.00 2.62 0.00 0.00 0.00 0.00 0.00 1.25 0.00 12.61 0.00 10.89 0.50 0.00 11.43 0.00 16.15 0.50 0.39 0.00 1.11 2.91 0.50 0.39 0.00 1.11 2.91 0.00 0.00 0.00 1.11 2.91 0.00 0.00 1.11 2.91 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.28 0.00 0.00 0.00 0.00 0.00 0.00 0.00
SG CS AL 0.00 0.00 0.00	0.28 0.00 0.00 0.28 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0
8 00.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	0.28 0.00 0.28 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
	7 82.0 0.00 0.00 0.00 0.00 0.00
KG 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	
	0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	
7 00.0 0.00	0.00 0.00 0.00 0.00 0.00
0.00 11.45 1	0.00 0.00 0.00 1.59 1.59
₹ 0.00 0.0	0.00 0.00 0.00 0.00 0.00
2.62 2.62 2.62 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 13 14 10.57
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.00 0.00 0.00 0.00 11 67.23 67.23
0.00 0.00 0.00 0.00 0.00 0.00 0.41 10 10 10 10 10 10 10 10 10 10 10 10 10	0.62 0.62 0.62 14 262.23 183.74 14 14 14 14 14 14 14
NS 0.00 NS 0.00 NS 0.00 NS 0.00 NS 3.40 NS 0.00 NS	831.56 736.65 736.65 11 4224.36 2469.71 11 8942.3215
E S S S S S S S S S S S S S S S S S S S	20748.06 831.56 9645.98 736.65 6 11 7682.942424.36 1254.5812469.71 6 11 10965.6713042.321 3661.08 3934.43
DENSITY SE NO. TOUS SE NO. TOUS DENSITY SE	DENSITY 20748.06 831.56 0.62 SE 9645.98 736.65 0.62 SE 9645.98 736.65 0.62 NO. TOMS 6 11 183.74 NO. TOMS 6 11 14 DENSITY 10965.6713042.3215252.31 SE 3661.08 3934.43 6484.43
13APR-18APR-20APR-25APR-25APR-01MAY-15MAY-22MAY-22MAY-25MAY-05JUN-05JUN-05JUN-	15.JUN - 15.JUN - 15.JUN - 15.JUN - 15.JUN - 12.JUN - 12.JUN - 12.JUN - 12.JUN - 12.JUN - 12.JUN - 13.JUN - 13.

Table C-47 Regional Density (No./1,000m3) of Bay Anchovy Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	6.38 8066.30 6.3816044.60 6 118	9059.41	4406.16 6061.00 72	1820.92 73	16.26 85.84 73	0.0 0.0 55 55	882	988	0.0 0.00 7.00 7.00 7.00
¥	6.38	9.0 9.0 9.0	2	X X	X	S Z	.	S Z	S.
S	11.74	9.0	X X	X S	S	SZ SZ	S.	SE .	S
SG	0.00	3.55 6.55	SZ Z	×	S.	S.	S.	S Z	S.
KG	7.20 7.20 7	0.00	X.	%	S.	S	S	SE .	S.
욮	0.26 0.16 10	0.00	\$	ž	æ	SE SE	X .	SS	SS
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	9.00	9.00	9.00	999	999	9.00
ŝ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	246.44 170.74 13	0.08 0.05 13	0.00	0.00	0.17 0.10	0.00	0.00	0.00	0.00 0.00 0.00
3	4314.65 1699.33 11	1089.62 864.12	178.48 69.54 12	0.00	0.00	0.00	0.00	0.00	0.00
12		18401.57 4208.52 14	3245.36 1350.10	21.15 14.07 11	129.93 85.84 11	0.70 0.70 11	0.00	0.00	0.00
¥	9580.543 4698.26 11	3980.581 5363.86 11	9131.99 2635.37 11	1050.51 322.32	0.00	0.00	0.0 -	0.0 0.00 0.00 0.00	0.00
18	6123.2059580.5434571.53 2156.4414698.26 5815.75 6 11 14	5902.84 5902.84 6	2693.50 5288.00 7	2805.46 105 1792.11 32	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY 35258.8733980.5818401.57 SE 5902.84 5363.86 4208.52 NO. TOWS 6 11 14	DENSITY 22693.50 9131.99 SE 5288.00 2635.37 NO. TOWS 7 11	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	O4AUG- O6AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	285EP- 30SEP	120CT- 140CT

Table C-48 Regional Standing Crop (In Thousands) of Bay Anchovy Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	546 546 106	0 0 00	5033 2987 108	1433 623 115	0 118	1100	1329840 711220 110	1509307 168965 110	4527873 2023205 119	7247893 2873405 117	20110207813 201 2398957 6 118
	¥	000	000	000	176 142 9	000	000	00%	000	000	===	201
1992	ន	000	000	2027 1837 9	0010	000	000	000	000	000	0010	000
	SS	000	000	000	884	000	000	000	000	000	000	000
lankton	X 5	400	400	177 126 7	227	400	400	162 116 7	400	992	۸٥٥	001
chthyop	윺	000	007	288	2 2 5 5 5	005	002	005	000	005	000	000
River	폱	000	000	198 198 6	005	005	001	002	ጽ ጽ^	222 222 7	400	002
) tudina	3	005	005	203 198 11	58 5	005	០០ស៊	០០ស	222	០០ឯ	001	223 223 13
From Long	\$	00%	000	2333 2333 6	000	005	000	248 140 9	000	220	000	000
ermined	<u>a</u>	546 546 9	005	005	0 0 E	004	000	8152 7484 9		០០ឯ	០០ជ	4950 2202 12
uary Det	3	០០ជ	001	០០ជ	000	000	០០ស្	42645 32637 13	7200 2785 13	00=	005	9933 9933 11
kdson River Estuary Determined From Longitudinal River Ichthyoplankton Survey,	12	005	0 0 21	002	<u> </u>	000	00#	1076424 697348 11	798888 139371 11	201 74	84388 59131 14	4908368 2086764 14
Audson R	¥	005	005	005	78 575 9	000	000	202208 135716 9	703121 95484 9	190777 169002 11	5557560 2860804 11	2992173 902639 11
₹ ¥	18	X.	S.	SZ.	S	\$	NS.	S	S	Crop 4336609 2016134 TOWS 6	Crop 1605833 555 262223 286 TOWS 6	Crop 2291965 765212 765212 6
		Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
		St. 86.	St. SE NO.	SE SE	SE .	S S .	S S .	S 등 .	SE .	S % S	8 SE .	S 85.
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY - 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-48 Regional Standing Crop (In Thousands) of Bay Anchovy Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	81726766868 817 3891165 6 118	8121248922 81 2210672 6 119	7909055 1332677 72	834192 381830 73	41850 27624 73	225	00%	00E	00K
¥ 2	81726 817 3	8121	NS 7	ž S	S.	S.	ž S	S.	S S
ខ	1887 1887 5	000	SN	S	S.	S.	æ	S	S
98	000	625 625 6	S	S	S	S	SE SE	S	S
8 8	1019 1019 7	001	X.	S X	S.	S	S	S	S
₹	2843	005	S	S	S	S	S	NS NS	SZ SZ
¥	001	001	000	000	000	000	00%	000	000
3	0012	ဝဝည	000	000	000	000	000	002	000
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<u> </u>	51343 35572 13	50 E	002	005	ឧឌឧ	000	005	၀၀ဥ	000
3	637433 251054 11	160977 127662 11	26367 10273 12	004	002	007	002	0 0 2	0 0 21
12	6898411125515 72079 1871576 11 14	5921835 1354350 14	1044393 434476 11	6805 4529 11	41815 27624 11	225 11	002	005	001
¥	68984 72079 11	95833 30578 11	095064 504608 11	241009 73947 11	005	00=	005	005	00=
18	St. Crop 1279827136 SE 450723 33 NO. TOWS 6	Crop 7369554 77 1233769 12 TOWS 6	St. Crop 4743231 20 SE 1105260 (NO. TOMS 7	586378 374574 7	400	001	400	۸٥٥	001
	Crop TOUS	Crop TOMS	Crop TOHS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
		S 86.		S 8 6.	SE.SE.	8 SE .	S S S .	SE.	St. (8
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	285EP-	120CT- 140CT

Table C-49 Regional Density (No./1,000m3) of Bay Anchovy Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

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Regions Combined	0.00 106	0.00 0.00 108	0.00	0.00 0.00 115	0.00 0.00 118	0.0 11 10	0.0 110	0.00 110	0.00	0.00 0.00 117	0.08 118
₹	9.0	9.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.0 0.0 6	9.00	9.00	0.00 6.00
S	0.0 0.0 5	9.0	9.00	9.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SG	0.00	0.00 8	0.00	0.00	0.00	0.00	0.0 0.00 8	0.0 8	0.00	0.00	0.00
KG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 7
윺	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 10	0.0 0.00 10	0.00	0.0 0.0 0.0 0.0	0.00
¥	0.00	0.00	0.0	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.0 0.00 0.00	0.00	9.00	0.0 4 4	0.00 50.00	0.00 0.00 15	0.00 0.00 15	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13
å	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
۵	9.99	0.00	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00 13.00	0.00 0.00 13	0.0 0.08 13	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.0 0.00 12	0.00 12	9.00	 8.8.5	9.05	0.00 ±0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.0 0.00 0.00	9.00	0.00	0.00	0.00	0.00	0.00	9.00	1.04 0.95 11
18	SE	S	SZ	SZ	S.	S.	S	χ Ø	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE NO. TOUS	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04HAY- 08MAY	11HAY- 15HAY	18HAY- 22HAY	25MAY- 30MAY	O1JUN- O5JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-49 Regional Density (No./1,000m3) of Bay Anchovy Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 0.00 118	1.49	2.68	388	9.00	388	0.0 20.00	9.0 3.00 3.00	0.00 73
¥ 00	0.00	0.00	SX	S	S	S	S.	S	Š
S	0.00	0.00	S	SX	S	S	SN	SN	S
8	0.0	0.00	Z Z	9	S.	SZ SZ	Š	X.	SZ SZ
KG	0.00 0.00 7	0.00	SZ	SN SN	SZ	XX XX	SZ	SX SX	SZ.
₹	0.0 0.00 10	0.00 0.00 10	SZ SZ	S	SE SE	SS	XX SX	SN SN	SS
¥	0.00	0.00	0.00	90.0	0.00	0.00 6.00 6	0.00	0.00	0.00
8	0.00 13	0.00	9.00	9.00	9.00	9.9.2	9.00	9.00	0.00
S	0.00	999	9.00	0.00	9.0	9.00	9.99	0.0	0.0 0.0 4
<u> </u>	0.0 13	0.0 130	989	0.0 0.0 0.0	9.00	9.00	999	9.99	9.00
5	9.0	9.00	0.00 120 120	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	2.19 1.49 14	9.00	0.00	9.00	0.00	995	9.0	9.00
¥	9.00	0.00	995	995	9.00	9.0	9.0	9.0	99:
89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS							
DATE	29JUN- 03JUL	06.JUL- 10.JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-50 Regional Standing Crop (In Thousands) of Bay Anchovy Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	008	0 0 801	0 0 80	0 115	0 91	°°°£	1000	1000	1300	110	238 218 118
AL C	000	000	000	000	000	000	000	000	000	00 m	004
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98	ဝဝဆ	000	၀၀ ဆ	000	000	000	000	000	000	000	000
g	002	006	001	900	001	001	400	001	001	001	001
즆	000	001	001	005	005	000	000	005	၀၀ဥ	005	စစစ္
¥	000	000	000	000	000	۸٥٥	۷٥٥	400	۸٥٥	00 ~	001
3	005	005	005	002	002	ဝဝည	ဝဝည	၀၀ ည	0012	001	0011
ŝ	000	900	000	000	000	000	000	000	000	000	000
<u>e</u>	000	<u>၀၀</u> ဥ	ဝဝဝ	001	004	000	000	000	០០ឯ	០០ឯ	007
₹	005	ဝဝည	ဝဝက္	000	000	೦೦ಗ	០០ជ	೦೦೮	005	005	00=
72	004	៰៰ជ	00ជ	000	၀ ၀ ဝ	005	00=	٥٥٤	004	002	004
¥	005	005	005	000	000	000	000	000	005	005	238 218 11
81	SE SE	SE SE	SS	S.	¥	S.	S.	S.	000	000	000
	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop	Crop TOUS	Crop TOUS
	St. Se.	St. SE.	St.	St. NO.	St.	St. 86.	S &	S S .	S SE.	\$ % €.	SE.
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	OGMAY- OBMAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-50 Regional Standing Crop (In Thousands) of Bay Anchovy Yolk-Sac Larvae

	Regions Combined	0 0 811	706 481 119	002	00%	00K	00K	00 K	00 K	00K
	4	000	000	S	SS.	SS	S	S.	S Z	S Z
265	S	001	000	SS	S.	S	S.	S.	S Z	Š
udson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	98	000	000	¥ S	SZ SZ	N.	Z.	SS SS	\$	¥
ankton	9	001	001	SS	SS	SA SA	SS	S S	X X	S S
chthyop(윺	000	005	Ž.	S.	S.	Š	S.	SX SX	S
River	¥	001	400	000	000	000	000	000	000	000
tudinal	3	០០ស	០០ឯ	000	005	005	005	005	000	005
om Long	£	000	000	000	000	000	000	000	000	000
mined F	4	001	ဝဓည်	005	000	000	005	000	005	000
ary Dete	3	005	005	004	002	002	002	002	002	002
rer Estu	17	004	706 481 14	005	005	005	005	005	005	005
udson Rí	¥	001	005	005	005	005	005	005	005	005
t F	6	000	000	400	00h	۸٥٥	001	۸٥٥	001	400
		St. Crop SE NO. TOWS								
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-51 Regional Density (No./1,000m3) of Bay Anchovy Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

70	_										
Regions Combined	0.09	0.03	0.0 100 100	0.04 0.42 115	0.00	9.0	0.00	0.02 0.22 110	3.11	14.02 34.38 117	55.11 143.48 118
A.	0.00	0.40	0.00	0.00	0.0 0.00 10	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.0 8.00 8	0.0 0.0 8	0.0 8	9.0	9.0	9.0 8.0 8	0.0 8 8	0.0 8 8	0.0 80.0 80.0	9.00	6.52 6.52 6
X S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30 4.30
윺	0.00	0.00	0.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00 0.00 10	0.25 0.25 10
¥	0.00 0.00 6	0.00	0.00	0.0 0.00 0.00	0.00 0.00 10	0.00 0.00 7	0.00	0.00	0.00	0.00	0.00
3	0.00 100 10	0.00	0.00	0.04 0.04 16	0.00 0.00 16	0.00 0.00 15	0.00 15	0.00 0.00 15	2.2. 2.64 3.05	0.00 0.00 13	0.56 0.56 13
ş	0.00	0.00	0.00	0.42 0.42 10	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.00	00.0
4	0.09	0.00 0.00 0.00	0.0 0.00 0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	3.55 3.55 13	51.28 13.21 12
3	0.00	0.00 0.00 13	0.00 0.00 13	0.00	0.00	0.00	0.00	0.22 0.22 13	0.00	3.24 2.53 11	150.27 39.38 11
12	0.00 0.00 12	0.00	0.0 0.99 12	0.0 5 6 6	9.0 5.85	0.00	9.0	0.00	0.43	72.72 24.78 14	101.56 33.95 14
¥	0.00	0.00	989	0.00	0.0	0.00	0.00	0.00	1.57 0.85 11	54.65 13.79 11	352.18 132.20 11
B 1	SZ SZ	X.	NS.	S.	SX	SE .	Z.	SZ Z	2.74 1.33 6	48.05 18.97 6	49.49 13.07 6
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS						
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	OGMAY- OBMAY	11HAY- 15HAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	OBJUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-51 Regional Density (No./1,000m3) of Bay Anchovy Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	207.42 343.96 118	395.11 1116.83 119	1788.84 2459.63 72	1298.42 1158.47 73	1009.42 786.51 73	1392.59 1233.35 73	335.44 417.77 73	129.69 99.98 73	29.52 28.45 73
A. A.	0.0 0.0 6	18.39 18.39	S	S	SE	SX.	S	SX	S.
S	0.00	2.55 2.55 6	S Z	S	\$	X	S	SX.	SN
98	0.00	0.00	S	S .	S S	ž	S	SX	SX X
KG	5.06 3.85 7	0.00	£	SZ.	SZ Z	S	æ	S	SH.
윺	9.00	90.0	SE SE	S	S	S	X S	SZ .	X X
¥	0.00	0.67 0.67	29.85 10.65 6	99.27 34.30 6	52.75 13.13 6	241.87 96.23 6	32.36 10.66 6	35.70 12.92 6	12.31 7.48 6
3	18.78 3.67 13	146.28 45.19 13	101.98 36.76 9	233.88 25.78 10	134.75 27.66 10	307.99 69.97 10	124.95 24.62 10	33.86 7.63 10	24.61 10.85 10
\$	57.84 14.97 9	43.48	111.75 17.50 6	101.85 23.49 6	140.74 36.06 6	641.65 187.27 6	67.98 18.59 6	71.36 8.22 6.22	30.27 5.94 6.94
٩	1085.42 149.94 13	682.52 156.64 13	153.08 53.25 10	350.74 92.79 10	983.77 259.43 10	765.61 147.81 10	245.90 28.92 10	86.05 35.50 10	23.57 3.96 10
5	977.40 195.84 11	2368.44 438.90 11	4716.43 1599.85 12	2776.05 577.99 12	3180.27 417.37 12	5261.14 1052.92 12	248.66 41.77 12	278.54 72.06 12	66.22 20.06 12
. 22	343.38 233.94 14	606.47 159.19 14	4623.08 1669.74 11	2793.75 425.63 11	1614.23 291.24 11	1793.45 467.62	574.70 122.50 11	187.19 33.33 11	51.66 12.37 11
¥	57.88 14.99 11	14.04 1253.55 7.82 1001.15 6 11	1627.01 2947.57 t 148.59 821.90 s	738.34 3293.47 179.66 885.18 7 11	1139.49 149.48 11	851.06 174.42 11	1091.67 390.78	158.17 39.10 11	13.63
	150.65 47.58 6		1627.01 148.59	738.34 179.66 7	829.41 517.39 7	1277.96 303.88 s	297.32 56.33	186.69 24.73	13.90
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOW	DENSITY SE . NO. TOWS		DENSITY SE NO. TOW	DENSITY SE NO. TOUS		DENSITY SE NO. TOWS
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT - 140CT

Table C-52 Regional Standing Crop (In Thousands) of Bay Anchovy Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	6 6 8 8	51 108	0 0 80	91 87 115	118	1200	2001	885	1441 520 119	47200 9481 117	158585 33013 118
AL	000	51 9	000		ဝဝဋ	000	000	000	000	0010	004
ន	000	000	000	0010	00%	000	000	000	000	0010	000
SG	000	000	000	000	000	008	000	000	000	000	9711
KG	400	400	00 r	001	400	400	001	906	00 r	001	609 7
윺	000	001	۸٥٥	005	005	005	005	005	005	<u>၀၀</u> စ္	225
¥	009	00%	009	005	000	002	002	002	001	001	001
3	005	00=	005	ი ი გ	002	0 0 2	០០ស	០០ស	370 370 13	೦೦ಓ	222
ş	009	000	009	885	000	000	000	000	000	000	000
<u> </u>	550	000	000	0 0 E	004	00	000	000	០០ស	740 740 13	10683 2753 12
5	០០ឆ	ဝဝည	០០ជ	000	000	ဝဝည	០០ជ	នួនជ	005	478 373 11	22201 5818 11
12	០០ជួ	០០ជ	002	005	005	001	005	005	137 137 14	23402 7967 14	32682 10926 14
¥	005	00 <u>0</u>	005	000	000	000	000	000	361 195	12538 3163 11	80797 30330 11
18	NS NS	SZ Z	SZ SZ	SE.	S RS	SX	SZ SZ	S.	574 278 6	10042 3965 6	10344 2732 6
	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOWS
	St. 6	St. (St. C	St. (St. C	St. (SE NO. 1	St. (St. C	St. C	St. (St. C
DATE	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04MAY- 08MAY	11MAY- 15MAY	18MAY - 22MAY	25MAY- 30MAY	O1JUN- O5JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-52 Regional Standing Crop (In Thousands) of Bay Anchovy Post Yolk-Sac Larvae

	Regions Combined	541142 87189 118	1010230 246373 119	NS 3279076 617490 72	2375589 263094 73	1692814 168713 73	2224559 236336 73	626726 99204 73	224805 20227 73	50738 5957 73
	Comp	3,00	24	327 61	237	95	222	30	22 2	IV.
	¥	009	2355 2355 6	S	SN	S	SE	S	SZ .	S
1992	ន	00 M	410 410 6	S	2	S.	N	N.	S N	S.
Survey,	SG	004	009	SE	S.	SZ Z	SX XX	SS .	S 2	S
ankton	8	716 545 7	400	\$	S	S	S	X SX	X X	SX.
udson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	욮	005	000	SN	S	S Z	SX.	SS	S S	S
River	¥	00	201 201 7	8900 3174 6	29594 10227 6	15727 3916 6	72110 28689 6	9648 3179 6	10644 3853 6	3669 2229 6
itudinal	3	2625 514 13	20449 6318 13	14255 5139 9	32694 3604 10	18836 38 <i>67</i> 10	43054 9781 10	17468 3442 10	4734 1066 10	3440 1517 10
rom Long	ŝ	12000 3105 9	9020 1545 9	23183 3631 6	21130 4874 6	29197 7480 6	133113 38850 6	14103 3856 6	14803 1704 6	6279 1232 6
srmined F	<u>•</u>	226133 31238 13	142194 32634 13	31893 11094 10	73071 19331 10	204956 54049 10	159505 30793 10	51229 6026 10	17928 7397 10	4910 825 10
uary Det	5	144397 28933 11	349906 64842 11	696789 236357 12	410125 85390 12	469842 61661 12	777264 155555 12	36737 6171 12	41151 10645 12	9783 2963 12
iver Est	12	110504 75286 14	195169 51230 14	1487759 537342 11	899062 136972 11	519477 93724 1.1	577153 150485 11	184946 39420 11	60239 10725 11	16626 3981 11
Hudson R	¥	13278 3440 11	287591 229684 11	676231 188561 11	755590 203077 11	261422 34293 11	195250 40015 11	250452 89653 11	36288 8971 11	3127 762 11
÷ ÷	8	31487 9945 6	2935 1634 6	340066 31057 7	154322 37552 7	173357 108140 7	267111 63515 7	62144 11773 7	39020 5168 7	2904 898 7
•		Crop TOMS	Crop TOUS	Crop TOMS	Crop TOMS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOWS
!		St. O	St.	S S S.	8 % .	8 S.	St.	St.	S S S	S S .
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Regional Density (No./1,000m3) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-53

DATE		B	¥	12	5	<u>a</u>	ΑÞ	3	¥	륲	2	SG	ន	₹	Regions Combined
13APR- 18APR	DENSITY SE NO. TOWS	SK SK	0.00 10	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.0	0.00
20APR- 25APR	DENSITY SE NO. TOWS	S	0.0 1000	0.00	0.00 0.00 13	0.00 0.00	0.00	0.00	0.0 0.0 6	0.00	0.00	0.00	0.00	0.0	0.00 108 108
27APR- 01MAY	DENSITY SE NO. TOUS	S.	0.00	0.00 0.00 12	0.00	0.00	0.00 6.00	0.00	0.0 0.00 6	0.00	0.00	0.00	0.00	0.00	0.00 0.00 108
04MAY- 08MAY	DENSITY SE NO. TOWS	N.	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00 16	0.0 0.00 10	0.00	0.00	0.00	0.00	0000	0.00 0.00 115
11MAY- 15MAY	DENSITY SE NO. TOUS	S.	0.00	0.00	0.00	0.00	0.00 100 100	0.00 0.00 16	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	0.0 0.00 0.00	0.00 0.00 118
18MAY- 22MAY	DENSITY SE NO. TOWS	Z.	0.00	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00 100 100	0.00	0.00	0.00	0.00	0.00
25MAY- 30MAY	DENSITY SE NO. TOWS	æ	99.0	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00 110
01JUN- 05JUN	DENSITY SE NO. TOWS	S.	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00 110 110
08JUN- 12JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.0	0.00	0.00	0.00	0.00	0.0 0.00 6	0.00
15 JUN- 19 JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.0 5	0.00	0.00 0.00 117
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 10	0.00	0.00 0.00 6	0.00	999	0.00

Table C-53 Regional Density (No./1,000m3) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00	0.00	0.17 1.15 27	98.72 106.95 57	226.34 238.63 73	390.47 339.90 73	293.51 187.36 73	209.34 149.64 73	107.89 80.54 73
¥	0.00	0.00	SZ	SZ.	SZ.	SZ .	\$2 *	S#	S.
ន	0.00	0.00	SN	SE	N.	N.	S.	SH.	SE
SG	0.00	0.00	X X	S.	NS.	S	Ş	S.	S.
χ	0.00	0.00	Š	\$	SS	S	22	S	XX
₽	0.00 1000	0.0 0.00 0.00	XX SX	#S	NS.	22 .	SE SE	SS.	SE SE
¥	0.00	0.00	0.00	15.20 13.31 6	13.47 8.17 6	127.05 92.90 6	7.84 4.45 6	59.05 17.44 6	23.51 13.49 6
3	0.00	0.00 13	9.00	36.73 15.41 10	19.72 6.94 10	106.43 76.89 10	53.32 7.45 10	236.37 105.61 10	50.31 11.47 10
ŝ	0.00	0.00	0.00	13.48 2.77 6	12.16 5.48 6	25.24 6.59 6	24.86 10.31 6	64.66 21.39 6	31.03 9.39 6
9	0.00	0.00	0.04	8.42 7.88 10	70.18 22.53 10	31.59 21.98 10	142.82 35.57 10	54.88 7.97 10	25.76 12.31 10
*	0.00	9.00	0.23	236.58 55.38 12	733.13 130.51 12	1436.85 258.93 12	533.17 75.87 12	619.98 79.15 12	251.62 52.35 12
12	0.00	0.00	0.00	254.53 74.87 11.	379.42 144.31 11	895.17 164.54 11	710.34 90.52 11	318.51 50.09 11	268.35 43.71 11
¥	995	0.0 1.00	1.12	151.19 36.02 11	344.38 98.14 11	293.38 67.60	357.45 48.74 11	178.88 25.87 11	108.27 16.05 11
18	9.09	0.00	0.00	31.36	238.22 93.84 7	208.02 42.11	518.27 131.65 7	142.42 31.14	104.28 32.02 7
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	288EP- 30sep	120CT - 140CT

Table C-54 Regional Standing Crop (In Thousands) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 901	0 0 80	0 0 8	0 115	0 118	900	900	000	0 0 6	0 11 0	0 0 81
A C	000	000	000	000	005	000	000	000	000	00 W	000
S	005	000	000	0010	009	000	000	000	000	00 W	000
98	ဝဝ ဆ	000	000	000	000	000	000	ဝဝဆ	000	00%	000
, 9	400	400	001	006	001	001	001	001	001	002	۸٥٥
료	000	001	001	°°=	005	005	005	005	000	005	000
¥	000	000	004	၀၀င္	005	001	001	002	001	001	400
3	000	°°=	005	002	002	001	០០ជ	ဝဝည	០០ជ	0 0 <u>ti</u>	០០ឯ
<u>.</u>	000	000	00%	000	000	000	000	000	000	000	000
9	000	005	000	០០ដ	002	000	000	000	ဝဝည	០០ឯ	002
5	០០៦	០០ឯ	001	000	000	០០ឯ	០០ជ	១០ជ	°°=	°°=	005
21	002	0 0 <u>7</u>	002	005	000	005	005	00=	004	004	002
¥	၀၀ဥ	၀၀ဥ	000	000	000	000	000	000	°°=	°°=	005
18	S	SE SE	S#	S	S.	SX.	S	N.	000	000	000
	Crop	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOWS	Crop	Crop TOUS	Crop TOWS	Crop TOWS
	St. SE.	St. NO.	SE.	St. 86.	Se.	S SE.	5 % S.	St	St. SE	St. (St. (
DATE	13APR- 18APR	25APR-	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Young of Year Table C-54 Regional Standing Crop (In Thousands) of Bay Anchovy

	Regions Combined	0 118	1400	301 260 72	181151 27967 73	383127 58739 73	675713 74100 73	542397 43803 73	340395 27232 73	196013 18577 73
	¥	000		S.	S	S	S.	S	S	S
1992	ន	00 W	000	S	SZ.	S S	SZ	Ş	S	S S
Survey,	98	000	004	9	S	S	S	S	SE	SE SE
ankton (S S	002	002	S.	NS.	NS.	SN.	SX	SE .	ž
terraing crop (in incusance) of bay Anchovy in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	005	005	S	S	S	SE	S	S.	S
Toung of Tear al River Icht	. X	001	001	000	4531 3968 6	4016 2434 6	37879 27697 6	2338 1325 6	17605 5200 6	7008 4021 6
af tudina	3	೦೦ಬ	០០ឯ	000	5134 2154 10	2757 970 10	14878 10749 10	7453 1041 10	33043 14763 10	7033 1603 10
Anchovy From Lon	ŝ	000	000	000	2797 575 6	2522 1136 6	5236 1367 6	5158 2139 6	13414 4437 6	6438 1947 6
iable C-14 Regional Standing Crop (in incusands) of Bay Anchovy in Hudson River Estuary Determined From Lo	<u>a</u>	001	០០ជ	995	1754 1641 10	14621 4694 10	6581 4578 10	29755 7411 10	11433 1661 10	5367 2564 10
ousancs) uary Det	5	005	00=	233	34952 8181 12	108310 19281 12	212276 38254 12	78769 11209 12	91594 11694 12	37173 7735 12
o tin in iver Est	12	004	004	00=	81912 24095 11	122100 46441 11	288075 52952 .11	228595 29131 11	102500 16119 11	86357 14065 11
Kudson R	¥	00=	005	257 257 11	34685 8263 11	79009 22514 11	67308 15510 11	82005 11182 11	41038 5936 11	24840 3681 11
nat star	81	000	000	400	15386 6554 7	49792 19614 7	43479 8801 7	108324 27516 7	29768 6508 7	21797 6694 7
		Crop TOUS	Crop TOVS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOMS	Crop TOMS	Crop TOMS
e n		S 85.	SE.	SE.	8 8 S.	S 8 5.	S S S.	SE.	5 S S.	8 8 £
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	03SEP-	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Table C-55 Regional Density (No./1,000m3) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ns NED								
Regions COMBINED	23.41 58.74 210	112.78 383.06 210	70.78 109.23 210	154.95 225.60 210	50.68 171.85 210	98.15 146.92 210	30.31 60.98 210	24.03 56.37 210
¥	0.00 0.00 13	0.00 0.00 13	1.45 1.45	0.04 0.04 13	0.50 0.50 13	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13
ន	0.00 0.00 21	1.82 0.89 21	21.88 16.37 21	2.08 1.45 21	1.66 1.35 21	5.7 2.64 21	0.25 0.25 21	0.00
SG	0.00 0.00 18	0.29 0.29 18	4.40 1.66 18	0.00 0.00 18	2.29 1.52 18	5.06 3.92 18	0.0 8.08	0.00 18
S S	0.36 0.32 15	5.19 3.08 15	31.80 14.82 15	12.38 9.77 15	9.91 2.61 15	14.62 7.29 15	0.00	0.00 0.00 15
≩	9.00	0.51	7.51 2.29 10	23.52 11.02 10	15.16 6.07 10	1.63	0.51 0.51	0.00
¥	0.00	22.17 13.03 8	2.47 1.26 8	188.89 96.62 8	204.22 166.19 8	10.03 6.87 8	3.01 1.98 8	1.64 1.54 8
3	26.21 25.12 13	33.63 11.64 13	144.34 56.32 13	241.28 27.31 13	36.31 21.49 13	430.20 103.60 13	74.52 7.72 13	6.85 1.03 13
<u>a</u>	18.85 2.20 8	50.67 6.64 8	31.24 16.87 8				46.40 23.77 8	10.94 5.44 8
4	53.43 26.53 14	298.95 180.93 14	137.68 36.70 14	407.91 19.51 14	40.84 19.15 14	208.81 39.73 14	28.08 12.81 14	3.23 2.08 14
5	123.91 39.89 27	634.16 327.42 27	153.90 55.27 27	386.09 166.56 27	29.52 6.40 27	141.26 40.55 27	99.81 47.34 27	24.84 4.02 27
12	57.83 22.78 46	219.13 65.68 46	123.45 39.17 46	340.03 96.36 46	137.58 24.10 46	196.79 38.33 46	85.93 24.23 46	133.50 44.20 46
¥	0.28 0.28 17	86.88 46.10 17	189.19 45.17 17	169.53 53.87 17	116.83 19.96 17	83.66 31.04 17	25.16 9.84 17	107.37 34.21 17
	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE NO. TONS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-56 Regional Standing Crops (in Thousands) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ons INED	886	6 N.O.	500	20 40			.	
Regions COMBINED	55740 11469 210	26940 6587 21	172167 21849 210	40454(50974 21(15731(5063) 21(230764 27224 21(75087 12156 210	75654 16309 210
AL	001	001	186 185 13	১ ১ চ	65 13	001	00 5	001
cs	200	293 144 21	3517 2632 21	334 232 21	267 217 21	930 424 21	40 21 21	200
ទ	ဝဝ ည	51 18	776 292 18	002	404 267 18	892 690 18	008	008
8	55 55 5	434 55 55	4499 2096 15	1752 1383 15	1402 369 15	2069 1031 15	ဝဝက	០០វេ
윺	005	æ æ c	1242 379 10	3892 1824 10	2509 1004 10	270 170 10	325	000
¥	000	6608 3886 8	736 374 8	56313 28806 8	60886 49547 8	2990 2048 8	898 589 8	687 8 8
3	3664 3512 13	4701 1626 13	20177 7872 13	33728 3817 13	5076 3004 13	60138 14483 13	10418 1079 13	958 144 13
\$	3911 457 8	10512 1376 8	6481 3499 8	18179 3520 8	2751 859 8	16579 14774 8	9625 4932 8	2269 1128 8
<u>.</u>	11131 5527 14	62283 37695 14	28683 7647 14	84983 4064 14	8509 3989 14	43502 8278 14	5850 2669 14	672 432 14
5	18306 5893 27	93688 48371 27	22736 - 8166 27	57040 24607 27	4362 945 27	20870 5990 27	14745 6994 27	3670 594 27
71	18611 7330 46	70520 21135 46	39727 12606 46	109426 31009 46	44275 7757 46	63329 12335 46	27655 7798 46	42963 14225 46
¥	65 17	19933 10577 17	43405 10362 17	38893 12359 17	26804 4580 17	19194 7122 17	5772 2258 17	24633 7848 17
	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop	Crop TOWS	Crop TOWS
	SE.	SE.	St.	St. SE.	St. 당	St. 86.	St. NO.	SE.
DATE	13.UL- 18.UL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-57 Regional Catch-Per-Unit-Effort (CPUE) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

				•						
Regions COMBINED	<0.005 0.05 100	0.00	0.03 0.33	0.55 2.72 100	0.47 2.89 100	2.35 12.19 100	0.42 2.03 100	85.44 940.29 100	3.04 100	0.15 1.10 100
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.05 0.05 19	0.00	9.00	0.0 0.0 0.0	989	9.00	9.00	999	90.0	0.00
98	0.00 0.00 25	0.00 150	0.00	0.00	0.00	0.00	0.00	0.0 1.0 6	0.00	0.00
S S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5
€	0.00	0.00 8	0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00 0.00 8	0.00 0.00 5	0.00	0.00	0.00	0.00	0.0 0.00 2.00	0.00
3	0.00 8	0.00	0.00 ×	0.00 0.00 6	0.00	0.00	0.00	0.17 0.17 6	0.00	0.00 0.00 6
ş	0.00 m	0.00	0.00 3.00	0.00 0.00 2	0.00	0.00	1.00 7.7	0.00	3.60 2.06 5	0.00 0.00 5
4	0.0 0.0 200 200	0.00	0.00	0.00	0.00	0.60	0.00	3.60 2.42 5	0.60	0.40
5	0.00	0.00	0.00	0.07	0.71	0.0 4.0 4.0	0.29 0.16 14	1.57 1.35 14	0.00	0.07
17	0.0 1.00	9.00	0.00	5.17 2.64 24	2.54 1.59 24	0.71 0.36 24	3.50 1.86 24	30.88 12.29 24	0.08 0.06 24	0.38 0.19 24
¥	0.00	0.00	0.33	1.40 0.68 5	2.40 5.40 5	26.80 12.18 5	0.20 0.20 5	989.00 940.21 5	2.20 2.20 5	1.00
	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE Se No. Tows	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE No. TOWS	CPUE SE No. TOWS	CPUE SE No. TOWS	CPUE SE NO. TOWS
DATE	23JUN- 26JUN	06JUL- 09JUL-	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	285EP- 305EP	120CT- 150CT	260CT- 280CT

Table C-58 Regional Standing Crops (in Thousands) of Bay Anchovy Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

	Regions COMBINED	8	008		68 80 80 80	828	£ 50	12 88 88 88	888	35 00	0220
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	98	ဝဝည	ဝဝည	၀၀ ည	000	000	000	000	000	000	000
	8	000	000	000	0010	002	0010	0010	0010	000	00 W
	윺	000	008	008	00 W	005	0010	00 W	0010	00 W	00 W
1992	¥	000	000	o o so	0010	00 W	0010	005	0010	00 W	00 W
Survey,	3	00m	00m	00 M	000	000	000	000	· ••••	000	00%
ch Seine	ŝ	00 M	00 m	00m	00%	0010	00 W	M 64 FG	0010	6- NI N	00 W
From Bea	<u> </u>	00m	00m	00m	00 m	0010	0 4 IU	00 W	22 33	04W	44N
termined	3	001	001	۸٥٥	00 <u>4</u>	5 8 7	4 W 2	844	42 42 48 48	004	420
Estuary Determined From Beach Seine Survey,	72	005	°°=	°°=	235 120 24	55.22	32 17 24	159 85 24	1403 558 24	4 m %	2,04
Ver	¥	00m	00m	ммм	= 80 R	តិតិស	202 92 5	N N IS	7448 7081 5	5 5 5	60 80 N
in Hudson R		Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TONS	Crop TOUS	Crop	Crop TOUS
. -		St. C 86. 1	St. C.	St. C SE 70	St. C SE NO. T	St. C SE 36. T	St. C SE NO. T	St. C 86. 7	St. C	St. C. SE 30. 10	86. C
	DATE	23JUN- 9 26JUN S	N 10600 8 - 1060	203UL - S	03AUG- S 06AUG S	17AUG- S 20AUG S	31AUG- S OZSEP S	14SEP- S 16SEP S	28SEP- S 30SEP S	120CT - S	260CT - S 280CT S

Table C-59 Regional Density (No./1,000m3) of Bay Anchovy Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	12.42 44.55 210	21.73 29.71 210	4.86 10.57 210	4.87 10.09 210	1.36 5.97 210	3.68 12.99 210	0.92 1.99 210	0.35 2.02 210
¥F	0.00	0.00	0.0 13 13	0.00	0.00	0.00	0.00 13	0.00
S	0.00 0.00 21	0.00	0.00 0.00 21	0.00	0.00 0.00 21	0.00	0.00	0.00 2.00
SG	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00	0.00 0.00 18	0.00	0.00 0.00 18
χg	0.00 0.00 15	2.11 0.88 15	0.00	3.31 2.90 15	0.30 0.30 15	0.00	0.00 0.00 15	0.00
윺	0.00	0.00	3.30 2.58 10	2.20 0.86 10	0.04 0.04 10	0.00	0.51 0.51	0.00
¥	0.00	0.83 0.67 8	5.78 4.58 8	2.35 2.16 8	0.00	0.08 0.05 8	0.74 0.74 8	0.00 8
3	1.20 0.60 13	38.12 11.77 13	4.60 2.10 13	9.85 2.14 13	0.30 0.10 13	1.00 0.58 13	1.94 1.11 13	0.00
ş	0.01 8	8.86 3.53 8	11.31 3.15 8	7.94 3.23 8	8.49 5.56 8	18.46 11.64	2.37 0.09 8	0.00 0.00 8
4	5.47 2.30 14	5.86 5.46 14	0.80	3.92 1.46 14	1.54 1.28 14	6.53 4.05 14	0.66 0.64 14	0.04
8	8.81 4.40 27	16.11 6.59 27	1.92 0.67 27	5.89 3.93 27	0.29 0.11 27	4.91 3.22 27	1.47 0.72 27	0.06 0.03 27
12	33.03 20.16 46	61.47 14.85 46	10.12 2.54 46	6.06 1.85 46	3.39 1.07 46	7.39 1.83 46	1.22 0.49 46	2.16 0.95 46
¥	100.46 39.41 17	127.40 20.90 17	20.53 7.89 17	16.97 7.20 17	1.92 1.35 17	5.74 1.65 17	2.15 0.85 17	1.94 1.78 17
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13JUL - 18JUL	27JUL - 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Regional Standing Crops (in Thousands) of Bay Anchovy Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992 Table C-60

ຼ ຄ								
Regions COMBINED	36289 11157 210	60323 7166 210	13674 2557 210	12085 2158 210	3747 1273 210	9775 2696 210	2310 416 210	1155 511 210
AL	0 0 E	0012	001	001	0012	001	001	0 0 15
ន	005	200	200	200	200	0 0 tz	2100	200
98	ဝဝည်း	005	ဝဝဋ	ဝဝည္	002	000	008	0 0 85
8	0 o t	298 125 15	001	468 411 15	125	ဝဝည	၀၀႑ာ	០០ជ
윷	005	000	546 427 10	364 143 10	۲ ۰ ۰۵	005	225	005
¥	008	246 200 8	1724 1365 8	669 843 8	008	23 8 8	221 221 8	000
3	167 84 13	5329 1645 13	643 294 13	1377 300 13	42 13	139 81 13	271 155 13	0 0 E
ş	mm co	1837 732 8	2346 654 8	1647 671 8	1761 1154 8	3830 2415 8	493 19 8	000
9	1140 479 14	1222 1137 14	36 37 45	817 304 14	321 267 14	1361 843 14	138 134 14	80 4
3	1302 650 27	2381 974 27	283 27	871 581 27	42 16 27	726 476 27	217 107 27	9 4 27
21	10630 6486 46	19782 4778 46	3256 819 46	1949 594 46	1091 345 46	23 <i>77</i> 588 46	394 159 46	695 307 46
¥	23047 9042 17	29227 4794 17	4709 1810 17	3892 1653 17	441 310 17	1318 379 17	493 195 17	444 409 17
	St. Crop SE NO. TOWS							
DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-61 Regional Catch-Per-Unit-Effort (CPUE) of Bay Anchovy Yearling and Older in Hudson River Estuary Determined From Beach Saine Survey, 1992

Regions COMBINED	2.94 17.85 100	12.59 69.06 100	5.00	.01 001	0.19 1.56 100	8.4.5	.05 100	. 12 100 100	5.85	0.02 0.22 100
28	27				•					
¥	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.0
S	99.0	0.00 0.00 19	0.0 0.00 4	9.00	9.0 5.05	0.00 0.00 10	0.00	0.00	0.00 1000	0.00
SG	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00	0.00	9.00	0.00	0.00
æ	0.00 0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00	0.00
€	0.00 8	0.00 0.00 8	0.0 8	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00 0.00 5	0.00
¥	0.00	0.00 8	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00
3	0.00 0.00	0.00 2.00 2.00	0.00 3.00	0.00	0.0 0.0 6	0.00	0.00	0.00	0.00	0.00
ş	0.00 0.00	1.00 2.00	0.00 0.00	0.00	0.00	0.00	0.40	0.00	0.80 0.80 5	0.00 0.00 2
4	0.00 0.00 3	0.00	5.33 E.55 E.	0.00	0.00	0.60 0.60 5	0.00	0.00	0.00	0.00
5	0.14 0.14 7	7.71 4.22 7	0.29 0.29 7	0.00	0.00	0.00 0.00 14	0.00	0.00	0.00	0.00
12	25.82 17.28 11	141.36 68.92 11	14.09 4.36	10.29 5.51 24	0.13 0.09 24	0.17 0.10 24	0.17 0.12 24	1.42	0.04 0.04 24	0.08 0.08 24
¥	9.33 4.48 3	1.00	0.67 0.33	12.20 7.12 5	2.20 1.56 5	0.20 0.20 5	0.00	0.00	0.40	0.20
	£	. &	£		. v	হ		रु	रु	Ş.
	CPUE SE NO. TOWS									
DATE	23JUN- 26JUN	06JUL-	20JUL- 22JUL	03AUG- 06AUG	17AUG 20AUG	31AUG- 02sep	14SEP- 16SEP	. 28sep-	120CT - 150CT	260CT- 280CT

Yearling and Older Table C-62 Regional Standing Crops (in Thousands) of Bay Anchovy

	Regions COMBINED	1247	8	<u> </u>	6641	5133	3	202	\$ 5	3	220	99	2	8	2 5	901	5	_	100	0.1	<u>د</u>	100	3:	Ų	3	~ ~	* 5	3	80 ×	. 5	}
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1992	¥	0	0	€0	0	0	80	0	0 (3 0	0	0 1	ın	0	0	ın.	0	0	In	0	0	sv.	0	0	ر. د	0	0 1	n	0	-	n :
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rom Beac	<u>e</u>	0	0	143	0	0	m	67	۶¢ د	m	0	0	ī.	0	0	ស	•	•	'n	0	0	10	0	0	'n	0	0	'n	0	o 1	n
Estuary Determined From Beach Seine Survay,	5	4	4	7	207	14.	_	∞	∞	7	0	0	14	0	0	4	-		7	0	• •	7	0	0	7	0	-	2	0	۰;	4
ary Dete	21	173	785	=	5423	5131	Ξ	079	198	=	897	251	*2	•	4	77	œ		. 52	ω	ن	54	\$	5 2	54	~	~	5	4	4 ;	5 7
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in Hudson Ri		_		"	^		1 0	6		co.	0		Ø	£		S	£		ç	۵	L	ç	o.		S.	Q.		•	•	,	S.
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	DATE	23JUN-	26JUN		-TOP	09JUL		20JUL-	22JUL		03AUG-	06AUG		17AUG-	20406		21416.	DSSEP		14SEP-	16SEP		28SEP-	30SEP		120CT-	150CT		260CT-	280CT	

Table C-63 Regional Density (No./1,000m3) of American Shad Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

70	_										
Regions Combined	0.0 0.05	0.0 86.0 86.0	1.05 8.13 108	101.93 374.62 115	50.17 243.96 118	15.15 57.69 110	3.60 10.06 110	28.37 67.16 110	2.57 26.71 119	1.52 7.42 117	0.00 118
A	9.0	9.00	3.78 2.41 9	585.48 83.82 9	331.78 156.99 10	73.50 45.55 6	27.86 8.02 6	271.25 65.88 6	3.67	8.18 5.37	9.00
S	0.0 0.00 0.00	0.00	0:29 0.29 9	605.88 364.47 5	13.90 3.37 6	70.02 30.51 6	1.94 4.94 6.	68.45 13.07 6	0.51 0.51 6	3.17 2.24 5	0.00
80	0.0 0.0 8	9.9 8.8	0.0 0.0 8	3.65 3.06 6	221.00 185.81 6	13.88 7.55 8	4.69 2.30 8	0.45 0.28 8	28.10 26.53 6	8.33 4.60 6	0.00
KG	0.00	0.00	8.49 7.76 7	27.21 21.64 7	35.37 18.30 7	23.89 16.30 7	5.02 4.54 7	0.29	1.12 0.46 7	0.00	0.0 0.00 7
웊	0.00	0.00	0.00	0.98 0.52 11	0.00	0.0 0.00 0.00 0.00	3.24 2.63 10	0.0 10 10	9.00	9.00	0.00
¥	0.00	0.00	0.00 6.00 6	9.00	9.0	0.55	0.00	0.00	0.00	0.00	0.00
3	0.0 0.00 0.00	0.0 1.88	9.00	0.0 0.00 16	0.0 0.09 7	0.00	0.00 15	0.00 0.00 15	0.00 0.00 13	0.00 0.00 £1	0.00
ŝ	0.00 6.00 6	0.00	0.0 0.0 6	0.00	0.00	0.00	97.0 9.44 9	0.00	0.00	0.00	0.00
2	999	0.0 0.00 10	0.0 0.00 10	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.08 0.08 13	0.00
₹	0.00	0.00 13	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00
12	200	0.00	0.00 12	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	9.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	NS	S	S.	SS.	S.	S Z	2	S	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04MAY- 08MAY	11HAY- 15HAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

E998 Table C-63 Regional Density (No./1,000m3) of American Shad

	Regions Combine	0.0 811	0.00	0.00	0.0 2.00 2.00	998	0.00 23.00	9.00 7.00 7.00 7.00	9.0 2.00 2.00 2.00	0.0 2.88
	*	0.00	0.00	S	S	S	S	S	Š	SK
	S	0.00	0.00	S	S.	N	N.	SZ	S	S
~	8	0.00	0.00 0.00 6	SZ.	SZ.	S	S.	SZ.	S	S
vey, 199	2	0.00	0.00	X X	SZ	SE .	S	SZ Z	S	S
kton Sur	£	9.00	9.00	SZ SZ	SN	SZ Z	S.	SN .	Š	SN
thyoplan	¥	0.00	0.00	0.00	0.00	0.00	0.00	0000	0.00	0.00
Eggs River Ichthyoplankton Survey, 1992	3	0.00	0.00 0.00 13	0.00	0.00 0.00 0.00	0.00	0.00 100 100	0.00	0.00	0.00 10
	ŝ	99.6	0.00	0.00	9.00	0.00	0.00	000	0.00	0.00
ne Longit	2	0.0 5.85	0.00	9.00	9.00	999	9.00	999	9.00	999
ver Estuary Determined From Longitudinal	5	0.00	9.0	0.00	0.00	0.00	0.00	0.00	0.00	9.00
y Detern	12	0.00	0.00	9.00	9.0	0.00	9.0	9.0	0.00	0.00
ry (RO.)	¥	0.00 1.00	0.0 1.00	0.0 1.00 1.00	9.00	0.00	0.00	0.00	0.00	0.00
son River	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in Hudson Rf		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	- DENSITY SE NO. TOWS	DENSITY SE No. Tows	DENSITY SE .NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28sep- 30sep	120CT- 140CT

Table C-64 Regional Standing Crop (in Thousands) of American Shad Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

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Regions	Complin	υ,	5		, 0	108	127	1142	5	177020	59638	115	88690	38526	118	26658	8074	110	6043	1388	110	45862	8698	110	2665	7697	119	3041	1122	117	0	0	12
•	¥	00	>	0	•	0	787	308	0	74981	10734	0	42491	20105	2	9413	5834	•	3568	1028	•	34739	8437	•	027	380	•	1048	88	S.	0	0	•
!	S	00	5	•	•	٥	97	46	0	97385	58585	10	2234	245	•	11254	7067	•	312	312	•	11002	2100	•	82	85	•	206	360	'n	0	۰.	•
	S	00	> ∞	0	0	Φ	0	0	€	643	540	•	38961	32757	•	2447	1331	€0	826	406	∞	8	63	©	4955	4677	•	1468	811	•	0	۰,	0
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S	È	00	•	0	0	~	0	0	~	162	87	=	0	0	=	0	0	2	537	435	2	0	0	9	0	0	2	0	0	2	0	0 9	2
à	£	00	•	0	0	•	0	0	•		0	2	0	0	5	164	\$	~	0	0	~	0	0	~	0	0	~	0	01	_	0	o r	-
3	5	00	5	0	0	=	0	0	=	0	0 ;	9	0	0	92	0	0	5	0	0	1	0	0	5	0	0	£		۰;	5	0	٠;	2
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£	<u>.</u>	00	12	0	0	12	0	0 ;	72	0	0.5	2	0	0 ;	6	0	0	=	0	0 ;	=	0	0	=	0	0 ;	7	0	۰;	<u> </u>	0	>	ž
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		Crop	TOWS	Crop	;	1048	Crop	٠ :	S	Crop	9	8	Crop	9	10HS	Q	٠	SE SE	Crop	9	TOHS	æ	:	£	g	!	S.	g.	٩	ç	g	4	2
		St. Cr SE			3E		St. Cr			St. Cr			St. Cr		NO. 10	St. Crop		10. TOWS	St. Cr			St. Crop		0. TOWS	t. Crop	SE E	0. TOWS	t. Crop	SE		St. Crop	ה קבר ה	
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DATE		13APR-		20APR-	25AP		27APR-	0 1 1 1		O4MAY-	OSMAY		11HAY-	15₩ 2		18MAY-	22HA		25MAY-	SOMA		O1JUN-	250		-NOF80	1210		15JUN-	1920X		22JUN-	nro7	

Table	3 5	Table C-64 Regional Star in		ding Crop (1) Hudson River	in Thousai r Estuary	ands) of y Determ	Crop (In Thousands) of American on River Estuary Determined From		Eggs dinal Ri	/er Ichi	Shad Eggs Longitudinal River Ichthyoplankton Survey, 1992	ton Surve	1992			
DATE			E	¥	72	5	₽.	\$	₹	¥	윺	χ g	98	S	AL CO	Regions Combined
29JUN- 03JUL	SE.	Crop TONS	000	•• =	004	00 =	00E	000	0 0 ti	002	005	001	000	0010	000	0 0 81
06JUL- 10JUL	8 8 S.	Crop TOUS	000	005	004	005	001	000	0010	002	005	001	000	00%	000	005
20JUL - 22JUL	SE SE	Crop TOWS	۸٥٥	005	005	002	000	000	000	009	ω Z	SZ	S	S.	æ	992
04AUG- 06AUG	SE.	Crop .	00,	00 <u>5</u>	005	002	000	009	005	009	S	SE SE	SZ .	S	X	00K
18AUG- 20AUG	SE.	Crop TOUS	۸٥٥	00 <u></u>	005	004	005	000	005	000	S	S	S	SZ	≅	00K
O1SEP- O3SEP	SE.	Crop TOUS	001	00 <u>±</u>	005	0 0 2	000	000	000	000	SS	Sa	Sa	Sa	S Z	ook
15SEP- 17SEP	5 % S.	Crop TOWS	400	00 <u>=</u>	005	0 0 21	000	000	000		S	S	S	S	SZ	oòk
288EP- 308EP	SE.	Crop TOUS	۸٥٥	<u>-</u>	005	002	000	000	000	000	S	SX	S	S	S	ook
120CT - 140CT	St. No.	Crop TOWS	. 002	00=	005	002	005	000	00 <u>0</u>		SX	NS.	S	S2	S	00K

Table C-65 Regional Density (No./1,000m3) of American Shad Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

							-				
Regions Combined	0.00	0.00 108 108	0.0 0.00 108	0.11 1.31 115	3.65 12.45 118	72.30 349.09 110	81.86 279.47 110	16.77 46.69 110	15.59 43.47 119	5.57 45.46 117	0.83 7.78 118
¥	999	999	0.00	0.00	37.46 12.34 10	656.01 346.69 6	794.04 269.71 6	38.08 7.78 6	155.50 37.04 6	64.22 45.01 5	10.74 7.78 6
S	0.0 0.0 0.0 0.0	0.00	0.00	0.00 5.00	0.49	118.25 16.98 6	79.51 57.76 6	78.96 15.08 6	24.17 18.11 6	2.24 2.24 5	9.0
98	0.00	0.00	0.00	1.3.	4.71 1.52 6	53.34 31.22 8	81.21 41.18 8	53.60 40.28 8	17.95 12.82 6	5.98 8.98	0.00
S S	0.00	0.00	0.00	0.00	1.06 0.60 7	32.23 18.69 7	27.27 18.11	27.70 16.32 7	5.03	0.00	0.00
₹	0.00	0.00	0.00	0.00	0.13 0.13	9.00	0.00	2.84 1.57 10	0.00 0.00 0.00	9.00	0.00
*	0.00	0.0 0.0 6	0.00	0.00	9.00	0.00	0.24	0.00	0.00	0.00	0.00
3	0.00	9.00	0.00	0.00	0.00 0.00 16	0.00 15	0.00 150	0.00	0.00 ±	0.00	0.00 0.00 13
ş	0.00	0.00	0.00	0.00	9.00	۲.۲. د د ه	0.00	0.00	0.00	0.00	0.00
<u>~</u>	0.00	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.0 0.00 13	0.00	0.00 0.00 12
₹	0.00	0.00 13	0.00	0.00	9.00	9.0	0.00	0.00	9.00	9.00	9.65
12	0.00	0.00	0.00	9.00	9.00	9.00	9.00 ±0.00	9.00	0.00 7.00	0.00	0.00
¥	9.00	0.00	9.00	0.00	0.00	9.00	9.00	0.00	0.0 ± 0.0	9.00	995
BT	S S	S.	X	S.	S	S	SN	Z.	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE SE NO. TOUS	DENSITY SE NO. TOWS							
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-65 Regional Density (No./1,000m3) of American Shad Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey,

	Regions CS AL Combined	0.00 0.00 0.00 0.00 0.00 0.00 5 5 6 118	 6.00 8	SZ.	NS NS 0.00 0.00 0.00 0.00 0.00 0.00	SS SS	S S S S		S S S S S
28	gs	0.00	0.00	S	×	SZ SZ	2 2 X	2 2 2 2	Z Z Z Z Z Z
Survey, 15	KG	0.00	0.00	SN	SX SX				
Estuary Determined from Longitudinal River Ichthyoplankton Survey, 1992	¥ ₩	0.00	0.00	S S S	S S				
Ichthyopl	> ¥	0.00 3	0.00	0.00	0.00				
l River	₹	0.00	00.00	0.00	0.00			·	·
gitudina	ŝ	0.00	0.00	0.00	0.00				
	<u>a</u>	0.00	0.00	0.00	0.00				
	5	0.00	90.5	0.00	0.00				
	27	0.00	0.00	0.00	0.00	•	•		
	*	9.9.	9.0	995	0.00				
	B	0.00	0.00	0.00	0.00	•	•	•	·
		DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS				
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	04AUG- 06AUG- 18AUG- 20AUG	OKAUG- OKAUG- 18AUG- 20AUG O1SEP- 03SEP	06AUG 06AUG 118AUG 20AUG 01SEP 03SEP 15SEP 17SEP	06AUG 06AUG 18AUG- 20AUG 01SEP- 15SEP- 17SEP 17SEP 17SEP 30SEP- 30SEP-

Table C-66 Regional Standing Crop (In Thousands) of American Shad Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0 0 90	0 0 80	0 0 80	231 115	5877 1607 118	118591 44930 110	132717 36586 110	31407 7919 110	27676 6050 119	9638 5871 117	1375 996 118
	At Co	000	000	000	000	4797 1580 10	84014 11 44400 4	101691 13 34541 3	4877 3 997 6	19915 2 4744 6	8224 5764 5	1375 9% 6
	S	000	000	000	00 W	88°	19006 84 2730 44 6	12779 101 9285 34		3885 19 2911 4	360	000
	SG	000	00 8	008	2		•	-	12692 2423 3 6		•	
	S				231	830 268 6	9404 5505 8	14317 7260 8	9449 7102 8	3165 2260 6	1054 1054 6	000
	និ	400	400	001	001	150	4560 2644 7	3858 2562 7	3919 2309 7	117	001	400
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	¥	005	005	000	000	000	000	000	000	001	005	005
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		Q. ω	e w	Q. W	D W	a 6	Q v	a. v	0. 10	0. 40	0 0	0 0
		. Crop	. Crop	Crop	. Crop	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS
		S 85.	St. SE.	S & S.	SE.	S & S.	S S .	S S S	S SE.	8 S.	SE.	S K 5.
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-66 Regional Standing Crop (In Thousands) of American Shad Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions	ombined	0 0 8	0 0 61	002	00K	00E	ook	00K	00 K	00%
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		Crop TOWS	Crop TOVS	Crop TOUS	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS
		8 % S.	St.	S SE.	St.	SE.	SE.	St.	SE.	8 8 5.
	DATE	29JUN- 03JUL	1070L- 1070L	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	158EP- 178EP	28SEP- 30SEP	120CT- 140CT

Regional Density (No./1,000m3) of American Shad Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-67

CH IP WP 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.11 0.00 0.00 0.00 0.11 13 9 9 7
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 1.60 0.00 0.00 0.00 1.27 13 9 9 15
0.00 0.21 0.00 34.40 0.00 0.12 0.00 28.97 11 13 9 13
0.96 0.45 3.18 39.42 0.96 0.31 0.97 32.44 11 13 9 13
0.00 1.61 0.94 12.29 0.00 0.78 0.94 5.95 11 12 9 13

Regional Density (No./1,000m3) of American Shad Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992 Table C-67

70									
Regions Combined	31.69 91.32 118	11.80 48.78 119	0.0	992	9.00	995	998	9.68	988
At.	52.52 22.66 6	79.44 37.40 6	S	S	S.	S	S	S	SS SS
S	251.43 80.61	61.48 30.18 6	S.	S	S	S	NS	S	S.
98	64.45 27.82 6	4.43 6.43 6	S	S	XX	S	SZ	SX.	SN SN
2	41.53 23.46 7	7.04 7.04 7	SZ.	S	S	SZ .	S ₹	S	SS S
욮	69: 69: 60:	0.9 0.99 10	S	SZ X	X X	S X	SZ SZ	S	SS.
¥	0.35 0.35 7	0.00	0.00	0.00 0.00 8	0.00 0.00 6	0.00	0.00	0.00 0.00 6	0.00
3	0.00	0.00 13	0.0 9.0 9	0.00 0.00 0.00	0.00 0.00 0.00	0.00 100 100	0.00 0.00 0.00	0.00 0.00 10	0.00 10 10
ş	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00
4	0.00	0.00	9.00	90.0	0.00	0.00	0.00	0.00	0.00 0.00 10
5	9.00	0.00	0.00	0.00 12	0.00	0.00	0.00	0.00	0.00
72	0.0 8.85	0.00 4.	9.00	9.0	99:	9.00	9.00	9.00	50.0
¥	9.0	9.00	9.05	0.00	9.00	9.00	9.00 1.00 1.00	0.00	0.00
æ	989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TONS	DENSITY SE No. Tows	DENSITY SE NO. TOWS
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	288EP- 308EP	120CT- 140CT

Table C-68 Regional Standing Crop (In Thousands) of American Shad Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

SAPIN ST. Crop NS NS NS NS NS NS NS N		Regions Combined	00	1 06	00	90	0	9 8	0	5		13 o	4434	8947 110	2269	2412 110	2460	110	0316	119	0445	117	13976	118
St. Crop HS				_															2.5	Ξ			_	
St. Crop NS		¥		Φ.	00	.	0	>	0		0	0 0	16172	8144 6	402524	118307 6	298	235 6	00	•	19402	5	63739	9
St. Crop NS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3	S	00	5	00	•	0	- 4	0 (⊃ iv	0	0 0	3546	1940	15200	3718 6	67885	54343 6	14708	9	43782	2	24803	9
St. Crop NS. Cr	1624 5	SG	00	∞	00	.	0 (⊃ ©	0 (•	0	0 40	1841	148 8	1356	8 8	157139	81321 8	8168	9	42900	9	9622	9
St. Crop NS		9	00	~	00	^	00	> 	00	~	0	۸ ۵	2860	2962 7	7211	3174	56254	7	25296	1	9488	1 00	6202	-
St. Crop NS	ado de la como	윺	00	•	00	~	0	~	0	7=	0	0 =	0	۰ <u>5</u>	88	5	199) 10	5107	10	9080	5	4211	5 0
St. Crop St. Crop St. Crop St. Crop NS NO. TOMS NO. TOMS NO. TOMS St. Crop NS St. Crop NS NO. TOMS St. Crop NS St. Crop NS NO. TOMS St. Crop NS St. Cr		¥	00	•	00	•	00	o		5		- 5	0	۸0	397	255	0 (o	2186	2	19295	<u>~</u>	3152	7
St. Crop St. Crop St. Crop St. Crop St. Crop St. Crop No. TOMS No. TOMS St. Crop No. TOMS No.		3	00	5	00	; =	00	-	00	5	0	5	ŧ.	र र	0	. ₹	224	15	4808	<u>.</u>	5511	<u> </u>	1717	35
St. Crop NS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B	ş	00	•	00	•	00	.	00	5	0 (. 6	0	0 0	0	> 0	0	- •	00	•	198	90	196 261	20
St. Crop NS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		٩	00	٥.	00	, 5	00	5	00	, t	0	5 2	0	- •	0	- •	0 (- •	3 %	35	33	32	335	<u> </u>
St. Crop NS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		5	00	13	00	, E	00	Į.	00	.	0	> •	0	. £	0	υĘ	0 (៦ជ	00	, =	141	=	00	7
81. Crop NS St. Crop NS		12	00	12	00	, C	00	5	00	5	0	- 5	0	₽=	0	°	0	2=	00	, 2	2.9	72	00	, 2
St. Crop		¥	00	2	00	, 5	00		0	•	0	- •	0 (- 4	0	-	00	-	00	` =	00	'=	00	; =
St. Crop SE SE NO. TOWS SE Crop SE	:	B 1	S.		S.		SE		S		NS.		SE				S		00	•	00	•	00	• •
															Crop	TOUS			Crop	TOWS			Crop	TOWS
13APR-13APR-20APR-25APR-25APR-01MAY-05MAY-05JUN-05JUN-15JUN-15JUN-15JUN-25JUN-25JUN-26JUN-			SE.	9	St.	. €	St.	5	St.	S	st.	¥ &	St.	₩ Š	St.	₩ Ç	st.	ž Š	St.	ž	St.	; 2	St.	₹ છે
\cdot		DATE	13APR- 18APR		20APR-		27APR-		O4MAY-	¥ 600	11MAY-	TAMCI		ZZMAT	ZSMAY-	Amoc .	OTJUN-	NOCCO	-NOC 90		15 JUN-		22JUN-	

Table C-68 Regional Standing Crop (In Thousands) of American Shad Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	64761 14542 118	21997 6935 119	200	00%	00%	00K	00K	00K	00K
	, ₹	6727 2902 6	10174 4790 6	S Z	SZ	SZ Z	SN	SX.	S.	S
344	ຮ	40413 12957 5	9882 4850 6	S.	S	S.	S	S	S.	NS.
1494 101	SG	11362 4904 6	787 781 6	S	S	S.	NS	\$2	SZ	SZ
	8	5875 3318 7	88	S.	S	S S	S	SZ	SZ	SX
	£	280 280 10	163 163 10	SZ.	S	SS	S	SZ	S Z	SX
	¥	201 201 7	001	000	000	000	000	000	000	000
	₹	၀၀ည	ooti	~~~	005	005	005	005	000	000
	ŝ	000	000	000	000	000	000	000	000	000
	2	00 N	00E	000	000	000	000	000	005	000
	₹	005	005	002	002	002	002	0 0 2	002	007
	12	002	004	005	005	005	005	005	005	200
	¥	005	005	005	005	005	00#	=	00=	 =
•	16	000	004	906	000	۸٥٥	400	۸٥٥	001	400
		Crop TOWS	Crop TOWS	Crop TOUS	Crop	Crop TOMS	Crop	Crop TOWS	Crop TOMS	Crop TOUS
		SE SE	St.	SE.	SE.	8 SE.	St. 86.	S SE.	S S .	St. 86.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-69 Regional Density (No./1,000m3) of American Shad Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

DATE		18	¥	12	3	4	ş	3	¥	윺	KG	\$G	ន	4	Regions Combined
13APR- 18APR	DENSITY SE NO. TOWS	SZ Z	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00 10 10	0.00	0.00	0.00	0.00 8	889		0.00
20APR- 25apr	DENSITY SE NO. TOWS	SZ	0.00	0.00 0.00 12	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 8	999	0.00	0.00
27APR- 01MAY	DENSITY SE NO. TOWS	SS	0.0 0.0 10	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	0.0 86 86
04MAY- 08MAY	DENSITY SE NO. TOUS	SZ.	0.00	0.0 0.00 1.00	0.00	0.00 13	0.00	0.0 0.0 4	0.00	9.0	0.00	0.00	0.00	0.0	0.00 0.00 115
11MAY- 15MAY	DENSITY SE NO. TOUS	SS.	0.00	0.00 100 100	0.00	0.00	0.00	0.00 50.00	9.00	0.00	0.00	0.00	0.00	9.00	0.00 0.00 118
18MAY- 22MAY	DENSITY SE NO. TOUS	S.	0.00	0.00	0.00 13	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00 8	0.00	0.00	0.00 110
25HAY- 30HAY	DENSITY SE NO. TOUS	SE	0.00	0.00	0.00 13	0.00	0.00	0.00 0.00 15	0.00	9.00	0.00	0.00 0.00 8	0.00	0.00	0.00 0.00 110
01JUN- 05JUN	DENSITY SE NO. TOWS	Š	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00 8	0.00	0.00	0.00 110
08JUN- 12JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00	0.0 0.00 0.00	0.00	 88.9	0.0 8.09	0.00	0.00
15 JUN- 19 JUN	DENSITY SE NO. TOWS	0.00	0.00 1.00	0.00	0.00	0.00 0.00 13	0.12 9.12	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.01 0.12 117
22JUN- 26JUN	DENSITY SE No. Tows	0.00	0.00	0.00	0.21	1.06 0.85 12	1.09 0.54 9	1.82 1.70 13	4.10	25.80 13.40 10	18.17 8.93 7	74.38 55.12 6	7.99 6.57 6	26.10 14.63 6	12.36 59.68 118

Table C-69 Regional Density (No./1,000m3) of American Shad Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	29.76 49.71 118	45.09 94.65 119	13.62 56.80 72	4.27 16.30 73	1.19 2.39 73	0.99 3.87 73	0.41 1.38 73	0.70 1.61 57	1.30 3.96 73
AL C	52.85 21.84 6	250.33 87.71 6	SZ.	S	S.	X	S.	S	S
S	186.00 30.29 5	128.68 17.28 6	SN	S.	S.	SN	N	NS	SN.
98	50.50 14.78 6	92.08 26.18 6	S Z	S S	SZ	SZ Z	SZ Z	NS	S.
KG	42.67 26.99 7	72.74 15.52 7	S	22	S	SE	S	S	SS.
윺	33.73 9.65 10	14.29 3.79 10	S	SS SS	SZ ZZ	SE	SZ Z	SZ Z	SS.
¥	5.3 5.8 7	10.72 4.17 7	1.29 0.92 6	1.74 1.29 6	0.25 0.25 6	0.26 0.26	0.24 0.24 6	0.60 0.30 6	0.57 0.57 6
3	5.34 1.28 13	5.14 1.76 13	11.83 7.18 9	3.87 1.83 10	0.90 0.86 0.	0.98	0.64	0.0 0.00 0.00	1.82 0.05 10
\$	0.92	1.54	3.81 64.	0.43	0.44 0.44 6	0.95 0.73 6	0.39 0.39	1.18 0.45 6	5.20 3.43 6
<u>a</u>	0.10 0.15	6.57 1.92 13	0.86 0.36 10	3.30 1.61 10	4.76 1.67 10	0.95	0.47 0.47 10	0.52 0.21 10	0.39
3	9.00	4.10 1.50	57.32 54.42 12	7.29 7.08 12	0.43	4.60 3.68 12	0.22 0.22 12	0.88 0.48 12	0.63 0.45 12
12	0.09	0.00	11.60 88.88 11	15.75 14.38 11	0.00	0.21 12.0 12.1	0.19	9.6	9.00
¥	9.00	9.00	7.11 4.21	1.08 1.08 1.08	8:0:	0.0 1.00 1.00	0.00	9.00	0.0 ±
B	0.00	0.00	15.14 10.61 7	0.00	0.86 0.86 7	0.00	1.14	2.45 1.42 7	55.
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-70 Regional Standing Crop (In Thousands) of American Shad Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	003	0 0 80	000	005	0085	•••	0 0 0	0 0 0	1300	25 17 17 18	26535 10293 118
7	000	000	-	000	005	000	000	000	00%	00 W	3343 1873 6
S	005	900	000	000	000	000	0,00	000	00%	00 m	1285 1055 6
9S	000		008	000	000	000	000	000	00%	000	13112 9718 6
KG	۸٥٥	001	400	001	۸٥٥	001	400	001	006	001	2571 1263 7
₹	000	001	001	00=	001	000	005	000	005	005	4269 2218 10
¥	000	000	000	005	002	001	000	001	901	901	1221 525 7
3	005	oo=	00=	003	002	០០ជ	ంంగ	០០៦	០០ឯ	០០ដ	254 237 13
\$	000	000	000	000	000	000	000	000	000	ស្ល	227 111 9
٩	000	005	000	001	004	000	000	006	ဝဝည	0 0 ti	221 178 12
5	0 0 E	0015	០០ឯ	000	000	ဝဝည	ဝဝည	00E	005	00=	- H H
12	005	004	002	000	000	00=	00=	005	004	004	004
¥	005	005	000	000	000	000	000	000	005	°°;	00=
8	SS .	SS	S.	S	S.	S	S	S	000	000	000
	Crop TOWS	Crop	Crop TOWS	Crop TOUS	Crop TOWS	Crop	Crop TOUS	Crop TOVS	Crop .	Crop TOWS	Crop TOWS
	St. Crop SE NO. TOWS	St. O	St. C	St. C	St. C SE NO. 1	St. C SE NO. 1	St. C	St. C SE NO. 1	St. C SE NO. 7	SE.C.	St. C
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY 22MAY	25HAY- 30HAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Young of Year Table C-70 Regional Standing Crop (In Thousands) of American Shad

	Regions Combined	62544 7655 118	87840 12738 119	20002 8937 72	8394 4786 73	1964 492 73	1355 598 73	67 291 33	1174 335 73	2054 829 73
	4	6769 2797 6	32059 11233 6	S	S	8	S S	SE	SZ.	Š
2%	S	29896 4868 5	20683 2778 6	SX SX	SE SE	¥8	SS	S	\$	S
urvey, 1	SG	8903 2606 6	16234 4616 6	SE SE	SE	S	SS.	X.	S	S
ankton S	æ	6036 3818 7	10290 2195 7	NS.	SX SX	Ş	S S	S Z	S.	S
ing Grop (in Thousands) of American Shad Idson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	5582 1596 10	2364 628 10	S	SE SE	X.	S.	SS	×	S.
roung of real	¥	4399 1759 7	3197 1244 7	386 273 6	384 384 6	ጜ <mark>ጜ</mark> ኈ	¢£°9	£5°	178 89 6	151 6
i tudinat	8	746 771 13	719 246 13	1654 1003 9	256 10	126 120 10	¥85	886	000	255 7 10
can Shad rom Long	ŝ	192 9	320 207 9	340	8%%	888	198 151 6	22,	77.7 78.7 79.7	1078 712 6
ot Ameri rmined F	<u>a</u>	322	1370 400 13	をなる	687 336 10	348 10	198 153 10	8 8 C	109 44 10	82 82 10
usands) ary Dete	중	001	605 222 11	8468 8040 12	1077 1046 12	235	679 544 12	222	131 52	93
(In Tho Ver Estu	72	004	002	3732 2858 11	5069 4629 11	005	\$\$=	188	005	005
Table C-70 Regional Standing Crop (In Thousands) of American Shad in Hudson River Estuary Determined From Long	¥	00#	00#	1630 966 11	409 11	437 11	005	005	°°=	00=
al Standi in Ku	6	000	000	3165 2218 7	001	180 180 7	001	239	512 297 7	374 374 7
Region		. Crop	. Crop	. Crop	. Crop	. Crop	. Crop	. Crop	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS
Ŗ		S S S S S S S S S S S S S S S S S S S	S S S	SE.S	S 8 5.	St.	St. 86.	SE SE	2 2 2	
Table	DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL -	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Table C-71 Regional Density (No./1,000m3) of American Shad Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regfons COMBINED	10.44 15.75 210	3.06 5.27 210	1.06 3.55 210	0.79 1.44 210	0.69 1.75 210	0.64 1.59 210	0.64 1.72 210	0.33 0.44 210
¥	15.09 8.11	13.18 3.41 13	4.19 2.37	1.52 0.41 13	1.77 0.36 13	3.25 1.49 13	2.23 0.54 13	0.46
S	48.27 6.36 21	6.35 1.81 21	1.25 0.66 21	1.85 0.50 21	1.14 0.49 21	1.67 0.35 21	1.35 0.36 21	0.94 0.21 21
98	32.96 10.45 18	3.08 1.10 18	0.49 0.18 18	0.76 0.23 18	0.19 0.08 18	1.52 0.32 18	1.46 0.67 18	0.42 0.15
ΚG	6.63 1.46 15	3.01 0.93 15	0.18 0.10 15	0.96 0.41 15	1.41 0.68 15	0.50 0.30 15	0.31 0.31 15	0.36 0.10 15
윺	5.35 1.75 10	2.05 1.41 10	1.86	0.20 0.14 10	1.07 0.96 10	0.05	0.10 0.07 0.0	0.21 0.08 10
¥	4.73 3.62 8	2.05 1.99 8	2.08 2.08 8	0.05 0.05 8	0.00 0.00 8	0.21 0.06 8	0.69 0.65 8	0.16 0.10 8
3	4.47 2.37 13	1.21 0.58 13	0.60 0.57 13	0.24 0.09 13	0.79 0.63 13	0.12 0.06 13	1.28 1.24 13	0.16 0.07 13
9	2.38 2.31 8	2.51 1.52 8	0.02 0.02 8	1.52 0.76 8	0.72 0.70 8	0.08 0.05 8	0.02 0.02 8	0.03 0.03 8
4	3.38 1.71 14	1.73	0.88 0.76 14	0.78 0.68 14	0.71 0.64 14	0.05	0.00	0.17
*5	0.78 0.18 27	0.67 0.35 27	0.25 0.08 27	0.58 0.40 27	0.12 0.04 27	0.15 0.06 27	0.02	0.22 0.08 27
77	0.48 0.16 46	0.72 0.27 46	0.24 0.06 46	0.98 0.46 46	0.12 0.04 46	0.08	0.01 0.01 46	0.62 0.19 46
¥	0.76 0.64 17	0.21 0.08 17	0.71	0.10 0.04 17	0.17 0.06 17	0.03 0.02 17	0.15 0.06 17	0.24
	DENSITY SE NO. TOWS							
DATE	13.UL - 18.UL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT - 090CT	190CT - 230CT

Table C-72 Regional Standing Crops (in Thousands) of American Shad Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ູ ຄ								
Regions COMBINED	2701 2701 210	6057 970 210	2327 749 210	1744 293 210	1326 300 210	1190 213 210	1250 30 3 210	767 94 210
Ą	1933 1038 13	1687 436 13	537 304 13	\$ E E	227 46 13	416 190 13	285 70 13	24 13 13
S	7758 1022 21	1020 292 21	201 204 212	297 81 21	183 5 2 2	268 24 21	217 58 21	24, 121
98	5811 1841 18	543 193 18	32 18 18	134 41 18	34 15 18	268 57 18	258 118 18	73 27 18
X S	937 206 15	425 132 15	ឧភភ	55 87 51	200 200 15	535	44 15	55 55
윺	885 289 10	339 10	308 172 10	253	159 159	ဆက္၌	456	ಜಪಕ
¥	1410 1080 8	612 593 8	621 621 8	5 5 8	00	20 tz 8	205 193 8	49 8 8
3	625 332 13	169 13	\$ & E	35 E	£ 88 £1	700	179 174 13	22
ş	493 479 8	520 315 8	mmæ	315 158 8	149 145 8	7,08	440	~~
4	703 356 14	364 297 14	184 159 14	163 141 14	149 133 14	5~7	004	35
5	15 72	\$28	37	88 27	18 6 72	25 6 72	273	32 24 24
12	155 46	2883	£23	315 149 46	9 1 1 8	% 8 9 7,8 9	mm 9	98 88 88
¥	55 54 54	46	18	193	327	7 14	¥2,	54 17
	_		_	_			_	
	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOUS	Crop 1048	Crop TOWS	. Crop	Crop TOWS
	SE.	S 8 5	St. 86.	S 8 5	S S 5.	S 86.	SE.	S 8 5.
DATE	13JUL- 18JUL	27JUL - 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-73 Regional Catch-Per-Unit-Effort (CPUE) of American Shad Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

	•									
Regions COMBINED	18.01 62.60 100	38.31 120.96 100	51.49 209.29 100	19.16 27.64 100	13.84 21.73 100	12.77 17.33 100	13.26 20.92 100	11.17 18.59 100	6.41 9.04 100	3.67 7.78 100
4	£.45	5.00	22.42 7.76 12	34.00 13.70	11.86 2.60 7	27.86 7.31	13.29 2.62 7	15.14 3.34 7	7.14 3.74 7	0.00 0.00 7
CS	19.26 12.58 19	15.11 4.58 19	32.16 7.98 19	20.20 8.28 10	30.00 10.81 10	13.90 2.62 10	25.60 9.72 10	3.80 1.14 10	3.70 2.84 10	0.00
98	5.47 2.69 15	16.33 6.73 51	64.67 24.44 15	27.67 6.94 9	25.89 4.25 9	18.56 6.19 9	20.11 5.87 9	12.78 4.47 9	3.89 1.45 9	9.00
ă S	38.13 37.98 8	16.75 10.80 8	64.38 18.02 8	48.40 17.33 5	14.40 9.98 5	10.00 3.41 5	9.40 3.66 5	17.40 7.86 5	1.00 0.77 5	0.00 5.00
윺	21.13 9.82 8	15.63 5.94 8	59.13 20.78 8	10.20 4.40 5	3.20 1.07 5	3.80 1.83 5	12.60 5.14 5	14.40 2.27 5	7.20 3.14 5	0.40 0.24 5
¥	13.25 6.32 8	61.25 14.27 8	46.50 10.16 8	12.60 8.33	34.00 13.10 5	21.80 9.15 5	40.00 13.90 5	14.80 8.03 5	8.60 3.67	2.80 0.86 5
3	90.00 44.81 3	63.33 20.69 3	32.00 10.54 3	37.83 5.50 6	36.67 7.50 6	35.17 8.16 6	23.83 6.20 6	36.83 12.84 6	9.83 3.04 6	3.50 1.57 6
ŝ	12.33 10.87 3	116.33 76.71 3	229.67 203.72 3	11.60 2.50 5	6.40 0.81 5	11.40 5.05 5	3.20 1.16 5	6.00 2.97 5	4.80 2.08 5	1.20 0.58 5
٩	11.67 6.12 3	138.33 88.71 3	1.45	6.80 2.94 5	0.40	5.60 3.20 5	3.20 2.96 5	6.40 2.14 5	7.20 3.28 5	6.40 3.98 5
5	3.14 2.82	11.43 3.26 7	40.43 23.71 7	5.79 3.81 14	1.43 0.73 14	3.71 0.82 14	5.86 4.43 14	4.5 4.7 7.7	6.07 1.28 14	16.64 5.78 14
72	0.00	0.18 0.18	14.18 6.06 11	8.21 2.22	1.29 0.43 24	1.08 0.33 24	1.83 0.56 24	0.30 24.00	7.8 7.8 24.4	7.88 2.46 24
¥	0.00	0.00 3.00	8.00 2.65	6.60 2.73 5	0.60	0.40	0.20	0.80 0.37 5	9.60 2.25 5	5.20 1.24 5
	S.	XIS	Ş	WS WS	¥.	SH	· SH	S.A.	S.	ž.
	CPUE SE NO. TOWS									
DATE	23.JUN- 26.JUN	06JUL- 09JUL-	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

	_																													
	Regions COMBINED	2130	3	00	3822	8	100	5808	1017	100	2938	351	<u>5</u>	2088	274	100	1832	161	90	1952	78	5	1417	5	901	1094	<u>></u> 9	3	\$ <u>\$</u>	5
	¥	54	2	2	8	2	2	305	905	2	462	8	~	161		_	378	8	^	181	36	_	206	.	_	6	~ r		00	^
	ន	379	5 48	6	297	8	\$	633	157	₽	397	5	2	230	213	2	273	25	2	504	191	2	ĸ	2	6	R.	8	2	00	5
	98	96	47	5	287	118	5	1135	459	ŧ	98 7	122	o -`	424	ĸ	0	326	5	•	353	5 0	•	224	۶,	٥.	8	Q ^c	>	00	•
	KG	328	327	€	144	8	∞	554	155	€	417	149	د	124	8	ın	8	23	'n	2	3	ę.	150	3	ın	ф 1	~ •	^	00	, ru
Young of Year 1992	웊	92	12	€	6	7	€0	ĸ	%	∞	£	'n	'n	4	-	'n	20	~	ن	2	•	iv.	81	M)	ιν	Φ.	4 1	^	*0.005	5
	¥	*	5	€0	435	ē	∞	330	2	€	&	20	so ,	241	8	5 0	155	\$	ĸ	787	8		105	22	6	2	% '	'n	2 4	'n
Shad e Survey	3	959	477	m	673	220	m	341	112	m	403	20	•	391	8	•	375	84	•	254	8	•	392	137	•	105	32	•	37	•
ding Crops (in Thousands) of American Shad er Estuary Determined From Beach Seine Survey,	\$	33	೩	m	307	202	m	\$09	537	m	ñ	~	'n	17	~	ın	30	13	in	80	M	ĽΛ	16	∞	iv.	£	in i	'n	M C	1 EV
inds) of I From Be	<u>a</u>	108	29	m	1275	818	m	07	5	m	83	22	'n	4	~	'n	25	20	'n	8	23	'n	26	ຂ	S.	8	ନ୍ଧ '	'n	22	'n
n Thouse	₹	88	2	~	307	8	~	1087	638	~	156	103	4	38	ຂ	2	100	25	4	158	119	4	131	47	14	163	*	4	877	<u>5</u> 2
Crops (1	12	0	0	=	60	∞	=	779	22	=	373	2	72	26	ຂ	7	65	. 51	*		ĸ	54	36	*	54	358	K	*	358	2%
Standing River E	¥	0	0	m	0	0	1 0	8	2	m	22	2	ın	ın	۲n	so.	M	~	N	~	~	'n	•	m	'n	2	12	ın.	8	> KO
Regional Standing Crops (in Thousands) of American Shad in Hudson River Estuary Determined From Beach Seine Surv		Crop	•	TOUS	Crop		TOWS	Crop	<u>.</u>	TOWS	200	<u>.</u>	TOWS	Crop	•	TOWS	Crop	•	TOWS	Crop	<u>.</u>	TOUS	Crop	•	TOUS	Crop		TOUS	Crop	TOUS
		St.	SE	2		ĸ		St.	8			S			뽒			SE		St.	S	8		SE		St.		9	St.	# S
Table C-74	DATE	23JUN-	26JUN		-111190	TOP 60		- 2010L	22JUL		03AUG-	06AUG		17AUG-	20AUG		31AUG-	02SEP		14SEP-	16SEP		28SEP-	30SEP		120CT-	150CT		260CT-	7007 7007

Table C-75 Regional Density (No./1,000m3) of American Shad Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	0.00 0.00 210	0.00 0.00 210	0.01 0.07 210	0.01 210	0.00 0.00 210	0.00 0.00 210	0.00 0.00 210	0.00 0.00 210
¥	0.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00 13	0.00 0.00 13
ន	9.0 2.0 21	0.00 0.00 21	0.00 21 21	0.11 0.05 12	0.00 0.00 12	0.00 21	0.00 0.00 21	0.00 21
SG	0.00 18	0.00 18	0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18
KG	0.00	0.00 0.00 15	0.00	0.00	0.00 0.00 15	0.00 0.00 15	0.00	0.00 0.00 15
울	0.00 0.00 10	0.00	0.00 0.00 10	0.00 0.00 10	0.0 0.00 0.00	0.0 0.00 0.00	0.00	0.0 0.00 0.00
¥	0.00	0.00	0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
đ	0.00	0.00	0.00 8	0.00 8	0.0 0.0 8	0.00 0.00 8	0.00 8	0.00
₫.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 27
12	0.00	0.00	0.07 0.07 46	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL - 18JUL	27JUL - 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-76 Regional Standing Crops (in Thousands) of American Shad Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

NED NED			61 61 G	m m C	0.00	666	860	866
Regions COMBINED	210	210	272	812	200	0 0 210	2,01	25.0
AL	001	0 0 15	0 0 £	០០ជ	0012	0 E	0 O E	0 0 V
S	200	2100	200	81 8 LZ	210	005	200	200
98	ဝဝဆ	002	ဝဝဆ္	00%	0 0 85	002	005	000
χę	0 0 L	001	0 0 2	០០វ	0 0 15	០០ស្	၀၀ဢ	០០វា
윺	000	000	000	005	000	000	000	005
¥	000	000	000	000	000	o o s	000	000
3	0 0 E	001	០០ជ	០០ឆ	០០ឯ	៰៰ឨ	០០ជ	០០ឯ
ŝ	000	008	008	000	008	000	000	000
2	004	002	004	002	004	0 0 7	0 0 4	0 0 7
₹	0 0 27	0 0 27	0 0 27	0 0 27	0 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 0 27	0 0 27	0 0 27
21	003	003	823	ဝဝဒ္	ဝဝဖွ	00%	00%	00%
¥	004	0 0 7	007	007	001	002	005	005
	ک	o s	S S	e s	e s	e s	a s	& %
	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	it. Crop ie 10. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS
DATE	13JUL - S 18JUL S	27JUL - S 01AUG S	10AUG- S 14AUG S	24AUG- \$ 28AUG \$	08SEP- \$	21SEP- S 25SEP S	050CT - S	190CT - 8

Table C-77 Regional Catch-Per-Unit-Effort (CPUE) of American Shad Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	NGO	880	000	10.00.00						
Regi	00	0.00	9.0	0.18 1.83 100	0.00	<0.005 0.04 100	0.00	0.0	0.00	885
Ą	0.0 2.85	0.00 0.00 12	0.00 0.00 12	0.00	0.00	9.00	0.00	0.00	0.00	0.00
ន	0.00 5	0.00 19	0.00 19	0.00 0.00 10	0.0 0.00 1	999	0.00 0.00 0.00	0.00 10	0.0 0.0 10	0.00 0.00 10
SG	0.00 15	0.00 0.00 15	0.0 0.00 ts	0.00	0.0	9.00	0.00	0.00	0.00	0.00
KG	0.0 8	0.00 0.00 8	0.0 0.0 8	0.00	0.00	0.00	0.00 5.00	0.00	0.00	0.00
욮	0.00	0.00 0.00 8	0.0 8 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5
*	0.00 0.00 8	0.00	0.0 8 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00 0.00 3	0.00 0.00	0.00 0.00 3	1.83 1.83 6	0.00 0.00 6	0.00	0.00	0.00	0.00	0.00
ŝ	0.00 0.00	0.00 0.00	0.0 0.00 x	0.00	0.00	0.00	0.00 0.00 s	0.00	0.00	0.00
4	0.00 0.00 3	0.00 0.00 3	0.00 3.00	0.00	0.00	0.00 0.00 5	0.00	0.00 0.00 5	0.00	0.00
5	0.00	0.00	0.00	0.00 0.00 14	0.00 14	0.00	0.00 7.	0.00	0.00	0.00 0.00 14
12	0.27	0.00	0.00	0.00	0.00	3.0 0.0 %	0.00	0.00 2.00 24	0.00	0.00
¥	0.00	0.00 0.00 3	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00 0.00 8	0.0 0.00 s	0.00
	TOMS	TOWS	TOWS	\$	SH	ž	2	\$	द	æ
	SE SE	SE NO.	SE NO.	CPUE SE NO. TOWS						
DATE	23JUN- 26JUN	06JUL- 09JUL-	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- O2SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-78 Regional Standing Crops (in Thousands) of American Shad Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	12 9 100	0 0 00	0 001	886	0 0 00	~~ <u>6</u>	0 0 00	0 0 0	0 0 00	0 00
₹	002	002	002	400	400	400	00	۸٥٥	400	400
ន	005	005	006	005	002	000	• • • <u>•</u>	000	005	005
SG	ဝဝက္	0012	ဝဝည	000	000	000	000	000	000	000
K G	008		000	00 m	0011	0010	005	0010	00 W	00 W
욮	000	000	000	00 W	0010	00 W	0010	00 M	00m	000
¥	000	000	000	00 W	00n	00 IV	00 W	0010	00 m	00 10
3	00m	00%	00m	223	000	000	000	000	000	000
ş	00m	00m	00m	0010	002	00 in	0010	0010	0010	0 O W
<u> </u>	00M	00m	00m	0010	001	00 W	0 0 in	0010	0010	00 in
5	002	۸٥٥	001	004	002	002	002	004	004	004
. 21	505	°°=	005	0 0 %	200	00×3	00%	00%	00%	00%
¥	00 M	00m	00M	00 w	000	00n	0 O IN	00 m	001	00 m
	0 40	a w		a o	a w	e o	α· 6	ъ ъ	ۍ د	ጅ የ
	St. Crop SE NO. TOWS	. Crop	. Crop	. Crop	. Crop	. Crop	Crop.	St. Crop SE NO. TOWS	:. Crop	t. Crop 5. TOWS
	\$ W S	. 8 8 5	S S S	. 88 .	SE.	8 8 5.	. # S		S S S S S S S S S S S S S S S S S S S	% % 5
DATE	23JUN- 26JUN	.061UL-	203UL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-79 Regional Density (No./1,000m3) of Alewife Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 106 0.00	0.00 0.00 108	0.00	0.00 0.00 115	0.00 118	0.00 110	0.00 110	0.00 110	0.00 119	0.00 0.00 117	0.01 0.18 118
¥	9.00	9.0	99.0	9.00	0.00 10 10	0.00	0.00	9.99	9.0	0.00	0.00
ន	0.0 5.00 5.00	0.00	9.0	0.00	0.00	0.00	0.00	0.00	0.0 6.00 6	0.00	0.00
SG	0.00 8.00	0.0 8	0.00	0.0 6.00 6	0.00 0.00 6	0.0 0.0 8	0.00	0.0 0.08	0.0 8.09	9.09	0.00
KG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
₹	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00	0.00 10 10	0.00 0.00 10	0.00	0.00
¥	0.00	0.00	0.0 6.00 6.00	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18 0.18 7
₹	0.00	0.00	0.00	0.0 0.00 16	0.0 0.00 16	0.0 0.00 ts	0.00 0.00 15	0.00 0.00 15	0.00 0.00 13	0.00	0.00
ş	0.00	0.00	0.00	0.00	0.00 0.00 10	0.00	0.00	9.00	9.00	0.00	0.00
<u>=</u>	0.00	9.00	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.00 13	0.00	0.00	0.00
72	0.00	0.00	0.00	0.00 100 100	0.00	0.00	0.00	9.0	0.00	0.00	0.00
¥	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 ± 0.00	0.00
8	S Z	SX SX	S.	S	×	S.	S	SZ.	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE ND. TOWS	DENSITY SE NO. TOWS				
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22 JUN- 26 JUN

Table C-79 Regional Density (No./1,000m3) of Alewife Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	3.28 28.04 118	5.14 13.14 119	1.52	0.40 1.37 73	9.55 5.55 5.55	0.14 0.67 73	2.04	0.59 1.38 73	0.27 0.88 73
¥	0.00	0.00	¥.	NS.	SN	S.	SE .	S.	S.
ន	6.00 K.K.z	0.50 0.50 6	S.	S.	S.	S.	S	S	SN
98	33.05 27.84 6	25.09 10.72 6	S.	SE .	S.	S.	X.	S	S
KG	3.03	21.38 5.60 7	S	N	S	S	X X	S	S.
£	999	4.81 2.31 10	S	SZ.	S.	N	S.	X.	S
¥	5.7 2.63 7	13.28 4.49 7	2.84 0.70 6	0.23 0.23 6	0.25 0.25 6	0.00	0.48 0.48 6	2.21 0.81 6	0.87 0.51 6
ਣੋ	9.0	1.16 0.69 t1	9.00	2.7 1.34 0	0.61 0.57 10	6.0 8.0 5	882	1.72 0.83 0	0.97 0.69 10
\$	999	0.50	0.93 6.80 6	0.00	0.30	9.0	9.0	9.09	9.00
9	0.00	0.15 13 13	0.00 10.00	0.00	9.00	0.19 0.13	9.00	0.00	0.30
3	0.00	9.95	0.00 120 120	0.00	0.43 0.22 12	0.00 12	0.00	0.00 0.00 12	0.00
12	0.0 2.00 4.00	0.0 4.00	9.00	0.19 1.19	9.9	0.00	0.00	0.78 0.78 1.1	0.00
¥	9.00	0.00	0.00	9.6	9.00	0.00	9.00	0.00	0.00
16	999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE No. Tows	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

	Regions Combined	00%	0 0 801	0 0 80	115	0 91	900	000	200	200	117	52 8 1
	4	000	000	000	000	005	000	000	009	000	0010	000
266	ន	000	000	000		000	000	00%	004	000	00n	000
urvey, 1	S	000	000	00	000	000	00	000	00	000	000	000
ankton S	8 8	۸٥٥	400	001	400	00 ~	001	400	400	400	400	001
Year Ichthyopl	윺	000	001	400	005	005	005	000	000	000	000	000
ding Crop (in Thousands) of Alewife Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	¥	000	000	000	005	005	400	400	400	001	400	25 E
Yo itudinal	3	၀၀ဥ	005	005	002	ဝဝန	ဝဝည	0 o 17	0 o ti	0 E	ဝဝည	0012
fe rom Long	ŝ	000	000	000	000	000	000	000	000	000	000	000
of Alewi rmined F	4	000	005	005	០០ដ	002	000		000	00E	០០ជ	001
Regional Standing Crop (in Thousands) of Alewife in Hudson River Estuary Determined Fro	3	00E	0012	០០ឯ	000	000	0011	0010	0 O E	005	005	005
(In Tho ver Estu	12	0 0 2	004	002	000	000	005	005	005	002	002	002
ing Crop udson Ri	¥	005	000	000	000	000	000	000	000	00=	005	00=
ol Stand in H	18	NS.	SZ Z	SZ .	SS	SS	NS NS	2	2	000	000	000
Regions		Crop TOWS	Crop TOUS	Crop TOUS	Crop	Crop	Crop TOWS	Crop TOWS	Crop TOWS	Crop 1048	Crop TOUS	. Crop
-80		St. No.	St. 80.	st. 86.	SE SO.	St. SE.	St.	SE.	SE.	S & S.	SE.	SE SE
Table C-80	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22 JUN- 26 JUN

Table C-80 Regional Standing Crop (In Thousands) of Alewife Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	8109 4979 118	12580 2483 119	1231 307 72	515 208 73	286 130 73	52 52 52 52	420 312 73	1146 362 73	458 185 73
	¥	000	000	S	¥8	SS.	S	SE	W.	S Z
1992	CS	121 121 5	22.20	S.	¥ .	NS	S.	S	S.	S.
	SG	5827 4908 6	4423 1890 6	S	SZ SZ	S S	S S	S	SZ.	S
ankton	8	428 275 7	3025 793 7	SN	S Z	S.	SN.	S.	S	X X
. Estuary Determined From Longitudinal River Ichthyoplankton Survey,	웊	005	382 10	S	S	SE	S	S.	SE.	X.
Z TVOL	¥	1727 785 7	3958 1339 7	848 208 6	880	κκ ∘	000	142 142 6	660 240 6	260 151 6
tudinal	3	១១ ៦	162 97 13	181 153	385 187 10	882	££ 20	278 278 10	241 116 10	135 96 10
rom Long	ŝ	000	55 °	25.30	000	3 3 °	000		000	00%
Tallined I	4	00E	825	٠.٠٥	000	005	188	00.5	005	63 10
ary vete	3	005	00 <u>÷</u>	002	002	326	002	002	៰៰៷	002
	12	004	002	00=	32=	00E	°°5	•°=	245 245 11	005
ucason Kive	¥	00=	00=	005	00=	005	00=	005	00 <u>E</u>	905
Ē	m	000	000	400	400	400	00 <i>L</i>	0 0 N	400	00 <i>F</i>
		. Crop	. Crop	. Crop	. TOWS	. Crop	Crop .	. Crop	Crop TONS	Crop TONS
		5 S 5.	S 86.	S S .	S & C	S S .	SE.	SE. SE.	St. 86.	동 K K
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	O4AUG- O6AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	285EP- 30SEP	120CT- 140CT

Table C-81 Regional Density (No./1,000m3) of Alewife Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

					•			
Regions COMBINED	0.59 1.48 210	1.01 3.38 210	0.58 3.08 210	0.36 1.35 210	0.04 0.18 210	0.48 3.11 210	0.23 0.89 210	0.37 1.22 210
¥	0.54 0.19 13	0.00 0.00 13	0.00	0.19 0.14 13	0.05 0.05 13	0.65	0.05 0.05 13	0.00 0.00 13
ន	0.9 231	1.92 0.41 21	0.04 0.03 21	0.50 0.11 21	0.02 0.02 21	0.65 0.17 21	0.76 0.20 21	0.38 0.15 21
80	0.50 0.28 18	0.39 0.12 18	0.02 0.02 18	0.49 0.20 18	0.04 0.03 18	0.34 0.10 18	0.87 0.42 18	0.44 0.29 18
χe	1.16 0.46 15	4.18 2.08 15	0.50 0.28 15	2.77 1.32 15	0.27 0.17 15	3.73 3.06 15	0.00 0.00 15	0.38 0.18 15
€	2.02 0.74 10	0.65 0.51	4.03 2.24 10	0.03	0.00 0.00 10	0.09	0.20 0.15	0.17 0.08 10
¥	0.65 0.65 8	2.70 1.34 8	2.14 2.09 8	0.00 8	0.03 0.03 8	0.06 0.04 8	0.81 0.74 8	0.77 0.77 8
3	0.64 0.61 13	2.31 2.21 13	0.13 0.11	0.08 0.04 13	0.00	0.04 0.04 13	0.01	0.15 0.07 13
3	0.00 0.00 8	1.74 0.85 8						
≗	0.66 0.65 14	0.02 0.01 14	0.01	0.06 0.02 14	0.02 0.02 14	0.00	0.02 0.02 14	0.08
3	0.00	0.00	0.02 0.02 27	0.09 0.03 27	0.00	0.00 0.00 27	0.00 0.00 27	0.11 0.04 27
12	0.00	0.01 0.01 46	0.01 0.01 48	0.04 0.02 46	0.00 0.00 46	0.22 0.15 46	0.03 0.02 46	0.17 0.07 46
¥	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.08 0.05 17
	DENSITY SE NO. TOWS	DENSITY SE NO. TONS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TONS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-82 Regional Standing Crops (in Thousands) of Alewife Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

e								
Regions COMBINED	1221 296 210	2211 594 210	1424 727 210	648 192 210	88 27 210	881 442 210	570 238 210	940 298 210
Αľ	8 X E	001	001	24 13	ক ক চ	825	<u> </u>	០០ជ
S	146 21 21	2,8%	212	21 48	445	104 28 21	121 23 21	62 24 21
86	87 50 18	69 22 18	446	87 35 18	7 د ق	0 8 8 8	153 74 18	77 18
KG	\$ 85	591 295 15	235	392 187 15	523	528 433 15	០០៥	32.55
₽	334 122 10	10 80 10	567 370 10	ಸ್ ∿5	005	4 ~6	1234	28 13 10
¥	194 194 8	806 398 8	639 624 8	008	න න න	7 1 8	240 222 8	230 230 8
3	88 13 13	323 308 13	ត ត	12 o ti	005	សសដ្	12	202
ş	000	000	000	000	00 80	008	000	361 177 8
<u>e</u>	137 135 14	E 0 7	00 <u>4</u>	ឯកវ	พพ ฐ	002	ស ល 春	8 8 7
5	0 0 22	0 0 27	27.3	14 5 27	0 0 27	0 0 27	0 24	5 27
12	00%	m m 9	พพชู	57 ~ 3	00%	200	5 0 3	52.5
¥	001	0 0 7	111	0 0 7	0 0 7	0 0 1	004	8 12 13
				_	_			
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOHS	Crop TOWS	Crop TOUS	Crop TOWS
	S 86.	S 8 5.	왕 않 양	St. SE.	S & S.	SE.	S # 5	SE.
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21sep- 25sep	050CT- 090CT	190CT - 230CT

Table C-83 Regional Catch-Per-Unit-Effort (CPUE) of Alewife Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

-										
Regions COMBINED	0.00	6.65 29.08 100	2.05 11.76 100	3.89	0.12 0.85 100	0.26 1.12 100	1.66	6.73 100 100	0.03	0.08 0.38 100
A.	0.00 12	0.25 0.18 12	0.17 0.17 12	0.00	0.00	0.43	0.00	1.43	0.14 0.14 7	0.00 7
ន	0.00	6.21 3.56 19	5.47 4.01 19	0.0 0.0 0.0	0.00	0.00	0.20 0.20 10	0.20 0.20 10	0.00	0.0 1.00 1.00
SG	0.00 0.00 15	0.80 0.33 15	1.3 2.5 2.5	0.22	0.56	0.71 9.71	0.00	1.33 0.97 9	0.00	0.00
KG	0.00 0.00 8	2.88 1.75 8	2.38 1.35 8	3.40 2.27 5	0.00 0.00 5	0.00	0.00 0.00 5	0.20 0.20 5	0.00	0.00
웊	0.00 0.00 8	9.38 3.49 8	1.13 0.74 8	0.00 0.00 5	0.00 0.00 5	0.00	0.80 0.80 5	0.00	0.00 5.00	0.00
꿆	0.00	15.25 8.68 8	7.1. 8	0.20	0.00 0.00 s	0.00 0.00 5	0.80 0.80 5	0.00 0.00 5	0.00	0.20
3	0.00 3.00	31.33 26.49 3	0.00 0.00 3	0.17 0.17 6	0.50	0.00	0.00	5.17 3.63 6	0.00	0.00
S	0.00 3.00	9.67 5.93	11.33 10.84 3	3.60 3.12 5	0.40	0.1. 67.0 27.0	1.20 1.20 5	0.20 0.20 5	0.00 0.00	0.00 2
<u>a</u>	0.00 0.00 3	4.00 2.31	0.33 0.33	0.00	0.00	0.00	0.00	0.20 0.20 5	0.20 0.20 5	0.00
3	0.00	0.00	0.14 0.14 7	0.00	0.00	0.00	0.00	0.07	0.07	0.21 0.21 14
12	0.00	0.00	0.18	0.38 0.21 24	0.00	0.13 0.13 24	0.00	0.00	0.00	0.13 0.13 24
¥	0.00 3.00	0.00	0.00	0.20	0.00	0.00	0.00	0.0 0.08 5	0.00	0.20
	**	**	**	20	**	40	50	45	6 0	s
	CPUE SE NO. TOWS									
DATE	25JUN- 26JUN	70160 - 70160	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	285EP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-84 Regional Standing Crops (in Thousands) of Alewife Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

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Regions COMBINED	0 0 0	2880 1999 100	220 87 100	325	15 100 100	£ 50	4 8 100	108 7.4 100	2 E S	7 8 00 100
¥	004	200	นน _์	۸٥٥	007	99 ~	002	6 6,	486	001
S	006	122 07 19	86 6	44£	005	005	445	446	002	002
S	៰៰៷	4 8 8	30 45 51	4 M O	550	550 0	000	9 43	000	000
8	000	ئن کا م	8 2 2 8	288	00 W	00 W	00 m	200	00 W	00 W
≩	000	548	~ ~ ∞	0010	00 in	00 W		000	005	005
¥	00 0	80 80 80 80	57 ~ 8	~~ &	00 W	00 W	0 0 E	00 W	00 in	
3	00M	334 282 3	0 0 m	0 N N	tu tu 40	000	000	9 32	000	000
ŝ	00 M	25 8 8	25 m	0- 80 N	4-4-RV	40,0	MMIN	tU	00 IV	66 iù
4	00M	34 3 3	nmn	00 IN	00 W	0010	0010	N N W	W W 10	0010
5	400	400	446	004	00%	004	004	202	4 4 4	004
12	00=	005	89#	70 2	00%	99%	200	00%	00%	993
¥	00 M	00m	00 M	W W 10	00 W	0010	00 W	0010	00 W	01 W ID
	Crop TONS	e s	& <u>\$</u>	8 %	d s	S &	८ रू	8 र	8 &	8 &
	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS
DATE	23JUN- 26JUN	06JUL-	20JUL-	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02sep	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-85 Regional Density (No./1,000m3) of Alewife Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	0.06 0.64 210	0.02 0.12 210	<0.005 0.02 210	0.03 0.14 210	0.01 0.04 210	0.04 0.25 210	0.02 0.08 210	0.07 0.83 210
4	0.00 0.00 13	0.00	0.00 13	0.0 13 13	0.00 0.00 13	0.24 0.24 13	0.00 0.00 13	0.00
S	0.00 0.00 21	0.23 0.11 21	0.00	0.28 0.14 21	0.04 0.03 21	0.16 0.07 21	0.05 0.05 21	0.02 0.02 21
86	0.00 0.00 18	0.00 0.00 18	0.02 0.02 18	0.00 18	0.00 0.00 18	0.06 0.03 18	0.14 0.06 18	0.02 0.02 18
χg	0.00 15	0.00 0.00 15	0.00 0.00 15	0.02 0.02 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00
욮	0.00	0.00	0.00	0.00	0.00	0.02 0.02 10	0.0 0.00 0.00	0.00 10
¥	0.00	0.00	0.00 8	0.0 8	0.00	0.00	0.0 8	0.00 0.00 8
3	0.00	0.00	0.00	0.00 0.00 13	0.00	0.01 0.01 13	0.00	0.00
ŝ	0.00 8	0.00	0.00 8	0.00 8	0.03	0.00 8	0.00 0.00 8	0.83 0.83 8
≙	0.0 8.0.4 7.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.02	0.02 0.02 27	0.00	0.00	0.00	0.00	0.00 0.00 27	0.00 0.00 27
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02 0.02 17
	DENSITY SE NO. TOWS							
DATE	13 JUL - 18 JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08sep- 12sep	21SEP- 25SEP	050CT - 090CT	190CT - 230CT

Table C-86 Regional Standing Crops (in Thousands) of Alewife Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	141 133 210	43 210	210 4 210	49 210 210	£ 9 012	33 210 210	37 14 210	25 26 26 26
4	0012	0011	001	001	0 0 tt	222	0010	0 O E
S	200	38 21 21 38	200	22 52 52	25 ~ 2	218	5 6 12	2 m m
SG	ဝဝရွာ	ဝဝဆု	4 4 81	002	ဝဝဆ	12 o 85	8118	4 4 8 E
KG	០០ជ	0 0 1	0 o t	ա ա Ն	ဝဝည	001	ဝဝပ်	၀ ၀ က
윺	ంంర్	005	00.5	005	005	445	005	005
¥	000	000	00	000	000	000	000	ဝဝဆ
3	០០ជ	0 o ti	០០ជ	00E	០០ឯ	E	០០ឯ	0011
ŝ	ဝဝဆ	000	000	000	K48	000	000	ដដ
9	138 14	004	004	002	004	004	002	002
3	2 a a	2333	0 0 27	0 0 22	0 0 27	0 0 27	0 0 27	27
21	003	003	ဝဝဖွ	009	003	00%	003	00%
¥	002	ĸ w †	001	0 0 7	0 0 1	0.07	٠٠٢	4 4 C
	Crop TOHS	Crop TONS	Crop TOWS	rop SNS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
			St. C 86. ∃		St. C. SE. 7		St. C SE NO. 14	
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-87 Regional Catch-Per-Unit-Effort (CPUE) of Alewife in Hudson River Estuary Determined From Beach Seine Survey, 1992

. G										
Regions COMBINED	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AŁ	0.00 0.00 12	0.00	0.00 0.00 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	90.00	9.00	999	999	999	9.00	99.5	9.00	99.0	99.0
SG	0.00 0.00 \$	0.00 0.00 15	0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ξ	0.00 0.00 8	0.00 0.00 8	0.00	0.00 0.00 5	0.00 0.00 5	0.00	0.00 0.00 5	0.00	0.00	0.00
æ	0.00 8	0.00	0.00 8	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00 5.00	0.00 0.00 5
¥	0.00	0.00 0.00 8	0.00 0.00 8	0.00 0.00 5	0.00	0.00	0.00 0.00 5	0.00	0.00	0.00 0.00 5.00
3	0.00	0.00	0.00 3.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00
ŝ	0.00 0.00 x	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5
4	0.00	0.00 0.00 3	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00 14	0.00	0.00	0.00	0.00
12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00 0.00 5	0.00	0.00 5.00
			4 0	50	40	40				,
	CPUE SE NO. TOWS									
DATE	23 JUN- 26 JUN	70160 - 70190	20 JUL - 22 JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Yearling and Older Table C-88 Regional Standing Crops (in Thousands) of Alewife

Table C-88	\$	Regional Si	itending Crops River Estuary	Crops (1 tuary De	(in Thousands) of Alewife Determined From Beach Sein	rds) of A From Bea	ds) of Alewife From Beach Seine	Survey,	Yearlti 1992	Yearling and Older 1992					
DATE			¥	21	5	e	9	ક	¥	윺	KG	SG	ន	ر بر الا	Regions COMBINED
23.UN- 26.JUN	S & S.	Crop TOWS	oom	445	001	oon	00m	0 0 M	000	000	000	ဝဝည	005	០០ ភ	4 4 00 100
70600 -	S S .	Crop TOUS	00M	005	001	00M	00M	00M	000	000	000	ဝဝည	00 ō	007	0 0 6
20JUL - 22JUL	S S S	Crop TOWS	00M	200	0 0 2	00m	00 m	00m	000	000	00 0	ဝဝည်	005	005	0 0 0
03AUG- 06AUG	S S .	Crop TOWS	00 W	00%	004	00%	00 N	000	00 m	0010	0010	000	000	001	900
17AUG- 20AUG	SE.	Crop TOUS	0010	00%	004	002	ooin		00 m	00 N	0010	000	005	400	000
31AUG- 02SEP	S 86.	Crop TOUS	0010	00%	004	0010	00 W	000	00 in	0010	001	000	000	001	0 0 00
14SEP- 16SEP	St.	Crop TOUS	00 W	00,%	004	.00v	00 W	000	00 W	00 W	00 W	000	000	002	0 0 0
28SEP- 30SEP	S & S.	Crop TOUS	90 W	00%	004	0010	00 W	009	00 W	00 W	00 W	000	000	001	000
120CT - 150CT	5 % S	Crop TOUS	00 0	00%	004	00N	0010	000	00 W	00 W	00 W	000	005	001	000
260CT - 280CT	8 S.	Crop TOUS	00 IN	00%	004	0010	00 m	000	00 W	00 W	0010	000	005	400	0000

Table C-89 Regional Density (No./1,000m3) of Blueback Herring Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 500 500	9.0 50.0 80.0	6.6.6	0.00	 9 1.90	9.8.E	885	0.00	8.8.€	100	8 6 8
Reg	- -				88	00	00	00	00	00	0,4,
4	0.00	0.00	0.00	0.00	999	0.00	0.00	0.00	0.00	0.00 0.00	0.00
ន	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00 5.00	0.00
S	0.0 8 8	0.00 8	0.0 8	0.00	0.00 0.00 6	0.00 0.00 8	0.00 8	0.00 8	0.00	0.00	0.00
XG	0.00	0.00	0.00	0.00 0.00 7	0.00	0.00 0.00 7	0.00	0.00	0.00	0.00	2.40
윺	0.00	0.00	0.0 0.00 7	0.00	0.00	0.00	0.00 0.00 10	0.0 0.0 0.0	0.0 5 5	0.0 0.00 10	0.00
폱	0.0 6.00 6	0.00	0.00	0.00 1000	9.0 5.0 5.0 5	0.00	0.00 7	0.00 7	0.00	0.00	0.00
3	0.0 0.0 0.0	0.00	0.00	0.0 16	0.0 7.0 7.0 7.0	0.00 0.00 75	0.00 15	0.00 15	0.00 0.00	0.00 0.00 13	0.00 0.00 13
£	0.00	0.00	0.0 6.00 6	0.0 0.0 10	0.0 0.0 10	9.00	0.00	0.00	0.0 0.00 9	0.00	0.00
4	0.00	0.00 100 100	0.0 0.00 10	0.00 0.00 13	0.00 7.	0.00	0.00	9.00	0.00 13	0.00 13	0.00 0.00 12
5	0.00	0.00 13	0.00 13	0.00	0.00	0.00 13	0.0 130 13	0.00	9.00	0.00	0.00
12	0.00	0.00 0.00 12	0.00 12	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00
¥	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	9.65	0.00	0.00
B	SN	S.	S.	SE SE	N	SZ SZ	SZ	S	0.00	0.00	0.00
	DENSITY SE NO. TOWS										
DATE.	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04HAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	OBJUN- 12JUN	15 JUN- 19 JUN	22 JUN- 26 JUN

Table C-89 Regional Density (No./1,000m3) of Blueback Herring Young of Year

BT YK 12 CH I		5	-	<u> </u>	£	3	¥	CN PK HP KG	KG	90	ន	¥.	Regions Combined
0.00	0.0		0.00	0.00	0.00	3:	252.08	522.23	28.99	5.37	51.12	8.9	67.10
0.00 0.00		_	8.±	0.00 13	9.0	4.4 5.5	198.83	252.87 10	28.99	5.TS	31.43	4.05 6	
1.75 0.00 0.00 0 1.75 0.00 0.00 0 6 11 14		00	0.00	0.00	0.50	0.94 0.44 13	288.77 98.92 7	537.08 129.76 10	439.72 85.91 7	242.45 62.12 6	754.80 173.15	982.74 359.32 6	249.90 443.80 119
0.00 0.00 27.01 59 0.00 0.00 11.70 54		22.22	59.44 54.83 12	0.82 0.51	85.52 45.99 6	713.85 210.61 9	138.95 56.21 6	8	SE SE	SE SE	S	S	128.20 229.72 72
8.78 12.80 35.54 176.79 6.10 5.42 28.89 146.35 7 11 11		176. 146.	283	19.69 5.63 10	49.51 11.23 6	207.62 108.92 10	188.85 76.50 6	S	SE .	S	S	SN N	87.45 200.48 73
0.63 6.48 4.18 47.14 0.63 1.67 2.30 23.75 7 11 11 12		23.7	450	3.73 2.02 10	63.82 15.41 6	157.59 14.21 10	63.34 40.86 6	S	S	S	SN	X	43.36 51.83 73
0.88 0.94 2.33 25.33 0.88 0.94 1.46 14.08 7 11 11 12		23.7	282	11.51 5.62 10	67.26 27.49 6	123.70 63.06 10	166.55 49.29 6	S.	SZ.	S	SN	SX.	49.81 86.00 73
1.65 0.00 0.86 1.51 1.65 0.00 0.59 0.59 7 11 11 12		2.0	-02	17.18 8.68 10	4.51 2.94 6	417.12 66.74 10	206.72 185.89 6	SE .	S	S	S.	S.	81.19 197.72 73
0.00 0.49 1.11 26.30 0.00 0.28 0.56 6.03 7 11 11 12		6.6	222	8.76 2.23 10	154.05 61.09 6	232.00 82.79 10	127.02 54.21 6	SX	SE	S.	N.	S	68.72 116.48 73
22.19 40.07 11.27 31.18 9.54 17.32 4.32 9.31 7 11 11		9.3	∞ <u></u> ∾	15.32 6.78 10	212.88 103.74 6	213.59 73.82 10	119.25 45.85 6	SX.	S	SH	SZ.	S.	83.22 137.32 73

	Regions Combined	0 0 90	108	00.80	0 0 21+	0 0 8tt	000	1100	000	100	110	340 340 118
	4	000	000	000	000	000	000		000	00%	000	000
1992	ន	005	000	000	001	000	000	004	000	000	00 W	000
	SG	000	000	000	000	000	000	ဝဝဆ	008	000	004	000
ankton S	ã	400	400	۸٥٥	400	400	400	400	001	~ ° °	400	340 340 7
ear chthyopl	£	00%	400	400	005	00=	000	005	005	005	005	005
Young of Year nat River 1cht	¥	00%	000	009	000	002	400	00 ~	400	400	400	400
ing Yo itudinal	3	005	005	005	002	002	០០ស	0 o t	០០ជ	0 o £	០០ជ	០០ជ
Table C-90 Regional Standing Crop (In Thousands) of Blueback Herring Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey,	ş	000	000	000	000	005	000	000	000	000	000	000
of Blueb rmined F	<u>a</u>	000	005	005	0011	004	000	000	000	០០ដ	០០ឆ	000
usands) ary Dete	3	០០ស	0012	ဝဝည	000	000	0 o ti	00 <u>t</u>	00£	00=	005	005
(In Tho ver Estu	71	០០ជ	004	002	000	005	005	00=	00#	002	002	004
ing Crop udson Ri	¥	005	000	005	000		000	000	000	00=	005	005
al Stand in H	18	NS.	S.	S S	S Z	Z.	S.	S	SZ SZ	000	000	000
Region		Crop 10WS	. Crop									
06-5		St. NO.	S & S.	S S S	8 % S	St. 86.	S 86.	St. 86	SE SE .	St.	SE.	S SE.
Table	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	O1JUN- O5JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-90 Regional Standing Crop (In Thousands) of Blueback Herring Young of Year

	Regions Combined	176508 72857 118	527697 67013 119	176602 36310 72	142027 36275 73	64858 13258 73	88190 18225 73	125300 · 56232 73	108441 23598 73	134830 27966 73
	*	884 717 8	125858 46017 6	₩ ₩	S	ž	SE SE	SH.	S	N.
1992	S	8216 5052 5	121320 27831 6	S.	SN.	S	S.	S	S	S.
Survey,	SG	947 555 6	42742 10952 6	X.	SE .	S	N	S.	NS.	SS.
lankton	S S	4101 4101 7	62207 12153 7	X X	S	X	S.	æ	S	SZ.
rear Ichthyop	윺	86421 41847 10	88878 21473 10	NS.	S	X	2	SZ.	SX	S.
Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	¥	75152 59276 7	86092 29490 7	41426 16757 6	56302 22808 6	18884 12182 6	49655 14694 6	61632 55419 6	37869 16163 6	35553 13669 6
ring T gitudina	₹	788 606 13	15 15 15	99790 29441 9	2902 3 15226 10	22030 1987 10	17292 8816 10	58310 9330 10	32431 11574 10	29858 10319 10
From Lon	ŝ	000	105 201 9	17742 9540 6	10272 2330 6	13239 3198 6	13954 5702 6	936 609 6	31958 12674 6	44164 21522 6
ver Estuary Determined From Longitudio	<u>a</u>	០០ឯ	០០ឯ	170 107 10	4103 1172 10	420 10 10	2397 1171 10	3579 1807 10	1825 465 10	3192 1413 10
uary Det	5	005	00=	8782 8101 12	26118 21621 12	6965 3509 12	3742 2080 12	223 87 12	3885 891 12	4606 1375 12
iver Est	12	004	004	8692 3765 11	11437 9297 11	1345 741 11	749 470 11	275 120 11	359 180 11	3625 1389 11
Hudson R	¥	005	00=	005	2936 1243 11	1486 383	217 217	٥٠ ٤	£8±	9194 3975 11
ţ	8	000	365	400	1835 1275 7	131	\$\$ 7	345	001	4637 1994 7
		Crop 1048	Crop TOMS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Cröp TOUS	Crop TOUS	Crop TOWS
:		8 S S	St. 86.	SE.	St. Se	S S S.	St. 86.	St.	S & S.	S S S.
	DATE	29JUN- 03JUL	06JUL 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT-

Table C-91 Regional Density (No./1,000m3) of Blueback Herring Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	07 10 10	886	222	222	15 Z O	\$ E 0	250	222
Reg	16.07 23.88 210	31.50 61.50 210	88	51.	22.3 65.1	43.2	19.61 114.15 210	15. 42.
7	23.01 3.35 13	9.09	8.99 4.59 13	81.31 35.51 13	12.31 2.62 13	44.83 23.12 13	17.64 7.06 13	0.39 0.21 13
ន	68.03 9.04 21	117.32 41.50 21	38.32 11.89 21	73.37 13.00 21	46.96 20.95 21	26.68 5.22 21	19.46 3.88 21	0.84 0.29 21
SG	25.10 4.29 18	50.03 20.34 18	54.38 14.85 18	18.96 4.74 18	17.45 2.85 18	15.57 3.14 18	18.66 7.68 18	1.17 0.47
A 2	15.09 2.98 15	43.25 18.29 15	28.02 9.90 15	101.87 33.59 15	23.60 6.21 15	27.56 15.64 15	9.98 3.18 15	12.16 7.57 15
₹	28.69 13.44 10	54.81 29.47 10	60.48 29.05 10	16.29 5.36 10	22.09 6.27 10	16.38 12.21 10	18.47 2.49 10	1.63 0.70 10
품	2.20 1.31 8	3.20 2.65 8	99.34 92.11 8	26.49 6.71 8	15.96 9.22 8	28.74 22.99 8	4.34 2.28 8	23.73 12.82 8
3	13.97 9.19 13	43.11 18.36 13	61.75 5.49 13	26.57 3.02 13	116.10 60.53 13	13.24 3.16 13	28.41 18.69 13	44.84 5.08 13
3	14.62 13.52 8	46.62 8.77	13.22 5.15 8	6.37 0.99 8	3.86 3.86 8	27.62 19.33 8	117.01 112.00 8	33.91 16.61 8
<u>a</u>	1.56 0.65 14	1.98 0.71 14	0.32	4.22 2.56 14	2.65 1.95 14	0.93	0.72	36.79 35.52 14
3	0.36 0.08 27	3.08 0.47 27	4.23	3.18 0.60 27	0.64	1.29 0.46 27	0.06	13.57 4.58 27
21	0.20 0.07 46	2.49	0.85 0.23 46	5.53 1.73 46	0.28 0.16 46	0.26	0.37 0.08 46	15.03 5.97 46
¥	0.00 0.00 17	3.05 1.17 17	1.42 0.79 17	0.08 0.05 17	1.07	0.21 0.14 17	0.13 0.07 17	0.76 0.16 17
	DENSITY SE NO. TOWS							
DATE	13.JUL - 18.JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-92 Regional Standing Crops (in Thousands) of Blueback Herring Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ons INED	80 41 C	٨٥٥	W00	10 10 O	8 -0	m v0 O	ສທອ	888
Regions COMBINED	31278 4204 210	6304; 994(21(7315 2814 21(5873 734	42951 967 21(36053 9056 210	4299 2346 21	3744 933 21
AL	2947 430 13	1164 566 13	1151 588 13	10413 4548 13	1576 336 13	5742 2961 13	2259 904 13	50 27 13
S	10935 1452 21	18857 6670 21	6160 1911	11793 2089 21	7548 3368 21	4289 839 21	3127 623 21	135 47 21
SG	4426 757 18	8819 3586 18	9587 2619 18	3343 836 18	3076 503 18	2745 554 18	3290 1355 18	205 82 18
X 9	2134 421 15	6118 2587 15	3964 1400 15	14411 4753 15	3339 878 15	3899 2213 15	1412 450 15	1720 1071 15
윺	4748 2224 10	9070 4877 10	10008 4807 10	2696 887 10	3656 1038 10	2710 2021 10	3056 411 10	270 115 10
¥	657 390 8	954 791 8	29617 27461 8	7898 2001 8	4758 2749 8	8569 6854 8	1293 680 8	7076 3823 8
3						1851 441 13		
3	3033 2804 8	9671 1819 8	2743 1069 8	1321 206 8	1794 800 8	5730 4011 8	24275 23236 8	7035 3445 8
91			7984			<u>8</u> 22		
5						191 68 27		
77	823	800 205 46	2223	1778 556 46	223	223	118 25 46	4838 1920 46
¥	007	699 268 17	327 182 17	117	245 101 17	49 32 17	29 15 17	174 36 17
	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOWS
	S SE.		SE.		SE SE	SE .	St. Se NO.	
DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	OBSEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-93 Regional Catch-Per-Unit-Effort (CPUE) of Blueback Herring Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

							•			
Regions COMBINED	0.00 100 0.00	1.64 5.82 100	41.06 300.87 100	119.17 604.83 100	18.39 80.22 100	31.78 122.82 100	66.34 252.13 100	47.73 308.97 100	29.39 213.55 100	25.31 177.31 100
Ą	0.00 0.00 12	2.75 1.81 12	0.92 0.45 12	27.57 24.82 7	1.00	42.71	14.57 5.78 7	15.86 12.36 7	1.71	0.00
ន	0.00	1.63 0.80 19	46.47 18.82 19	389.20 378.49 10	15.10 8.20 10	5.20 2.48 10	17.00 7.28 10	14.30 10.66 10	0.0 0.00 0.00	0.20 0.20 10
8	0.00	0.60	3.60 1.32 15	8.67 5.73	32.11 17.61 9	75.89 38.59 9	30.44 13.28 9	22.33 14.20 9	0.33	0.00
KG	0.00	0.25 0.16 8	7.38 3.39 8	104.20 69.92 5	8.00 7.26 5	23.80 10.47 5	220.00 176.38 5	34.00 17.49 5	208.20 208.20 5	0.00
2	0.00	0.38 0.26 8	63.50 38.82 8	5.60 4.63 5	66.20 36.84 5	0.60	105.40 62.96 5	7.00 3.54 5	0.60 0.60 5	0.00
¥	0.00	7.73 4.80 8	2.25 1.45 8	6.80 5.80 5	1.60 1.36 5	1.60 1.36 5	126.40 120.68 5	5.60 5.60 5	0.00	2.80 1.46 5
3	0.00 %	2.33	47.67 24.90 3	19.00 5.60 6	19.50 5.70 6	196.17 107.71 6	111.00 81.86 6	427.17 306.75 6	78.17 36.24 6	13.33 11.07 6
£	0.00 3	3.33 2.03 3	316.67 296.67 3	19.40 13.48	9.00 3.97 5	28.20 11.85	162.60 83.04 5	14.40 7.33	23.40 8.99 5	10.20 4.87 5
<u>a</u>	0.00	0.67 0.67 3	4.00 4.00 3	16.20 12.57 5	67.80 67.80 5	6.60 4.69 5	8.60 8.60 5	23.00 21.27 5	1.20 1.20 5	1.60 1.12 5
중	0.00	0.00	0.00	1.7 4.1 4	0.43	0.29 0.16 14	0.07	1.29 0.62 14	1.21 0.77 14	5.57 2.64 14
71	0.00	0.00	0.27	73.04 38.46 24	0.00	0.29 0.15 24	0.00	0.17 0.13 24	0.00	29.58 17.39 24
¥	0.0 8	0.00	0.00 3.00	758.60 463.80 5	0.00	0.00	0.00	7.60 6.37 5	37.80 29.30 5	240.40 176.01 5
	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE No. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS
DATE	23JUN- 26JUN	06JUL -	20JUL - 22JUL	O3AUG- O6AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-94 Regional Standing Crops (in Thousands) of Blueback Herring Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

SE G										
Regions COMBINED	000	545	2540 908 100	18617 8439 100	\$25 55	4477 1451 100	5680 1985 100			3512 1549 100
Ą	ဝဝပ္	23.2	ភភភ	375 337	40 r	580 562 7	867 7	215 168 7	23 7	400
ន	005	343	914 370 19	7658 7447 10	297 161 10	102 104 10	334 143	281 210 10	005	445
S	០០ស	17 21	282	152 101 9	309	1332 677 9	534 233	392 249 9	000	000
2	000	8 → 5	25 g	897 602 5	8 % s	202 805 505	1894 1518 5	293 151 5	1792 1792 5	0010
윺	000	<0.005 <0.005 8	67 83 88	₩	85 54 55 55	1 <0.005	131 78 5	Ø 4 10	← ← RJ	00 W
품	008	55 35 ea	5t 0 8	84 88 80 80	£5°	5 50	897 856 5	64 60 80	0010	85°
3	00m	% 50	508 265 3	202 60 6	208 61 6	2089 1147 6	1182 872 6	4550 3267 6	386	142 118 6
ŝ	00m	O- IO IO	835 782 3	28 °	25 z	\$ E &	429 219 5	8 5 € ₹	2 % 8	27 13 5
2	00M	400 M	37	149 116 5	625 5 5	64 5.5 5.5	ድድ in	212 196 5	## c	ស្ស
3		001			552			27.23		150 71 74
21	00=	005	5.45	3319 1748 24	00%	£ − %	2,00	2,000	24.0	13.6 25.2 24.2
¥	00m	00m	00M	5713 3493 5	0010	00 IN	0010	57 48 5	285 221 5	1810 1326 5
	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS
	SE SE.	St. 85.	8 % 5.	S # 5.	St. SE	St. 86.	S SE.	St.	St. NO.	8 8 S
DATE	23JUN- 26JUN	06JUL-	20JUL -	O3AUG- O6AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-95 Regional Density (No./1,000m3) of Blueback Herring Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	0.05 0.57 210	<0.005 0.02 210	0.02 0.29 210	0.00 0.00 210	0.00 0.00 210	0.09 0.65 210	0.01 0.04 210	005 0.05 210
		0.00 13 0.00						
ន	0.00	0.00	0.00 0.00 21	0.00 0.00 21	0.00 0.00 21	0.34 0.11 21	0.00	0.00 23
98	0.00 0.00 18	0.02 0.02 18	0.29	0.00 5.00 \$	0.00 18	0.04	0.07 0.04 18	0.00 18
2	0.03 0.03 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00 0.00 15
₽	0.00	0.00	9.00	0.00	0.00	9.0 2.25	90.0	0.00
퐖	0.00 8	0.00 8	0.00	0.00	0.00	0.00 8	0.0 8	0.00
3	0.57 0.57 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13
ŝ	0.00 0.00 8	0.00 8	0.0 0.0 8	0.00 8	0.00	0.00 8	0.00 8	0.00 8
٩	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-96

	Regions SG CS AL COMBINED	0 0 0 95 0 0 0 80 18 21 13 210	4 0 0 4 4 0 0 4 18 21 13 210	50 0 0 50 50 0 0 50 18 21 13 210	0 0 0 0 0 0 0 18 21 13 210	0 0 0 0 0 0 18 21 13 210	8 55 11 179 5 18 11 108 18 21 13 210	12 0 0 12 6 0 0 6 18 21 13 210	9 9 0 0
and Older	#P KG	0 0 4 4 5 7	0 0 0 5t	0 0 0 2t	0 0 0 51	0 0 0 5t	106 0 106 0 15 15	0 0 0 5t	00
Yearling and Older , 1992	¥	008	်ဝဝဆ	008	000	008	008	000	00
meback Merring Shoals Survey,	3	222	001	001	001	005	005	00%	00
-	<u>41</u>	0 0 0 4	0 0 0 %	004	004	0 0 4	0 0 4	00 4	00
(in Thousands) of Bl Determined From Fall	5	0 0 22	0 0 22	27	0 0 27	0 0 27	0 0 27	0 0 27	00
nding Crops ver Estuary	YK 12	12 12 17 46	0 0 0 17 46	0 0 0 17 46	0 0 0 17 46	0 0 0 17 46	0 0 0 17 46	0 0 0 17 46	00
Regional Sta in Hudson Ri		Crop TOUS	Crop TOWS	Crop TOWS	Crop TONS	Crop TONS	Crop TOWS.	Crop TOWS	Crop
Table C-96	DATE	13JUL - St. 18JUL SE NO.	27JUL- St. O1AUG SE NO.	10AUG- St. 14AUG SE NO.	24AUG- St. 28AUG SE NO.	OBSEP- St. 12SEP SE NO.	21SEP- St. 25SEP SE NO.	050CT- St. 090CT SE NO.	190CT- St.

Table C-97 Regional Catch-Per-Unit-Effort (CPUE) of Blueback Herring Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions SG CS AL COMBINED	00 0.00 0.08 0.09 00 0.00 0.08 0.57 15 19 12 100	00 0.00 0.00 0.00 00 0.00 0.00 0.00 15 19 12 100	00 0.00 0.00 0.00 00 0.00 0.00 0.00 15 19 12 100	0.00 0.00 0.00 0.00 10 7	00 0.00 0.00 0.00 00 0.00 0.00 0.00 9 t0 7 100	0.00 0.00 0.00 0.00 7 01	0.00 0.00 0.00 0.00 7	00 0.00 0.00 0.00 00 0.00 0.00 0.00 9 to 7 100	00 0.00 0.00 0.00 00 0.00 0.00 0.00 9 10 7 100	00 0.00 0.00 0.02 00 0.00 0.00 0.20
KG	0.00 0.00 0.00 0.00 0.00 0.00 8 8 15	0.00 0.00 0.00 0.00 0.00 0.00 8 8 15				0.00	0.00 0.00 5	0.00 0.00 0.00 0.00 0.00 0.00 8 \$ \$	0.00 0.00 0.00 0.00 0.00 0.00 9 \$ \$	3.00 0.00 0.00 3.00 0.00 0.00
¥	0.00 1.00 0.00 0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 5.00	0.00 0.00
	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 3 3	0.00 0.00 0.00 0.00 3 3	0.00 0.00 0.00 0.00 5 5	0.00 0.00 0.00 0.00 5 5	0.00 0.00 0.00 0.00 5 5	0.00 0.00 0.00 0.00 5 5	0.00 0.00 0.00 0.00 5 5	0.00 0.00 0.00 0.00 5 5	0.00 0.00
T2 CH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.2	0.00
¥	0.00 0.00 0.00 0.00 3 11	0.00 0.00 0.00 0.00 3 11	0.00 0.00 0.00 0.00 3 11	0.00 0.00 0.00 0.00 5 24	0.00 0.00 0.00 0.00 5 24	0.00 0.00 0.00 0.00 5 24	0.00 0.00 0.00 0.00 5 24	0.00 0.00 0.00 0.00 5 24	0.00 0.00 0.00 0.00 5 24	0.20 0.00
	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE Se No. Tows	CPUE SE
DATE	23JUN- 26JUN	09JUL -	2010L- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Yearling and Older Table C-98 Regional Standing Crops (in Thousands) of Blueback Herring

	Regions COMBINED	8 4 001	0000	6	0 0 0	0000	6 006	008 44	9
	¥	5	00½ oc	2007	001	00 ~ 00	or oor	00 400	7
	S	005	006 00	\$ 00Q	005	000 00	5 005	000 00	2
	SG	៰៰ឨ	ဝဝက် ဝင	ت 000	000	000 00	000	000 00	٥
01der	92	008	000 00		0010	00100	on 00n	00m 00	r.
	웊	000	000 00		00 W	00N 00	on oon	00M 00	ιn
Yearling and 1992	¥	~ 4 €0	00000		000	00N 00	5 N O O N	00N 00	5
Survey,	3	00m	00m 00	m 000	000	0000	· • • • • •	000 00	•
lueback ch Seine	ŝ	00m	00m 00	w ook	60 in	00 m 00	on 00n	00m 00	'n
itanding Crops (in Thousands) of Blueback Herring River Estuary Determined From Beach Seine Survey,	٩	00m	00m 00	m 00v	00 iv	00m 00) N O O N	00% 00	'n
Thousand irmined F	₹	400	001 00	r 004	004	004 00	5 00 7	004 00;	7
ops (fn ary Dete	21	005	00 <u>+</u> 00	t 00%	00%	00% 00	% 00% %00%	00% 00	54
nding Cr ver Estu	¥	00m	00m 00	w 00w	00 N	00 N 00	on 00n	00N NN	iv.
mai stai Idson Ri			·	•					
Regional S in Hudson		Crop TOUS	Crop	Crop TOVS	Crop TOUS	Crop	TOUS TOUS		10 25 25
96-5		SE.SE	St 85 St.		8 % 5.		\$ \$ \$ \$ \$ \$	S S S S S S S S S S S S S S S S S S S	Ş
Table C-98	DATE	23JUN- 26JUN	06JUL- 09JUL- 20JUL- 22JUL-	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP 14SEP-	28SEP- 30SEP	120c7 - 150c7 - 260c7 - 280c7 -	

Table C-99 Regional Density (No./1,000m3) of Alosa spp. Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.36 2.99 106	0.54 4.52 108	5.58 28.59 108	100.66 227.64 117	3394.38 4347.38 127	275.87 1556.00 118	9.43 35.79 169	431.30 2114.48 177	7.78 94.04 190	0.05 0.45 191	0.00
¥	2.57 2.57 9	6.51 4.52 9	44.60 26.97 9	1025.51 204.86 10	793.1239818.72 3394.38 396.1224344.0524347.38 7	1634.87 1333.85 6	97.91 34.08	5152.77 2114.44 :	95.99 93.97 11	0.22 0.22 10	0.0
S	1.52 1.52 10	0.00	19.96 9.41 9	167.77 98.99 6	793.123 396.122 7	1498.10 796.51	11.17 10.64 12	21.74 12.93 12	4.71 3.56 11	0.40 0.40 10	0.00 8
Se	0.0 8	0.0 0.08	0.78 0.32 8	11.08 7.10 6	103.29 70.17 6	169.48 86.76 9	0.00 0.00 15	0.23 0.23 16	0.43 0.29 11	0.00	0.0 0.00 0.00
KG	0.00	0.00	0.00	3.08 1.55	15.51 6.54 7	7.31 3.99 9	3.60 2.63 13	0.15 0.15 14	0.0	0.00	0.00
₹	0.00	0.00	1.59	0.28	1.62 0.63 12	0.00	0.49	9.00	0.00	0.00 18	0.00
¥	0.26 0.26 6	0.00	0.00 6.00 6	51.0 51.0	0.0 0.0 10	0.00 0.00 7	0.00	0.00	0.00 0.00 13	0.00 13	9.00
3	0.0 0.00 0.00	0.00	0.00	0.0 0.0 16	0.00	5.0 5.0 5.0	0.0 28 23	0.00	0.00	0.00	0.00
ş	0.0	0.00	0.00	0.00 10	0.00	0.0 0.0 0.0	0.0 0.0 16	0.00 0.00 15	0.0 85 85	0.00 18	0.00
4	0.00	0.0 0.00 0.00	0.00	0.00 0.00 13	0.26 0.26 19	0.00	0.00 0.00 12	0.00 0.00 12	0.0 0.8 23	0.00	0.00
5	0.00	0.00 0.00 13	0.00 0.00 13	0.00	0.00	0.00	0.00	0.0 5 5	0.00 18	0.0 0.0 18	0.00
. 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 12	6.0 6.6.1	0.00 0.00 18	0.00	0.00
¥	9.00	9.00	9.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
8	SX SX	SE SE		X S	X X	S	SS	NS.	0.00	0.00	0.00
•	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-99 Regional Density (No./1,000m3) of Alosa spp. Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0.00	0.00 129	28.6	0.00 73	388	0.00 73	388	388	0.00 73
	k	0.00	0.00	S	SS.	S ·	S	ž	2	æ
	S	0.00	0.00	X	æ	%	S	S	S	X.
J	SG	0.00	0.00	Z.	2	X.	SE	x .	S	S.
441 133	8	0.00	0.00	S.	2		S.	9	S.	X
50	윺	0.00	9.00	S .	S S	¥8	SE	S .	SS	SS S
ESCUELY DESCRIPTION OF THE LONG LONG STREET STREET, ST	¥	0.0 0.00 8	0.00 8	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.00
	3	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00 10 10	0.00 0.00 0.00	0.00	0.00 1000	0.00 1.00
	\$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<u>a</u>	0.00	0.00	0.00	9.00	9.00	9.00	9.00	989	999
	5	0.00	0.00	0.00	0.00	0.00	0.00 12	0.00	0.00	0.00
1 necet	12	0.00	0.00	0.00	0.00	0.00	.0.0 10.00	9.00	9.00	0.00
-	¥	0.00	0.00	0.00	9.00	9.00	0.00	99.	9.00	99.5
TI TUBBLE KING	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DENSITY SE NO. TOWS								
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	285EP- 305EP	120CT- 140CT

Table C-100 Regional Standing Crop (In Thousands) of Alosa spp. Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

St. Crop NS		2	14 15000	AGI ESCO	ary veter	La paulu	rguon mo	tudinal	RIVEL I	Longitudinal River ichthyoplankton Survey,	ankton s		1992		
Crop NS 0 <td></td> <td>18</td> <td>¥</td> <td>12</td> <td>5</td> <td>۵</td> <td>ŝ</td> <td>3</td> <td>¥</td> <td>윺</td> <td>8 9</td> <td>SG</td> <td>ន</td> <td>¥</td> <td>Regions Combined</td>		18	¥	12	5	۵	ŝ	3	¥	윺	8 9	SG	ន	¥	Regions Combined
Crop TOMS HS 0	왕왕	SX SX	005	0 0 2	0 0 15	000	000	005	% 2%	000	002	000	244 244 10	329 329 9	651 416 106
Crop Num NS 0 0 0 0 0 0 0 56 137 3208 575 TOWS NS 0 10 0 0 10 2 2 15 15 36 153 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365 1513 365	당당	8	000	002	0015	000	000	005	000	۸٥٥	001	000	000	833 979 9	833 579 108
Crop NAS NS 0 0 0 0 46 47 436 1953 2696s 131336 TOMS NS 0 10 0 13 10	27APR- St. OTMAY SE.	S.	005	002	0012	000	000	005	000	264 203 7	001	137 56 8	3208 1513 9	5712 3454 9	9321 3776 108
Crop ToWs NS 0 0 53 0 0 0 53 0 0 105 125 <	O4MAY- St. OBMAY SE. NO.	S.	000	005	000	0011	000	005	7 7 7 7 7 7	47 29 11	436 219 7	1953 1252 6	26966 15911 6	131336 26236 10	160783 30710 117
Crop TONS NS 0 0 0 102 102 0 0 564 12 564 15 152055 9 170835 15085 170835 17085 170835 17085 170835 1708 170835 170	11MAY- St. 15MAY SE. NO.	S.	000	000	000	12 12 E	005	005	005	268 105 12	2195 926 7	18209 12371 6	127480 63669 7	5099520 3117703 10	5247726 3118378 127
Crop TONS NS 0 0 0 0 0 0 0 1776 4364 1753 1754	18MAY- St. 22MAY SE. NO.	S	000	°°±	ဝဝည	000	000	102 102 15	001	°°E	1035 564 9	29878 15295 9	240792 128025 9	209375 170824 6	481181 214022 118
Crop TONIS NS 0 242 242 0 0 0 0 21 27 41 41 2078 2078 270793 270793 TONIS 0 0 0 0 0 0 0 21 41 41 41 2078 2078 270793 270793 Crop Crop Sin 0 <	25MAY- St. 30MAY SE. NO.	SZ.	000	000	០០ស	0 0 2	002	008	002	80 19 19	510 373 13	ဝဝင်	1796 1710 12	12539 4364 9	14924 4702 169
Crop 0 0 0 0 0 0 0 0 0 0 0 12593 756 12293 TOWS 6 11 18 18 23 18 19 13 17 14 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 14 18 24 13 18 12 11 10 64 28 Crop 0 0 0 0 0 0 0 0 64 28 Crop 0 0 0 0 0 0 0 64 28 Crop 0 0 0 0 0 0 64 28 Crop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <t< td=""><td>SE.</td><td>SX SX</td><td>000</td><td>242 242 11</td><td>002</td><td>002</td><td>៰៰៱</td><td>0 0 27</td><td>០០ដ្</td><td>000</td><td>21 24 14</td><td>14 14 15</td><td>3494 2078 12</td><td>659907 270793 12</td><td>663704 270801 177</td></t<>	SE.	SX SX	000	242 242 11	002	002	៰៰៱	0 0 27	០០ដ្	000	21 24 14	14 14 15	3494 2078 12	659907 270793 12	663704 270801 177
Crop 0	SE. NO.	000	00=	00\$	ဝဝဆ	23	00\$	000	0012	001	002	223	578 578 11	12293 12034 11	13124 12048 190
Crop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S S .	000	00 <u></u>	002	ဝဓာ	2,00	၀၀ ဆိ	00%	001	ဝဝဆ	000	005	33 5	9889	282
	S & S.	000	00=	004	001	006	002	0 0 %	°°5	005	000	000	000	000	1700

Table C-100 Regional Standing Crop (In Thousands) of Alosa spp. Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0 142	0 129	00%	00%	00K	002	00E	ook	00E
	AL CO	000	400	S	S	ž	SZ Z	S	SZ.	S
3,45	ន	00 M	002	S.	S	2	Š	S	S	SZ.
	S	000	400	S	SE	SZ Z	SS	SS	S S	S
KTON SI	ă	005	005	SE .	SZ SZ	SZ	S.	\$	S	S
dson River Estuary Determined From Longituainal Kiver Ichtnyopiankton Survey,	뢒	004	000	SX	SZ	S	S	S	S	S S
KIVEF I	¥	000	000	000	000	000	000	000	000	000
נתמונים	3	ဝဝည်	០០ជ	000	೦೦ರ	005	000	005	005	005
Long!	ŝ	002	000	000	000	000	000	000	000	000
III Ded Fr	<u>a</u>	០០ឯ	001	005	005	005	005	005	000	005
ry Deter	5	005	005	0 0 2	002	002	002	00ជ	005	002
Estua	21	004	002	00[001	005	00=	005	00=	60 <u>F</u>
udson Rive	¥	004	005	00 5	005	••±		00 5	005	005
Ē	æ	002	000	001	002	001	001	001	001	۸٥٥
		St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE. NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS
	DATE	29JUN SI 03JUL SI	06JUL S 10JUL SI	20JUL - S 22JUL SI	04AUG- S 06AUG SI	18AUG- S 20AUG SI	O1SEP- S O3SEP S	155EP- \$ 175EP \$	288EP- S 308EP S	120CT - \$

Table C-101 Regional Density (No./1,000m3) of Alosa spp. Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

" <u>T</u>	864	000	10 O M	0.00	10.0A			01015	***		
Regions Combined	0.0 0.0 35	0.0 5.08	0.99 108	9.29 14.93 117	13.86 24.54 127	1598.07 6555.46 118	184.84 584.47 169	13.62 51.62 77	238.13 855.00 190	12.44 103.37 191	0.09 1.23 17
¥	0.00	9.00	9.00	1.61 0.62 10	58.47 18.49 10	044.75 402.04 6	1047.90 492.48 9	82.20 47.38 12	1077.38 482.99 11	161.03 103.37 10	1.23
ន	0.00	0.00	0.00	12.19 5.46 6	23.03 6.09 7	3015.4714044.75 1333.69 6402.04 9	879.76 1 298.98 12	47.93 17.99 12	1819.34 699.82 11	0.00	0.00 8
98	0.00 8	0.00	0.00	21.56 10.93 6	12.78 2.40 6	1741.59 451.59	223.52 95.96 15	14.44 7.82 16	38.41 20.42	0.68 0.68 11	0.00
X 5	0.00	0.00	0.00	14.48 2.24 7	22.62 6.01	263.03	42.86 19.92 13	13.42 5.56 14	82.85 71.46 14	0.00	0.00 1000
뢒	0.00	0.00	0.00	27.62 7.10	15.82 5.02 12	33.13 12.71 11	20.89 9.13 19	3.11 1.70 20	48.71 45.66 17	0.00 0.00 18	0.00
¥	0.00	0.0 0.0 6	£.6 8.0	13.91 3.41 10	17.05 11.82 10	25.77 21.61 7	0.84 0.54 14	2.10 1.17 13	22.95 19.82 13	0.00	0.00
3	0.00	0.00	0.04	14.61 1.81 16	3.67	1.07 0.68 15	1.99 23.52	0.19 0.13 27	3.60	0.00	0.00
3	0.00 0.00 6	0.00	0.00 0.00 6	3.70 1.37 10	8.80 3.65	14.34 8.11 10	0.27	0.00	1.27 1.27 18	0.00 18 18	0.0 5.00
4	0.00	0.00 0.00 1000	0.00	1.77 0.98 13	3.74 1.28 19	34.38 30.33 9	0.7 2.2	0.00	1.20 0.85 23	0.00	0.00 1900
5	0.00	0.00	0.00	0.00	0.34	3.20 2.27 13	0.0 51.0 54.0	9.0	0.00 8 8	0.00 18 18	0.00
12	0.00	0.00	0.00	9.00	9.0.2	51.0	0.00	99.	0.00	99.2	0.00 14
¥	9.00	9.00	0.00	0.00	9.00	0.00	0.00	9.00	0.00	9.6	0.00
B 1	2	ž	8	x	S S	ž.	\$	Ş	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS					
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Yolk-Sac Larvae Table C-101 Regional Density (No./1,000m3) of Alose spp.

	Regions Combined	1.26 9.07 142	6.39 83.10 129	0.00	0.00 73	388	388	388	388	0.00
	4	16.39 9.07	0.00	S	S	S	S	S	S	S
	S	0.00 0.00 2	0.00 0.00 7	S	SE	SZ	SS.	X X	SZ Z	SZ Z
2	98	0.00	0.00	NS NS	SZ.	SZ	SE SE	SE .	S.	SZ Z
vey, 19	KG	0.00 11	0.0 0.0 10.00	SE SE	¥.	S.	SH.	SZ.	SE .	NS
nkton Sui	₽	0.0 0.00 74	0.0 0.00 0.00	S	S	N.	S	S	SN.	S.
Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	*	0.0 8 8	0.0 8 8	0.00	0.00	96.9	0.0 6.00 6	0.0 6.00 8	0.00	0.00
River 10	3	0.00	0.00 0.00 15	0.00	0.00 0.00 0.00	0.0 0.0 0.0	0.0 0.00 10	 865	0.0 0.00 10	9.00
tudinal	ŝ	90.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
om Longi	₽	0.00	0.00 0.00	0.0 0.00 100	0.00 1000	0.00	0.00 0.00 0.00	0.0 0.0 0.0	0.00 10 10	0.00 0.00 10
mined Fr	5	0.00	0.00	0.00 12	0.00	0.00 12	0.00 0.00 12	0.00	0.00	0.00 0.00 12
ry Deter	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00 1.00	9.00	9.00
<u> </u>	¥	0.0 2.00 4.00	0.00	9.00	0.0 1.00	9.00	0.00	0.00	0.0 1.00	0.0 1.00 1.00
in Hudson Rive	18	0.00	83.10 83.10 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in Au		DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	288EP- 308EP	120CT - 140CT

Table C-102 Regional Standing Crop (In Thousands) of Alosa spp. Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 5	0 0 80	527 295 108	19913 2682 117	27515 4610 127	2651591 851286 118	325173 81140 169	23843 6921 177	464818 129174 190	20744 13239 191	158 158 174
¥	000	000	000	206 10 10	7489 2368 10	1798688 819899 6	134202 63071 9	10527 6068 12	137979 61855 11	20623 13238 10	158 158
S	005	000	000	1959 877 6	3702 979 7	484682 214366 9	141405 48055 12	7704 2891 12	292426 112483 11	005	
SG	000	000	000	3802 1928 6	2254 422 6	307034 79614 9	39406 16918 15	2545 1379 16	6772 3599 11	120 120 11	000
ă	001	400	400	2048 317 7	3200 850 7	37211 8596 9	6064 2817 13	1899 787 14	11721 10110 14	ဝဝပ္	000
윺	000	001	001	4571 1175 11	2619 831 12	5483 2103 11	3457 1510 19	515 282 20	8061 7555 17	000	00\$
¥	000	000	522 295 6	4148 1017 10	5083 3524 10	7682 6444 7	250 161 14	627 350 13	6842 5909 13	0 O E	005
3	000	005	տ ռ Έ	2042 252 16	512 186 17	149 35 15	<u> </u>	27 18 27	503 425 19	2,00	2,00
울	000	000	000	768 285 10	1826 757 11	2976 1682 10	57 57 16	0 0 21	263 263 18	0 O D	002
9	000	၀၀ဥ	005	369 200 13	780 266 19	7163 6318 9	156 148 12	0012	250 178 23	200	005
3	00£	001	001	000	9 2 2	473 335 13	ននត	005	ဝဝဆ	005	0 0 1
12	002	005	004	005	000	65	0 0 5	005	008	002	004
¥	005	000	005	000	000	000	000	000	005	00=	00=
₽	Z	X S	X X	SX.	S.	S	SZ SZ	SS SS		000	000
	Crop TOWS	Crop TOUS	Crop TOMS	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TONS	Crop TOWS
	St. No.	St. SE NO.	St. SE NO.	St. SE NO.	St. 86.	% % %	St.	St.	St.	SE.	8 % .
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-102 Regional Standing Crop (In Thousands) of Alosa app. Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	2100 1162 142	17369 17369 129	002	00%	0012	0012	0 0 	00K	00K
AL G	2100 1162 9	400	S Z	S.	S X	N.	N.	S	S.
S	00 W	400	Š	S	S	SE .	S	S.	S.
80	000	400	S.	S S	SZ ·	S	S	SX SX	SE
χę	°°;	005	S Z	S.	S.	NS.	SN.	S Z	S .
흪	004	005	2	S .	S	SN.	S.	x	S.
¥	000	000	000	000	000	000	000	000	000
3	៰៰ស	០០ឯ	000	005	005	000	၀၀ဥ	000	005
ŝ	000	005	000	000	000	000	000	000	000
<u>•</u>	០០ជ	00ជ	000	005	005	ဝဝဥ	005	005	005
₹	005	00=	002	002	៰៰ឨ	០០ជ	៰៰ឨ	002	002
12	004	002	٠٠٢		005	005	005	00=	00=
¥	004	00=	••E	0°5	00=	005	005	00 <u></u>	005
6	002	17369 17369 6	001	400	001	001	001	001	001
	Crop TOUS	Crop	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS
	St. C	St. C	St. C	St. (8 St. C	S SE . C	S S	St. (St. C SE. 7
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-103 Regional Density (No./1,000m3) of Alosa spp. Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions	0.00	0.00 0.00		0.01 0.13 117	3.57 7.10 127	285.99 1630.86 118	646.51 1460.79 169	667.13 3180.60 177	586.71 1557.69 190	928.19 2488.20 191	929.28 1855.21 174
_	9.0	0.00	0.00	0.00	0.00	2351.90 1593.48 6	1580.14 547.29 9	27.60 13.58 12	15.86 7.90 11	4170.12 1882.79 10	3154.73 1085.22 9
ę	9.0	0.00	6 00°0 00°0	0.0	1.67	513.38 226.61 9	3494.49 1152.21 12	151.09 95.60 12	792.67 669.73 11	1332.21 505.69 10	2176.27 577.82 8
•	0.0	0.00	0.00	9.0	9.04 3.42 6	291.17 257.06 9	1595.70 578.90 15	2172.08 813.39 16	1471.76 483.90 11	1598.63 677.49 11	2409.07 1039.31 10
:	0.0	0.00	0.00	0.00	5.62 3.06	42.58 18.33 9	801.31 385.30 13	4771.14 3067.53 14	2516.10 1127.07 14	2125.07 1095.80 12	2236.74 782.34 10
g	0.00	0.00	0.00	0.0	11.72 3.10 12	65.54 23.11 11	248.42 152.06 19	524.80 168.88 20	981.45 381.40 17	1000.21 416.08 18	532.12 189.65 19
. å	6.00	9 000	0.00	0.00	9.76 4.00 10	94.49 34.40 7	15.80 6.00 14	211.44 76.68 13	716.47 319.03 13	848.85 646.89 13	573.14 289.17 11
5	9.0	5 66	9.00	0.0 5.0 74	1.25 0.54 17	4.31 2.02 15	15.04 4.61 23	106.42 29.59 27	951.03 473.28 19	781.25 368.39 24	753.59 336.49 24
9	0.00	9.00	9.00	0.00	0.87 0.70 11	38.69 23.20 10	3.43 1.11 16	39.10 16.09 15	135.96 44.08 18	107.14 42.70 18	88.47 28.34 16
9	0.00	0.00	0.00	0.13 0.13	2.59 1.22 19	25.14 22.66 9	2.61 2.17 12	1.18	39.59 12.55 23	97.16 40.23 24	91.33 49.83 19
č	900	0.0 2.00	0.00 0.00 13	0.00	0.34 0.34 9	3.09	0.92 0.46 15	0.73 0.35	5.28 2.06 18	4.31 1.96 18	51.91 42.21 17
	0.00	0.00	0.00 0.00 12	0.00	0.00	1.51 0.88 11	0.29	0.00	1.04 0.53 18	1.47 0.82 16	0.9 0.72
}	0.00	0.00	0.00	0.00	0.00	0.1	0.00	0.00	9.00	9.00	9.0
Ġ	S X	S	X.	S.	S.	S	X S	S.	0.00	0.00	12.43 10.97 6
	DENSITY	NO. TOWS DENSITY SE	NO. TOWS DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS						
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-103 Regional Density (No./1,000m3) of Alosa spp. Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	499.61 1987.45 142	244.08 466.78 129	1.03 6.15 72	0.04	0.00 23 20	0.00 23 20 20 20 20 20 20 20 20 20 20 20 20 20	22.84 22.71 73	0.0 3.0 3.0	0.09 0.72 73
4	160.13 65.65	519.90 115.55 7	S.	S	SS	S	S.	S.	S
S	954.96 137.25 5	305.03 98.32 7	S	æ	SX	SZ.	S S	S .	S
SG	3244.29 1888.46 6	555.81 175.57	æ	S	Ş	S	S	S	%
ΚG	1154.49 490.86 11	917.32 300.09 10	%	S	S Z	SZ.	S S	S	SZ
윺	392.04 121.74 14	727.45 266.12 10	S.	S.	SZ .	S	SN .	SX.	S
¥	561.65 323.64 8	143.49 56.22 8	1.78	0.00	0.0 0.09 4	0.00	0.00	0.00	0.00
3	11.13 4.04 15	1.28 0.78 ts	6.16 5.99 9	0.33 0.33	9.0 88.0 88.0	0.0 0.0 0.0 0.0	9.65	9.6 5.8 5	0.0 0.00 0.00
\$	1.26 0.57 10	0.54 0.44 10	0.28 0.28 6	0.00	0.00	0.00	22.71 22.71 6	0.00	0.00
9	0.26 0.14 13	0.0 43.0 13.0	0.0	9.00	0.0 0.00 0.00	900	0.0 0.0 0.0	0.00 0.00 0.00	0.00
5	0.97 0.97 11	0.0 1.88	0.00	0.00	0.00	0.00 12	0.00	0.00	0.00
72	0.46	0.00	0.0	0.00	0.00	9.00	0.00	0.00	0.72 0.72 11
¥	5.10 1.83 1.4	1.55	0.00	0.00	995	0.00	9.0	0.00	0.00
B	8.26 3.20 12	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NOTOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	29JUN- 03JUL	-102UL 102UL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Table C-104 Regional Standing Crop (In Thousands) of Alosa spp. Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

				•							
Regions Combined	0 0 0	0 0 80	0 0 80 1	27 27 117	8450 1538 127	494926 212600 118	1208124 230727 169	1258949 458757 177	1291390 248572 190	1902038 384426 191	1907169 290826 174
4	000	000	000	000	005	301204 204074 6	202365 70091 9	3535 1740 12	2031 1012 11	534061 241126 10	404022 138983 9
ຮ	005	-	000	000	269 192 7	82517 36423 9	561675 185197 12	24285 15366 12	127408 107646 11	214129 81281 10	349795 92874 8
SG	000	000	008	000	1594 603 6	51332 45319 9	281315 102058 15	382929 143398 16	259465 85310 11	281831 119439 11	424710 183226 10
K	001	400	400	001	795 434 7	6024 2594 9	113361 54508 13	674972 433963 14	355953 159447 14	300633 155022 12	316431 110677 10
€	00%	001	400	005	1939 513 12	10847 3824 11	41110 25164 19	86846 27948 20	162415 63116 17	165520 68854 18	88057 31384 19
¥	000	000	000	၀ ၀ ဥ	2908 1191 10	28170 10255 7	4709 1789 14	63038 22860 13	213604 95115 13	253072 192861 13	170873 86212 11
3	000	.00=	005	005	174 75 17	602 282 15	2102 644 23	14877 4136 27	132946 66161 19	109212 51497 24	105345 47039 24
ŝ	000	000	000	၀၀ဥ	180 145 11	8027 4814 10	712 230 16	8112 3337 15	28205 9144 18	22226 8857 18	18353 5879 16
4	000	005	005	27 27 13	540 253 19	5237 4721 9	543 452 12	247 214 12	8248 2614 23	20243 8381 24	19028 10382 19
3	០០ឆ្	0012	០០ឯ	000	S 55 &	456 214 13	136 69 15	108 15	781 305 18	637 290 18	7669 6236 17
12	002	004	007	000	000	485 283 11	882	00=	336 172 18	265 265 16	289 248 14
¥	000	005	005	000	000	%	000	000	00=	005	00 <u>F</u>
18	XX	S.	S.	S	S.	S S	22	X .	000	000	2598 2293 6
	Crop TOWS	Crop TOWS	St. Crop SE . NO. TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOMS	Crop TOUS	Crop
	S S .	St. 86.	SE .	St.	SE SE	S S S	5 S.	St.	SE.	SE.	St. C
DATE	13APR- 18APR	20APR- 25APR	.27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-104 Regional Standing Crop (In Thousands) of Alosa spp. Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	1146660 354875 142	507308 73822 129	1450 932 72	388	00K	00K	4711 4711 73	00%	ង្គង្គ
	A	20507 1 8408 9	66583 14799 7	S.	2	S	X.	S	S.	S
1992	S	153493 22061 5	49027 15803 7	ž.	S Z	SZ Z	SZ .	SE SE	Ø .	S Z
	S	571954 332927 6	97987 30952 7	X X	8	X	S Z	S	SK SK	SE
ankton	2	163326 69442 11	129774 42454 10	%	8	S	SZ Z	%	¥.	SH
Ichthyop	윺	64877 20147 14	120382 44038 10	S S	S S	S	ž S	Z.	S	æ
River	¥	167446 96488 8	42780 16762 8	531 404 6	000	000	000		009	000
itudinal	3	1556 565 15	51 85 81	861 838 9	9 92	005	005	005	000	005
kdson River Estuary Determined From Longitudinal River Ichthyoplankton Survey,	\$	261 117 10	E26	888	000	000	000	4711 4711 6	000	000
rained F	9	35 13 13 13 13 13 13 13 13 13 13 13 13 13	ဆ ဆ ည	005	000	005	000	000	005	000
ary Dete	5	143 143 11	00=	002	002	002	002	002	007	002
ver Estu	7	149 105 14	004	005	005	005	005	005	005	23.5
udson Rf	¥	1169 419 41	356 356		0°E	005	005	005	°°E	005
₹	6	251 888 51	122 122 6	۸٥٥	۸٥٥	001	400	400	400	۸٥٥
		Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS
		£ % ;	5 % S.	S 8 5.	왕 않	8 % 5.	S & S.	8 St.	S & .	SE SE
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-105 Regional Density (No./1,000m3) of Alosa spp. Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

														~	eatons
DATE		E E	¥	12	3	4	ş	3	¥	£	8 9	SG	S	₹	Combined
13APR- 18APR	DENSITY SE NO. TOWS	SN	999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.0	0.00	0.00 0.00 106
20APR- 25APR	DENSITY. SE NO. TOWS	SN	0.00	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	000	0.00	0.00 108 108
27APR- 01may	DENSITY SE NO. TOWS	S	0.00	0.00	0.00 0.00 t3	0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.0 8	0.00	9.00	0.00 0.00 80 0.00
04MAY- 08MAY	DENSITY SE NO. TOWS	S.	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00 0.00 16	0.00	0.00	0.00	0.00	00.0	9.00	0.00 117
11MAY- 15MAY	DENSITY SE NO. TOWS	Š	0.00	0.00	0.00	0.00	0.00 1.00	0.00	0.0 0.00 1.00	0.00	0.00	0.00	0.00	90.0	0.00 0.00 127
18MAY- 22MAY	DENSITY SE NO. TOWS	SS	0.00	0.00	0.00	0.00	9.00	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00 118
25MAY- 30MAY	DENSITY SE NO. TOWS	S	0.00	0.00	0.00 0.00 15	0.00	0.0 7 7	0.00	0.00 0.00 14	0.00	0.0 3.0 3.0	0.00 15	0.00	000	0.00 169
O1JUN- O5JUN	DENSITY SE No. Tows	S	0.00	0.00	0.00	0.00	0.00 0.00 15	0.00 0.00 27	0.00	0.00 50 50	0.00	0.0 0.0 16	0.00	0.00 12	0.00 0.00 177
OBJUN- 12jun	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.0 23 23	0.0 0.9 18	0.00	0.00	0.00	0.00	0.00	0.00	9.0	0.00 0.00 190
15JUN- 19JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00 0.00 18	0.00 2.00	0.00 180 18	0.00	0.00 0.00 13	0.0 0.08 18	0.00	0.00	0.0 10 10	0.0 0.00 0.00	0.0 19 19
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	9.69	0.00 0.00 24	0.00	200	0.00	9.00	0.0 0.0 8	3.13 9.13	0.24 3.13 174

Table C-105 Regional Density (No./1,000m3) of Alosa spp. Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	70.05 141.88 142	4.99 26.21 129	0.00	0.00	0.00 0.00 73	0.00 73	0.00 73	0.00 73	0.04
4	42.43 23.63 9	9.78 7.20	SZ Z	SZ Z	S	· S	8	SZ Z	S
S	189.42 25.75 5	0.68 0.68 7	S.	SX.	SZ Z	SE .	SE SE	HS	NS.
98	237.38 40.53 6	20.61 20.61 7	SS.	SX	S.	SN	S	N	S
8	192.98 71.71 11	9.24 7.54 10	S X	S.	SX.	SN	\$	SN	S
£	187.36 104.00 14	23.81 12.35 10	S.	S	£	SH	S.	N.	S.
¥	60.96 36.17 8	0.0 8.0 8.0 8.0	0.00	9.0	0.00	9.00	9.9	0.00	9.0
3	0.14 0.15 15	0.00 0.00 ts	0.00	9.00	0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0	9.00	0.31 0.31
ş	0.0 0.0 10	9.00	0.00 0.00 6	0.00	0.00	0.0 8.89 8.80	0.0 0.00 0.00	9.0	0.00
9	0.00 0.00 13	0.04	0.0 0.0 10 10	9.00	0.0 0.0 0.0	0.0 0.0 0.0	9.0 5.00 5.00	9.00	9.00
5	985	9.0	0.00 12 12	0.00	0.00	0.00	0.00 1200	0.00	0.00
12	0.00	0.00	0.0 1.00		0.00	9.00	0.0 1.00	0.00	9.00
¥	90.0	0.0 1.00	9.00	9.00	 288 288	9.00	9.05	9.0	5.00
18	0.09	0.00	0.00	0.0 7	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS		DENSITY SE NO. TOUS	DENSITY SE NO. TOWS				
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL		18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-106 Regional Standing Crop (In Thousands) of Alosa spp. Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 90	0 0 80	0 0 8	0 0 <u>7</u> †	0 0 127	0 0 81	0 0 69	001	008	0 0 161	401 174
¥ 5	000	000	000	005	000	000	000	004	005	000	401 9
ន	902	000	000	000	001	000	002	002	00=	000	00
98	00 6 0	ဝဝဆ	000	000	000	000	ဝဝည	002	005	005	005
¥G	001	001	002	001	002	000	ဝဝဂ္	002	004	០០ជ	005
출	000	001	001	°°‡	002	001	005	900	002	00\$	005
¥	000	000	00%	005	005	400	004	0015	0 0 E	00ti	00 <u></u>
3	000	00=	005	002	004	ဝဝည	008	0 0 2	005	00%	00%
ŝ	000	009	009	000	005	ဝဓဉ	002	<u>ဝဝက</u>	ဝဝဆု	၀၀ဆ	002
₽.	000	005	005	001	00\$	000	០០ជ	00%	23 0 0	00%	000
3	០០ដ	0012	0012	000	006	០០ឯ	០០ស	005	ဝဝဆ္	ဝဝရာ	005
12	007	៰៰ឨ	005	000	005	005	002	005	000	002	004
¥	ဝဝဥ	005	000	000	000	000	000	000	005	005	eo t
8	S	S	SZ SZ	NS NS	SZ SZ	S.	S.	N.	000	000	000
	Crop	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOWS	Crop TOWS	Crop	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS
	St. NO.	8 SF.	St.	St. SE. NO.	St. SE. NO.	St. 6	S # 5.	St. (St. C 86. 1	St. C	St. C
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25HAY- 30HAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

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Table C-106 Regional Standing Crop (In Thousands) of Alosa spp. Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	154226 24346 142	10446 4406 129	902	00%	00%	00K	ဝဝင်	00E	ជជន
AL COT	5434 1 3026 9	1252 922 7	S	S.	S.	S.	S.	S	S
ន	30446 4139 5	011 011 7	S	SE	S#	SN	SS	SE	SH.
98	41850 7145 6	3633 3633 7	æ	S	SZ.	\$2	Š	S.	SZ
KG	27298 10144 11	1308 1067 10	SE SE	S.	SE	SN	SZ SZ	S	S
즆	31006 17211 14	3940 2044 10	SZ.	SZ .	S	S X	SS	S	S.
꿃	18173 10782 8	961 8 8	000	000	000	000	000	00%	000
3	5 5 5	ဝဝည	000	005	005	005	002	000	225
ŝ	002	00 <u>0</u>	000	000	000	000	000	000	000
<u>a</u>	០០៥	۲ × ٤	005	000	005	005	005	005	005
5	°°=	005	004	002	004	0 0 21	0 0 2	0 0 2	002
12	002	004	005	005	. 0 =	005	005	005	00 <u>=</u>
¥	004	005	005	005	005	00=	••=	0°5	•°=
18	002	000	۸٥٥	00,	906	001	901	001	۸٥٥
	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TOWS
	SE SE .	St. 86.	st. SE.	S S S	SE. SG.	SE.	St.	St. NO.	SE.
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT - 140CT

Table C-107 Regional Density (No./1,000m3) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

DATE		B	¥	21	5	9	9	3	¥	윺	8	8	S	4	Regions Combined	
13APR- 18APR	DENSITY SE SE NO. TOWS	SZ	0.00	0.00	0.00 0.00 13	0.00	0.00 0.00 6	0.00 0.00 10	0.00 0.00 6	0.00 0.00 6	0.00	0.00	0.00	0.00	0.00 106	
20APR- 25APR	DENSITY SE NO. TOWS	S	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 8	0.00	0.00	0.00 0.00 108	
27APR- 01MAY	DENSITY SE NO. TOWS	SZ.	0.00	0.00	0.00 13	9.00	0.0 0.00 6	0.00	0.0	0.00	0.00	0.0 0.0 8	0.00	0.00	0.00 0.00 108	
04MAY- 08MAY	DENSITY SE NO. TOWS	SZ.	0.00	0.00 0.00 10	9.00	0.00 13	0.00	0.00 0.00 16	0.0 0.00 100 0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11MAY- 15MAY	DENSITY SE NO. TOWS	SH	0.00	0.0 0.00 10	0.00	0.00	0.00	0.0 0.00 16	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	0.00 0.00 1	0.00 0.00 118	
18MAY- 22MAY	DENSITY SE NO. TOWS	¥S	0.00	0.0 1.00	0.00 13	0.00	0.00	0.00 0.00 ts	0.00	0.00	0.00	0.0 8 8	0.00	0.00	0.00	
25MAY- 30MAY	DENSITY SE NO. TOWS	SZ Z	0.00	0.00	0.0 0.08 13	0.00	0.00	0.0 0.00 15	0.00	999	0.00	0.0 8 8	0.00	0.00	0.00	
01JUN- 05JUN	DENSITY SE NO. TOWS	SZ.	0.00	0.00	0.00	0.00	0.00	0.00 0.00 15	0.00	9.00	0.00	0.00	0.00	0.00 6.00 6	0.00	
08JUN- 12JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	9.0	0.00 ±3.00	0.00	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15JUN- 19JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	9.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	0.00	0.00 0.00 12	0.00	0.00 0.00 13	0.00	0.00 1000	0.00	0.00	9.00	0.00 6.00 6	0.00 118	

Table C-107 Regional Density (No./1,000m3) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

							•		
Regions Combined	0.00 0.00 118	0.00	0.00 2.00 2.00	0.00 25.00 25.00	0.06	0.15 1.22 73	0.21 1.28 73	0.04 0.33 73	0.00 20.00
¥	0.00	0.00	SX	S	SS	S.	S	X	X.
ន	0.0 0.00 5	0.0	S	S.	S	S.	×	X.	8
SG	0.00	0.00	S.	æ	æ	SS	SS.	NS NS	S S
ă	0.00	0.00	SS.	SS.	SE SE	S	S	S	S
₽	0.0 0.00 10	0.0 0.0 0.0 0.0	S	SZ .	S.	S	S	S	S
¥	0.00	0.00	0.00	0.0 0.00 8	0.49 0.49 6	0.00	0.24 0.24 6	0.00	0.00
3	0.00 13	0.00	0.00	0.00	0.00 0.00 10	0.0 0.00 0.00	0.07 0.07 10	9.00	0.00 10
ŝ	9.00	0.00	0.00 6.00 6	0.00 6.00	0.00	1.22	0.13 0.13 6	0.33 0.33 6	0.00
4	0.0 1.00 1.00	0.0 5.0 £	0.00 0.00 0.00	9.9.5	999	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00 0.00 10
5	0.00	0.00	0.00 0.00 12	0.00	0.00	9.09	0.00 0.00 12	0.00 12	0.00
12	0.00	0.0 7.00	0.00 1.00	9.0	9.0	0.0 1.00	9.00	9.09	0.00
¥	0.00 1300	0.00 1.00	0.0 1.00 1.00	9.0	9.00	9.00	1.25 1.25 1.25	9.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	158EP- 178EP	28SEP- 30SEP	120CT - 140CT

Table C-108 Regional Standing Crop (In Thousands) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

																										-							
Regions Combined		0	106	0	0	108 80	0	0	108	0	0	115	0	0	118	0	0	110	0	0	110	0	0	110	0	0	119	0	0	117	ò	0	218
₹		0	•	0	0	0	0	0	٥	0	0	•	0	0	5	0	0	•	0	0	•	0	0	•	0	0	•	0	0	ın	0	0	۰
S	3		2	0	0	•	0	0	•	0	0	ī.	0	0	•	0	0	Φ	0	0	•	0	0	•	0	0	•	0	0	sv.	0	o ·	٥
S	;	0	€	0	0	∞	0	0	₩	0	0	•	0	0	•	0	0	€	0	0	€	0	0	₩	0	0	9	0	0	•	0	•	٥
¥.	2 6	0	~	0	0	2	0	0	~	0	0	~	0	0	~	0	0	~	0	0	2	0	0	~	0	0	7	0	0	^	0	01	_
_ €	<u> </u>	•	•	0	0	~	0	0	~	0		•	0			0			0	0	5	0	0	2	0	0	5	0	0	2	0	0 9	2
ă				0				-		0						0			•			0				•		0				01	
2							0			0			0			0			0			0			0			0			0		
<u> </u>				0					5												0	0						0			0		
		. 0			0				13										0			0					=======================================	0			0		
		,	•		0			0		0			0			0			0			0					74	0			0		
		- 0	5	0	0	5	0	0	2	0	0	o	0	0	•	0		•	0	0	o	0	0	•	0	0	=	0	0	=	0	0 ;	=
Į		£		NS S			NS			NS		٠	SX SX			SZ			KS.			NS			0	0	9	0	0	•	0	0	•
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		. E			끯						뽒							NO.			₩.						₩0.				St.	SE	<u>.</u>
DATE		18APR			25APR			OTMAY			OBMAY			15MAY			ZZMAY			30MAY			MOPSO MOSSO			12JUN		15.JUN-			22JUN-		_

Young of Year Table C-108 Regional Standing Crop (In Thousands) of Gizzard Shad

	Regions Combined	0 811	0 0 6	902	002	147 147 73	254 254 23	395 73 73	388	00K
	A	000	000	SZ.	S	SZ.	S	SZ	SZ	S
1992	S	00 W	000	SZ.	S	S	SZ.	S.	SE SE	SX
	98	000	000	S	NS.	S	S	SX.	NS.	S.
ankton S	S S	001	001	SE SE	S Z	SX SX	SZ.	SZ.	S.	\$
icar Ichthyoplankton Survey,	≙	005	000	SZ SZ	S X	S	S.	S Z	S Z	SZ Z
River	¥	001	001	000	000	147 147 6	000	22.0	000	000
tudinal	3	002	001	000	000	005	000	555	000	000
om Longi	ŝ	000	000	000	000	000	254 254 6	27 27 6	889	000
mined Fr	<u>e</u>	០០ជ	0015	000	005	000	005	000	000	000
ry Deter	₹	00 <u>=</u>	005	0 0 2	002	004	005	0 0 2	002	002
or Estua	21	004	002	00=	005	005	005	005	°°5	005
lable C. 100 kegional standing cipt (in incusands) of distand shad founding of the complete c	¥	°°=	005	005	005	005	005	286 286 11	005	00=
	8	000	000	001	906	00 r	400	400	906	901
		Crop TOUS	Crop TOWS	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOVS	Crop TOWS
3		St. 86.	S 8 5.	SE.	St. Se.	St.	SE.	SE.	St. NO.	St.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-109 Regional Density (No./1,000m3) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

					•			
Regions COMBINED	0.00 0.00 210							
A.	0.00	0.00 130	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.00 21	0.00 21	0.00	0.00 21	0.00 0.00 21	0.00 0.00 21	0.00	0.00
SG	0.00 81	0.00 0.00 18	0.00	0.00	0.00 0.00 \$5	0.00	0.00	0.00
KG	0.00	0.00	0.00	0.00	0.00 0.00 15	0.00 0.00 15	0.00	0.00
윺	0.00	0.00	0.00	9.00	9.00	90.0	9.00	0.00
폱	0.00	0.00	0.00 8	0.00	0.00	0.00 8	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ŝ	0.00 8	0.0 0.0 8	0.00 8	0.00	0.0 8 8	0.00 8	0.00	0.00
<u>a</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
•	DENSITY SE NO. TOWS							
DATE	13.JUL - 18.JUL	27JUL - 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT - 090CT	190CT - 230CT

Table C-110 Regional Standing Crops (in Thousands) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	0 012	0 0 210	0 0 210	0 0 210	0 0 210	0 210	0 210	210
¥	0 0 tt	0 0 ti	00 ti	001	0 0 ti	0 0 ជ	០០ជ	០០ជ
S	0 0 12	200	0 0 12	005	0 0 12	0 0 7	0 0 12	0 0 12
SG	ဝဝည်း	002	ဝဝည	00 20	00 25	002	ဝဝည်	002
K G	ဝဝည	0 o T	៰៰៵	ဝဝည	0 0 %	០០ស	ဝဝည်	០០វ
윺	000	000	000	005	002	002	005	005
*	000	000	000	000	000	000	000	000
3	០០ដ	០០ជ	001	001	0015	០០៦	0 0 E	០០ជ
\$	000	000	000	000	008	000	000	000
<u>a</u>	002	002	004	004	002	002	004	004
5	0 0 27	0 0 27	0 0 22	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27
12	00%	009	00%	009	003	00%	00%	00%
¥	004	001	001	001	001	004	004	004
	Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOUS	Crop TOWS	Crop TOWS	Crop TONS
	St. SE.	5 % S.	8 SE .	SE SE.	SE.	S & .	St.	St. SE
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21sep- 25sep	050CT - 090CT	190CT - 230CT

Table C-111 Regional Catch-Per-Unit-Effort (CPUE) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

DATE		¥	12	3	4	ŝ	3	¥	윷	S S	98	S	Ą	Regions COMBINED
23JUN- 26JUN	CPUE SE NO. TOWS	0.0 0.00 %	0.00	0.00	0.00	0.00 2.00	0.00 3.00	0.00 0.00 8	0.00 0.00 8	0.00 0.00 8	0.00 0.00 15	9.00	0.00	0.00 100 0.00
10160 - 10160	CPUE SE No. TOWS	0.00	0.00	0.00	0.00 0.00	0.00	0.00 3.00	0.0 0.00 8	0.0 0.00 8	0.0 0.00 8	0.00	0.00 19	0.00 0.00 12	0.00
20 JUL - 22 JUL	CPUE SE No. TOWS	0.00 0.00 x	0.00	0.00	0.00	0.00	0.00 0.00	0.0 0.00 8	0.0 0.08	0.00	0.00	0.00	0.00 0.00 12	0.00
03AUG- 06AUG	CPUE SE No. TOWS	0.0 5.00 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00 0.00 0.00
17AUG- 20AUG	CPUE SE No. TOWS	0.00	0.00	0.00	0.00	0.00	5.00 5.00 6	22.00 20.06 5	0.00	0.00	9000	9.0 5.00 5.00	0.00	2.25 20.67 100
31AUG- 02sep	CPUE SE NO. TOWS	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.0 0.00 0.00	0.00	0.03 0.40 100
148EP- 168EP	CPUE SE No. TOWS	0.00 5.00	0.00 0.00 24	0.0 0.00 14	0.00 0.00 5	0.00	0.00	0.00	0.0 0.00 5	0.00	0.00	9.0 5.00 5.00	0.00	0.00
288EP- 308EP	CPUE SE NO. TOWS	0.00	0.00 0.00 24	0.00	0.00	0.00	0.00	0.0 0.00 \$	0.0 0.00 5	0.00	0.00	9.00	0.00	0.00
120CT - 150CT	CPUE SE NO. TOWS	0.00	0.00	0.00 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260CT- 280CT	CPUE SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.00 5	0.00	0.00	0.0 0.00 0.00	0.00	0.00

Table C-112 Regional Standing Crops (in Thousands) of Gizzard Shad Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	0 0 00	0 0 0	0 0 0	006	209 152 100	100	0 0 00	0 0 00	0 0 00	0 0 00
¥	007	007	007	400	400	001	400	۸۵٥	400	400
ន	005	000	005	005	000	005	005	000	000	005
98	០០ជ	៰៰ជ	001	000		000	000	000	000	000
KG	000	000	000	001	00 W	0010	0010	00 W	0010	00 W
윺	000	000	000	0010	00 iv	0010	00 W	00 m	00 M	0010
¥	00	00	000	00 W	156 142 5	00 W	00 m	00 W	00 w	0010
3	00m	00m	00m	000	ដីលី	000	000	000	000	000
ŝ	00M	00M	00M	00 W	0010	e- ← RV	00 m	0010	0010	0010
₽	oom	00M	00M	00 in	00 W	0010	00 W	00 m	0010	001
5	901	001	001	004	004	004	004	004	60 7	004
72	005	005	005	00%	00%	00%	00%	00%	00%	00%
¥	00m	00M	00m	0010	00 W	000	00 iv	00 IN	0 Ö IN	00 m
	8 ¥	Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TONS	Crop TOWS	Crop TOUS	Crop TOUS
	St. Crop SE NO. TOWS	St. Cr SE NO. 10	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. C. 86. 13	St. Crop SE NO. TOUS	St. Cr SE NO. 10	왕 동 5
DATE	23JUN- 9 26JUN 9	3 - TNF 60	20JUL - 8 22JUL - 8	03AUG- 96AUG S	17AUG- 3 20AUG 3	31AUG- 02SEP	14SEP-	28SEP- 3	120CT - 150CT	260CT - 1280CT

Table C-113 Regional Density (No./1,000m3) of Gizzard Shad Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

•								
Regions COMBINED	0.00 210	0.00	0.00	0.00 210	. 0.00 0.00 210	0.00	0.00	0.00
AL.	0.00	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00 13
S	9.0 2.08	0.0 2.0 2.0	9.68	0.0 2.88	9.00	2.08	0.0 2.0 2.0	0.00 2.00 2.00
SG	0.00	0.00	0.00	0.00	0.00 18	0.00 18	0.00	0.00 18
8	0.00	0.00	0.00 0.00 15	0.00	0.00 500 5	0.00	0.00 0.00 15	0.00 0.00 15
윺	9.00	9.00	0.00	0.00	9.00	900	0.00	0.00 0.00 10
*	9.0	0.0 8 8	0.00 8	0.00 8	0.00 8	0.00 8	0.00 8	0.00 8
3	0.00	0.00 130	0.00	0.00	0.0 13 13	0.00	0.00 0.00 13	0.00
ş	0.00	0.00 0.00 8	0.00 8	0.00	0.0 8	0.0 0.0 8	0.00	0.00 8
<u>=</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.0 0.0 7	0.0 0.0 4	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	. α	হ	_ &	_ s	্জ	_ s	~ st	_ s
	DENSITY SE NO. TOWS		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-114 Regional Standing Crops (in Thousands) of Gizzard Shad Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	0 0 210	0 0 210	0 0 210	0 0 210	0 0 210	270 270	0 0 210	0 0 210
AL G &	០០ជ	០០ជ	០០ជ	0 0 E	001	0015	0 0 £	0 o ti
ន	005	200	0 0 5	200	005	200	0 0 12	005
S	ဝဝရွာ	00%	008	ဝဝရွာ	008	008	00 %	ဝဝ ရွာ
KG	ဝဝည်	០០ដ	០០ស	០ ០ វ	០០៥	0 0 स	០០៥	0 o ti
Ŧ	00ರ	၀၀ဥ	၀၀ဥ	000	000	စစ္	၀၀င္	005
¥	၀၀ ဆ	ဝဝဆ	000	000	000	000	000	000
3	ဝဝည	ဝဝည	00ដ	၀၀ည	0012	0015	ဝဝည	೦೦೭
9	000	000	ပ ၀ ဆ	000	008	008	၁၀ဆ	၁ဝဆ
₽	002	002	004	004	002	004	004	004
5	24 0 0	0 0 22	0 0 27	0 0 27	0 0 22	0 0 2	27	0 0 22
72	00%	00%	00%	003	ဝဝဖွ	003	003	003
¥	0 0 7	005	005	005	005	005	005	005
	Crop TOWS	Crop TONS	Crop	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	. Crop
	St. C SE NO. 1	5 % E	St. C	St. C 86. 1	St. C	St. C SE	SE. C.	St. C NO. T
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-115 Regional Catch-Per-Unit-Effort (CPUE) of Gizzard Shad Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

•										
Regions COMBINED	0.00	9.00	0.07 0.07	9.00	0.00	0.08	0.06	0.06 0.52 100	0.0 100 100	0.02 0.20 100
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00 1000	0.00	0.00	0.00	9.00	999	0.00
SG	0.00 5.00	0.00 15	0.07 0.07 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KG	0.00	0.00	0.00 8	0.00	0.00	0.00 5.00	0.00	0.00	0.00 0.00 s	0.00
윺	0.0 8	0.0 8 8	0.00 8	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.0 8	0.00	0.00	0.00 0.00 s	0.00	0.00	0.00	0.20
3	0.00	0.00	0.00 3.00	0.00	0.00	1.00 0.45 6	0.67 0.67 6	0.33 0.33 6	0.00	0.00
ŝ	0.00 0.00	0.0 3.00	0.00 0.00 3	0.00	0.00	0.00	0.00	0.40 0.40 5	0.00	0.00
2	0.00 0.00	0.00	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	0.0	0.00 11	0.00	0.00	0.00	0.00	0.00	6.00	0.00 0.00 24	0.00
¥	0.00 0.00	0.00 x	0.00 0.00	0.00	0.00	0.00	0.0 5.00	0.0 0.00 5	0.00	0.00
	õ	ē.	হ	ž.	Ş	Š	S	ş	ş	S
	CPUE SE NO. TOWS		CPUE SE NO. TOWS							
DATE	23 JUN- 26 JUN	06JUL- 09JUL	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	288EP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-116 Regional Standing Crops (in Thousands) of Gizzard Shad Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

•										
Regions COMBINED	0 0 0	0 0 00	100	0 0 00	0 0 00	12 s 6	7 100	2 4 00	0 00	00
¥	002	0 0 7	0 0 2	001	001	001	001	001	400	001
ន	000	005	005	000	005	005	၀၀င္	005	000	၀၀ဥ
S	ဝဝင်	001	£	000	000	000	000	000	000	000
8	000	000	ဝဝဆ	00 tu	0010	0010	00 EV	0010	0010	0010
윺	000	008	00	0010	90 iv	0010	0010	0010	0010	0010
¥	000	000	008	0010	0010	000	000	0010	00 m	
3	00 M	00m	00m	000	000	= 20.4	~~•	440	000	000
\$	00m	00m	00 m	0010	001	0010	000	n	00 m	001
₽	00m	00m	00m	00 m	0 O in	00 W	0010	0010	00 m	00%
5	000	001	400	004	004	004	004	004	004	004
21	00 <u>t</u>	005	°°5	00%	. 00%	00%	00%	00%	. 00%	00%
¥	oom	00m	00m			0010	0010	0010	0010	0010
						•				•
	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
	£ # £	S S 5.	Se Se	% % %			S SE	8 S S	SE SE	8 St.
DATE	23JUN- 26JUN	06JUL- 06JUL-	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	288EP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-117 Regional Density (No./1,000m3) of Rainbow Smelt Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

ons	6.0 9.0 9.0 9.0	0.0 0.0 0.0 0.0	888	887	2 E & & & & & & & & & & & & & & & & & &	882	882	889	888	225	228
Regions Combined								335	0.0	0.00	0.00
¥	9.9	0.00	0.00	0.00	9.00	9.0	0.00	0.00	0.00 0.00 6	0.0 0.0 5	0.00
S	0.0 0.00 10	9.00	0.00	0.00 0.00 5	0.00	0.00 0.00 6	0.0 6.00 8	0.0 0.0 6	0.00	0.00	0.00
SG	0.00 8	0.00	0.00 0.00 8	0.00 0.00 8	48.43 48.43 6	0.0 8	0.0	0.00	0.0 0.0 6	0.00 0.00 6	0.0 0.00 6
KG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 7	0.00
4	0.00	0.00	0.00	0.00 1.00	0.0	9.00	9.00	0.0 0.0 0.0	0.0 0.00 10	0.0 0.0 10	0.00 10
둋	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 7	0.00	0.00 7	0.00
3	0.00 0.00 0.00	0.00	0.00	0.0 0.00 14	0.0 5.03	0.00 0.00 15	0.00 15	0.00 15	0.0 0.0 13	0.00 13	0.00 13
£	0.00	0.0 6.00 6	0.00 0.00 6	0.0 0.00 0.00	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.0 0.0 10	0.00 10	0.00	0.00	0.00	0.00	0.00	0.00 13	0.00 0.00 13	0.00
3	0.00 0.00 13	0.00 0.00 13	0.00	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00	0.00	0.00
12	0.00 0.00 12	0.00	0.00 0.00 12	9.00	0.00	0.00	0.00	0.00	0.0 0.00 74	0.00	0.00
¥	0.00 10	0.00	0.00	0.00	0.00	99.0	0.00	0.00	0.00	0.00	0.00
18	S	SE SE	82	¥S	SE SE	X S	S.	N.	0.00	0.00	0.00
٠	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	O4MAY- OBMAY	11MAY- 15MAY	18MAY- 22MAY	25MAY - 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Eggs Table C-117 Regional Density (No./1,000m3) of Rainbow Smelt

					•					
	Regions Combined	0.00	0.00	0.00	9.00 7.00 7.00	99.0	388	388	388	0.0 0.0 73
	4	0.00 0.00 8	0.00	SX	S	S	S.	SN	S Z	SX.
	S	0.00	0.00	S	SZ.	S	S.	NS.	S	S.
~	98	0.00 6.00 6	0.00 0.00 6	S	S	S	S	N.	S.	SZ Z
vey, 199	KG	0.00	0.00	S	S	S	S	S.	S.	S Z
(No./1,Juumis) of Mainmow Smeit Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	0.0 0.00 0.00	0.00	8	S	S	S.	SE SE	S	S Z
thyoplan	¥	0.00	0.00	0.00	0.00	9.09	999	9.00	0.00	0.00
iver 1ch	3	0.00	0.00	0.00	9.00	9.00	9.00	0.00 1000	0.00	0.00 0.00 10
udinal R	ŝ	99.0	9.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
bow smet m Longit	4	0.00	0.00	999	999	9.00	0.0 0.0 0.0 0.0	0.0 0.0 0.0	0.00 0.00 0.00	0.00
or Kalin	5	0.00	995	0.00 12	0.00	0.0 0.95 12	0.00	0.00	0.00	0.00
1,000ms) y Determ	12	9.00	9.0	9.0	0.0 1.00	0.00	0.00	0.00	0.00	9.00
ty (MO./ r Estuar	¥	9.00	995	9.65	995	9.0 1.88	0.00	0.00	0.00	0.00 1.00
Regional Densit in Hudson River	•	0.0 6.00 6	9.99	0.0 7	0.00 7	0.00	0.00	0.00	0.00	0.00
Table C-117 Regional Density (No./7,UUMBS) of Kainbow Smelt in Hudson River Estuary Determined From Longitu		DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS					
Table C	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT - 140CT

Table C-118 Regional Standing Crop (In Thousands) of Rainbow Smelt Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 2	0 0 801	0 0 80	0 11 0	8538 8538 118	1100	0 0 0 1	0 0 0 0 0 0	100	0 117	001
A C	000	000	000	000	၀၀ဥ	000	000	000	000	00%	000
S	ဝဝဥ	000	000	0010	000	000	000	00%	000	0010	000
98	ဝဝဆ	000	000	000	8538 8538 6	000	00	000	000	000	000
2	001	001	۸٥٥	۸٥٥	001	001	001	001	001	001	002
윺	009	۸٥٥	001	005	005	000	005	005	၀၀ဥ	005	000
* **	00%	000	00%	000	005	001	001	001	007	001	001
3	000	005	001	002	၀၀ဍ	0 0 5	ဝဝည္	0 0 1	0 0 E	0 0 E	001
9	00%	000	000	000	000	000	000	000	000	000	000
<u>a</u>	000	005	000	០០៛	004	000	000	000	0 0 £	00H	002
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72	002	002	៰៰ឨ	000	000	٥٥٤	005	005	002	002	004
¥	000	005	005	000	000	000	000	000	005	°°=	005
8 1	SX	S S	S S	S	S S	N.	χ	S	00%	000	000
	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOVS	Crop TOWS	Crop TOWS
	St. SE.	St. SE NO.	St. SE NO.	st. 86	SE.SE	SE SE	St. SE.	St. 86.	St.	St. SE NO.	St. Se.
DATE	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	O1JUN- OSJUN	OBJUN- 12JUN	15.JUN- 19.JUN	22JUN- 26JUN

E998 Table C-118 Regional Standing Crop (In Thousands) of Rainbow Smelt

> = 100 -	2	PINOLES OF THE PRINCIPLE	in Ruds	on River	r Estuary	Determi	Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey,	Longitue	Jinel Ri	er Ichtl	hyoplank	on Surve	y, 1992			
DATE			=	¥	21	5	≙	ŝ	3	¥	웊	KG	98	S	Regions AL Combined	7
-MIN-02		Croo	•	0	0	0	0	•	0	0	0	0	•	0	0	_
O3.1UL		<u>}</u>	. 0	0	0	0	0	0	0	0	0	0	0	0		
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06.1131.		Crop	0	0	0	0	0	0	0	0	0	0	0	0	0	_
10701		}		0	0	0	0	0	0	0	0	0	0	0		
	Š	TOUS	•	=	7	=	13	٥	.	~	1 0	~	•	•		_
20.JUL •	2	Crop	•	•	0	0	0	0	0	0	X S	SE	NS.	RS.	NS O	_
22.101.	S	L i	0	0	0	0	0	0	0	0					o ;	_
	2	TOWS	^	7	=	12	5	•	٥	•					22	
O4AUG-	st.	go C	0	0	0	0		0	0	0	S	SE SE	NS	¥S	NS O	_
06AUG	8		0	0		0	0	0	0	0					ָר ט יי	_
	Š	TOWS		=	F	12	P	•	5	•					2	
18416-	t	Crop	0	0	0	0	0	0	0	0	KS	NS NS	SE SE	SE	NS 0	_
20AUG	SE		0	0	0	0	0	0	0	0					0	_
	2	TOWS	~	Ξ	7	12	5	•	2	•					2	_
O1SEP-	St.	Crop	0	0	0	0	•	0	0	0	SH	NS	NS	ź	NS O	-
03SEP	8		0	0	0	0	0	0	0	0					-,	
	€	TOWS	7	=	=	12	2	•	2	•					e.	•
15SEP-	St.	Crop	0	0	0	0	0	0	0	0	SE	NS.	¥S	KS	NS O	~
17SEP	띯		0	0	0	0	0	0	0	0					- [-
	9.	1045	~	=	=	72	2	•	₽	•					2	_
28SEP-		Crop	0	0	0	0	0	0	0	0	¥S	SN	SX.	NS	NS O	~
30SEP			0	o	0	0	0	0	.	0					- 1	_
	9€	TOWS	7	=	=	12	0	•	5	•					ď	•
120CT-		Crop	0	0	0	0	0	0	0	0	NS	SX	X.	NS	NS 0	0
140CT	SE		0	0	0	0	0	0	- :	۰ د					- 1	3 *
		TOWS	^	=	=	12	2	•	2	٥					•	^

Table C-119 Regional Density (No./1,000m3) of Rainbow Smelt Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

. 70											
Regions Combined	0.00	<0.005 0.04 108	4.18 10.23 108	49.19 64.82 115	7.10	3.50 25.78 110	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	1.12 0.50 9	0.00	9.0 5.00 5.00	9.00	9.0.9	0.00	0.00 0.00 6	0.00	0.00
ន	0.00 0.00 0.00	0.00	18.39 8.46 9	0.00 0.00 5	9.20 4.66 6	0.00	0.00	0.00	0.00	0.00	0.00
86	0.0 8	0.00 8	12.25 3.96 8	30.79 8.89 6	13.92 4.10 6	0.0 8.0 8	0.0 8 8	0.00	0.00	0.00	0.00
KG	0.00	0.00	4.69 2.28 7	150.85 39.94 7	24.92 4.63	20.91 20.91 7	0.00	0.00	0.00	0.00	0.00
윺	0.00	0.00	6.66 3.11	187.48 42.04 11	17.86 11.04 11	20.24 15.05 10	999	999	0.00	9.00	0.00
¥	0.00	0.00	5.28 1.24 6	142.56 23.20 10	3.57 1.91 10	0.00	0.00	0.00	0.00	0.00	0.00
3	9.00	9.00	0.06	52.96 10.39 16	3.58 1.38 16	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00
ş	0.00	0.00	0.16 0.16 6	21.84 10.41 10	0.72 0.46 10	0.00	0.00	0.00	0.00	0.00	0.00
91	0.00	0.0 0.04 10	0.21	3.03 2.22 13	9.91 4.04 14	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00
5	0.00	0.00	1.33 0.81	0.75	1.55 0.70 9	0.88 0.88 13	0.00 0.00 13	0.00 0.00 13	9.00	0.00	9.0
12	0.00	0.00	0.00 12	0.00 0.00 10	0.00 0.00 10	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.0 1.88	99.	 188
18	S	S	X	S	SS	XX SX	S.	SE	0.00	0.0 0.09	9.09
	DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS						
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-119 Regional Density (No./1,000m3) of Rainbow Smelt Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

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BT YK	¥			72	3	<u>a</u>	ŝ	3	¥	윺	χg	SG	ន	7	Combined
DENSITY 0.00 0.00 0. SE 0.00 0.00 0. NO. TOUS 6 11	995		00	0.00	0.00	0.00	0.00 9.00 9	0.00	0.00 7	0.0 0.00 100 100	0.00	0.00	0.00	0.00	0.00 0.00 118
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 NO. TOUS 6 11 14	0.00		00	288	0.00	0.00	0.00	0.00 0.00 13	0.00	0.0 0.0 10	0.00	0.00	0.00	0.00	0.00
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 NO. TOUS 7 11 11	0.00		00	288	0.00	0.00	0.00	0.00	0.00	S	S.	NS.	S	NS.	0.00
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 NO. TOWN 7 11 11	0.00		0.0	88-	0.00	0.00 0.00 10	0.00	9.00	0.00	S	SX SX	SE	S	S	99°
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 0.00 0	0.00 11		0.0.	00-	0.00	0.00	0.00	9.00	0.00	S	S.	S	SN N	S.	0.0 3.00 3.00
DENSITY 0.00 0.00 0.00 s. 0.00 0.00 0.00 0.00	0.00		997		0.00	0.00	0.00	0.00	0.00	S	NS.	S	SE SE	X .	0.00 3.80 3.80
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 0.00 0	0.0 1.00 1.00		995		0.00	0.00	0.00	9.00	0.00	S .	S	Š	KS.	SS	9.00 2.00 2.00 2.00
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 NO. TOWS 7 11 11	0.00		995		0.00 0.00 12	0.00	0.00	0.00	0.00	9	SS	SS.	S S	S S	0.00 33 33
DENSITY 0.00 0.00 0.00 se 0.00 0.00 0.00 0.00 NO. TOWS 7 11 11	0.00	•	90-		0.00	0.00	0.00	0.00 10 10	0.00	S.	S	S.	SZ .	NS NS	0.00 200 200 200 200 200 200 200 200 200

Table C-120 Regional Standing Crop (In Thousands) of Rainbow Smelt Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0 0 00	9 0 BOL	8876 1693 108	112972 11732 115	14424 2437 118	6437 3869 110	100	200	1300	00 211	0 0 118
	¥	000	000	143 65	000	005	000	000	000	000	0010	000
	S	005	000	2956 1360 9	0010	1479 750 6	000	000	000	00%	0010	000
	98	000	000	2160 699 8	5429 1568 6	2454 723 6	000	000	000	000	000	00%
	KG	001	001	664 323 7	21341 5651 7	3525 655 7	2958 2958 7	001	001	001	001	۸۵۰
,	₹	00%	001	1103 515 7	31025 6958 11	2956 1827 11	3349 2491 10	000	000	000	005	005
	¥	000	000	1573 370 6	42502 6918 10	1064 569 10	400	001	001	001	00 r	۸٥٥
	3	ဝဝဝ	005	พ.พ.ธ	7404 1452 16	501 193	០០ប្	០០ជ	o o ប្	0011	០០ជ	០០ជ
	Š	000	00%	32 6	4530 2159 10	85 55 50	000	000	000	000	000	000
	91	000	٥.00	35	631 462 13	2066 841 14	000	000	000	០០ដ	0 O E	0 0 2
	5	0 0 E	០០ស្	196 120 13	58.0	229 103 9	130 130 130	001	0011	005	00=	005
	12	0 0 2	០០ជ	002	000	005	005	005	00=	004	004	0 0 7
	¥	005	005	005	000	000	000	000	000	005	005	005
	B	SE SE	S	N.	S.	SN	S	S	S	000	000	000
		Crop TOUS	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOMS
		St. C SE NO. 1	St. C SE NO. 1	St. C	St. C	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. 1	St. C SE 10. 1	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-120 Regional Standing Crop (In Thousands) of Rainbow Smelt Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 118	110	002	00K	00K	00K	ంండ	00E	00E
AL CO	000	000	SZ	S.	S	S	SN.	S	SN SN
S	00 W	000	SS.	SS	Ş	S S	S	S	S
98	00%	000	S	S	SE SE	S.	S	8	S
8	400	400	SZ Z	SS SS	S	S	S	S	S
•	005	005	S	\$	S	S	S.	Š	S
¥	001	400	000	000	000	000	000	000	000
3	00#	០០ជ	000	005	005	005	005	005	000
ş	000	000	000	000	000	000	000	000	000
<u>=</u>	ဝဝဉ်	០០ឯ	005	005	005	000	000	000	005
5	005	005	002	00%	002	002	0 0 2	0 0 2	001
12	002	002	005	005	005	005	00=	005	005
¥	005	005	00#	00#	00=		00=	••=	00=
6	000	000	001	۰۰۰	00h	001	00 r	001	001
	Crop	Crop TOUS	Crop	Crop TOWS	Crop TOMS	Crop TOMS	Crop TOMS	Crop TOMS	Crop TOWS
	S & 6.	S 8 5.	St.	S 88 5	SE.	8 St.	S & S.	8 S S	S # 5
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	288EP- 308EP	120CT- 140CT

Table C-121 Regional Density (No./1,000m3) of Rainbow Smelt Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

					•						
Regions Combined	0.00 100 100 100	0.00 1080	0.00	1.26 8.67 115	25.41 125.17 118	57.92 104.19 110	76.35 130.68 110	41.43	42.53 112.30 119	33.19 95.27 117	28.74 56.68 118
4	0.00	9.00	999	0.00	9.00	0.0 6.00 8	0.00	0.00	3.1. 38.0 30.0	0.00	0.0 0.09 4
S	0.00	9.00	999	9.00	99.9	9.0	9.0	99.9	90.0	4.17	9.0.9
SG	0.00	0.00	0.00	0.00	3.55 3.00 6	6.09 5.05 8	73.67 33.18 8	12.65 12.65 8	0.00	0.00 0.00 6	0.00
KG	0.00	0.00	0.00	0.00	0.86 0.61 7	36.28 11.96 7	56.46 8.08 7	178.72 147.60 7	4.56 4.56 7	4.88 3.45 7	0.00
윺	0.00	0.00	0.00	0.00	16.47 4.16 11	161.23 38.90 10	158.24 54.65 10	12.47 3.01 10	0.57 0.57 10	2.20 1.72 10	10.68 6.71 01
¥	0.00	0.00	0.00	0.00	145.43 118.72 10	388.89 93.62 7	259.17 53.28 7	42.60 26.76 7	37.23 22.20 7	72.26 53.30 7	6.23 2.59 7
3	0.00 10 10	9.00	9.0	0.0 0.0%	5.44 1.95 16	22.49 11.47 15	234.66 96.69 15	133.68 31.15	74.89 23.65	80.64 54.30 13	113.99 31.57 13
S	9.00	0.00 6.00 6.00	0.0 6.00 6.00	13.32 8.64 10	64.10 35.19	47.9 2.73	96.16 25.94 9	38.44 10.42 9	52.38 14.64 9	23.76 12.84 9	25.59 3.38 9
٩	0.00	9.00	0.0 0.0 0.0	0.77 0.54 13	65.38 17.22 14	37.72 11.68 9	21.52 7.51 9	67.64 32.98 9	49.04 23.37	45.16 15.11 13	23.25 6.52 12
3	0.00 13	0.00	0.00	1.01	2.81	14.68 5.11 13	10.66 2.38 13	7.83 3.06 13	211.71 102.22 11	68.55 16.37	39.59 9.63 11
12	0.00 0.00 12	0.00	0.00	0.00 0.00 10	0.57 0.43 10	9.46	5.55 1.25 11	1.35 0.87 11	70.52 13.35	123.12 50.86 14	119.81 43.34 14
¥	0.00	0.00 0.00 10	0.00	0.00	0.27	0.22	0.11	1.83	41.90 11.60	3.28 1.24 11	30.25 11.36 11
18	S S	S.	SZ SZ	SE SE	S	SE SE	SN SN	S.	8.45 3.49 6	3.43 2.31 6	4.28 3.28 6
	DENSITY SE NO. TOWS										
DATE	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22 JUN- 26 JUN

Table C-121 Regional Density (No./1,000m3) of Reinbow Smelt Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	4.70 10.74 118	2.24 8.50 119	1.62 11.34 72	0.4.4 74.5 74.5 74.5 74.5 74.5 74.5 74.5	3.68	3.5% 5.7%	0.00 2.00 2.00	9.9 2.88 2.88	0.0 0.00 23
4	0.0 6.00 6.00	0.0 6.00 6.00	SZ Z	SZ .	SZ Z	S	SE SE	Z.	S.
ន	0.00 0.00 5	0.00 0.00 6	S.	SN.	S	S	S	SH	S
S	0.00	0.00 0.00 6	SZ	S	SN	S	SX	S	SX
KG	0.0%	0.00	S	S#	\$	¥2	SZ	N.	S .
£	2.21 1.29	0.0 0.00 0.00	SX XX	SS.	SE	XX	SX	SE SE	SZ SZ
¥	3.86 1.94 7	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.00
8	13.52 5.49 13	0.22	9.00	9.0 0.0 0.0	0.0 0.00 1	1.1	0.0 0.00 5	9.00	9.00
£	8.28 4.42 9	0.42	0.00	0.00	0.00 0.00 6	3.67 3.67 6	9.00	9.09	0.00
<u>e</u>	7.11 3.03 13	0.0 0.0 0.0 0.0 0.0	0.0 0.0 10	0.0 0.0 0.0 0.0	0.0 0.0 10	9.00	0.0 0.0 5	999	9.00
3	12.68 4.88 11	6.23 3.95	0.00	0.00 0.00 12	0.00 0.00 12	0.00 12	0.00 0.00 12	0.00	9.00
12	6.29 1.53	7.41 4.08 14	0.59	4.38 4.38	0.00	0.00	0.00	9.00	9.00
¥	6.15 1.90 1.	7.62 4.53	1.12	0.00	0.00	0.0 1.00 1.00	0.00 0.00 11	0.00	9.99
*	0.00	7.15	11.27	0.39	0.00	0.91	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	285EP- 305EP	120CT - 140CT
					•		•		

Regions Combined	0 0 00	0 0 801	0 0 80	3078 1796 115	75171 36332 118	168827 28971 110	185050 24167 110	85040 24002 110	108957 18501 119	100094 24535 117	81949 15080 118
4	000	000		000	000		000	000	213 213 6	00 W	000
ຮ	005	000	000	0010	000	000	.000	000	000	670 670 5	000
SG	000	ဝဝဆ	000	000	626 529 6	1073 890 8	12987 5849 8	2230 2230 8	000	000	000
Ķ	00 ~	400	00h	901	122 87 7	5133 1691 7	. 7987 1144 7	25284 20881 7	645 45	687 069	906
윺	000	001	001	00=	2726 688 11	26681 6437 10	26186 9043 10	2063 499 10	220	365 10	1768 1110 10
¥	000		000	၀၀ဍ	43358 35395 10	115942 27912 7	77267 15885 7	12701 7979 7	11099 6619 7	21543 15891 7	1856 277 7
3	၀ ၀ င်	001	005	ოოგ	760 272 16	3144 1603 15	32804 13517 15	18687 4354 15	10469 3306 13	11273 17591 13	15935 4413 13
ş	000	000	000	2764 1792 10	13297 7301 10	3733 2014 9	19950 5382 9	7974 2161 9	10867 3036 9	4928 2665 9	5309 702 9
4	000	000	000	161 112 13	13620 3588 14	7858 2433 9	4484 1565 9	14091 6871 9	10217 4869 13	9407 3149 13	4844 1359 12
5	0012	០០ភ	00H	149 67 9	415 382 9	2168 755 13	1574 352 13	1156 452 13	31278 15102 11	10128 2418 11	5849 1422 11
17	005	002	0012	000	25 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	3045 1427 11	1785 403 11	273	22695 4296 14	39622 16367 14	38555 13946 14
¥	000	၀၀ ဥ	005	000	220	ន្តស្ល	ស ស ស	419 246 9	9613 2661 11	28.3 1.88 1.88	6939 2607 11
B1	æ	NS.	NS	N.	N.	S	S.	S	1767 728 6	717 482 6	894 886 6
	Crop TOMS	Crop TOWS	Crop TOMS	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOMS	Crop 10MS	Crop TOMS	Crop TOWS	Crop TOMS
	St. 1	% % %.	S 85.	% % ₹	S SF.	8 % .	S 85.	8 %.	S S .	£ % ₹	5 % S
DATE	13APR- 18APR	20apr- 25apr	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22 JUN- 26 JUN

Table C-122 Regional Standing Crop (In Thousands) of Rainbow Smelt Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	12056 2062 118	6687 1999 119	2802 2377 72	1491 1412 73	00E	1108 800 87	ook	002	002
¥	000	000	S	SE SE	S X	S	S .	S.	SE SE
S	00 in	000	S	S	æ	S	SE SE	S.	SZ SZ
SS	000	000	S	NS	Ş	S	S	S.	S.
W.	141 141 7	001	S	Š	S	S	22	S	\$2
₹	366 213 0	000	NS.	Ş	S	S	S S	S	SZ Z
*	1151 580 7	400	000	000	000	000	000	000	000
3	1890 768 13	225	000	000	005	155 155	005	000	ဝဝဉ
ŝ	1719 719 9	87 97 9	00%	000	000	762 762 6	000	000	000
<u>a</u>	1482 627 13	222	၀၀ဍ	005	000	005	000	000	000
3	257 11 12	921 583 11	00%	007	0012	00ជ	00 <u>7</u>	០០ជ	001
12	2025 494 14	2383 1314 14	<u> </u>	1410 1410 11	00=	001	00#	00=	00=
¥	1410 1123 11	1748 1038	257 257 11	00=	eo£	00=	00=	00=	00=
19	000	1495 918 6	2355 2355 7	222	400	85,	400	400	400
	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOMS	Crop TOUS	Crop TOUS	Crop	Crop TOWS	Crop TOUS
	S	St. (SE. 7	St. (SE NO. 1	St. (SE NO. 1	St. C	St. (SE NO. 1	St. C	St. (SE NO. 1	St. C SE NO. 1
DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-123 Regional Density (No./1,000m3) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

						,			•							
DATE		18	¥	71	5	٩	9	3	¥	윺	8	98	S	¥	Regions Combined	
13APR- 18APR	DENSITY SE NO. TOWS	S.	9.0	0.00 0.00 12	0.00	0.00	0.00	0.0 0.00 0.00	0.00	0.00 0.00 6	0.00	0.00 0.00 8	0.00 10	0.00	0.0 9.0 8	
20APR- 25apr	DENSITY SE NO. TOWS	S	9.0 5.00 5.00	0.0 0.00 12	0.00	0.0 0.00 0.00 0.00	0.00 0.00 \$	0.00	0.00 6.00	0.00	0.00 0.00 7	0.00 0.00 8	0.00	0.00	0.00 108 108	
27APR- 01MAY	DENSITY SE NO. TOWS	S.	0.00 100 100 100	0.00	0.00 0.00 13	0.0 0.00 10	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.00	9.00	0.00 108 108	
OGMAY- OBMAY	DENSITY SE NO. TOWS	S.	0.00	0.0 0.0 10	0.00	0.0 0.0 £1	0.00 0.00 10	0.0 0.0 16	0.00	0.00	0.00	0.00	0.00	999	0.00 0.00 115	
11MAY- 15MAY	DENSITY SE NO. TOWS	S	0.00	9.00	0.00	0.00	0.00 10 10	0.00 0.00 16	0.0 0.00 10	0.00	0.00	9.69	0.0 0.00 6	9.00	0.0 118	
18MAY- 22MAY	DENSITY SE NO. TOWS	\$	9.00	0.00	0.00 0.00 13	9.00	0.00	0.00 0.00 15	0.00	0.0 100 100	0.00	0.0 80.0 80.0	0.00	0.0 0.0 0.0 0.0	0.00	
25MAY- 30MAY	DENSITY SE NO. TOWS	SX.	0.00	9.00	0.00	0.00	0.00	0.00 0.00 15	0.00 0.00 7	0.0 0.00 100	0.00	9.0	0.00	9.9	0.00 10.00	
OTJUN- OSJUN	DENSITY SE NO. TOWS	SZ.	0.00	9.0	0.00 0.00 13	9.00	00.0	0.00 0.00 15	0.00	999	0.00	0.0 8 8	0.0 0.0 6.00	9.99	0.00	
08JUN-	DENSITY SE NO. TOWS	0.00	0.00 1.00	0.00 0.90 14	0.00	0.00 1.00	0.00	0.0 0.00 13	0.00	0.0 0.00 5	0.00	9.0	0.0 0.00 6	0.0 6.00 6	0.00 119	
15JUN- 19JUN	DENSITY SE NO. TOWS	0.00	995	0.28 0.28 14	0.00	0.0 0.08 £	0.00	0.0 4.0 13.0	0.00	0.0 5.86 5.80	0.00	9.69	9.00	0.00 0.00 5	0.03 0.32 117	
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	1.13 0.80 11	4.08 2.98 14	10.01 7.34 11	0.78 0.30 12	0.51	5.34 2.59 13	0.00	0.00 1000	0.00	9.00	9.00	0.0 6.0 6	1.68 8.40 118	

Table C-123 Regional Density (No./1,000m3) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	11.73 22.63 118	22.77 46.98 119	19.91 43.18 72	31.65 92.06 73.	10.25 13.20 73	12.81 18.87 73	1.90 4.51 73	6.37 21.22 73	6.96 11.67 73
4	0.0 0.0 6	0.0 6.00 6.00	S	SK.	\$	SX	SX	SE SE	28
ន	0.0 5.00 5.00	0.0 6.00 6	S.	SZ .	¥.	SZ.	S.	S.	S.
98 1	0.00	0.0 0.0 6	SH .	SZ .	S	S.	NS.	SR.	N.
KG	1.7 7.7	0.00	SN.	NS NS	Ş	S.	S.	S	X.
로	9.00	2.00 1.31	S.	S.	NS.	NS	SN	S.	S.
¥	5.32 2.60 7	5.25 2.70 7	8.69 4.26 6	0.77	0.76 0.44 6	1.03 0.69 6	2.82 1.67 6	0.28 0.28 6	1.61
YK TZ CH IP WP CM PK HP KG	34.52 10.41 13	21.84 11.47 13	2.57	3.1 11.0	18.14 7.96 10	54.94 15.90 10	2.13	2.55 2.55 10	3.84 2.14 10
3	23.86 10.76 9	9.60 2.42 9	3.09 1.15 6	82.80 69.31 6	19.62 2.55 6	20.82 8.24 6	9.01 3.58 6	43.21 20.94 6	48.15 11.22 6
9 1	21.05 6.56 13	25.00 8.77 13	15.58 15.50 10	67.82 57.32 10	14.05 7.54 10	3.01	1.00 0.26 10	3.82 2.19 10	2.32 2.17 10
5	12.59 5.18 11	49.93 20.20 11	19.12 7.71 12	25.69 12.47 12	8.31 0.98 12	4.71 2.15 12	0.00 0.00 12	0.31 0.31	0.00
12	51.68 14.37 14	44.58 10.89 14	16.26 8.51	18.24 6.83 11	10.31 5.65 11	5.5.5	0.00 1.00	9.65	9.69
¥	1.22 1.22	117.85 35.80	39.50 33.97	26.90 6.70 11	3.07	8.98 3.33	0.21	6.00 8.62	9.90
8	0.0	19.90 13.24 6	54.43 22.86 7	23.94 11.31 7	3.84	7.89	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	29JUH- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-124 Regional Standing Crop (In Thousands) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

BT YK TZ CH	, YK 12	21	•	5		₽	\$	3	¥	. ₽	KG	5 58	S	۸ 5 ه	Regions Combined
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11 16 11	6 11 14 11	14 11	-		₹		٥	Ð	~	욘	~	ø	ĸ	₩.	117
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0 184 959 1085	0 184 959 1085	959 1085	1085		3	٠.	105	361	0	0	0	0	0	0	1509
TOWS 6 11 14 11	6 11 14 11	14 11	Ξ		•	~	0	ħ	~	우	7	•	•	9	118

Young of Year Table C-124 Regional Standing Crop (In Thousands) of Rainbow Smelt

	Regions Combined	34881 5629 118	65067 10157 119	35334 9771 72	53362 19126 73	16715 2835 73	17691 3083 73	3270 946 73	10419 4386 73	11429 2410 73
	4	000	000	SZ Z	9	S	S	S	NS.	S.
265	ន	0010	000	S.	S	S.	S.	S	S	S Z
ırvey, 19	SG	000	000	S.	SZ.	SE SE	SE	SZ.	S	S
inkton St	8	246 246 7	400	S	SX	SX SX	SX SX	SS	SS	S Z
iding Crop (in incusance) of Maincom Smelt Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	000	332 217 10	S.	SX	SS	SZ	\$	S	S
al River 10	¥	1587 7.7	1564 806 7	2590 1271 6	230 230 6	227 130 6	307 205 6	841 498 6	వే వే ^అ	420 301 6
tudinal	3	4826 1455 13	3053 1604 13	359	984 435 10	2536 1113 10	7680 2223 10	303 298 10	356 356 10	537 299 10
rom Long	ŝ	4951 2232 9	1992 503 9	238 85 6	17178 14379 6	4071 529 6	4320 1709 6	1868 744 6	8964 4343 6	9988 2328 6
or Kalmo rmined Fi	2	4386 1367 13	5207 1827 13	3246 1148 10	14128 11943 10	2928 1571 10	627 273 10	208 10 10	736 455 10	483 452 10
ding Crop (in Incusards) of Kaimoom Smelt Hudson River Estuary Determined From Long	5	1859 766 11	7376 2984 11	2825 1139 12	3796 1842 12	1227 144 12	695 318 12	0 0 2	4 4 4 5 7	002
(In Ind ver Estu	77	16631 4625 14	14346 3506 14	5234 2738 11	5870 2198 11	3318 1817 11	352 352 11	001	905	005
ing crop udson Rf	¥	394 280 11	27037 8213 11	9061 7792 11	6172 1536 11	1607 705 11	2061 765 11	\$\$ =	££=	005
al Stand for E	6	000	4159 2767 6	11377 4778 7	5004 2364 7	802 467 7	1649 844 7	001	001	400
Region		Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOMS	Crop TOUS
-124		S S 5.	S S S	5 % S.	S 8 5	S S .	S S .	S S S	S 86 .	S & S.
Table C-124 Regional Stan in	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Table C-125 Regional Density (No./1,000m3) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

e ED								
Regions COMBINED	6.39 14.28 210	7.58 34.55 210	2.93 9.13 210	11.03 77.32 210	5.75 23.90 210	2.37 11.87 210	1.07 8.68 210	0.97 6.20 210
4	0.0 5.00 £	0.0 0.00 13	0.00 13	0.00 13	0.00 13	0.00 0.00 £1	0.00 0.00 13	0.00 0.00 13
ន	0.00 2.00 2.00	0.00 0.00 21	0.00 21	0.00 21	0.00 21	0.00	0.00 21	0.00
98	0.0 0.0 18	0.00 0.00 18	0.00	0.0 18 18	0.00 18	0.00	0.00 18 18	0.00 0.00
2	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00 0.00 15	0.00	0.00 0.00 15	0.00
€	1.54 0.94 10	0.0 0.00 10	1.56 1.56	0.09	0.00	0.00	0.51 0.51	0.70
¥	2.32 1.18 8	0.72 0.49 8	0.73 8	5.97 2.92 8	2.82 2.79 8	1.30 0.64 8	0.27 0.11 8	0.97 0.77 8
3	0.04	12.59 2.17 13	3.16 2.42 13	113.93 77.23 13	34.75 11.16 13	11.47 3.22 13	3.24 3.20 13	2.17 2.00 13
ŝ	8.49 5.97 8	35.89 32.61 8	18.80 5.26 8	7.05 2.12 8	31.33 20.95 8	15.66 11.41 8	8.82 8.05 8	1.86 1.67 8
₽.	24.37 7.32 14	3.10 1.81 14	0.04	0.74 0.64 14	0.00	0.03	0.00	5.85 5.53 14
5	26.00 10.22 27	3.38 2.67 27	0.49 0.22 27	0.04 0.02 27	0.05 0.04 27	0.00 0.00 27	0.00 0.00 27	0.02 0.02 27
12	7.86 2.46 46	5.37 1.67 46	2.89 1.26 46	0.35 0.17 46	0.01 0.01 46	0.00	0.00	0.00
¥	6.05 1.46 17	29.90 10.59	7.47 6.73 17	4.14	0.09	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL - 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-126 Regional Standing Crops (in Thousands) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	15549 2650 210	19155 7236 210	7549 1991 210	406 845 210	229 692 210	5244 2417 210	445 731 210	219 261 210
2 8	₹ %	6	K	86	54	ww.	Ø -	25.
¥	0 0 E	0 O E	001	0015	0 0 13	0010	0 0 £	001
S	2100	2100	2,00	200	0 0 12	200	200	2100
98	008	002	ဝဝည်း	00 %	ဝဝရာ	0 0 2	0 0 2	002
2	005	0 0 t	ဝဝည	0015	០០ស	001	ဝ ့ ဝ က	០០ជ
웊	255 156 10	000	258 258 10	25 25	၀၀၀	005	225	113 113
¥	692 353 8	216 147 8	225 209 8	1781 870 8	841 833 8	386 190 8	5 % a	290 231 8
3	ራ ಬඩ	1760 303 13	441 338 13	15926 10795 13	4858 1561 13	1604 450 13	452 447 13	304 280 13
S S	1760 1239 8	7445 6765 8	3900 1090 8	1463 441 8	8 4346 8 8	3248 2367 8	1829 1670 8	386 347 8
4	5077 1524 14	645 377 14	004	154 134 14	004	944	002	1219 1151 14
5	3841 1509 27	500 394 27	32 22	6 4 27	8 27	0 0 27	0 0 27	33
12	2531 791 46	•				009		004
¥	1387 336 17	6860 2429 17	1715 1545 17	950 316 17	20 11 17	0 0 7	0 0 7 1	001
	Crop	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TONS
	SE SE.	SE SE	SE.	SE.				% % 86.
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-127 Regional Catch-Per-Unit-Effort (CPUE) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

ris NEO										
Regions COMBINED	9.00	0.0	0.00	9.00	9.00	0.00	9.00	0.00	9.95	9.00
¥	0.00	0.00 0.00 12	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	99.6	0.00 190 190	90.0	90.00	0.00	0.00 0.00 0.00	0.00	0.00	0.00	0.00
80	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ĸĢ	0.00 0.00 8	0.00	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00 5.00	0.00 5.00	0.0 0.00 5
윷	0.00 0.00 8	0.00	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 5.00
3	0.00	0.00	0.00 3.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.00	0.00 6.00 6.00
9	0.00	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 8
4	0.00 0.00 3	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5
₹	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 14	0.00
71	0.00	0.00	0.00	0.00	0.00 0.00 24	0.00 2.00 2.4	0.00 24 24	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00	0.00
	æ	হ	æ	হ	હ	ক		হ	æ	£
	CPUE SE NO. TOWS									
DATE	23 JUN- 26 JUN	06JUL-	20 JUL - 22 JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	280CT-

Table C-128 Regional Standing Crops (in Thousands) of Rainbow Smelt Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	008	000	000	008	၀၀႙	008	008	008	000	000
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8	000	000	000	0010	0010	0010	00 W	00 in	000	0010
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¥	000	000	000	00 IN	00 W	0010	0010	00 W	00 W	0010
3	00m	00M	00M	000	000	000	000	000	000	000
ŝ	00m	oom	00 M	00 N	00 in	00 M	0010	0010	00 m	00 W
<u>a</u>	00M	00 M	00m	000	00 W	0 O IN	0010	001	000	0010
5	۰۰۰	001	001	002	004	004	004	004	004	004
77	005	005	°°5	200	200	00%	00%	00%	00%	00%
¥	00M	00 M	00M	00 W	0010	0010	00 m	00 M	0010	0010
				• •	0 4		0 60	0 14	Q (A	0. 60
	Crop TOUS	Crop TOHS	Crop 1048	Crop TOWS	Crop TOUS	St. Crop SE NO. TOWS	Crop TOWS	Crop TOMS	Crop TOUS	Crop TOWS
	S S 5.	\$ 8 5.	8 8 St	8 8 £	5 % S	5 K S	8 8 5.	\$ # £	S S S.	SE. NO.
DATE	23JUN- 26JUN	70F60 -70F90	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	288EP- 30sep	120CT- 150CT	260CT- 280CT

Table C-129 Regional Density (No./1,000m3) of Rainbow Smelt Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

								
Regions COMBINED	0.00	0.07 0.73 210	0.00	<0.005 0.02 210	<0.005 0.02 210	0.00 0.00 210	0.01 0.05 210	0.00 210
¥	0.00 0.00 13	0.00 0.00 13	0.00	0.00	0.00	0.99	0.00	0.0 13 13
ន	0.00 0.00 21	0.02 0.02 21	0.00	0.00	0.00 0.00 21	0.00	0.00	0.00 0.00 21
98	0.00 0.00 18	0.00 0.00 18	0.00	0.00 0.00 18	0.00 18	0.00	0.00 18	0.00
9	0.00 0.00 15	0.05 0.05 15	0.00	0.00 0.00 15	0.00 0.00 15	0.00	0.00 0.00 15	0.00 0.00 15
윺	0.00	0.0 0.00 0.00	0.00	0.00 100 100	0.0 0.00 t	9.00	0.00	0.00 0.00 10
¥	0.0 0.00 8	0.00 0.00 8	0.00 0.00 8	0.0 0.08	0.00	0.00 8	0.00	0.0 8
3	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
ŝ	0.00 0.00 8	0.0 8.0 8	0.00 0.00 8	0.02 0.02 8	0.02	0.00 0.00 8	0.03	0.00 0.00 8
<u>•</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00 0.00 27							
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TONS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
DATE	13 JUL - 18 JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT - 090CT	190CT - 230CT

Yearling and Older Table C-130 Regional Standing Crops (in Thousands) of Rainbow Smelt

	Regions COMBINED	210	0 162 0 151 3 210	210	0 0 2 3 2 10	0 3 2 10 3	0 0 0 0 13 210	0 12 0 8 13 210	0 0 0 0 13 210
	S AL	0 0 1	1 13 0	000	000	21 13	2,00	200	200
	รว จร	0 0 18 21	0 4 0 4 18 21	0 0 0 0 18 21	0 0 18 21	0 0 81	0 0 18	0 0 2 2	0 0 81
	KG S	002	88 21	0 0 1	0 0 15 1	0 13 1	0 0 1	၀၀ 1	00 र 1
2	품 *	000	.005	005	005	005		000	002
1992	- *	000	000	000	008	000	○○ ∞	00 &	000
ey,	3	001	០០ជ	០០ជ	០០ជ	ဝဝည	០០ជ	លសញ្	០០ជ
Shoats	9	008	151 151 8	000	448	mmæ	000	~~ 8	008
ver Estuary Determined From Fall Shoals Surv	٩	004	004	002	004	004	004	004	004
termined	3	0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	27
crops (1	72	00%	009	00%	003	003	00%	00%	003
	¥	001	0 0 7	0 0 1	004	0 0 7	0 0 71	0 0 71	001
lable t-lou kegionat ota in Hudson Ri		St. Crop SE NO. TOWS	Crop TOWS	. Crop	Crop TOWS	. Crop	. Crop	. Crop	. Crop
- - -			SE SE	S SE.	se.	. S & .	SE. SE.	8 8 S	8 8 5
apre	DATE	13JUL- 18JUL	27.JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-131 Regional Catch-Per-Unit-Effort (CPUE) of Rainbow Smelt Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

•										
Regions COMBINED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.00 0.00
₹	0.00	0.00	90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.00	0.00	90.0	9.00	0.00	9.00	0.0 0.0 0.0	9.00	9.00	9.00
SG	0.00 \$	0.00 5	0.00 0.00 15	99.0	0.00	0.00	99.6	99.0	99.0	99.6
KG	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5
₹	0.00 0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00 5.00
¥	0.00 0.00 8	0.00	0.00 0.00 8	0.00	0.00	0.00 0.00 5	0.00	0.00 0.00 5	0.00	0.00
3	0.00 0.00 3	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ŝ	0.00 0.00	0.00 x	0.00	0.00	0.00	0.00	0.00	0.00 2.00	0.00	0.00 5.00
<u>a</u>	0.00 0.00 3	0.00 3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 5.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00 3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						44	40			4
	CPUE SE NO. TOWS									
DATE	23JUN- 26JUN	10°60 - 10°90	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Yearling and Older Table C-132 Regional Standing Crops (in Thousands) of Rainbow Smelt in Hurson Biver Estuary Determined From Reach Saine Surv

	Regions COMBINED	0 001	0 0 0	0 0 00	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	000
	¥	002	002	០០ជ	001	001	001	001	400	00 ~	001
	S	000	00 5	000	002	005	005	000	005	005	000
	SG	៰៰ស	00t	០០ស	000	000		000	000	000	000
	KG	000	000	000	0010	00w	0010	00 W	0010	00 In	001
	£	000	000	000	0010	00 in	00 W	0010	002	0010	001
1992	¥	000	000	000	0 O W	00 w	00 iv	00 IN	00 W	0010	001
Survey,	3	00m	00m	00m			000	000	000	000	000
ch Sein	ŝ	00m	00m	00m	0010	00in	00 in	0010	0 0 iv	0010	001
from Bea	<u>e</u>	00m	00m	00m	00 tv	0010		o ò ru	00 W	0010	0010
ermined	₹	۸٥٥	001	001	004	004	007	004	004	004	004
ver Estuary Determined from Beach Seine Survey,	21	005	005	005	00%	00%	00%	00%	0 0 %	00%	00%
-	¥	00m	00m	00M	0010	00 to	00 W	0010	00 W	00 tu	0010
in Hudson R		Crop TOWS	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOWS	Crop TOWS	Crop .	e ¥	Crop TOWS	e s
ŧ		St. Crop SE NO. TOWS	St. Cr. SE NO. TO	St. Crop SE NO. TOWS	St. Crop SE NO. TOHS						
	DATE	23JUN- 26JUN S	3 70060 8 -10160	203UL - 8	03AUG- 06AUG- 9	17AUG- S 20AUG S	31AUG- 9	14SEP- 9	28SEP- 9	120CT - 150CT 8	260CT - \$

Table C-133 Regional Density (No./1,000m3) of Hogchoker in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

ned 78	9.9. 8.8.8	888	888	885	888	889	ស្ដីទ	សិទ្ធិទ	= r o	955	0 O O
Regions Combined					0.00 118	9.0.1	0.05 0.58 110	0.05 0.59 110	0.01 0.17	467.86 1538.27 117	129.02 950.19 118
¥	9.00	9.9	9.9	9.9	0.0	0.0	0.00	0.00	0.00	0.0 5.00	0.00
cs	0.00	0.00	0.00	9.9	9.0	0.00	0.00	0.00	0.00	0.00	0.00
S	9.0	0.0 8.00 8	0.0	0.00	0.00 0.00 6	0.0 0.0 8	0.0 0.0 8	0.0 0.08 8	9.09	9.09	0.00
X S	0.00 0.00 7	0.00	0.00 0.00 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
슢	0.00 0.00 0.00	0.00	0.00	9.6	0.00	0.00 1.00	0.00 0.00 10	0.00 0.00 0.00	0.0 0.0 0.0	0.00	0.00
፷	0.00	0.0 8.0 8	9.0	0.0 0.0 0.0	9.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00 0.00 11	9.00	0.00	0.0 5.8	0.00	0.00 15	0.00 0.00 15	0.17 0.17 13	0.00 0.00 £1	0.00
ş	0.00	0.00 0.00 6	0.0 0.0 6	0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.0 0.00 10	0.0 0.00 10	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00 130	0.00	0.00
3	0.00 0.00 13	0.00	0.00 13	9.00	9.00	0.00	0.00 13	0.00 0.00 13	0.00	0.00	0.00
12	0.00	0.00	0.00 0.00 12	0.00 0.00 10	0.00	0.00	9.00	9.00	0.00	1.42 1.18 14	158.02 80.54 14
¥	9.00	0.00	0.00	0.00	0.00	0.00	0.58	0.59	0.0 1.00 1.00	5273.36 1537.56 11	1180.73 932.68 11
₽9	S Z	₹ S	Z.	SN	X	S S		S .	0.00	807.38 5273.36 46.99 1537.56 6 11	338.51 1180.73 162.74 932.68 6 11
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS									
DATE	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-133 Regional Density (No./1,000m3) of Hogchoker Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

									•
Regions Combined	47.78 161.49 118	214.57 912.72 119	81.07 51.28 72	244.35 1061.13 73	15.13 74.17 73	388	388	0.0 3.00 3.00 3.00	0.0 0.00 73
¥	0.00	0.00	S S	Z.	2	X X	Z.	S	S
S	0.00 2.00	0.00	S	S	SE SE	SE	2	SX XX	SS
SG	0.00 0.00 6	0.00	S S	₹ .	₹ .	ž Ž	Z.	S	S
ă	0.00	0.00	XX	SS SS	\$	ž.	2	X X	S
₽	9.00	9.00	S	SE SE	2	SN .	SE .	SE	NS
¥	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00 130 13	90.0	0.00 0.00 0.00	0.0 0.0 0.0	0.00 0.00 10	0.00	0.00	0.00
\$	999	999	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>=</u>	0.00 0.00 13	0.00	0.00	0.00 0.00	0.0 40.0 10	90.0	9.00	0.00	0.00
₹	0.00	0.00	0.00	0.00 12	0.00	0.00	0.00	0.00	0.00
12	110.61 64.22 14	0.00	0.00	995	0.43	9.0	9.6.	9.0	9.0
¥	335.84 103.68 11	1310.31 701.64 11	73.68 33.82 11	23.23 6.30 11	120.54 74.17	9.0	9.6	0.00	9.65
*	174.71 105.84 6	1479.15 583.75 6	574.92 38.55	1931.57 1061.11	0.00	0.00	0.00	0.00 0.00 7	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS							
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	288EP- 30SEP	120CT - 140CT

Table C-134 Regional Standing Crop (In Thousands) of Hogchoker Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions	0 0 0	0 0 801	0 0 80	0 115	0 0 118	0 0 0 0 0 0	133 133 110	135 135 110	24 19	1379026 352883 117	392488 218208 118
4		000	000	000	005	000	000	000	004	001	000
٢	000	000	000	0010	000	000	000	000	000	00 W	000
9		000	000	000	000	000	&	000	000	000	00%
9	001	001	001	001	001	400	001	001	001	001	001
9	000	001	400	005	005	စစစ္	005	000	005	005	၀၀ဥ
ă	. 000	000	000	005	005	001	001	001	001	001	001
3	000	005	005	ဝခ်	002	0 0 2	០០ស្	០០ស	222	០០ដ	001
S	000	00%	000	005	000	000	000	000	000	000	000
٩	000	005	000	0012	002	000	000	000	០០២	00ជ	005
3	០០ឯ	០០ភ	005	000	000	0012	០១ជ	០០ឆ្	• • •	٥٥٤	005
12	007	002	002	005	005	°°=	005	00=	004	458 378 14	50852 25920 14
¥	000	000	000	000	000	000	133 9	135 135 9	°°=	1209815 352746 11	270884 213976 11
18	S.	S	SZ SZ	S#	S	SE	SZ Z	SZ.	000	168752 1 9821 6	70753 34015 6
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS
	SE SE	S & .	St.	S S .	St. SE NO.	S SE.	St.	St.	St.	8 St.	S S
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-134 Regional Standing Crop (In Thousands) of Hogchoker

	Regions Combined	149162 38502 118	609774 201986 119	137068 11186 72	409051 221791 73	27803 17017 73	ook	00K	00K	00%
	*	004	000	SN	SX	S.	SZ.	NS NS	S	₹ .
365	S		000	SZ	\$	S	S	S	S	SS
urvey, 1	SG	000	000	S.	S Z	XX XX	SZ SZ	S	S	S .
ankton S	χ.	400	400	S	S	S	SE	S	S	S X
chthyopl	윺	002	000	\$2	S	S	S	SX.	S	S X
River 1	¥	00	400	000	000	000	004	000	000	000
itudinal	3	០០ជ	០០ជ	000	005	000	၀၀င္	000	005	005
rom Long	ş	000	000	000	000		000	000	000	000
rmined F	٩	០០ជ	០០ជ	005	005	995	000	000	000	005
ary Dete	5	005	005	005	០០ជ	002	0 0 2	002	002	002
Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	71	35597 20667 14	004	00,5	005	139 139 11	001	°°;	00=	002
udson Ri	¥	77048 23787 11	300612 160971 11	16903 775 11	5329 1538 11	27655 17017 11	00=	00=	00=	00=
i i	18	36518 22123 6	309161 122011 6	120165 8058 7	403722 221785 7	001	001	001	400	400
		Crop TOWS	Crop TOUS	Crop TOMS	Crop TOUS	Crop TOWS	Crop TOMS	Crop TOUS	Crop.	Crop TOWS
5		% % %	St.	St.	SE.	S SE.	S S S.	S & .	SE.	SE SE
	DATE	29.JUN- 03.JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-135 Regional Density (No./1,000m3) of Hogchoker Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 100 000	0.00 0.00 108	0.00 0.00 108	0.00 0.00 115	0.00 0.00 118	0.00 110	0.00 110	0.00 110	0.00	0.00 117	0.00 118
¥	9.00	0.00	0.00	0.00	0.0 0.0 100 100	0.0	9.0	9.00	0.00	0.00	0.00 0.00 6
ន	0.00 10	0.00	9.9	0.00	0.00	0.00	0.00	0.0 0.0 6	0.00	0.0 0.00 5	0.00
SG	0.00	0.00 8	0.0 8	9.00	0.00	0.00 8	0.00	0.0 0.00 8	0.00	0.00	6.98
KG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00	0.00	0.00	0.00	0.00	0.0 0.00 10	9.09	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00 0.00 10	0.0 0.0 0.0 0.0	0.00 0.00 7	0.00	0.00	0.00	0.00	0.00
3	0.00	9.0	9.0	0.00 0.00 16	0.00 0.00 16	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.0 0.00 13	0.00 1300	0.00 0.00 13
£	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	9.00	9.00	0.00 130	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 12
3	0.00	0.00 0.00 13	0.00 0.00 13	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00 0.00 12	0.00 12	0.0 0.0 10	9.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00 100 100	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00
19	S	S.	Š	S S	SX SX	. XX	X S	×	9.0	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS				
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY - 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Yolk-Sac Larvae Table C-135 Regional Density (No./1,000m3) of Hogchoker

	Regions Combined	0.00	0.00	0.00	0.00 2.00 2.00	998	998	0.00	388	995
	*	0.00	0.00	S	S	S.	S.	SX XX	SH .	SS
	ន	0.00 5	0.00	X	S.	¥	Ş	S	SH.	S S
~	98	0.00	0.00	S.	N.	S	S.	S	S	SE .
vey, 199	, K	0.00	0.00	S.	\$	S	S	S.	S.	S Z
kton Sur	윺	0.00 0.00 0.00	0.00	S	S	S	S.	S	X.	S .
thyoplan	¥	0.00	0.00	0.00	0.00 6.00	0.00	0.00	9.00	0.00	0.00
Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	3	0.00	0.00	0.00	999	0.00 10 10	0.00 1000	0.00 0.00 0.00	0.0 0.0 0.0 0.0	0.0 0.00 1.00
udinal R	ŝ	9.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.00	0.00
From Longit	<u>a</u>	9.00	0.00	0.00 100 100	0.00 0.00 10	0.00	0.00	9.00	0.00	9.00
ined Fro	5	0.00	9.00	0.00	0.00 12	0.00	0.00	0.00	0.00	0.00
Estuary Determined	21	0.0 0.00 4	0.00	0.00	0.00	0.00	0.00 +	0.0 1.00	0.0 1.00	9.00
_	¥	0.0 1.00 1.00	9.0	0.00 1.00	0.00 1.00	0.00	0.0 1.00	9.0	9.00	995
Regional Density in Hudson River	16	0.0 6.00 6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iable C-135 Kegional Density in Hudson River		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
Table	DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	288EP- 30SEP	120CT- 140CT

Table C-136 Regional Standing Crop (In Thousands) of Hogchoker Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

ns Dec	008	008	0 0 8	ဝဝည	000	005	005	000	000	005	000
Regions Combined	7	5	. 2	=	118	=======================================	=		200	=======================================	001
4	000	000		000	005	000	000	000	009	00 W	000
S !	005	000	000	000	000	000	00%	00%	00%	0010	000
98	000	000	000	000	00%	000	008	000	000	000	000
KG	001	001	001	400	006	001	001	001	001	400	001
윺	000	001	001	°°=	005	005	٥ - 5	005	005	005	000
¥	000	000	000	000	005	001	901	001	001	001	001
3	၀၀ဥ	005	°°5	002	002	0 0 ស៊	០០៦	០០ស្	0 o ti	០០៦	០០ឆ
€	00%	000	00%	000	005	000	000	000	000	000	000
<u>a</u>	000	000	005	០១ដ	004	000	000	000	005	០០ឯ	005
5	ဝဝည	០០ជ	00 ti	000	000	០០ឯ	೦೦ಓ	០០ឯ	005	005	°°5
12	004	002	002	000	000	005	°°±	005	002	004	002
¥	000	၀၀ဥ	005	000	000	000	000	000	005	005	00=
₩	S.	S	S	S	S2	SE SE	S	S	000	009	000
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS
	St. SE NO.	St. NO.	St. No.	SE.	St.	SE.	Se St.	SE	St. C	St. 6	St. C SE NO. 1
DATE	13APR- 18APR	20APR- 25APR	27APR- O1MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Yolk-Sac Larvae Table C-136 Regional Standing Crop (In Thousands) of Hogchoker

	Regions Combined	0 0 811	110	200	00K	00K	00K	ook	ook	ook
	4	000	00%	S	S	S	SE SE	SE	Ş	S
1992	ន	00 N	00\$	SE .	SE	æ	SS SS	SZ SZ	S =	S
	S	000	000	SZ	SE	S	SS	SS	SZ	S
inkton St	KG	۸٥٥	00 ~	S	S	Š	S Z	S	SX	S Z
ing tipy tim impossible of magnitude in the second section Survey, idean River Ichthyoplankton Survey,	£	005	000	æ	S Z	S.	S S	S S	SN	S
River 10	¥	۸٥٥	001	000	004	000	000	000	000	000
tudinal	3	001	001	000	005		000	005	005	002
om Long	9	000	000	000	000	000	000	000	000	000
mined From	<u>-</u>	0012	001	000	005	005	000	005	005	000
idson River Estuary Determ	5	00=	00=	005	002	0 0 21	002	002	0 0 21	002
ver Estu	21	004	004	005	005	005	005	00=	005	005
dson Rt	¥	005	005	005	005	005	005	00=	005	002
T C T	84	000	000	901	400	901	001	۸٥٥	400	400
S Region		St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS					
Andre C'IJO Regional Standard in Al	DATE	29JUN- ST 03JUL SE	06JUL - SE 10JUL - SE	20JUL - SE 22JUL - SE 82JUL - SE	04AUG- ST 06AUG ST	18AUG- SI 20AUG SI	OJSEP- SI OJSEP SI	158EP- SI 17SEP SI	28SEP- Si 30SEP SI	120CT - Si 140CT SI

Table C-137 Regional Density (No./1,000m3) of Hogchoker Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Pontone	Combined	0.00 100 100 100	0.00 0.00 108	0.00	0.00 0.00 115	0.00	0.00	0.00	0.00	0.00	0.00 0.00 117	0.00 118
	¥	9.00	99.0	0.00	0.00	0.0 0.0 0.0	9.0	999	0.00	0.00	0.00	0.00
	S	9.0 5.85	0.00	0.00	0.00 0.00 5	0.0 0.90 6	9.0	88.	0.00	0.00	0.00 5.00	0.00
	SG	0.0 8	0.00 0.00 8	0.0 8	96.9	999	0.00	0.00	0.00	0.00	0.00	9.99
	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	윺	0.00	0.00	0.00	9.0	0.00	0.00 1000	0.00 0.00 10	0.00 100 100	9.00	0.00 0.00 0.00	0.00
	¥	0.00	0.0 6.0 6.0	9.00	0.0 1000	0.00 10 10	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.0 10 10	9.0	9.00	0.00 16	0.00 16	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00
	ŝ	0.0 6.00 6.00	0.00	0.0 6.00 6	0.0 0.00 100 100	0.00	0.00	0.00	0.00	0.00	66.6	0.00
	<u>-</u>	0.00	0.0 0.00 10	0.00	0.0 0.0 13	0.0	0.00	90.0	0.00	0.00	0.00 0.00 13	0.00
	3	0.00	0.00 0.00 13	0.0 0.00 13	9.00	0.00	0.0 13 13	0.00	0.00	0.00	0.00	0.00
	72	0.00	0.00 0.00 12	0.00 0.00 12	0.0 0.00 10	9.0 5.85	9.6	0.00	0.00	0.00	0.00	0.00
	¥	0.00	0.00	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	00.0	0.00 1100	0.00	0.00
	B	S.	S.	SX	SZ.	SE SE	S	S	Š	0.00	0.00 0.00 6	0.00
		DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS						
	DATE	13APR- 18APR	20APR- 25APR	27APR- OTMAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-137 Regional Density (No./1,000m3) of Hogchoker Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 118	0.00	0.00	0.0 0.0 2	0.07 0.39 73	0.0 2.00 2.00	3.00	0.00 73	3.00
¥.	0.00	00.0	x	S	X	SE SE	S	SE .	SZ SZ
S	9.00	0.00	SE SE	SX SX	SZ Z	S S	¥	Ş	æ
98	9.09	9.09	S	S S	SX SX	S	SX SX	SE	SS
8	0.00	0.00	%	S	S S	S	S S	ž	X X
윺	90.0	9.00	X X	S.	S.	S	ž.	S	S.
¥	9.00	0.00	9.0	9.00	0.26 0.26 6	0.0 0.0 6	0.00	0.0 0.0 6	0.00
8	0.00 1300	0.0 130 13	999	0.0 0.0 0.0	0.29	0.00 0.00 t	0.00 0.00 0.00	0.00 100 0.00	0.00 1000
\$	9.00	9.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00 0.00 13	0.00 0.00 0.00	0.0 0.00 0.00	0.00	0.00	999	 6.00 5	0.00
5	0.0 1.00	0.00	0.00	0.00	0.00 12	0.00	0.00 12	0.00 0.00 12	0.00
12	0.00 0.00 14	0.00	0.00	0.00	0.00 1.00	0.00	 	0.00	 200
¥	9.00	0.00	0.00	0.00	995	0.00	995	0.0 1.00	995
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- 03SEP	15SEP- 17SEP	288EP- 30SEP	120CT - 140CT

Table C-138 Regional Standing Crop (In Thousands) of Hogchoker Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

										•		
	Regions Combined	0 0 5	0 0 80	0 0 801	1 0 0 1 1 1 1	008	900	000	0 0 2	100	0 117	0 0 \$
	4	000	000	000	000	005	000	000	000	000	001	000
	CS	ဝဝဉ	000	000	0010	000	000	000	000	000	00 W	000
•	98	000	000	000	000	000	6	000	000	000	000	000
	KG	001	906	001	001	001	001	001	001	001	001	001
	£	000	۸٥٥	001	005	00 <u>=</u>	000	005	၀၀ ဥ	005	005	၀၀ဥ
	¥	00%	000	000	005	005	001	001	007	001	006	400
	3	005	°°=	005	00%	002	00t	ဝဝည	001	001	0 0 E	០០ជ
	d.	000	000	000	005	005	000	000	000	000	000	000
	9	000	000	000	0011	002		000	000	០០ឯ	០០ជ	000
	*	០០ជ	ဝဝည	០០ឯ	000	000	0 0 E	០០ជ	001	00=	005	005
	12	0 0 21	0 0 2	០០ជ	005	005	005	005	°°=	004	004	004
	¥	005	005	005	000	000	000	000	000	00=	00=	005
	19	SZ Z	S.	S.	NS.	S.	S	S	N.	000	000	000
		Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
		St. C SE. 1	St. 0 SE 10	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. T	St. C	St. C SE NO. T	St. C
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	OSJUN OSJUN	12JUN-	15.3UN- 19.JUN	22JUN- 26JUN

Table C-138 Regional Standing Crop (In Thousands) of Hogchoker Post Volk-Sac Larvae in Hudson Rivar Estuary Determined From Longitudinal River Ichthyoslankton

	Regions Combined	0 8 1	900	002	00K	117 78 57	00K	002	00%	00K
	A.	000	000	S	SN	S.	S	S.	S	S.
1992	ន	00 W	004	S.	S	æ	S.	S	¥.	X.
Survey,	8	000	000	S	SZ.	S	S Z	S	S	SZ.
ankton :	9	400	001	X.	S	SE SE	SH.	S	S.	N.
chthyopl	. ₹	000	005	S	S S	S	SZ	82	S	SZ
River	¥	001	00 >	000	000	°23		000	000	000
tudinal	3	ooti	0012	000	005	44 0	000	000	005	005
om Longi	ŝ	000	000	000	000	000	000	000	000	000
mined Fr	٩	0 o ti	០០ឯ	005	005	005	005	005	000	0.05
ry Deter	5	005	005	002	002	002	002	002	002	002
r Estue	12	004	004	00[005	005	005	005	°°5	00 <u></u>
ludson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	×	500	005	005	•°=	°°5	°°5	00 =	005	005
Ē	8	000	000	001	906	400	001	400	906	400
		Crop TOUS	Crop	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS
		S SE.	S & .	St. No.	% % €.	S SE .	S SE.	St.	St.	S SE.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-139 Regional Density (No./1,000m3) of Mogchoker Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

DATE		8	¥	12	5	9	ş	3	¥	줖	8	SG	ន	A C	Regions Combined
13APR- 18APR	DENSITY SE NO. TOWS	SX SX	0.00	0.00	0.00 ££	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00 106
20APR- 25APR	DENSITY SE NO. TOWS	X.	0.00	0.00 12	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.0 8	0.00	0.00	0.00
27APR- 01MAY	DENSITY SE NO. TOWS	NS NS	0.00	0.00	0.00 0.00 t3	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 108 108
04MAY- 08MAY	DENSITY SE NO. TOWS	₹	0.00	0.00	0.00	0.00	9.00	0.00 16	9.00	0.00	0.00	0.00	0.00	9.00	0.00 115
11MAY- 15MAY	DENSITY SE NO. TOWS	<u> </u>	0.00	0.00	9.00	0.00	9.00	0.00 5.00	0.0 0.00 5.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 118
18MAY- 22MAY	DENSITY SE NO. TOWS	S S	0.0 0.00	0.00	0.00	0.00	0.00	0.0 0.00 15	0.00	900	0.00	0.00	0.00	9.0	0.00
25MAY- 30MAY	DENSITY SE NO. TOWS	S.	0.00	0.00	0.0 0.00 t	0.00	0.00	0.00 15	0.00	0.00	0.00	0.00 8	0.00 6.00 6	99.9	0.00 110
01 JUN- 05 JUN	DENSITY SE NO. TOWS	SZ	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00 0.00 15	0.00	9.00	0.00	0.00	0.00	0.00	0.00
08JUN- 12JUN	DENSITY SE NO. TOWS	0.0 0.09 6.09	0.00	0.00	0.0 11	0.00 13.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15 JUN- 19 JUN	DENSITY SE NO. TOWS	0.00	0.00 1.00	0.00	0.00	0.00 13.00	9.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00 5.00 %	0.00 5.00 5.00	0.00 0.00 117
22JUN- 26JUN	DENSITY SE NO. TOWS	0.00	0.0 1.00 1.00	0.00	0.00	0.00 12	0.00	0.00 0.00 t3	0.00	0.00	0.00	0.00	0.00 6.00 6	0.0 6.00 8	0.00 0.00 118

Table C-139 Regional Density (No./1,000m3) of Hogchoker Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

									*.	
	Regions Combined	0.00 0.00 118	0.00	0.00 0.00 72	0.00	0.00 0.00 73	9.16 50.1 ET	9.00 20.00	9.6 7.7 73	0.19 0.47 73
	¥	9.09	0.0	S.	X.	S S	SR .	SE .	SN SN	SN SN
	S	0.00 0.00 5	0.00	¥.	N.	S	S	S	S.	S
2	98	0.00	0.00	SN	SN SN	NS	SN	SK	S.	S.
r vey, 19	X6	0.00	0.00	SX	S.	S	SN	S	S.	SE .
שפ שטאוו	윺	0.00	0.00	S	SK SK	S.	S.	S	S S	S
Estuary Determined From Longitudinal River Ichtnyoptankton Survey, 1992	¥	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.28	0.57
Kiver IC	3	0.00 13	0.00 0.00 13	0.00	0.00 0.00	0.0 0.00 0.00	1.09	0.0 0.00 10	1.22 0.96 10	0.0 0.00 0.00
	£	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18 1.36 6	0.34
LEWOT IIIO	9	0.00	0.00	0.00	0.00	0.00	0.18 81.0 61	0.00	0.40	0.58 0.34 10
	5	0.00	0.00	0.00	0.00	0.00 0.00 12	0.00	0.00 0.00 12	0.00	0.00
ary veter	12	0.00	0.00	0.00	9.00	0.00	0.0 1.00	0.0 1.00	0.00	9.00
_	¥	0.0	9.00	9.0	9.9	9.00	9.9	9.0	9.00	0.00
III RUGSON KIVER	8	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ë		DENSITY SE NO. TOWS	DENSITY SE NO. TOUS							
	DATE	29JUN- 03JUL	1010L 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	285EP- 30SEP	120CT- 140CT

Table C-140 Regional Standing Crop (In Thousands) of Hogchoker Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 9	0 108	0 0 801	115	0 0 81	000	000	000	0 0 6	110	1180
AL Co	000	000	000	000	005	00%	000	000	000	00 M	000
S	000	000	000	001	000	000	000	000	009	000	000
98	008	000	000	00%	000	000	00	000	000	000	000
KG	۸٥٥	001	400	۸٥٥	400	400	۸٥٥	۸٥٥	400	400	400
鱼	00%	400	۸٥٥	005	00=	005	005	000	005	005	005
¥	000	009	009	002	002	00 ~	001	۸٥٥	400	۸٥٥	۸٥٥
3	000	001	00=	00%	002	០១ជ	၀၀ ည	<u> </u>	ంంభ	002	០០ឯ
\$	009	000	000	005	005	000	000	000	000	000	000
٩	000	005	000	០០ជ	004	000	000	000	ဝဝည်	ဝဝည	002
5	00ti	0 O D	0 o £	000	000	002	00ជ	០០ជ	005	005	005
21	004	002	០០ជ	005	005	005	005	005	004	004	004
¥	000	005	005	000	000	000	000	000	00=	005	005
Ħ	S	S	S Z	S	X X	S	S	SZ.	000	000	000
	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOWS
	St. Cr 88. TC	St. Cr Se St	St. C. 86. T.	St. C. 86. 1	St. C. Se. 7	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. 1
DATE	13APR- 18APR	20APR-	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-140 Regional Standing Crop (In Thousands) of Hogchoker Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0081	100	002	00K	ဝဝင်	190 151 27	00K	998 335 73	361 73 73
AL	00%	000	S	SX.	S	SS	S .	N.	S
S	00 W	000	SS	2	SS	S S	SZ Z	SS	S Z
98	000	000	S.	SE	S	SS	S	Š	SH.
X 5	001	001	S.	æ	S.	æ	S	SS	S
윺	005	000	S.	S	S	S	S	S	S
품	001	001	000	00%	000	000	009	జే జే °	651 85 6
3	០០ជ	0 0 E	000	005	005	152 146 10	000	171 135 10	၀၀ ဥ
ŝ	000	000	000	000	000	009	000	283 660 6	35 45 6
4	00 ti	០០ជ	005	000	005	388	000	\$\$2	122 0 0 1
5	005	°°5	002	004	004	002	0 0 2	002	0 0 2
77	004	0 0 4	005	005	005		00=	005	00=
¥	005	005	005	00=	00=	005	°°E	005	005
æ	000	000	001	400	400	400	۸٥٥	00 r	001
	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOVS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS
	St	S S S	St. 6	St.	St. 0	St. C	S 등	SE. 1	SE. C
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-141 Regional Density (No./1,000m3) of Hogchoker Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

NED SE								
Regions COMBINED	0.05 0.48 210	<0.005 0.03 210	<0.005 0.02 210	0.27 2.28 210	0.15 210 210	0.07 0.23 210	0.14 0.85 210	0.27 1.68 210
¥	0.00 0.00 13	0.00	0.00 0.00 13	0.00	0.00	0.0 130 130	0.00 13	0.00
ន	0.00 21	0.0 21 21	0.00 21	0.00 21	0.00 0.00 21	0.00 21 21	0.00 21	0.00 21
SG	0.04 0.03	0.00 0.00 18	0.00 0.00 18	0.0 0.00 18	0.28 0.28 18	0.00 18	0.00	0.02 0.02 18
χg	0.03 0.03 15	0.00 0.00 15	0.00 0.00 15	0.00 15	0.03	0.03	0.20 0.07 15	0.03 0.03 15
윺	0.00	0.00	0.00 10	0.00	0.29 0.17 10	0.07	0.05 0.05 10	0.00
ጃ	0.00	0.03 0.03 8	0.0 8 8	0.00 8	0.19 0.12 8	0.15 0.15 8	0.07 0.07 8	0.00
3	0.00 0.00 13	0.00 0.00 13	0.00	0.15 0.05 13	0.04 0.03 13	0.35 0.15 13	0.06	1.37 1.36 13
\$	0.00 0.00 8	0.00 0.00 8	0.02 0.02 8	0.0 0.08	0.07	0.24 0.07 8	1.23 0.84 8	0.25 0.16 8
4	0.00	0.00	0.00	0.00	0.00	0.02	0.05	1.02 0.82 14
5	0.00 0.00 27	0.00	0.00	1.10	0.00	0.02	0.00	0.02 0.02 27
12	0.48 0.48 46	0.00	0.00	2.00	0.93 0.93 46	0.00	0.00	0.53 0.50 46
¥	0.00	0.00	0.00	0.00	0.00 0.00 17	0.00 17	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL - 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21sep- 25sep	050CT- 090CT	190CT- 230CT

Young of Year Table C-142 Regional Standing Crops (in Thousands) of Hogchoker in Hudon Diver Estimate Intermined From Fall Shoals Surv

13.01L St. Crop 154 10 10 10 10 10 10 10 1			in Hudson	River	Estuary Determined From Fall Shoals	terminec	i From Fa	il Shoal	ls Survey,	1992						
ST. Crop ST. Cro	DATE			¥	12	₹	٩	ŝ	3	꿆	₹	8	SG	ន	₹	
81. Crop	13.UL- 18.UL			00	154	00	00	00	00	00	00	44	~ ₩	00	00	
St. Crop No. TOMS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	 			17	94	27	14	6 0	13.	∞	5	18	27	13	
St. Crop NO. TOWN St. Crop NO.	27JUL-			0	•	0	0	0	0	5	0	0	0	0	0	
St. Crop	OTAUG			0	٥:	0	٥;	0	0;	5,	0 (٥;	0	٥;	0	
St. Crop 0 0 4 0 4 0<		<u>.</u>		-	97	22	4	x	5	∞	0	5	8 E	2	13	
SE. Crop 0 0 4 0<	10AUG-			0	0	0	0	4	0	0	0	0	0	0	0	_
St. Crop 0 643 163 0 0 27 0 <	14AUG			٠;	۰;	٥ ;	۰;	4 (٥;	0 (۰;	۱, ه	٥;	٥;	o i	
St. Crop NO. TOMS 0 643 643 163 163 0 0 27 7 0 0 0 0		Š		-	ĝ	/2	*	x 0	13	20	2	₽	18	5	5	
SE 0 643 163 0 0 7 0 <td>24AUG-</td> <td></td> <td></td> <td>0</td> <td>643</td> <td>163</td> <td>0</td> <td>0</td> <td>21</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td>	24AUG-			0	643	163	0	0	21	0	0	0	0	0	0	
St. Crop 0 299 0 14 6 56 48 4 49 0 St. Crop 0 0 16 59 27 14 8 13 8 10 15 18 21 St. Crop 0 0 0 10 16 5 35 28 4 49 0 St. Crop 0 0 3 5 50 49 46 7 4 0 0 St. Crop 0 0 3 5 14 21 46 7 4 0 0 St. Crop 0 0 0 11 255 8 10 15 18 21 St. Crop 0 0 10 174 8 13 8 10 15 18 21 St. Crop 0 0 10 174 8 13 9 10 10	28AUG			0	643	163	0	0	7	0	0	0	0	0	0	
St. Crop 0 299 0 14 6 56 48 4 49 0 NO. TONS 17 46 27 14 8 13 8 10 15 8 0 St. Crop 0 0 3 5 14 8 13 46 7 4 90 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 0 11 255 8 20 8 10 0 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 0 10 17 25 8 13 8 10 15 18 21 St. Crop 0 171 3 171 33 179 9 10 4				17	97	27	14	ဆ	13	&	9	75	81	21	13	
SE 0 299 0 10 5 35 28 4 49 0 NO. TOWS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 0 3 5 14 21 46 7 4 0 0 NO. TOWS 17 46 27 14 8 13 8 10 15 18 21 NO. TOWS 17 46 27 14 8 13 8 10 0 0 St. Crop 0 0 10 174 6 20 8 10 0 0 NO. TOWS 17 46 27 14 8 13 8 10 4 4 0 SE 0 0 161 3 171 33 190 0 4 4 0 SE	08SEP-			0	88	0	0	14	•	26	48	4	67	0	0	
St. Crop 0 0 3 5 50 49 46 17 4 0 0 St. Crop 0 0 3 5 14 21 46 7 4 0 0 St. Crop 0 0 0 11 255 8 20 8 10 0 St. Crop 0 0 0 10 174 6 20 8 10 0 NO. TONIS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 171 3 212 53 190 0 4 4 0 St. Crop 0 171 3 212 53 190 0 4 4 4 0 St. Crop 0 161 3 171 33 190 0 4 4 0 St. <t< td=""><td>12SEP</td><td></td><td></td><td>0</td><td>8 8 8</td><td>0</td><td>0</td><td>5</td><td>ιν</td><td>32</td><td>82</td><td>4</td><td>67</td><td>0</td><td>0</td><td></td></t<>	12SEP			0	8 8 8	0	0	5	ιν	32	82	4	67	0	0	
St. Crop 0 0 3 5 50 49 46 77 4 0 0 NO. TONS 17 46 27 46 77 4 0 0 St. Crop 0 0 10 174 8 13 8 20 8 10 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 171 3 212 8 19 10 15 18 21 St. Crop 0 171 3 212 8 19 10 15 18 21 St. Crop 0 171 3 217 33 190 0 4 4 4 0 St. Crop 0 161 3 171 33 190 0 4 4 4 0 St. Crop 0 <td></td> <td></td> <td></td> <td>12</td> <td>97</td> <td>27</td> <td>7</td> <td>Φ</td> <td>13</td> <td>80</td> <td>10</td> <td></td> <td>18</td> <td>21</td> <td>5</td> <td></td>				12	97	27	7	Φ	13	80	10		18	21	5	
SE 0 0 3 5 14 21 46 7 4 0 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 0 11 255 8 20 8 10 0 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 171 3 212 53 192 0 4 4 0 St. 0 161 3 171 33 190 0 4 4 0 NO. TOMS 17 46 27 14 8 13 8 10 15 18 21	21SEP-		Crop	0	0	m	5 0	20	67	46	=	4	0	0	0	
St. Crop 0 0 11 255 8 13 8 10 15 18 21 St. Crop 0 0 0 11 255 8 20 8 10 0 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 171 3 212 53 192 0 4 4 0 SE 0 161 3 171 33 190 0 4 4 0 NO. TOMS 17 46 27 14 8 13 8 10 15 18 21	25SEP			0	0	M	'n	14	21	9	~	4	0	0	0	
St. Crop 0 0 0 11 255 8 20 8 28 0 0 0 SE 0 0 10 174 6 20 8 10 0 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21 SE 0 161 3 171 33 190 0 4 4 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21				1	97	27	14	€	5	∞	10	15	18	7	13	
SE 0 0 10 174 6 20 8 10 0 0 NO. TOWS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 171 3 212 53 192 0 0 4 4 0 SE 0 161 3 171 33 190 0 0 4 4 0 NO. TOMS 17 46 27 14 8 13 8 10 15 18 21	050CT-			0	0	0	=	255	80	20	80	28	0	0	0	
NO. TOWS 17 46 27 14 8 13 8 10 15 18 21 St. Crop 0 171 3 212 53 192 0 0 4 4 0 SE 0 161 3 171 33 190 0 0 4 4 0 NO. TOMS 17 46 27 14 8 13 8 10 15 18 21	090CT			0	0	0	5	174	9	2	∞	9	0	0	0	
St. Crop 0 171 3 212 53 192 0 0 4 4 0 0 SE 0 161 3 171 33 190 0 0 4 4 0 0 0 101 17 46 27 14 8 13 8 10 15 18 21				12	97	27	7,	∞	5	∞	10	15	8	2	t.	
SE 0 161 3 171 33 190 0 0 4 4 0 NO. TONS 17 46 27 14 8 13 8 10 15 18 21	190CT-			0	171	m	212	53	192	0	0	4	4	0	0	
TONS 17 46 27 14 8 13 8 10 15 18 21	230CT			0	1 5	m	171	E	190	0	0	4	4	0	0	
		≥		14	9	27	4	∞	t	ဆ	2	£	8	2	13	

Table C-143 Regional Catch-Per-Unit-Effort (CPUE) of Hogchoker Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

ED										
Regions COMBINED	0.00	0.00	9.00	0.00	0.00	0.02 0.20 100	0.02 0.20 100	0.02 0.13	0.01	0.17 1.62 100
4	0.00 0.00 12	0.0 0.98 12	0.00 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.00	0.00 0.00 19	0.00 0.00 19	0.00 0.00 0.00	0.0 0.00 10	0.0 0.00 0.00	0.00 10 10	0.0 0.00 5	0.0 0.00 100 0.00	0.00
SG	0.00 0.00 ts	0.00 0.00 15	0.00 0.00 tt	0.00	0.00	0.0	0.00	0.11	0.00	999
8	0.00	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
£	0.00	0.00	0.00 0.00 8	0.00	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00
¥	0.00 0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.00 \$	0.00 0.00 5	0.00 0.00 5
ਣ	0.00	0.00 0.00 3	0.00	0.00	0.00	0.00	0.00	0.00	0.17 0.17 6	0.00
\$	0.00 0.00 m	0.00 0.00 3	0.00	0.00	0.00	0.20	0.20 0.20 5	0.00	0.00	0.40
≙	0.00 0.00 3	0.00 0.00 3	0.00 3.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60 1.60 5
3	0.00	0.00 0.00 7	0.00 0.00 7	0.00	0.00	0.00 0.00 14	0.00	0.07	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00 24	0.0 0.00 24	0.00 24	0.00 24	0.00 24	0.00 0.00 24
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ý	s	ø	v	s	s	s	s	ø	G
	CPUE SE NO. TOWS	CPUE SE NO. TOWS								
DATE	23JUN- 26JUN	06.JUL -	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-144 Regional Standing Crops (in Thousands) of Hogchoker Young of Year in Hurson River Estuary Determined From Beach Saine Survey, 1992

Table C	\$	Table C-144 Regional Star in Hudson Riv	nding c ver Est	og Crope (1n Estuary Dete	iding Crope (in Thousands) of Rogchoker er Estuary Determined from Beach Seine	s) of Hog rom Beach		Survey, 1	roung of 1992							
DATE			¥	12	₹	d1	ş	3	¥	e E	8	25	S	7 K	Regions COMBINED	
23JUN- 26JUN	SE SE.	Crop TOWS	oom	005	001	00M	00m	00m	000	000	000	ဝဝည	000	200	0 00	
06JUL - 09JUL	% Se St.	Crop TONS	00m	005	001	001	00m	0 0 M	000	008	000	ဝဝည	000	002	0 0 00	
20JUL - 22JUL	St.	Crop TOVS	00m	005	400	00m	0 0 M	oon		000	-	ဝဝည	005	0 0 <u>7</u>	0 00	
O3AUG- O6AUG	St.	Crop TOUS	00 M	004	002	0 0 W	00m	000	00 m	00%	00 M	000	005	001	0 0 0	
17AUG- 20AUG	Se st.	Crop TOWS	0010	00%	002	00 iv	0010	000	00 m	00 W	00 W	000	005	001	0 0 00	
31AUG- 02SEP	SE.	Crop TOHS	00 N	2,00	004	0010	~~W	000	0010	905	0 0 m	000	ဝဝဝ	400	100	
14SEP- 16SEP	SE.	Crop TOWS	00%	2,00	002	00 W	FU	000	00 FV	00 W	00v	000	000	400	0	
28SEP- 30SEP	St. SE.	Crop TOWS	00 W	00%	200	0010	00 W	000	00 W	00 W	00 W	000	000	002	4 to 0 to	
120CT- 150CT	SE.	Crop TOWS	00 W	00%	004	00 W	00 m	0 W W	00 M	00 m	00 W	000	000	۸٥٥	2 7 100	
260CT - 280CT	St.	Crop TOMS	001	200	004	ក ក ក		000	00 IV	00 W	0 0 IV	000	000	400	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	

Table C-145 Regional Density (No./1,000m3) of Hogchoker Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

•					-			
Regions COMBINED	13.97 36.02 210	9.03 12.74 210	17.38 20.28 210	10.37 21.00 210	14.49 26.51 ·	13.34 19.97 210	14.74 25.53 210	22.16 42.47 210
٩٢	1.81 0.38 13	0.37 0.12 13	2.95 1.22 13	0.37 0.25 13	1.99 0.65 13	0.60	0.70 0.33	0.00 0.00
ន	2.22	4.4	1.66	7.7	3.68	0.92	0.89	0.76
	0.58	2.7	0.50	1.10	1.36	0.86	0.70	0.12
	21	2.2	21	21	21	21	21	21
98	1.44	5.27	4.28	3.22	9.53	5.69	4.72	7.42
	0.60	1.32	1.45	1.40	3.74	2.32	1.69	2.39
	18	18	18	18	18	18	18	18
KG	3.49	8.83	5.43	8.13	1.13	15.75	12.78	11.76
	1.03	2.75	2.10	3.53	2.13	5.85	4.52	2.67
	15	15	15	15	51	51	15	15
윺	1.25 0.60 10	1.58 0.45 10	0.39 0.18	2.20 0.53 10	6.17 1.74 10	2.73 10	7.21 1.47 10	5.17 1.38 10
¥	1.26	2.49	1.57	7.51	4.60	8.64	28.02	35.53
	1.13	1.00	1.26	5.45	1.35	7.75	13.87	15.11
	8	8	8	8	8	8	8	8
3	5.20	5.37	13.78	37.55	64.37	33.38	31.74	51.84
	0.72	1.25	3.38	14.31	24.77	4.94	7.36	9.97
	13	13	13	13	13	13	13	13
ď	0.98	1.42	10.58	8.69	67.49	16.37	60.51	50.93
	0.48	0.33	3.77	4.11	0.88	7.09	17.99	22.34
	8	8	8	8	8	8	8	8
4	1.73 0.48 14	6.73 7.73	12.00 6.33 14	3.90	4.17 1.21 14	15.03 8.31	12.52 6.61 14	61.40 30.45 14
5	15.35	29.68	39.86	28.65	37.36	40.44	1.41	14.94
	3.52	6.65	6.61	11.61	5.68	11.85	0.30	3.01
	27	27	27	27	27	27	27	27
12	19.38	31.02	42.19	21.99	17.56	15.58	10.27	13.07
	2.97	5.00	6.62	5.71	4.43	2.58	2.58	3.13
	46	46	46	46	46	46	46	46
¥	113.57 35.66 17	13.17 8.78 17	73.90 15.75 17	0.29	8.89 2.06 17	0.52 0.26 17	6.08 2.29 17	13.13
	DENSITY	DENSITY	DENSITY	DENSITY	DENSITY	DENSITY	DENSITY	DENSITY
	SE	SE	SE	SE	SE	SE	SE	SE
	NO. TOWS	NO. TOWS	NO. TOWS	NO. TOWS	NO. TOWS	NO. TOWS	NO. TOWS	NO. TOWS
DATE	13.JUL - 18.JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	. 050CT -	190CT- 230CT

Yearling and Older Table C-146 Regional Standing Crops (in Thousands) of Hogchoker

in Hudson R	5		stuary D	etermine	d From F	ver Estuary Determined From Fall Shoals	s Survey,	, 1992	•					
YK 12		12		3	<u>a</u>	ş	3	¥	윺	88	98	S	AL	Keglons COMBINED
Crop 26055 6238 8181 955		6238 955		2268 519	380	88	727 101	375	808	493 146	254	356	232	37768
		97		22	2	€	£	∞	2	5	\$	2	t	210
		9983		4386	985	294	5	27.2	261	1249	626	714	48	23362
2015 1608 TOWS 17 46		1608 46		982 27	157 14	တို့ ဆ	ភ្	300 80	22	389 15	233 18	287 21	2 2	2838 210
Crop 16955 13576 3614 2130 TOUS 17 46	-	13576 2130 46		5889 977 27	2500 1318 14	2194 783 8	1927 472 13	469 376 8	30 01	768 298 15	755 255 18	267 81 21	378 157 13	45744 4632 210
Crop 67 7077 54 1837 TONS 17 46		7077 1837 46		4232 1716 27	811 514 14	1802 852 8	5249 2000 13	2239 1624 8	364 10	1151 499 15	567 248 18	317 176 21	47 32 13	23923 3781 210
Crop 2039 5650 473 1424 10NS 17 46	039 473 17	5650 1424 46		5519 839 27	869 253 14	932 182 8	8999 3462 13	1370 403 8	1021 289 10	1575 442 15	1681 658 18	591 218 21	255 83 13	30499 3996 210
Crop 119 5015 60 830 TOMS 17, 46		5015 830 46		5975 1751 27	3130 1731 14	3395 1470 8	4666 690 13	2575 2311 8	1178 452 10	2228 828 15	1003 409 18	149 138 21	F 3 E	29511 3976 210
Crop 1395 3305 526 830 TONS 17 46		3305 830 46		209 44 27	2608 1378 14	12552 3732 8	4437 1029 13	8353 4136 8	1194 244 10	1808 639 15	832 298 18	143 112 21	142 8	36926 5961 210
Crop 3012 4207 924 1007 TOUS 17 46		4207 1007 46		2207 445 27	12791 6343 14	10566 4634 8	7247 1394 13	10593 4505 8	856 228 10	1664 377 15	1309 421 18	22 8 22	001	54573 9295 210

Table C-147 Regional Catch-Per-Unit-Effort (CPUE) of Mogchoker Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

						•				
Regions COMBINED	0.58 1.93 100	0.89 5.69 100	1.00 3.56 100	0.22 0.84 100	0.28 1.17 100	0.19 100	0.16 0.68 100	0.06 0.33	0.02 0.21 100	0.18 1.76 100
¥	0.00	0.00 0.00 12	0.00	9.00	0.00	0.00	9.0	0.00	0.00	0.00
ន	0.32	0.37 0.16 19	0.42 0.18 19	0.0 5.0 5.0	0.00	0.0	0.30	900	0.00	0.00
S	0.27 0.12 15	0.00	0.07 0.07 15	0.0 1.0 6	0.10	0.22	0.11	0.00	0.00	0.00
KG	0.00 0.00 8	0.62 8.23	0.0 0.08	0.00	0.00	9.00	0.00	0.00	9.00	0.00
윺	0.00	0.0 8	0.0 8 8	0.00	0.20	0.00	9.00	0.00	0.00	0.00
품	0.0 8 8	0.00	0.0 8 8	0.00	0.00	0.00	9.00	9.0	0.00	0.00
3	1.33 0.88 3	7.00 5.51	3.00	0.67	0.00	0.00	9.09	999	9.0	0.00
\$	0.33	0.00 0.00	0.33	0.00	0.60	0.80	0.00	0.20	0.00	0.00 5.00
٩	0.33	0.00	6.67 2.60 3	0.20	0.00	0.20	0.20	0.40	0.20	2.00 1.76 5
5	0.71 0.57 7	0.43	3.71 2.36 7	1.29 0.67 14	2.14 0.98 14	0.50	1.00 0.56 14	0.07	0.00	0.21
71	2.36 1.25 11	2.18 1.26 11	0.45 0.25 11	0.29	0.13 0.07 24	0.46 0.15 24	0.08 0.08 24	0.0% 2%	0.08 0.06 24	0.00
¥	1.33 0.88	0.00	0.33 0.33 3	0.00	0.20	0.00	0.20 0.20 5	0.00	0.00	0.00
	CPUE SE NO. TOWS									
DATE	23 JUN- 26 JUN	06JUL- 09JUL	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-148 Regional Standing Crope (in Thousands) of Hogchoker Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	3 2 8 5	§ 8 €	. 55 & 55 50 05	285	\$% <u>\$</u>	3 55	24 10 10 10 10 10 10 10 10 10 10 10 10 10	8 4 00	9 £ 100	24 17 100
4	002	002	007	001	001	۸٥٥	001	001	001	001
S	იონ	~ w €	ოოტ	00 5	005	0 n 0	4 45	000	000	000
S	ខ ៤ ៦ មិ	001	2	~~~	~~~	440	N N O	000	000	000
8	000	ω ν ω	000	00 N	00 0	0 0 W	0 O IN	00 W	00 m	00n
웊	000	000	000	00v	. 005 . 005 5	005	0010	00 in	0010	00 m
¥	000	000	000	00 W			00 W		00 m	
3	ችውክ	K 82 w	00M	~40	000	000	000	000	000	000
ŝ	m	00M	~ ~ M	0010	0 0 W	01 ← N	00 W		00 in	0010
<u>e</u>	mmm	00m	3%8	0 0 IN	00 W	0 0 L	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	4 W W	~~~~	စား အ
5	₹ ₹	586	62 2 0 2	35 4	28 4 4	£ 6 4	27 15 14	202	004	0 W Z
21	107 57 11	±228	2==	£ 6 %	\$ m %	27 23	7 F 3	202	5¢ 3 ¢	2,00
¥	6 r w	00m	mmm	000	N N N	00 w	N W IS	00%	00 tu	0010
	8 &	& &	8 &	8	S &	& ₹	∂ . ₹5	2. 2.	2 %	δ
	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	t. Crop 5. TOUS	t. Crop TOVS	Crop TOUS	Crop	. Crop	. Crop	. Crop	. Crop
			. SE.	S S S	SE SE.	S S S	. St.	88.	St. SE.	8 8 £.
DATE	23JUN- 26JUN	70°60 08°101	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT	260CT - 280CT

Table C-149 Regional Density (No./1,000m3) of Spottail Shiner Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	99.9	0.00 108	0.00 108	0.00	0.00	0.00	0.00 110	0.00 0.00 110	0.00	0.00	0.00 1.8
¥	9.0	9.0	9.6.	9.0	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.0 0.0 0.0	9.00	9.00	0.00 5.00	0.00 6.00 6	0.00	0.00	0.00	0.00	0.00 5.00	0.00
S	0.00	0.00 8	0.0 0.00 8	0.00	0.0 0.00 6	0.0 0.08	0.0	0.0 8 8	9.99	9.0	9.09
χ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.0 0.00 0.00
¥	0.0 0.00 6	0.00	0.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
₹	0.00 0.00 10	0.00	0.00	0.0 0.00 16	0.0 5.00	0.0 0.00 t	0.0 0.00 15	0.0 0.00 15	0.0 0.00 13	0.0 0.08 13	0.00 0.00 13
£	0.00	0.00 0.00 6	0.00 0.00 6	0.00 0.00 0.00	0.00 10	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00 0.00 10	0.00 0.00 10	0.00	0.00	0.00	0.00	0.00	0.00 13	0.00 0.00 13	0.00 0.00 12
5	0.00 0.00 13	0.00 0.00	0.00 0.00 13	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.00 13	9.00	0.00	0.00
21	0.00 0.00 12	0.00 0.00 12	0.00 0.00 12	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00 14	0.00 7.
¥	0.00 0.00 10	0.00 0.00 10	0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00	 	0.00	9.00
B	S	SZ	SZ SZ	SS SS	NS NS	SZ.	SZ	SZ.	0.00	0.0 0.00 8	0.00
	DENSITY SE No. TOUS	DENSITY SE NO. TOWS									
DATE	13APR- 18APR	20APR-	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25HAY- 30HAY	01JUN- 05JUN	OBJUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-149 Regional Density (No./1,000m3) of Spottail Shiner Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00	0.00	0.00	0.00 73	90.0	 388	99° 788	9.0 2.0 2.0	0.00 0.00 73
₹	0.0 6.00 6	0.00	S	S	SZ SZ	S	SZ SZ	S	S
S	9.0	0.0 8.0 8	S.	SN	SE	S	S	S	S
SG	9.00	0.00	S	NS .	S	S	S	S	S
88	0.00	0.00 0.00 7	SE	S	S	S	S	S	S
흎	0.00 0.00 0.00	0.00	SZ	SS	\$2	SZ	SZ Z	SE SE	S
¥	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00 0.00 6
3	0.00 13	0.00	0.00	0.00	0.00	0.00	0.00 0.00 10	0.00 0.00 10	0.00 1000
ŝ	9.00	0.00	0.00	0.00	0.00	0.00	0.00 6.00	0.00	0.00
<u>=</u>	0.0 13.00	0.00 13	9.00	9.00	0.00 1000	90.0	9.00	0.00	0.0 0.0 0.0
5	0.00	9.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.0 1.00 1.00	9.6	0.00	9.00	99.5	9.00	0.00
¥	9.00	9.00	0.00	9.00	0.0 ±	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL- 10JUL	22JUL -	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	288EP- 30SEP	120CT - 140CT

Table C-150 Regional Standing Crop (In Thousands) of Spottail Shiner Eggs in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

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Regions Combined	-	. 🕶	_		-	-	-	•	-	-	, •
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SG	000	000	008	000	000	008	000	000	000	000	000
X 5	۸٥٥	001	00 r	00 r	400	400	001	400	00 r	001	400
≩	ö0 %	002	۸٥٥	005	005	000	005	005	005	005	005
¥	00%	000	000	000	005	400	400	400	00K	001	00 r
3	005	005	0°5	002	002	០០ស	៰៰៱	. o ក្	០០ឯ	0012	001
ŝ	000	000	000	005	005	000	000	000	000	000	000
<u>-</u>	000	<u>၀၀</u> ဥ	005	០០ជ	004	000	000	000	០០ជ	០០ឯ	00%
₹	០០ឆ	០០ភ	០០ឯ	000	000	០០ឆ	០០ឆ្	០០ជ	005	005	005
21	002	000	៰៰ឨ	٠ ٠ ٥	005	°°5	005	00 =	004	002	002
¥	005	005	000	000	000	000	000	000	005	00=	005
18	SZ	SE SE	S	S .	S	S	S	S	00%	000	000
	Crop TOWS	Crop TONS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS
	S & .	S 85.	S 85.	S S .	St.	S S .	SE.	£ 8 €.	SE.	SE SE	S &
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY - 22MAY	25MAY- 30MAY	O1JUN- O5JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

E998 Table C-150 Regional Standing Crop (In Thousands) of Spottail Shiner

	Regions Combined	0 8 1 8	1300	002	00E	00K	00K	00K	00E	00K
	¥	000	000	S	SS	SS	SX.	S Z	S S	SX.
1992	ន	0010	000	X	S Z	S	S.	æ	S	SZ.
Survey, 1	98	000	000	S Z	S	S	æ	S	S	S
ankton S	8	001	001	× ×	SZ.	S	SE SE	S	SZ Z	S
Longitudinal River Ichthyoplankton	윺	005	005	S.	S.	S	S	S	S	S
River I	¥	001	400	000	000	000	000	000	000	000
itudinal	8	0012	0015	000	005	005	000	000	000	000
rom Long	\$	000	000	000	000	000	000	000	000	000
mined F	<u>=</u>	0012	001	005	900	၀၀ဥ	000	000	000	000
udson River Estuary Determined From	5	005	005	002	0 0 2	0 0 2	004	002	004	002
er Estu	12	004	004	0.01	°°±	0°E	005	005	005	005
dson Ri	¥	005	005	005	°°5	005	005	005	005	00=
÷	18	000	000	00 r	001	00 ~	001	400	906	901
		Crop TOUS	Crop TOUS	Crop TOUS	Crop	Crop TOUS	Crop TOUS	Crop TOUS	Crop TONS	Crop TOKS
		S 8 5.	St. Se.	SE.	S. S.	St. NO.	St. 86.	SE.	S 86.	St.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-151 Regional Density (No./1,000m3) of Spottail Shiner Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions AL Combined	0.00 0.00 0.00 0.00 106	0.00 0.00 0.00 0.00 108	0.00 0.00 0.00 0.00 4 108	0.00 0.00 0.00 0.00 9 115	0.00 0.00 0.00 0.00 10 118	0.00 0.00 0.00 0.00 110	0.00 0.00 0.00 0.00 110	0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 4 119	0.00 0.00 0.00 0.00 117	
S	0.00	0.00	999	0.0	0.00	0.00	0.00	0.00	0.00	86.9	
SG	0.0	9.0	0.0	0.00	0.00	0.00 0.00 8	0.0	0.00	0.00	9.0	
និ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
윺	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	0.00	0.00	9.0	0.00	9.0	0.0 0.00 \$	0.00 0.00 15	0.0 5.83	0.0 5.8	9.0	
S	0.00	9.0	0.0	9.00	9.9			0.00	0.00		
4	0.00	9.0	9.00	0.00	0.00		0.00	0.00	0.00 13	0.0 0.0 13	
3	0.00	0.00	0.00	9.00	0.0	0.00	0.00	0.0 0.8 13	0.00	9.0	
12	0.0 0.00 12	0.00	0.00	9.00	9.00	0.0 1.00	9.00	995	0.00	0.00	
¥	9.6	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
BT	N.	S	S.	S.	SE .	SZ	S	X.	0.00	0.0	
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	

Table C-151 Regional Density (No./1,000m3) of Spottail Shiner Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Categriff Vereniined From Longitudinal Kivel Ichtijophalikion survey, 1992.	KG SG CS AL Combined	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	NS NS NS 0.00	0.00	0.00 72 72 NS NS NS 0.00 0.00 73	SX XX	SZ S	S	S
•	#P KG	0.00 0.00 0.00 0.00 10 0.	0.00 0.00 0.00 0.00 10 7	NS NS		NS NS				
	¥	0.00	0.00	0.00)	0.00	0.00	0 000 000 000		
	3	0.00	0.00	0.00		0.0 0.00 10	0.0 0.0 0.0 0.0 0.0 0.0 0.0	990 990 990		
	S	9.0	0.00	9.0		0.0	0.00	999 999 999	99, 99, 99, 99,	99, 99, 99, 99,
	<u>-</u>	0.00 13	0.00 13	0.00 0.00 10		9.0	9.0 9.0 9.0 9.0 9.0 0.0 0.0 0.0	990 990 990		990 990 990 990
	₹	0.00	0.00	0.00		0.00 0.00 12	0.00 0.00 12 0.00 0.00	00.0 00.0 00.0 00.0 00.0 00.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
	12	0.00	0.00	0.0 1.00		0.00	0.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0	991 991 991	881 881 881 881	991 991 991 991
	X	9.00	0.00	0.00		0.00	 	99. 99. 199. 199. 199.	881 881 881 881	881 881 881 881 881
	B 1	 8.0.9	0.00	0.00						
		DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS		DENSITY SE NO. TOWS				
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL		04AUG- 06AUG	04AUG- 06AUG 18AUG- 20AUG	O4AUG- O6AUG- 18AUG- 20AUG O1SEP- O3SEP	04AUG- 06AUG- 18AUG- 20AUG 01SEP- 03SEP- 15SEP- 17SEP	04AUG-06AUG-18AUG-20AUG-01SEP-03SEP-17SEP-30SEP-30SEP-

Table C-152 Regional Standing Crop (In Thousands) of Spottail Shiner Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions	0 0 20	0 0 80	0 0 80	0 0 2	0 0 85	0 0 0	0 0 0	000	0 0 6	0 0 <u>7</u> 1	008
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4	. 000			000	ဝဝဋ	000	000	00%	000	00 N	000
.	000	000	000	0010	000	000	000	000	000	00 W	000
98	000	000	008	000	000	000	000	ဝဝထ	009	000	000
2	002	00 <i>¢</i>	۸٥٥	001	001	001	400	001	007	001	400
윺	000	001	۸٥٥	005	005	000	000	005	၀၀င္	000	005
¥	000	00%	000	°°5	005	001	۸٥٥	001	001	001	٠٥٠
3	000	005	005	002	002	0 o t	002	0 0 t	0012	០០ជ	ဝဝည
<u>\$</u>	000	009	000	000	000	000	000	000	000	000	000
<u>e</u>	000	005	005	0012	002	000	000	000	០០ជ	0 O E	002
3	0012	00E	0012	000	000	០០ឆ	ဝဝည	0012	005	°°5	005
12	005	005	005	005	005	00=	°°=	00=	002	004	002
¥	000	000	000	000	000	000	000	000	005	005	005
E	š	SN	S	S	S	S	S	S	000	000	000
	Crop TOWS	Crop	Crop TOWS	Crop TOUS	Crop TOUS	St. Crop SE NO. TOWS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TONS	Crop
	SE.	SE.	St. Se.	St. NO.	St. NO.	St. SE.	St.	SE.	St. (SE NO. 1	St. 0	SE. C
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-152 Regional Standing Crop (In Thousands) of Spottail Shiner Yolk-Sac Larvae

X .	IN HI IN HE BATE 81	udson Riv	er Estuary	y Determine	Adson River Estuary Determined From Longitudinal	Longitu	dinal River		Ichthyoplankton Survey,	ton Sur	vey, 1992 SG	% CS	At Con	Regions Combined
009	205		004	0°5	០០៛	000	o o ប	001	005	001	000	0010	000	0 811
00%	00=	00-	004	°°=	0 o ti	000	0 O T	400	000	۸٥٥	000	000	000	006
007	.	00-	00=	004	005	000	000	00%	S	SN	8	S	S	200
007	905		005	002	005	009	000	000	S	SZ	æ	SN	SX.	00K
007	-	00-	005	0 0 2	005	000	000	000	S	SZ.	Š	S	SN	ook
00 7	00=		00=	ភិ០០	000	000	000	000	S	SZ	S	Ø	SE	00K
007	001		°°5	002	00 <u>0</u>	000	005	000	S	S	SE SE	S	S	00K
007	001		001	002	000	000	၀ ၀ ဥ	000	SZ	SE	SS.	S	S	00 K
007			005	0 0 2	000	000	000	000	SZ	SE	SS	S	S	ook

Table C-153 Regional Density (No./1,000m3) of Spottail Shiner Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

															,	
DATE		B1	¥	17	5	4	ŝ	3	¥	웊	ΚG	98	CS	7	Regions Combined	
13APR- 18APR	DENSITY SE NO. TOWS	S	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.0	9.0° 8.0%	
20APR- 25APR	DENSITY SE NO. TOUS	S.	0.00	0.00	0.00 13	0.0 0.0 0.0 0.0	0.0 0.0 6	0.00	0.00	0.00	0.00	0.0 8	0.00	0.0	0.00 0.00 108	
27APR- 01MAY	DENSITY SE NO. TOWS	S.	0.00	0.00	0.00 0.00 13	0.0 0.0 0.0 0.0 0.0	0.00	0.0 1.00	0.00	0.00	0.00	0.0 0.0 8	0.00	0.00	0.0 0.00 80t	
04MAY- 08MAY :	DENSITY SE NO. TOWS	S.	0.00	0.00 0.00 10	0.00	0.00 13	0.00 0.00 10	0.00 0.00 16	9.00	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00 0.00 115	
11MAY- 15MAY	DENSITY SE NO. TOWS	S.	0.00	0.00	0.00	0.00	0.00	0.00 0.00 16	0.00	0.00	0.00	9.00	 80.9	0.00 10	0.00 0.00 118	
18MAY- 22MAY	DENSITY SE NO. TOWS	SS	0.00	0.00	0.00 13	00.0	0.00	0.00	0.00	989	0.00	0.00	88.9	0.0 0.0 6	0.00	
25MAY- 30MAY	DENSITY SE NO. TOWS	SS	0.00	0.00	0.00 13	0.00	0.00	0.00 15	0.00	0.00	0.00 0.00 7	9.00	0.00 0.00	0.00	0.00	
O1JUN- O5JUN	DENSITY SE NO. TOWS	S	0.00	0.00	0.0 0.90 t3	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	
OBJUN- 12JUN	DENSITY SE NO. TOUS	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00 13	0.00	0.00	0.00	0.00	0.0 6.00 8	9.09	0.00 0.00 119	
15JUN- 19JUN	DENSITY SE NO. TOWS	0.00	0.00	0.00	 	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 117	
22JUN- 26JUN	DENSITY SE NO. TOWS	0.0 6.0 6	2.00	0.00	0.00	0.00 0.00 12	0.00	0.00 0.00 13	0.00 0.00 7	0.0 0.00 10	0.00	0.00	0.00 0.00 \$	0.00 6.00 6	0.00 118	

Table C-153 Regional Density (No./1,000m3) of spottail Shiner Post Yolk-Sac Larvae in Hudson River Estuary Determined From Loweitsuding Diver Inthonesian tone

	Regions Combined	0.10 0.99 118	0.00	0.00 22 20	0.00 73	0.00	 388	0.00 73	0.00 73 73	9.9.K
	4	0.00	0.00	SN.	XX	S.	S	X X	8	S
	ន	0.47 0.47 5	0.0 6.00 6.00	S.	æ	SX.	SX.	SS	S	SZ.
Q.	86	0.00	0.00 6.00 8	S	SX.	NS.	S X	S	S.	SX.
vey, 199	ž	0.00	0.00	SS	S	S	S	S	Š	S
kton Sur	テ	0.00 0.00 10	999	S	S	S	S	S	S	S.
thyoplan	¥	0.87 0.87 7	0.00	0.00 0.00 6	0.00	0.00	0.00	9.00	0.00	0.00
Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	3	0.00	0.00	0.00	0.0 0.00 10	0.0 0.00 0.00	999	0.0 0.00 10	9.00	0.00
udinal R	\$	999	0.00	0.00	0.00 6.00 6	0.00	0.00	0.00 0.00 6	0.00	0.00 0.00 6
m Longii	2	0.00	0.0 138	9.0 5.00 5	0.00	0.00	0.00	0.0 0.00 0.00	0.00	0.00 0.00 10
nined Fro	3	9.0	9.00	0.00 1.00	0.00 0.00 12	0.00	0.00	0.00	0.00	0.00
y Determ	12	0.00 74	0.00	9.0	9.00	9.00	0.00	0.00	0.00	0.00
	¥	9.00	995	90.0	0.00	0.00	0.00	0.00	0.00	0.00
in Hudson River	B	9.00	6.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ť Ž		DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS				
	DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	O4AUG- O6AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120cr- 140cr

	Regions Combined	00%	00 80	0 0 80	0 5 1	0 81	900	000	000	•••	0 117	1180
	A C R	000	000	000	000	000	00%	000	000	000	002	000
26	ន	000	000	000	00 W	000	000	000	000	000	00 W	000
ırvey, 15	86	000	000	000	000	000	000	00	00	000	000	000
e nkton Su	Ř	400	۸٥٥	400	400	۸٥٥	400	۸٥٥	400	۸٥٥	400	400
Post Yolk-Sac Larvae Hai River Ichthyoplan	윺	000	001	400	005	005	005	000	၀၀ဥ	000	000	000
t Yolk-Si liver Icl	¥	000	000	000	005	000	400	001	001	۸٥٥	00 r	400
Post cudinat F	3	000	005	005	005	002	o o រីប	០០ស	၀၀ ည	៰៰ជ	៰៰ដ	០០ស
l Shiner m Longit	S	000	000	000	005	005		000	000	000	000	000
o Thousands) of Spottail Shiner Post Yolk-Sac Larvae Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	<u>e</u>	000	005	005	០០ឯ	004	000	000	000	೦೦ಭ	០០ឯ	002
Crop (In Thousands) of n River Estuary Determi	8	002	០០ស	001	000	000	០០ជ	0 o ti	00E	°°=	00=	00=
(In Thou	21	002	០០ជ	005	000	၀၀ ဥ	00 <u>=</u>	00=	°°=	004	004	002
ထားမှ	¥	005	<u>၀၀</u> ဥ	000	000	000	000	000	000	00=	005	005
Standin in Hud	B	X S	SN	S	S.	SN	SN	S	S	000	000	000
Table C-154 Regional Standin in Hud		Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS
-154		St. NO.	S SE.	St.	St. 86.	St. No.	SE.	St. NG.	St. NO.	St. NO.	St.	SE. SE
Table C	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-154 Regional Standing Crop (In Thousands) of Spottail Shiner Post Yolk-Sac Larvae in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	336 271 118	0 0 0 5	002	00K	ook	00%	00K	00K	00E
	4	000	000	SE SE	S Z	S	S	S	S.	×
1992	S	κκ _ν	000	S.	S	S	S.	S	S	SS.
	SG	000	000	SZ Z	S	S S	S.		. X	S
ankton	KG	001	001	S x	SZ.	S	S	S Z	S.	S
tstuary Determined From Longitudinal River Ichthyoplankton Survey,	뢒	005	005	S.	×	S	S	2	S	S
R1Ver	¥	260 260 7	001	000	000	00%	000	00%	000	000
tudinal	3	001	0012	000	005	005	005	005	005	000
LGWOJ WO.	ŝ	000	000	000	900	000	009	000	000	000
	4	001	00H	005	005	002	005	000	000	005
ry veter	3	005	005	0 0 2	0 0 2	002	០០ជ	00½	007	001
_	12	002	004	005	00=	00 =	005	005	00 <u>=</u>	00=
INCISOTI RIVE	¥	°°5	00 <u></u>	•• =	005	°°=	005	60 5	005	005
=	B	000	004	۸٥٥	400	۸٥٥	400	۸٥٥	000	906
		Crop TOUS	Crop TOUS	Crop TOUS	Crop TONS	Crop TONS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS
		S S .	SE.	SE.	SE.	S & S.	St.	St. 86.	S 86.	SE.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	OGAUG-	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT - 140CT

Table C-155 Regional Density (No./1,000m3) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00	9.00	0.00 108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16 2.09 118
¥	9.00	9.69	0.0	9.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5	2.09 2.09 6
S	9.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00 6.00	0.00 6.00 6	0.00 5.00 5	0.00
SG	0.00 800 8	0.0 0.00 8	0.00	0.00	0.00	0.0 0.00 8	0.0 0.00 8	0.0 8 8	0.0 0.09 6	0.00	9.69
K 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
귶	0.00	0.00	0.00	9.00	9.00	9.00	999	9.00	0.00	0.00	0.00
7	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ટ	0.00	9.0	0.00	0.0 5.00	0.0 0.09 16	0.00 0.00 15	0.0 5.0 5	0.00	0.00 13	0.00 0.00 13	0.00
\$	0.00	0.00 0.00 6	0.00	0.0 0.00 10	0.0 0.00 100 0.00	0.00	0.0	0.0	0.00	0.0	0.00
4	0.00	0.00 0.00 10	0.0 0.00 0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.0 0.00 13	0.00
3	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00 13	0.00 0.00 13	0.00 0.00 13	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00 10	0.00	0.00	0.00	0.00	0.00	0.0 0.00 74	0.00
¥	0.00 0.00 10	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	RS	SS SS	S	SX	S	SZ	S#	X X	0.00	0.0 0.0 0.0 0.0	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11HAY- 15HAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-155 Regional Density (No./1,000m3) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00	0.00	0.00	0.00	0.00 73	0.00 0.00 73	0.00 0.00 73	0.00 8.00 8.00	0.00 0.00 73
4	9.0	0.00	SZ SZ	SX SX	SE	S.	SZ.	SZ.	SX.
ន	0.00	0.00	SN .	S.	S.	S.	X.	SX.	S.
88	0.00	0.00	S	S	SN .	S.	S.	NS.	S
. 9	0.00	0.00	SS	SZ.	Ş	S	SN	SX	SX
₹	0.00 0.00 0.00	0.00 0.00 10	SX SX	SE SE	\$	S	SS	SZ.	SZ SZ
¥	0.00	0.00	0.00	0.00	0.00	90.0	0.00	0.00	0.00
3	0.00	0.00 13	0.00	9.00	990	99.0	0.00	999	9.00
ŝ	999	0.00	9.0	9.09	9.00	0.00	9.00	0.0 6.00 6.00	0.00
<u> </u>	0.0 5.85	0.00 13	9.00	9.00	88.0	9.00	9.0	9.00	9.00
5	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	9.00	9.00	0.00	90.0	9.00	0.00	0.00
¥	9.00	9.00	0.0 1.00 1.00	0.00	9.0	9.00	9.00	9.00	9.00
.	989	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS								
DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-156 Regional Standing Crop (In Thousands) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

st de	008	008	0 0 8	001	008	<u>۔۔</u>	005	000	004	001	ထားက
Regions Combined	5	10	10	0 0 115	1100	Ē	Ē		005	110	268 268 118
¥	000	000	000	000	000	00%	000	000	000	0010	268 268 6
<u>ຮ</u>	000	000	000	00 W	00%	000	000	000	000	002	000
98	000	000	000	000	009	000	ဝဝဆ	000	000	000	000
2	۸٥٥	001	001	002	001	001	002	001	002	002	002
윺	000	001	001	005	005	000	000	000	000	000	000
¥	009	000	000	၀၀ ဥ	005	001	002	001	۸٥٥	400	002
3	000	00=	005	002	002	០០ជ	0 0 5	005	001	0 0 £	0011
<u>\$</u>	000	000	00%	005	005	000	000	000	000	000	000
4	000	005	005	០០ជ	002	000	000	000	0012	001	0 0 2
. 5	0015	០០ជ	០០ឯ	000	000	០០ដ	០០ជ	០០ជ	005	005	00=
21	002	002	002	000	005	005	00#	005	004	0 0 2	0 0 7
¥	005	005	၀၀ဥ	000	000	000	000	000	00 =	005	005
18	S	S.	S	S	S	SS	S	NS.		000	000
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop	Crop TOWS	Crop TOWS
	St. C SE NO. T	St. C SE NO. 1	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C 86. 7	St. ⊆ 86. ±	% % % %	St. Co SE NO. 10	St. C. No. 10
DATE	13APR- 18APR	20APR-	27APR- 9	04MAY - 9	11MAY- 8 15MAY 8	18MAY- 8 22MAY 8	25MAY- 8 30MAY 8	01JUN- 05JUN S	08JUN- S 12JUN S	15 JUN - S 19 JUN S	22JUN - 8 26JUN - 8

Table C-156 Regional Standing Crop (In Thousands) of Spottail Shiner Young of Year

	Regions Combined	0 0 118	200	200	00K	00Ľ	00K	00%	00%	00K
	A.	000	000	NS.	N.	S X	N N	S	S	<u>s</u>
1992	S	00%	000	S X	SX	SZ	SZ Z	SN.	S.	SZ.
	SG	000	000	S.	S.	S.	X S	Š	S	Z.
ankton	KG	400	400	82	SS	SS.	SS	S S	S	SS.
chthyopl	윺	000	000	SX.	S.	S	α	S.	S	×
River 1	¥	۸٥٥	400	000	000	000	000	000	000	000
tudinal	8	0015	0011	000	၀၀ဥ	005	005	005	000	005
rom Longi	ş	000	000	000	000	000	000	000	000	000
rmined F	<u>a</u>	០០ដ	០០ជ	005	005	005	005	000	005	000
ary Dete	5	00=	00=	002	002	0 0 2	002	004	007	004
er Estu	72	004	004	005	005	005	005	005	005	005
ludson River Estuary Determined From Longitudinal River Ichthyoplankton Survey,	¥	005	005	005	005	005	005	005	200	005
Ë	8	000	000	400	400	400	001	400	400	400
,		Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop	Crop	Crop TOMS	Crop TOWS	Crop
		St. NO.	St.	St. No.	S & S.	SE.	SE.	St. SE.	SE.	SE.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-157 Regional Density (No./1,000m3) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

. G								
Regions COMBINED	0.03 0.26 210	0.05	0.00 0.00 210	0.01 0.06 210	<0.005 0.05 210	<0.005 0.05 210	0.01 210	0.04 0.21 210
A.	0.05 0.05 13	0.00 0.00 13	0.00	0.05 0.05 13	0.00	0.05 0.05 13	0.09 0.06 13	0.00 0.00 13
ន	0.27 0.25 21	0.09	0.00 2.00 21	0.02 0.02 21	0.00 21	0.0 2.0 2.0	0.00	0.00
S	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.00 18	0.00	0.00 0.00 18	0.00 18	0.15 0.13 18
æ	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.05
€	0.00	0.52 0.50 10	0.00	0.02 0.02 10	0.05	0.00	0.00	0.00
¥	0.00	0.00 0.00 8	0.00 0.00 8	0.00 8	0.00	0.00	0.00	0.26 0.16 8
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00 0.00 8	0.00 0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00 0.00 27	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	G	v	v	s	s,		. <u>κ</u>	. 🕸
	DENSITY SE NO. TOWS							
DATE	13.UL- 18.UL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	218EP- 25SEP	050CT - 090CT	190CT- 230CT

Table C-158 Regional Standing Crops (in Thousands) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	210 210	101 83 210	0 0 210	13 8 210	8 8 210	6 6 210	21 8 07.2	110 53 210
AL C	৯ ৹ চ	ဝဝည	០០ឯ	৵৹ঢ়	0 o tī	৵ ৹য়	5 ខ ប	0015
S	74 70 70 70 70	15 21	2100	23 ca ca	0 0 12	200	0 0 12	0 0 12
98	ဝဝဆ	005	ဝဝဆ္	008	008	ဝ ဝ ဆ	0 O &	23 18
KG	0 0 t	០០៥	ဝဝက္	0 0 25	៰៰៷	០០ស	ဝဝင်	৮៷ឨ
욮	۰۰ <u>۰</u>	88 6	005	446	88 5	005	005	005
¥	000	000	000	008	000	000	00 &	£ 7,8
3	០០ជ	០០ជ	o o ដ	001	001	001	0 0 E	0 0 £
ŝ	ဝဝဆ	000	000	000	000	00 &	008	000
4	002	002	002	002	002	004	004	004
5	0 0 27	0 0 27	0 0 2	0 0 27	0 0 22	0 0 27	0 0 27	0 0 27
72	00%	00%	009	00%	003	003	009	00%
¥	007	002	005	002	005	001	001	0 0 7
	Crop TONS	Crop TOWS	Crop	Crop TOWS	do Sa	do St	Crop TOWS	e s
	St. Cr SE 56. 10	St. Cr SE 40. 10	St. Cr SE NO. 10	St. C. 56. 10	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Cr. SE NO. 10	St. Crop SE VO. TOWS
DATE	13JUL - 1	27JUL- 9	10AUG- 14AUG 1	24AUG- 9	08SEP- 12SEP	21SEP- 9	050CT- 090CT	190CT - 8 230CT 8

Table C-159 Regional Catch-Per-Unit-Effort (CPUE) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

			٠							
Regions COMBINED	0.07 0.68 100	0.36 1.80 100	11.75 100	4.12 15.04 100	10.40 40.87 100	8.82 58.69 100	6.08 21.20 100	6.46 100 100	3.80 15.46 100	9.76 62.28 100
¥	0.67 0.67 12	0.00	5.50 2.57 12	10.57 5.17 7	0.43	0.71 0.47 7	5.57 2.22 7	16.86 16.53 7	11.14 10.48 7	27.00 26.50 7
ន	0.00	0.78	2.47	8.80 6.39	7.80 5.45 10	0.80 0.39 10	9.10 6.46 10	2.20 0.99 10	2.20 1.40 10	45.90 45.46 10
SG	0.00 0.00 15	0.0 E.C.	1.07 0.50 15	5.44	11.89 13.64	15.22 10.98 9	13.00 7.57 9	18.00 2.94 9	1.00 0.78 9	33.22 32.97 9
8	0.00 0.00 8	0.25 0.25 8	16.50 8.81 8	19.20 11.69	29.00 21.12 5	69.00 57.30 5	5.40 2.77 5	10.40 3.60	12.60 7.19 5	0.40
윺	0.13 0.13 8	2.38 1.50 8	16.13 5.35 8	2.40 1.29 5	37.40 27.37 5	6.60 3.34 5	15.20 8.27 5	20.20 6.04 5	4.80 4.32 5	5.80 4.14 5
¥	0.00	0.13 0.13	7.75 4.28 8	2.00 1.05 5	29.60 17.21 5	8.40 5.12 5	21.00 16.35 5	1.80 0.92 5	6.80 6.31	0.00
3	0.00 3.00	0.67 0.67	0.67 0.67	0.00	1.83 6.	0.50 0.50 6	0.17	0.83 0.65 6	3.50 3.50 6	0.0 8.00 8.00
ž	0.00	0.00	3.33 2.40 3	1.00	6.60 3.12 5	4.40 1.69	3.20 1.36	7.00 3.74 5	3.60 2.06 5	2.60 0.93 5
≗	0.00	0.00	0.00	0.00	0.20	0.20	0.20 0.20 5	0.20	0.00	2.20 2.20 5
3	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
12	9.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00 3.00	0.00	0.00 x	0.00	0.00	0.00	0.00	0.00	0.00	0.00 5.00
	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOUS	JE , TOWS	JE , TOWS
									CPUE SE NO.	SE NO.
DATE	23JUN- 26JUN	10160 -10190	20JUL- 22JUL	O3AUG- O6AUG	17AUG- 20AUG	31AUG- O2SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-160 Regional Standing Crops (in Thousands) of Spottail Shiner Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

		¥	12	5	4	ş	3	¥	윺	χ g	SG	S	¥	Regions COMBINED
St. Crop SE NO. TOWS		00m	005	001	00m	00m	00m	00 0	<0.005 <0.005 8	000	០០ស	000	००८	9 6 0 <u>0</u>
Crop TOUS	5	00M	005	۸٥٥	00m	00m	~~m		mN®	N N 80	4 4 tī	4 E Q	004	8 5 0 0 0
St. Crop SE NO. TOWS	8	00M	°°5	400	00 M	o o m	~~m	8 8 8 8	20 8 ~ 8	142 76 8	ទី	\$ 22 ¢	583	375 93 100
St. Crop SE NO. TOWS	Crop TONS	0010	5°00	002	001	100 KM		4 ► €	M W W	165 101 5	820	£ 55 t	144 70 7	597 192 100
St. Cr SE NO. 10	Crop TOMS	00 IN	00%	004	01 01 TU	⊱ & ₹		210 522 5	34 6	250 182 5	204 204 904	153 107 10	99	913 321 100
St. C. 86. 10	Crop TOWS	0010	0 0 7 0 0 7	0 0 7	01 10 10 10 10 10	542		60 36 5	∞.4 rv	594 493 5	267 193 9	გ ლ ნ	5.4	973 531 100
St. C. 86. 10	Crop TOWS	0010	00%	~~ *	N N N	∞ 4 rv		149 116 5	6 6 2 2	2,46	228 133 9	179 127 10	23.0	221 100
St. Cr 86. 70	Crop TOUS	0 0 t n	00%	004	N N N	8		£ ~ ₹	25 7 2	8 1 2 8	316 52 9	£40 10	229 225 7	745 234 100
5 2	Crop TOUS	00 m	00%	004	001	0 IU IU	37 6 6	84 2 8	.	805 5 5 5	ន៍ដូច	43 10 10	151 142 7	422 169 100
St. Cr SE NO. 10	Crop TOWS	00 W	00%	002	20 20 20	~ ~ is	000	00 W	► in in	W W IU	583 979 9	903 894 10	367 360 7	1891 1125 100

Table C-161 Regional Density (No./1,000m3) of Spottail Shiner Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	282	822	245	230	280	- 20	<u>-</u> 80	m se o
Reg	000	0.09 0.22 210	99%	0.0	2.5.2	000		0.13 0.36 210
₹	0.15 0.07 13	0.51 0.15 13	1.17 0.44 13	0.63	1.36 0.47 13	0.74 0.29 13	1.01 0.33 13	0.49 0.27 13
ន	0.05	0.14 0.10 21	0.00 21 21	0.04 2.04 21	0.09 0.03	0.02 0.02 21	0.00 2.00	0.18 0.07 21
8	0.00 0.00 18	0.00	0.00	0.00	0.04 0.03 18	0.02 0.02 18	0.00 0.00 18	0.22 0.10 18
Σ Σ	0.00	0.38 0.13 15	0.03 0.03 15	0.08 0.08 15	0.00	0.02	0.31 0.11 15	0.62 0.22 15
웊	0.00	0.00	0.00	0.00	0.0%	0.02	0.00	0.07 0.07 10
¥	0.00	0.00 0.00 8	0.00 0.00 8	0.00	0.00 0.00 8	0.00 8	0.00 8	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
S	0.00 0.00 8	0.02 0.02 8	0.00	0.00 8	0.00 8	0.00 8	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00 0.00 27	0.00	0.00	0.00
12	0.0 0.0 9,	0.00	0.00	0.00	0.00 0.00 46	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13.JUL - 18.JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-162 Regional Standing Crops (in Thousands) of Spottail Shiner Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ons TNED	.	10 5		10.00	10 5	255		
Regions COMBINED	27 11 210	145 31 210	154 57 210	94 210	195 61 210	105 38 210	245 210	233 53
AL	865	20 13 13	150 57 13	81 43	174 61	38 13	130 42 13	33 35 55
ន	7 21	242	200	2°°	25.2	8 m m	200	212
98	002	002	00 %	ဝဝည်	۶ ع 18	446	002	38 17 18
ă	៰៰៵	54 18 15	4 4 T	စေ စာ ည်	001	พ พ ก ั	£3 51	88 15
욮	005	005	005	005	7 7 0.	440	005	556
¥	000	000	000	ဝဝဆ	000	000	000	000
3	០០ឯ	០០ឆ	០០ជ	០០ជ	០០ជ	០០ជ	0012	ოოლ
ŝ	000	mmœ	000	008	000		000	000
ď	004	0 0 4	004	002	004	004	0 0 4	004
5	0 0 27	0 0 27	0 0 27	0 0 27	0 0 72	0 0 27	0 0 27	0 0 27
21	00%	00%	003	009	00%	00%	00%	00%
¥	004	005	001	001	004	001	001	001
	ð v	ō ñ	ð ñ	ð õ	σ ∾	დ. დ	o w	c. w
	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS
DATE	13.JUL - 18.JUL - 18.JUL - 1	27JUL - 9	10AUG- 14AUG	24AUG- 9	08SEP-	21SEP- (25SEP (050CT- 090CT	190CT- 230CT

Table C-163 Regional Catch-Per-Unit-Effort (CPUE) of Spottail Shiner Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	33 30 30 30	64 to 00 to	78 03 00	288	\$22	250	5 T O	₽0 Ø ©	8.0.0	& O O
5 C	4.5.	w.	4 5 -	22.22	85	- 6-	5.37 44.81 100	5.7 16.8	5.2 40.7	31.1
¥	1.33 0.74 12	0.00	1.00 0.64 12	3.00 2.68 7	0.00	2.29	1.71 0.92	1.43 0.92 7	1.43 1.02 7	2.14 1.98 7
S	5.42 3.05 19	3.63 1.38 19	4.11 1.95 19	0.00	6.70 5.08 10	1.80	7.10 6.46 10	6.60 2.42 10	0.89 10	28.60 28.38 10
SG	5.7 8.1 81	0.07 0.07 15	1.40 0.86 15	23.33 21.61 9	0.22 0.15 9	1.11 0.56 9	1.33	23.67 12.09 9	1.78 1.53 9	0.44 0.44 9
KG	1.13 0.67 8	6.63 3.14 8	3.25 2.97 8	0.20	0.60	8.40 8.40 5	0.00	10.80 4.87 5	40.00 39.75 5	11.20 11.20 5
윺	9.50 5.92 8	12.50 3.93 8	6.38 3.32 8	6.80 6.80 5	18.00 16.52 5	3.80 2.20 5	7.00 5.78 5	20.40 9.59 5	5.40 4.92 5	7.40 5.67 5
¥	14.50 7.37 8	16.50 5.58 8	5.88 2.16 8	0.40	8.40 5.41 5	1.20 0.58 5	46.40 43.94 5	4.00 4.00 5	8.40 4.70 5.70	0.00
3	2.00 0.58 3	1.67 1.67 3	10.00 9.50 3	0.17 0.17 6	3.61	0.17 0.17 6	0.83 0.83 6	1.33 0.71 6	5.33 5.14 6	0.33 0.33 6
ŝ	9.33 5.21 3	2.00 1.15	1.33	1.00 0.77 5	1.40 0.93 5	2.00 0.84 5	0.00	0.80 0.37 5	0.20 0.20 5	0.00
٩	0.00 3.00	0.33 0.33	0.00 0.00 3	0.00	0.20	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00 0.00 3	0.00 w	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00	0.00
	TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	104S	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOUS
	SE NO.	SE SE	SE SE	SE SE	CPUE NO.	CPUE NO.	CPUE SE NO. 1	SE NO.	CPUE SE NO.	SE NO.
DATE	23JUN- 26JUN	06JUL- 09JUL-	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	288EP- 308EP	120CT - 150CT	260CT- 280CT

Table C-164 Regional Standing Crops (in Thousands) of Spottail Shiner Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	.31 87 00	288 00 00 88 88	00 14 00	88 100 00	12 8 8 8	180 100	34 30 34 38	87,78	92 20 30 30	6,29
2 S	4 -	77 -	`. M	4 M C	444		RI WI C	10.04	₩.m.—	~ to ←
AL.	& 6 5 5	002	700	36	400	34 54 7	23.7	\$ tt _	64 ₇	27 7
S	107 60 19	27 19	81 38 19	005	132 100 10	33.33	140 127 10	130 48 10	20 18 10	563 558 10
98	138 29 21	5	825	410 379 9	4 W O	9 9 9 8	23.0	415 212 9	31.0	∞ ∞
אַפ	5	57 27 8	8 6 8 8 6 8	01 00 IO	IO IO IO	222	0010	5 5 5 5 2 5	344 342 5	%% v
윺	57 ~ 8	გ ო ფ	∞4∞	ဆဆက	202	iu w iu	0 V 10	252	r 0 to	0 L 10
¥	103 52 8	117 40 8	<u>ភ</u> ិ ក្ ន	m cu in	38 5	0.4 W	329 312 5	288	346	001
3	3.6	စာ စာ က	107 101 3	000	43 39 6	000	000	7 & 0	55 6	440
đ	25 34 	io m m	44M	M W 10	4 U W	iv or iv	001	0, ←10	10	001
٩	00m	mmm	00m	001	200	0010	000	000	000	0010
5	001	400	۸٥٥	004	004	444	004	004	004	004
72	005	005	005	00%	00%	00%	00%	00%	00%	00%
¥	00M	00m	00m	00 W	0010	001	00 W	00 W	00 in	0010
	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS
DATE	23JUN- 26JUN	06JUL- 09JUL-	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-165 Regional Density (No./1,000m3) of Atlantic Sturgeon Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ns NEO								
Regions COMBINED	0.00 0.00 210	0.00	0.00 0.00 210	0.00	0.00 0.00 210	0.00	0.00 0.00 210	0.00 210
¥	0.00 0.00 t3	0.00	0.00	0.00	0.00	0.00 13	0.00	0.00
ន	0.00	0.00	0.00 0.00 21	0.00	0.00	0.00	0.00	0.00 0.00 21
SG	0.00 0.00 18	0.00						
χ	0.00	0.00 0.00 15	0.00 0.00 t5	0.00 0.00 15	0.00	0.00 0.00 15	0.00 0.00 15	0.00 0.00 ts
윺	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
품	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ક	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
울	0.00	0.00	0.00	0.00	0.00 8	0.00 8	0.00 8	0.00
<u>e</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
중	0.00	0.00	0.00	0.00	0.00 0.00 27	0.00 0.00 27	0.00 0.00 27	0.00
12	0.00	0.00	0.00	0.00	0.0 0.0 4	0.00	0.00 0.00 48	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-166 Regional Standing Crops (in Thousands) of Atlantic Sturgeon Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	210	0 0 210	210	0 0 210	210	210	210	210
A!	០០ឆ	០០ឯ	0 0 P	០០គ្	0011	០០ស្	០០ស្	០០ឆ្
S	0 0 12	2100	0 0 12	005	0 0 12	200	200	0007
20	ဝဝည	ဝဝဆ	ဝဝည်	002	ဝဝဆို	002	000	005
S S	001	០០៦	0012	០០ជ	00tř	ဝဝည်း	001	002
윺	000	005	000	000	000	000	005	000
¥	00	000	000	•••	000	000	000	000
3	ဝဝည	០០ជ	០០ជ	០០ឆ្	០០ជ	00 ti	0012	00 <u>k</u>
£	000	000	000	○ ○ ಐ	000	000	000	000
<u> </u>	004	002	0 0 7	004	004	007	004	004
3	0 0 27	0 0 27	0 0 27	0 0 27	0 0 22	0 0 2 2	0 0 27	0 0 27
12	00%	00%	003	009	00%	009	00%	00%
¥	001	0 0 1	001	001	001	0 0 7	004	004
	or N	e v	<u>د</u> د	e v	ይ &	\$ &	o v	ይ
	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS					
DATE	13.UL - 1 18.UL :	27JUL- 01AUG	10AUG- 14AUG	24AUG- 9	08SEP-	21SEP- (25SEP (050CT- 090CT	190cT - 3

Table C-167 Regional Density (No./1,000m3) of Atlantic Sturgeon Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

۵								•
Regions COMBINED	<0.005 0.04 210	<0.005 0.02 210	<0.005 0.04 210	<0.005 0.04 210	0.01 0.04 210	<0.005 0.02 210	0.00 0.00 210	<0.005 0.03 210
₹	0.00	0.00 0.00 13	0.00	0.00	0.00 0.00 13	0.00	0.00	0.00
S	0.00 0.00 21	0.00 0.00 21	0.00 21	0.00	0.02 0.02 21	0.00 0.00 21	0.00 0.00 21	0.00
98	0.00 0.00 18	0.00	0.00	0.00	0.00	0.00 0.00 18	0.00 2.00	0.00 0.00 18
æ	0.00 0.00 15	0.00	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00 0.00 25	0.00
₽	0.00	0.00	0.00 1000	0.00	0.02	0.00	0.00	0.02 0.02 10
¥	0.00 0.00 8	0.00	0.0 8.00 8	0.00 8	0.00	0.00	9.08	0.00
3	0.04 0.04 13	0.00	0.04	0.04 0.04 13	0.03 0.03 13	0.00 0.00 13	0.00	0.00 0.00 13
ş	0.00 0.00 8	0.02 0.02 8	0.00 0.00 8	0.00 8	0.00	0.02 0.02 8	0.00	0.00 0.00 8
4	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02
5	0.00 0.00 27	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 27
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00 0.00 17	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13 JUL - 18 JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-168 Regional Standing Crops (in Thousands) of Atlantic Sturgeon Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ຼ ຄ								
Regions COMBINED	10 7 210	4 4 210	5 210	5 210	12 7 210	5 210	210	8 210
AL	០០ជ	0012	៰៰៷	០០ជ	0012	001	០០ជ	៰៰ឣ
S	0 0 5	0 0 17	200	00 T	2 mm	2100	200	°°5
SG	၀ ၀ နာ	008	၀၀နာ	၀၀ ရွ	ဝဝဆု	0 0 8	၀ ၀ နာ	ဝဝဆ္
KG	0 0 2	ဝဝည	០០ដ	ဝဝပ	ဝဝဢ	០០ជ	ဝဝည	0 0 12
윺	005	005	002	002	445	002	့ ၀၀	wwō
¥	000	000	000	000	000	000	000	000
3	~ ~ ជ	០០ជ	សស.ស	ស សស៊	4 4 E	០០ឆ	0 0 ti	០០ជ
9	008	440	008	000	000	'nwœ	008	000
<u>-</u>	~~ 4	002	004	004	004	004	004	r. r. 4
₹	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 22	0 27 27
72	00%	004	004	009	009	004	009	00%
¥	004	004	0 0 1	001	004	001	004	004
		_	_	_		_		
	. Crop	Crop TOWS	. Crop	Crop TOUS	Crop	Crop TOUS	. Crop	Crop TOWS
	8 S.	S 유 .	S & .	8 % .	8 S.	St.	8 St.	St. 86.
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-169 Regional Density (No./1,000m3) of Shortnose Sturgeon Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	999	888	888	000		888	000	000
Regi	0.0	0.00 0.00 210	0.0	9.0.2	0.0	0.0	0.0	0.0
¥	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13
S	0.00 0.00 21	0.00	0.00 2.00 2.10	0.00 21 21	0.00 210 210	0.00 0.00 21	0.00 2.00 2.10	0.00 0.00 21
98	0.00 0.00 18	0.00 18 18	0.00 0.00 18	0.00 18 18	0.00	0.00 18 18	0.00 18	0.00 0.00 18
ĸ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
즆	0.00	0.00	0.00	0.00 0.00 10	0.00	0.00	0.00	0.00
¥	0.00 0.00 8	0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00 0.00 8	0.00	0.00 0.00 8
3	0.00 0.00 t1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ŝ	0.0 0.0 8	0.00 0.00 8						
٩	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00 0.00 27	0.00 0.00 27	0.00 0.00 27	0.00	0.00 0.00 27	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13.JUL- 18.JUL	27 JUL - 01AUG	10AUG- 14AUG	24AUG- 28AUG	OBSEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-170 Regional Standing Crops (in Thousands) of Shortnose Sturgeon Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	0 0 210	210 0 0	21 0 0 0	000	000	0 0 10	210 210	0 210
5 Q		N	N	N	N	N	N	~
¥	00ti	001	០០ឯ	ဝဝည	0012	ဝဝက်	001	001
ន	200	200	005	2,00	0 0 7	200	2100	2100
98	ဝဝည္	ဝဝဆ္	ဝဝဆ	00 &	ဝဝည်	000	000	008
2	00ñ	០០វ៊	០០វ	o o र	៰៰៷	ဝဝည	ဝဝည်	០០ជ
웊	002	005	005	005	005	000	005	000
¥	000		000	000	000	000	000	000
3	០០ជ	೦೦೭	០០ជ	ဝဝည	0 o ti	001	០០ជ	001
ŝ	000	၀၀ ဆ	00	000	000	000	000	000
<u> </u>	004	004	002	.002	004	004	004	004
3	0 0 2	00 %	200	0 27	0 0 27	0 0 27	0 0 27	0 0 27
21	00%	003	003	00%	004	004	00%	00%
¥	005	001	005	001	005	004	004	007
	<u>.</u>		_	_	_	_		
	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop TOWS
	5 S S.	S S .	S 8 5.	S & S.	S S.	S 88 5	8 % ?	S S .
DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-171 Regional Density (No./1,000m3) of Shortnose Sturgeon Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ns NEO								
Regions COMBINED	0.03 0.10 210	0.03 0.10 210	0.03 0.12 210	0.01 210	0.02 0.21 210	0.01 0.04 210	<0.005 0.03 210	0.02 0.08 210
¥	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 t1	0.00	0.00 0.00 13	0.00	0.00
ន	0.00 2.00	0.00 21	0.00 21	0.00 0.00 21	0.00 0.00 21	0.00 0.00 21	0.00 21 21	0.00 0.00 21
SS	0.00 0.00 18	0.00 0.00 18	0.00 0.00 18	0.0 0.81	0.00 18	0.04 0.03 18	0.02 0.02 18	0.06 0.04 18
KG K	0.19 0.09 15	0.16 0.08 15	0.16 0.07 15	0.03	0.21 0.21 15	0.00	0.00 0.00 ts	0.10 0.05 15
₽	0.02 0.02 10	0.09 0.04 10	0.03	0.03	0.02	0.04	999	0.04 0.04 10
¥	0.06	0.05 0.03 8	0.17 0.08 8	0.0 0.00 8	0.05	0.0 0.08	0.0 8 8	0.00 0.00 8
3	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ŝ	0.05 0.03 8	0.00	0.03	0.00	0.00	0.03 0.02 8	0.02	0.00
4	0.00	0.00	0.00	0.02 0.02 14	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00 0.00 27	0.00	0.00	0.00
12	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00 17	0.00 17	0.00	0.00
	DENSITY SE NO. TOWS							
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08sep- 12sep	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-172 Regional Standing Crops (in Thousands) of Shortnose Sturgeon Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	58 18 210	54 17 210	87 28 210	24 210 210	49 210	20 7 210	8 210	32 13 210
¥	001	០០ជ	0 0 13	001	001	0015	0015	001
S	2100	200	. 200	2100	2100	2300	200	200
SG	002	၀၀ နာ	000	ဝဝည်	0 0 85	7 4 8	4 4 ध	T & 8
ă	825	825	255	4 4 E	ខ្លួនជ	០០ជ	០០វា	4 ~ t
윺	440	\$ 7	_ဆ ဃ ဝီ	ស្ស	446	۲ 4 و	005	7 C D
¥	71 8	ည် ဇ ဆ	22 S	000	558		000	000
3	0012	៰៰៵	០០ជ	002	០០ជ	o o ដ	០០ជ	០០ដ
ş	ဂ်	000	~~*	000	000	~ 4 €0	446	00 0
ď	004	004	004	444	004	004	004	004
5	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27	0 0 27
12	003	00%	00%	•• •	00%	003	003	003
¥	002	007	004	001	004	001	004	002
	St. Crop	St. Crop S SE NO. TOWS		3- St. Crop 3- SE NO. TOWS			r- St. Crop SE NO. TOWS	f- St. Crop 7 SE NO. TOWS
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-173 Regional Density (No./1,000m3) of White Catfish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00 0.00 100	0.00	0.00	0.00 0.00 115	0.00 118	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	999	0.00	0.0 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.0 0.0 0.0 0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	0.00 0.00 8	0.00 0.00 8	0.0 8	0.00	0.00	0.00 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 7	0.00	0.00	0.00
₹	0.00	0.00	0.00	0.00	0.00	0.00	0.00 10	0.0 0.00 10	0.0 0.00 1	0.0 5.00 5.00	0.00
¥	0.00	0.00	0.00 0.00 \$	0.0 0.00 10	9.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00 0.00 16	0.0 0.0 5	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00	0.00 0.00 13
ŝ	0.00	0.00	0.00 0.00 6	0.0 0.0 10	0.00	9.00	0.00	0.00	0.00	0.00	0.00
₫.	0.00	9.00	0.00 10 10	0.00 0.00 13	0.00	9.0	0.00	9.0	0.00	0.00 13	0.00
₹	0.00 13	0.00 13	0.00	0.00	0.00	0.00 13	0.00	0.00 13	0.00	0.00	0.00
12	0.00 0.00 12	0.00 0.00 12	0.00	0.00	0.00 0.00	0.00	0.0 1.00 1.00	0.00	0.00	0.00	0.00
¥	9.00	0.0 0.00 0.00	0.0 0.00 10	0.00	0.00	0.00	0.00	0.00	0.0 1.00	9.00	0.00
18	SE	NS	NS NS	SR SR	S.	S.	S	SE SE	0.00	0.00	9.09
	DENSITY SE NO. TOWS										
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11HAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

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Table C-173 Regional Density (No./1,000m3) of White Catfish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0.00 0.00 118	0.00	0.00	0.00 0.00 73	0.00 0.00 73	0.00 0.00 73	0.00 0.00 73	0.00 5.00 5.00	0.00 7.000 7.000
	A G	0.00 6.00 6.00	0.00	SE	S	NS SN	S	SX SX	N	SE
	ន	0.00	0.00	S	S	S.	SN	S.	S.	S
v	98	0.00	0.00	S S	SS	S S	S	ž S	æ	S.
vey, 199	2	0.00	0.00	S.	S S	S S	SN	ž.	Z Z	S.
Estuary Determined From Longitudinal Kiver Ichtnyoplankton Survey, 1992	윺	0.00 0.00 10	0.00	SS.	SS	SS	S.	S S	S.	S S
tnyoptan	폱	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00
IVEF ICH	3	0.00 0.00 13	0.00	0.00	9.00	9.00	9.00	0.00 10 10	9.00	9.00
	ŝ	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00 6.00 6
T LONG!	2	0.00	0.00 130	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 10
uned Fro	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.0 12
y vetern	21	0.00 71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00
L	¥	9.0	9.0	0.00	0.00	0.00	0.00	0.00	9.0	0.0 0.0 1.00
In Hudson Kive	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DENSITY SE NO. TOWS	DENSITY SE NO. TONS	DENSITY SE NO. TOUS						
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	285EP- 30SEP	120CT- 140CT

Table C-174 Regional Standing Crop (In Thousands) of White Catfish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0 0 00	0 0 80	0 0 001	0 0 115	0 0 81	0 01	0 01	000	0 0 0 0 1	0 117	0 0 118
Reg AL Con	000	000	000	000	000	000	o o v	000	000	00 M	000
ន	000	000	000	00 w	000	000	000	000	000	00%	00%
SG	000	000	008	000	000	008	008	000	000	000	000
KG	001	۸٥٥	001	400	001	001	001	001	001	001	001
윷	000	400	001	005	005	005	၀၀၀	၀၀ င့	000	000	005
¥	000	000	000	005	ဝဝဋ	901	001	001	001	400	400
3	000	005	005	002	၀၀န	ဝဝည်	០០ស្	၀၀ ပု	ဝဝည်	001	ဝဝည
ŝ	000	000	000	000	000	000	000	000	000	000	000
2	000	005	000	0011	002	000	000	000	0 o ti	001	004
5	0 o ti	ဝဝည	0 o ti	000	000	0 o ti	០០ជ	0 o £	005	0 0 E	005
21	002	002	005	005	000	°°=	005	°°=	002	002	002
¥	000	၀၀ ဥ	005	000	000	000	000	000	00=	°°5	°°=
18	S.	æ	S.	æ	S.	S.	N.	S	000	000	000
	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TONS	Crop TONS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TONS	Crop TOWS
	St. C SE NO. 1	st. c se 86. 1	St. C SE NO. 1								
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

Table C-174 Regional Standing Crop (In Thousands) of White Catfish

	Regions Combined	0 0 811	119	0 0 22	00K	00%	00K	0012	0012	ook
	At.	000	000	S.	SS	S	SE	S.	ž	X
266	ន	0010	000	S.	S.	S	S.	SN	X.	X X
urvey, 1	98	000	000	82	S	S.	SN.	SZ.	S.	X.
ankton S	KG	001	001	SX	S	S	S.	SX	ž	S.
ding Crop (In Thousands) of White Cattish Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	욮	005	000	S.	S.	N.	SN .	S.	S	X S
Young of Year hal River Ichtl	*	001	001	000	000	000	000		000	000
ro itudinal	3	ဝဝည	០០ជ	000	005	005	000	905	000	ဝဝဉ
Cattish rom Long	ş	000	000	000	000	000	000	000	000	000
of white rmined F	4	០០ដ	0 0 £	005	000	005	005	000	005	000
ding Crop (in Inousands) of Wmite Cattish Hudson River Estuary Determined from Long	5	005	005	002	0 0 21	0 0 2	0 0 2	0 0 2	002	002
ver Estu	12	004	004	005	005	005	005	00=	00=	005
ing Crop udson Ri	¥	005	005	005	005	005	00=	00=	005	005
_	8	900	000	۸٥٥	001	۸٥٥	400	400	001	400
Table C-174 Regional Stai in		Crop TOUS	Crop 7045	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOMS	Crop TOMS
-174 -174		5 K S	S S .	8 % 5.	SE. NO.	8.8 S.	S S .	8 8 .	St. 86.	8 8 S.
Table	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15sep- 17sep	28SEP- 30SEP	120CT- 140CT

Table C-175 Regional Density (No./1,000m3) of White Catfish Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

_								
Regions COMBINED	0.04 0.26 210	<0.005 0.03 210	0.01 210	<0.005 0.03 210	0.03 0.25 210	0.01 0.05 210	0.01 0.06 210	0.01 210
¥	0.15 0.07 13	0.00 0.00 13	0.09 0.09 13	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13
ន	0.30 0.25 21	0.00 21	0.03 0.03 21	0.04 0.03 21	0.29 0.25 21	0.02 0.02 21	0.04 0.03 21	0.12 0.05 21
SG	0.00 0.00 18	0.02 0.02 18	0.0 0.0 8t	0.00 0.00 18	0.08 0.04 18	0.00 0.00 18	0.02 0.02 18	0.02 0.02 18
χę	0.00	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.03 0.03 15	0.05 0.03 15	0.03	0.00 0.00 15
윺	9.00	0.02	0.00	0.00	0.00	9.00	0.00	0.00
품	0.00 8	0.0 8	0.00 8.00	0.00 0.00 8	0.00	0.02 0.02 8	0.03 0.03 8	0.00 8
3	0.00	0.00	0.00	0.00	0.01	0.01	0.04 0.03	0.03 0.01 13
ŝ	0.00 8	0.00	0.00	0.00 8	0.00	0.00	0.00 8	0.00
≙	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 27	0.00
12	0.00	0.00	0.00	0.00	0.00	00.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS						
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-176 Regional Standing Crops (in Thousands) of White Catfish Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	202	~ w <u>o</u>	820	~ is 0	ñέο	000	# W O	F 0 0
Regi	245 210 210	7 210	18 12 210	2	947	21 ° 51	31 210	27 9 210
¥	δο ί	001	111	001	00E	001	001	៰៰ឣ
ន	748 71 71	0 0 12	25.2	212	46 21 21	2 m m	7 212	20 8 12
SG	002	448	00 %	005	4 8 81	00\$	446	4 4 8
9X	0 0 £	0 0 2	0 0 T	೦೦೭	4 4 E	≻≈ 5	44tī	ဝဝည
윺	005	446	ဝဝဝ	005	<u>၀၀</u> ဥ	005	005	005
¥	000	ဝဝလ	000	000	000	~~ 8	0 0 8	000
3	០០ដ	001	001	០០ជ		- . E	៤	4 % Ñ
æ	000		000	000	000	008	000	000
4	004	002	002	004	004	004	002	004
₹	0 27	0 27	0 27	0 0 27	0 27	0 0 27	0 0 72	0 0 27
12	009	004	003	003	004	0 0 9	00%	009
¥	400	0 0 1	0 0 2	004	0 0 7	0 0 7	007	001
	St. Crop SE NO. TOWS	St. Crop SE NO. TONS	St. Crop SE NO. TOWS					
DATE	13JUL- 8 18JUL 8	27JUL- S 01AUG S	10AUG- S 14AUG S	24AUG- S 28AUG S	08SEP- S 12SEP S	21SEP- S 25SEP S	050CT - S	190CT - S 230CT S

Table C-177 Regional Catch-Per-Unit-Effort (CPUE) of White Catfish Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

NED										
Regions COMBINED	9.00	9.9	999	9.0	0.0	9.00	9.0	9.0	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00 10 10
200	0.00	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S K	0.0 8	0.00 8	0.0 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00 0.00 8	0.00 8	0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.0 8	0.0 8	0.0 8 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 2
3	0.00	0.00	0.00 3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
\$	0.00	0.00 0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u> </u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00 0.00 24	0.00	0.00 0.00 24	0.00	0.00	0.00
¥	0.00 0.00 3	0.00 0.00	0.00 0.00	0.00 0.00 2	0.00	0.00	0.00	0.00	0.00	0.00 0.00 2
	rows	rows	TOWS	TOWS	TOWS	ZMO.	TOWS	TOWS	104S	104s
	CPUE SE NO. TOWS									
DATE	23JUN- 26JUN	06JUL -	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- Ò2SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-178 Regional Standing Crops (in Thousands) of White Catfish Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

		<u>a</u>	÷	3	¥	₽	S S	SG	S		Regions COMBINED
		00m	00M	00m	000	000	000	0 0 2	0 0 6	004	0 0 00
005		00m	00M	00m	000	000	000	0 0 ñ	005	004	000
3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		00m	00M	00m	000	000	008	០០៥	005	002	0 0 0
2,00		oon.	00 in		001	0010	000	000	005	900	0 0 00
00%		000	00 W	000	005	0010	00 W	000	000	002	0 0 0
00%		000	00 IN	000	0010	001	00 W	000	000	906	0 0 6
00%		00 m	00 IN	000	001	000	0010	000	005	00 r	008
00%		0010	0010		001	001	00 W	000	000	002	0 0 100
		oón	00 IN	000	0010	00 in	000	000	005	001	0 0 00
2,00		0010	0010	009	0010	00 M	00 W	000	005	002	000

Table C-179 Regional Density (No./1,000m3) of White Catfish Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	= 2 S	800	825	522	420	285	280	22.0
Reg COM	000	0.03 0.10 210	000	000	00.7	2.0.2	20.0	0.02 0.07 210
₹	0.24 0.15 13	0.00 13	0.28 0.20 13	0.09	0.0 13.00	0.04	0.09 0.06 13	0.00
S	0.23 0.16 21	0.21	0.02 0.02 21	0.09	0.22 0.09 21	0.00	0.05	0.06 0.04 21
SG	0.04	0.06 0.05 18	0.12 0.05 18	0.00	0.06 0.03 18	0.00	0.00 18	0.02 0.02 18
Æ	0.03	0.05 0.04 15	0.03 0.03 15	0.00	0.10 0.05 15	0.00 0.00 15	0.00	0.03 0.03 15
웊	9.00	0.00	90.0	9.00	9.00	0.02	0.00	0.00
¥	0.00	0.00 8	0.03 0.03 8	0.00 8	0.06 0.03 8	0.00 8	0.00	0.00
3	0.64 0.57 13	0.04	0.02 0.02 13	0.00	0.01 0.01 13	0.00 0.00 13	0.00	0.03 0.03 13
ş	0.01 8	0.00 8	0.00 8	0.00 0.00 8	0.00	0.03	0.02 0.02 8	0.00 8
<u>a</u>	0.00	0.03	0.09	0.00	0.00	0.01	0.04	0.01
₹	0.02 0.02 27	0.02 0.02 27	0.02 0.02 27	0.00	0.00	0.00 0.00 27	0.02 0.02 27	0.02 0.02 27
12	0.03	0.00	0.02	0.00	0.02	0.0%	0.02	0.01 0.01 46
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 17	0.01
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE SE NO. TOWS	DENSITY SÉ NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
DATE	13JUL - 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-180 Regional Standing Crops (in Thousands) of White Catfish Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

, ,	COMBINED	192 87 210	210	98 30 210	26 13 210	83 210 210	29 12 210	42 13 210	32 11 210
	AŁ	31 15 15	001	36 13 13	525	0011	००ध	5 8 5	0 0 E
	S	37 26 21	2 = 3	7 7 7	4,9 F	35 27 27	007	822	2,69
	SG	7 2 81	5 8 8 9	28 8 18	002	5 ~ ឆ	ဝဝဆ	၀၀ ဆ်	446
	9 Ke	4 4 T	စာ က ည်	4 4 č	0 5	7 8 	002	002	4 4 E
	윺	005	000	000	000	000	440	000	005
	¥	00	008		000	71 8	000	000	000
104 100	₹	825	សសឆ	ឧឧភ	0 0 E	5	0011	0012	សលដ្
	ş	mme	000	008	000	000	~ ~ 8	440	O O. 6
	٩	004	n n 4	13 × 4	004	004	4	ឧកភ្	00 1
	₹	27.3	23 m m	27.3.3	0 0 27	0 0 27	0 0 27	27	33 37
	21	553	00%	F 22 43	004	rs3	1 2 4 4	rs 3	443
INGL ESTOR	¥	001	0 0 7	0 71	0 0 7	0 0 1	0 0 2	0 0 2	ww.t
F 10800 E		Q. 10	a. va	a. w	a. w	Q. W	a. v	a v	a w
E		. Crop	. Crop	. Crop	. Crop	. Crop	. Crop	. Crop	. Crop
		se se.	SE SE	8 S.	S S .	8 St.	\$ 8 8.	S S S.	. St.
	DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	218EP- 258EP	050CT- 090CT	190CT- 230CT

Table C-181 Regional Catch-Per-Unit-Effort (CPUE) of White Catfish Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

DATE		¥	7.5	₹	<u>6</u>	\$	3	¥	윺	χg	SG	S	¥	Regions COMBINED
	CPUE SE NO. TOWS	0.00	0.27 0.14 11	0.00	0.00 0.00	0.00	0.00 0.00 3	0.0 0.0 8	0.00	0.00	0.00	0.00	0.08 0.08 12	0.03 0.16 100
	CPUE SE NO. TOWS	0.00 0.00 3	0.09	0.00	0.00	0.00	0.00	0.13 0.13	0.13 0.13 8	0.00	0.00	0.00 19	0.17	0.04 0.23 100
	CPUE SE NO. TOWS	0.00 0.00 3	0.27	0.00	0.00	0.00	0.33 0.33 3	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	CPUE SE NO. TOWS	0.00	0.04 0.04 24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.0 0.0 0.0	0.00	40.005 0.04 100
	CPUE SE NO. TOWS	0.00	0.0¢ 0.0¢ 2¢	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 0.0 0.0	0.00	<0.005 0.04 100
	CPUE SE NO. TOWS	0.00	0.04 0.04 24	0.00	0.00	0.00	0.00	0.00	0.20 0.20 5	0.00	0.00	0.00	0.00	0.02 0.20 100
	CPUE SE NO. TOWS	0.00 0.00 5	0.00	0.00 0.00 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 100 100	0.00	0.00 0.00 100
	CPUE SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CPUE SE NO. TOWS	0.00	0.00	0.00	0.00	0.00 5	0.00	0.00	0.00	0.00	0.00	0.00 0.00 10	0.00 0.00 7	0.00
260CT- 280CT	CPUE SE NO. TOWS	0.00	0.0% 0.0% 2%	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00 0.00 10	0.00	<0.005 0.04 100

Table C-182 Regional Standing Crops (in Thousands) of White Catfish Yearling and Older in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	17 6 100	7 4 100	31 00 100 100	2	2	100	0 0 00	0 0 00	0 001	2 o 0 1
AP CC	1-1-51	~ ~ <u>~</u>	0 0 21	400	400	002	00 ~	400	400	۸٥٥
S	005	005	006	000	005	000	005	005	005	005
SG	001	០០ជ	002	000	000	000	000	000	000	000
KG	008	000	008	00 IV	00 m	0010	000	00 M	0.0 %	00 iv
윺	000	.005 8	000	0010	00 W	<0.005 <0.005 5	00 W	00 M	00 w	000
¥	ဝင္	≈		00 W		0 0 r v			0010	00 IN
75	00M	00M	44M	009	000	000	00%	000	00%	009
9	00M	00 M	00m	001	00 W	0010	00 W	00 W	00 W	00 M
₫.	00 M	00m	00%	0 0 rú	00 W	0010	0010	0010	00 iv	001
픙	001	001	001	004	002	004	004	004	004	004
71	505	445	1912	2 0 3	2 2 2	2 2 2	00%	00%	00%	2 ~ 3
¥	00m	00 M	00 M	00 W	0 0 N	00 W	00 W	00 M	00 in	00 W
	ک	د	ठ <u>र</u>	e s	୫ ୫	er st	e s	8 ₹	&	Crop TOMS
	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOUS	St. Crop SE NO. TOWS				
DATE	23,UN- 26,UN	06JUL -	20JUL - 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

Table C-183 Regional Density (No./1,000m3) of Weakfish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00	0.00	0.00	0.00 0.00 115	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 118
Reg AL Con	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.00
S	0.00	999	999	90.00	0.00	. 00.0	0.00	0.00	9.09	0.00	0.00
SG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0	0.00	0.00
				. .	00	00	00		• •	99	66
% 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	9.00	9.00
풒	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 15	0.00	0.00	0.00
9	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	9.00	999	9.00
<u>e</u>	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	9.00	0.00	0.00	0.00 0.00 13	0.00
₹5	0.00	0.00 0.00 13	0.00	0.00	0.00	0.00	0.00 13	0.00	0.00	0.00	0.0 1.00 1.00
12	0.00 0.00 12	0.00 0.00 12	0.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	9.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B1	Š	S	S	SN	S	S	S	S	0.00	0.0 0.0 6	0.00
	DENSITY SE NO. TOWS										
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY - 22MAY	25MAY- 30MAY	01JUN- 05JUN	08JUN- 12JUN	15JUN- 19JUN	22JUN- 26JUN

Table C-183 Regional Density (No./1,000m3) of Weakfish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

	Regions Combined	0.00	0.00	0.00 0.00 72	1.68 9.24 73	1.98 5.38 73	8.04 20.48 73	1.39 4.04 73	1.79	0.0%
	¥	0.0 6.00 6	0.00	SZ.	SE SE	S S	X X	S.	NS	S .
	cs	0.00	0.00	Š	X	S.	æ	SX	SS SS	SZ.
	SG	0.00 0.00 6	0.00	%	SE SE	S S	X.	S	SZ SZ	S
	KG	0.00	0.00 0.00 7	X X	S S	SN	SN N	S	S.	SN SN
	뢒	0.0 0.0 0.0	0.0 0.0 0.0	S.	S.	S	S	S	S.	S.
	꽃	0.00	0.00	0.0 0.00 6	0.00	0.00	0.0 0.00 6	0.00	0.00	0.00
	3	0.00 13	0.00 0.00 13	0.00	0.00	0.00 10 10	0.00 0.00 10	0.00 10	0.0 0.0 0.0 0.0	0.00
	ş	9.00	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00 0.00 6	0.0 0.00 6	0.00
•	<u>a</u>	9.00	0.0 0.00 13	9.00	9.00	2.41 1.51 10	1.34 0.73 5	0.16 0.16 10	0.00 0.00 10	0.00 0.00 10
	3	9.00	0.00	0.00 0.00 12	0.40 0.40 12	0.87 0.43 12	2.40 2.40 12	1.30	1.19 0.75 12	0.28 0.28 12
•	72	0.00	0.00	0.00	11.34 9.22 11	1.05 0.55 11	7.63 1.88 11	1.12	0.53 0.53	0.00
	¥	9.65	9.0	0.00	1.73 0.38	3.03 2.53	21.76 9.80 11	0.00	1.53	0.00
	18	0.00 0.00 6	0.00	0.00	0.00	8.47	31.17 17.70 7	8.53 3.75	0.00	0.00
		DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE NO. TOWS	DENSITY SE No. Tows	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15sep- 17sep	28SEP- 30SEP	120CT - 140CT

Table C-184 Regional Standing Crop (In Thousands) of Weakfish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Young of Year Table C-184 Regional Standing Crop (In Thousands) of Weakfish

	Regions Combined	0 0 81 1	1900	002	4105 2970 73	3432 1156 73	14597 4389 73	2370 876 73	699 73 73	322
	k	000	000	N.	S	NS.	SX XX	S	SE SE	SX
1992	ន	0010	000	S	S.	SZ SZ	SZ Z	S	S	N
Survey,	98	000	000	S	S	S	S	S	S	S
ankton	8	400	400	SS	S .	S	Z Z	ž	S	S
chthyopl	웊	000	000	N.	S	SN	S	S S	S	S
River 1	¥	400	400	000	00%	000	000	000	000	009
tudinal	3	00ជ	001	000	005	005	000	000	005	005
om Long	\$	000	000	000	000	000	000	000	000	000
udson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	<u>e</u>	005	0015	005	005	501 315 10	280 151 10	33 33	005	005
ary Deter	₹	0.01	005	002	22 22	128 42 12	355 355 12	193 149 12	111 12	
er Estu	12	004	004	005	3650 2968 11	338 177 11	2456 606 11	362 362 11	121 11	00=
udson Ri	¥	005	005	005	396 82 11	695 580 11	4992 2248 11	005	352 352 11	00=
÷	18	000	000	001	400	1770 930 7	6514 3700 7	1782 784 7	00 r	400
•		Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop	Crop TOWS	Crop	Crop TOWS	Crop TOWS
		SE SE	SE SE.	SE.SE	S S S	S SE.	SE.	SE.	SE.	St.
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL- 22JUL	04AUG- 06AUG	18AUG- 20AUG	01SEP- 03SEP	15SEP- 17SEP	285EP- 30SEP	120CT- 140CT

Table C-185 Regional Density (No./1,000m3) of Weakfish Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

ns NED								
Regions COMBINED	<0.005 0.01 210	0.30 1.46 210	0.30 0.68 210	0.28 0.77 210	0.41 1.20 210	0.16 0.40 210	0.09 0.30 210	0.06 0.33 210
¥	0.00 0.00 13	0.00 0.00 13	0.00	0.00 13	0.00	0.00	0.00 0.00 13	0.00
S	0.00	0.00 0.00 21	0.00 21	0.00 21	0.0 2.0 21	0.00 21	0.0 2.0 21	0.0 2.0 21
98	0.00 18	0.00 0.00 18	0.0 0.08 18	0.00 18	0.00	0.00	0.00 18	0.00 18
ğ	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00 0.00 15	0.00 0.00 15	0.00
윺	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
¥	0.00	0.00	0.00	0.00	0.00 0.00 8	0.00	0.00 0.00 8	0.00 8
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ş	0.00 0.00 8	0.00 0.00 8	0.0 0.0 8	0.04 0.04 8	0.00 8	0.0 0.0 8	0.02 0.02 8	0.03 0.03 8
41	0.00	2.15 1.23 14	0.40	0.82 0.40 14	0.52 0.33 14	0.27	0.05	0.06
5	0.00	0.72 0.68 27	0.38 0.14 27	0.78 0.37 27	1.16 0.32 27	0.63 0.21 27	0.04 0.03 27	0.12 0.07 27
21	0.01	0.03 0.02 46	1.61 0.44 46	1.18 0.39 46	0.26 0.07 46	0.82 0.30 46	0.23 0.05 46	0.31 0.31 46
¥	0.00	0.65	1.23 0.48 17	0.52 0.38 17	3.01	0.25 0.12 17	0.77	0.20
	DENSITY SE NO. TOWS							
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table

	_								
	Regions COMBINED	4 210	713 290 210	938 183 210	792 181 210	1055 268 210	470 108 210	270 69 210	183 103 210
	Ą	0015	០០ឯ	០០ស	០០ជ	០០ជ	០០ជ	០០ដ	0012
	S	200	200	200	2100	2100	23 0	200	2100
	SG	002	ဝဝဆို	000	၀၀ ဆ	ဝဝည်း	o o ឆ្	ဝဝဆ	000
	ΚG	၀၀2	០០ស	ဝဝည	០០ស	0 0 1	ဝဝ £	0012	ဝဝည
of Year	윺	၀၀ဥ	005	၀၀ဥ	000	00 <u>0</u>	000	005	000
Young 1992	¥	008	008	000	000	000	000		000
Survey,	3	00£	០០ដ	០០ជ	001	001	0012	0 o £	0012
Jeakfish I Shoals	ŝ	000	000	0 0 8	စာ စာ စာ	000	008	m m co	r r 80
(in Thousands) of Weakfish Determined From Fall Shoals Survey,	₽.	004	449 257 14	±8,83	170 83 41	108 69 21	88 2	222	202
. Thousar termined	중	0 0 27	106 101 27	24 27	115 54 27	171 47 27	27.2	27	18 27
	12	449	5 × 3	518 141 46	380 124 46	% 77 82	263 98 46	%	<u>55</u> 3
itanding Crops River Estuary	¥	007	148 17	281 109 17	120 87 17	691 254 17	58 17	¥8. 7	327
Table C-186 Regional Sta in Hudson Ri		Crop TOUS	Crop TOWS	Crop TONS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOWS
8 π ~		St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T
Table C-(DATE	13JUL - 9 18JUL - 9	27JUL - 9	10AUG- 5	24AUG- 9	08SEP- 9	21SEP- 9	050CT - 9	190CT - S

Table C-187 Regional Catch-Per-Unit-Effort (CPUE) of Weakfish Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

DATE	PUE	0.00	12	£ 00	0.00	d 00.0	0.00	9X	₩ 0.0	0.00	98 98	S 0.0	AL 0.00	Regions COMBINED 0.00
<u>ພຸດ</u> ຊ	SE NO. TOWS CPUE	0° 0	 1. 0.	0.00	0.0 8.0		0.00 3	0.00 80.00	0.00 8	0.00 8 00.00	0.00 15 0.00	0.00	0.00	0.00 100 00 00
	SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 100
	CPUE SE NO. TOWS	90°	50.0	0.0 200 4	0.0 %	0.00 3	0.0 3.00	00°	0.0 8.00	0.0 80.0	0.00 5.00	0.0 2.09	0.00	0.00 100 0.00
	CPUE SE No. Tows	0.00 0.00 5	0.0 0.0 7,0 0.0 7,0	0.00 0.00 14	0.0 5.00 5.00	0.0 5.00 5.00	0.00 0.00 0.00	0.00 0.00 5	0.00	0.00	0.00	0.00 1000	0.00	<0.005 0.04 100
	CPUE SE NO. TOWS	0.00 0.00 5	0.00 0.00 24	0.00 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0 100 0.00
	CPUE SE NO. TOWS	0.00	0.00 0.00 24	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 100
	CPUE SE NO. TOWS	0.00	0.00 0.00 24	0.00	0.00 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CPUE SE NO. TOWS	0.00	0.00 0.00 24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CPUE SE NO. TOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CPUE SE NO. TOWS	0.00	0.00 0.00 24	0.00	0.00	0.00 0.00 5	0.00 0.00 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table C-188 Regional Standing Crops (in Thousands) of Weakfish Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	0 001	0 000	0 0 0	100 100	000	0 0 0	000	0 0 0	0 0 0	100
AL CC	002	002	0 0 2	002	400	400	400	400	00 r	۸٥٥
S	006	005	000	000	000	000	000	000	005	005
98	o o ស	၀ ၀ ည	៰៰៱	000	000	000	000	000	000	000
χ S	00	000	000	00 m	0010	0010	0 O IN	00 M	00 W	0010
윷	008	000	000	005	0010	00 0	00 iv	0010	00 m	00 W
¥	000	00	000	00 M	0010	002	00 m	00 w	00 W	000
3	00 M	00%	00m	000	000	000	00%	000	000	000
9	00 M	00%	00m	000	005	00 W	002	0010	0010	00 W
<u>≗</u>	00 M	00M	00m	000	0010	001	0010	00 IV	00 W	00 M
5	400	001	001	004	002	002	002	004	004	004
12	005	°°;	005	2 2 2	00%	00 %	00%	00%	00%	00%
¥	00M	00 M	00M	001 0	0 0 iv	000	0050	0010	00 in	00 M
	ક જ	e s	e s	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TONS
	St. Crop SE NO. TOWS	St. Crop SE. NO. TOWS	St. Crop SE NO. TOWS	St. Crop SE NO. TOWS	St. Cr SE NO. 10	St. Crop SE NO. TOWS	St. Cr SE NO. 10	St. Cr SE NO. 10	St. Cr SE NO. 10	St. Cr 86. 10
DATE	23JUN- S 26JUN S	N 70690 S 70690	2010L - S 22JUL - S	03AUG- 9 06AUG 9	17AUG- 20AUG	31AUG- 02SEP 9	14SEP- 9	288EP-	120CT - 150CT	260CT- 280CT

Table C-189 Regional Density (No./1,000m3) of Weakfish Yearling and Older in Hudson River Estuary Determined From Fall Shoals Survey, 1992

NED	10							
Regions COMBINED	40.005 0.01 210	0.00	<0.005 0.02 210	<0.005 0.02 210	0.00 0.00 210	<0.005 0.02 210	<0.005 0.03 210	0.00 0.00 210
¥	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00	0.00 0.00 13	0.00 0.00 13
S	9.0 2.88	0.0 2.00 2.00	9.9 2.88	0.00 2.00 21	0.00 21	0.00 0.00 21	0.00 21	0.00 21 21
98	0.00 0.00 18	0.0 0.00 18						
X	0.00 0.00 15	0.00	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15
₹	0.0 0.00 0.00	0.00	0.00 0.00 to	0.00	0.0 0.00 0.00	9.00	0.0 0.00 10	9.00
¥	0.00 8	0.0 8 8	0.0 0.88	0.00	0.0 0.00 8	0.0 8	0.00 0.00 8	0.00
3	0.00	0.00	0.00 0.00 13	0.00 0.00 13	0.00 0.00 13	0.00 13	0.00	0.00 0.00 13
ŝ	0.00	0.0 8	0.00	0.0 0.08	0.00	0.0 0.08	0.00	0.00
9.	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
₹	0.00 0.00 27	0.00	0.02	0.00	0.00	0.02	0.00	0.00 0.00 27
12	0.01	0.00	0.02 0.02 46	0.00	0.0 6.00 48	0.00	0.03	0.00
¥	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TONS
DATE	13JUL- 18JUL	27 JUL - 01 AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21sep- 29sep	050CT- 090CT	190CT- 230CT

Table C-190 Regional Standing Crops (in Thousands) of Weakfish in Hudson River Estuary Determined From Fall Shoals Survey, 1992

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Regions COMBINED	4 210	0 210	8 6 210	210	0 210	3 3 210	210	0 0 210
Ą	០០ឯ	០០ជ	0015	005	០០ជ	០០៦	001	៰៰ឨ
S	200	005	0 0 E	2100	005	0 0 T	200	200
98	008	002	ဝဝရွာ	೦೦೪	00 %	002	002	002
ă	0 o t	001	0 0 2	0 0 15	0 0 2	0 0 51	००६	0 o र
즆	000	ဝဝင္	005	005	<u>၀</u> ၀ဥ	000	000	000
¥	000	000	000	000	000	000	000	000
3	0 o ti	0011	០០ជ	ဝဝ ညှ	001	001	0011	0 0 E
\$	000	000	000	000	၀ဝ ဆ	000	000	000
9	004	004	004	44,4	004	004	004	004
舌	0 0 27	0 0 27	273	0 0 27	0 0 27	273	0 0 27	0 0 27
12	440	003	ณ ณ 🎝	009	003	009	703	00%
¥	005	005	007	005	.005	001	005	902
	Crop TOMS	Crop TOWS	Crop TOWS	Crop TOWS	Crop TOUS	Crop TOUS	Crop 1045	Crop TOMS
	\$ 8 S	S S S.	S S .	S 8 5.	S 8 5.	S K .	S S 5.	S. S. 5.
DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-191 Regional Catch-Per-Unit-Effort (CPUE) of Weakfish in Wudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	00.00	0.00 100 100	0.00 0.00 0.00	0.00 0.00 100	885	00.00	0.0 0.0 0.0 0.0	888	888	9.00
æ8	000	00						00	00	00
₹	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS	0.00 19	0.00	0.00	0.0 0.0 10	0.00	0.00	0.00	0.00 100 100	0.00	0.00 0.00 10
SG	0.00 0.00 15	0.00 0.00 15	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
æ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
웊	0.00	0.0 80.0 80.0	0.0 8	0.00	0.00 0.00 5	0.00	0.00	0.00	0.00	0.00
꿆	0.00	0.00	0.0 0.0 8	0.00	0.00	0.00	0.00	0.00	0.00 0.00 5	0.00
3	0.00	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00	0.0 0.00 0.00	0.00 0.00 6
ŝ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	200	0.00	0.00	0.00	0.00	0.00
¥	0.00 3	0.00	0.0 3.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	र्र	જ	হ	S	ফ	<u>s</u>	S	Ω	œ	ý
	CPUE Se No. Tows	CPUE . SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS					
DATE	23JUN- 26JUN		201UL-	O3AUG- O6AUG	17AUG- 20AUG	31AUG- O2SEP	14SEP- 16SEP	288EP- 308EP	120CT- 150CT	260CT - 280CT

Table C-192 Regional Standing Crops (in Thousands) of Weakfish in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions IL COMBINED				0 0 0 0 7 . 100					-	
				005		•				
SG	001	0 0 1	ဝဝည်	000	000	000	000	000	000	
_				0 0 0 0 0					00%	
	000		000	00 W	001	00 w	0010	00 W	00 m	
3	00%	00 m	00m	00%	000	000	000	000	000	
				00%						
				002						
21	005	005	005	200	2,00		2,00	2,00	00%	
¥	00M	00 M	00M	000	0010	000	001	001	001	
	St. Crop SE NO. TOWS									
DATE	23JUN- 26JUN	70670T-	20JUL- 22JUL	03AUG- 06AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	

Table C-193 Regional Density (No./1,000m3) of Bluefish Young of Year in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

Regions Combined	0.00	0.00 0.00 108	0.00	0.00 0.00 115	0.00	0.00 0.00 110	0.00	0.00	0.00	0.04 0.48	0.08 0.40 118
¥	0.00	9.0	9.00	0.00	0.00 0.00 10	0.00	0.00 0.00 6	0.00 0.00 6	0.0 0.0 6	0.0 0.00 5	9.0
ន	0.0 0.0 0.0	0.00	9.00	0.00	0.00 0.00 6	0.00 0.00 6	0.00 0.00 6	0.00 0.00 6	0.00	0.00	9.09
SG	0.0 8	0.00 0.00 8	0.00 0.00 8	0.00	0.00 6.00 6	0.0 8.00 8	0.0 0.08 8	0.00 8	0.00	0.00	0.00
X S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
≇	9.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 10
¥	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.0 0.00 0.00	0.00	200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.0 6.00 8	0.00 0.00 6.00	0.00 5.00	9.00	0.00	9.00	0.00	0.00	0.00	0.11
٩	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.21 0.13 12
ਝ	0.0 13	0.00	0.00	0.00	0.00	0.00	0.00 0.00 13	0.00	0.00	9.00	0.42 0.26 11
77	0.00	0.00	0.00 0.90 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25 0.25 14
¥	9.00	9.00	9.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B 1	SN	S	S	S.	S	S Z	SX	NS	0.00	0.48 0.48 6	0.00 0.00 6
	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS:	DENSITY SE NO. TOWS	DENSITY SE No. Tous	DENSITY SE NO. TOUS	DENSITY SE No. TOUS	DENSITY SE NO. TOWS
DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01 JUN- 05 JUN	08JUN- 12JUN	15JUN- 19JUN	22 JUN- 26 JUN

Young of Year Table C-193 Regional Density (No./1,000m3) of Bluefish in Hudson Bivar Estuary Determined From Low

	Regions Combined	4.51	1.59	0.28	2.02	9.00	1.15 1.82 23	2.22	0.04	0.00 73
,	¥	0.00	0.00	S	NS.	N	3 :	SN.	N	SN
	S	0.00	0.00	S	S	S	₩ ₩	S	SX	S
25	SG	0.00	0.00	SZ Z	¥8	SZ SZ	다 교	SE	X.	S.
rvey, 19	8	0.00	0.00	SN	SZ ·		22	SZ.	¥	SZ.
nkton Su	윺	0.00	0.0 0.0 0.0	N	N	S.	\$2 *E	X.	NS S	SE
chthyopla	¥	2.40 2.40 7	0.00 0.00 7	0.00 0.00 6	0.00	0.00	0.00 0.00 6	0.00	0.00	0.0
Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	3	3.85 3.59 13	0.60 0.40 13	0.00	0.00	0.00	0.62 0.62 10	0.00	0.00	0.00
itudinal	\$	0.66	1.04 0.58 9	0.00	0.00	0.00	0.00 0.00 6	0.00	0.00	0.00
rom Long	<u> </u>	0.27 0.18 13	0.59 0.21 13	0.30 0.15	0.05 0.05 10	0.00	0.05 0.05 10	0.04	9.00	9.00
rmined F	₹	1.32	1.96	0.46	0.47	0.00	3.17 1.16 12	0.21	0.34 0.34 12	0.00
ary Dete	12	0.38	1.29 0.77	0.83 0.25 11	1.25	0.00	5.18 1.25 11	0.19	99:	9.00
	X	0.46 0.46 11	0.72 0.48 11	0.64 0.46 11	0.74 0.65	9.00	0.15 0.15	1.29	0.0 1.00	0.00
in Kudson River	18	1.14 0.81 6	0.51 0.51	0.00	1.92 1.59 7	0.00	0.00	1.78 1.78	0.00	0.00
č ž		DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOUS	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS	DENSITY SE NO. TOWS
	DATE	29JUN- 03JUL	06JUL- 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	28SEP- 30SEP	120CT- 140CT

Table C-194 Regional Standing Crop (In Thousands) of Bluefish in Hudson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992

,	Regions Combined	0 0 90	0 0 0	0 0 80	0 115	0 0 118	100	0 0 0 0	0 0 0 1	0 0 0 1	101 101 117	208 75 118
	4	000	000	000	000	005	000	000	000	000	00 W	00%
!	ន	005	000	000	0010	000	000	000	000	000	0 0 W	000
•	SG	000	ဝဝဆ	000	00%	000	008	008	008	000	00%	000
	KG	001	006	400	001	001	001	00%	001	400	400	400
•	윺	009	۸٥٥	001	005	00=	005	005	005	005	000	0 0 0
	¥	000	000	00%	005	000	001	001	001	001	001	002
	3	005	005	00=	002	002	ဝဝည	០០វប	002	002	០០ឆ	0015
	9	000	000	000	000	000	000	000	000	000	000	6 22 6
	4	000	005	000	001	004	000	000	000	0 0 E	ဝဝည	44 27 12
	₹	0012	០០ឆ	០០ជ	000	000	001		0 E	00=	005	62 38 11
	12	002	002	0 0 2	005	000	005	005	005	004	004	80 74
	¥	000	000	000	000	000	000		000	005	005	005
	18	S	S.	S	SS.	SS S	NS	NS	S S	000	55,	000
		Crop TOWS	Crop TOWS	Crop TOWS	Crop	Crop	Crop TOWS	Crop	Crop TOWS	Crop	Crop	Crop TOWS
		St. C SE NO. 1	St. 0 SE. 7	St. C SE NO. 1	St. C SE NO. 1	St. C SE. T	St. C SE NO. 1	St. C SE NO. 1	St. C SE NO. T	St. C SE NO. T	St. C SE NO. T	St. C
	DATE	13APR- 18APR	20APR- 25APR	27APR- 01MAY	04MAY- 08MAY	11MAY- 15MAY	18MAY- 22MAY	25MAY- 30MAY	01JUN- 05JUN	-N05JUN- 12JUN	15 JUN- 19 JUN	22JUN- 26JUN

	Regions Combined	2107 914 118	1400 352 119	543 140 72	1053 490 73	00K	2265 447 73	769 73 73	322	0012
	A	000	004	S .	S	S	S	S	S	NS.
266	ន	0010	000	S	S	S	S	S	S	S.
urvey, 1	98	000	00%	S	S	S.	S	S	S.	S.
ankton S	8 9	001	001	S	2	S S	9	S	SZ	XX SX
ing Crop (in Thousands) of Bluefish Young of Year udson River Estuary Determined From Longitudinal River Ichthyoplankton Survey, 1992	윺	005	၀ ၀ ဥ	S	S	\$	S	S	SZ.	<u> </u>
Young of Year hat River Icht	¥	215 715	001	000	000	009	000	000	000	000
Yo I tudinal	3	538 502 13	58 13	000	000	005	87 87 10	005	005	005
ish rom Long	ş	136 116 9	216 120 9	000	000	000	000	000	000	000
of Bluef rmined F	<u>e</u>	57 38 13	124 43 13	31 0	555	000	555	ဆဆင္	000	000
usands) Iary Dete	5	26 11	290 139 11	67 34 12	50 21	0 0 2	468 172 12	31	50 12	00%
o (In Tho Ver Estu	21	123 23	414 247 14	267 80 11	403 325 11	005	1666 402 11	62 11	005	005
ling Crop ludson Ri	¥	\$5 1	265 111	146 105 11	169 148 11	005	13%	2% 2% 11	005	00=
Table C-194 Regional Standing Crop (In Thousands) of Bluefish in Hudson River Estuary Determined From	B	239 169 6	107 107 6	400	401 331 7	400	0 0 1	372 372 7	001	400
Region		Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOUS	Crop	Crop TOWS	St. Crop SE NO. TOWS	Crop
<u>-</u> 19		% % €	S & G.	SE.	S. S.	St. SE.	SE. NO.	S S .	\$ % £	St.
Table C	DATE	29JUN- 03JUL	06JUL - 10JUL	20JUL - 22JUL	04AUG- 06AUG	18AUG- 20AUG	O1SEP- O3SEP	15SEP- 17SEP	285EP- 30SEP	120CT- 140CT

Table C-195 Regional Density (No./1,000m3) of Bluefish Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	- E E O	6 00	8 M O	4 C 0	6.40	8 40	220	000
Regi	0.0	0.07 0.40 210	0.0	0.0	0.0	0.0	0.0	0.0
¥	0.00 130 13	0.00 0.00 13	0.00	0.00	9.00	0.00 0.00 13	0.0 0.00 13	0.00
S	0.0 2.88	0.0 0.00 21	9.9 2.88	9.0 2.85 2.85	0.00 2.00	0.00 21.00	0.00 21 21	9.00
98	0.0 8 8	0.0 8.00	0.00 18	0.0 0.08 18	0.00 180	0.00 81	0.00 180 180	0.00
KG	0.00 0.00 ts	0.00	0.00 0.00 15	0.00	0.00 0.00 15	0.00 0.00 15	0.00	0.00
윺	0.0 0.0 0.0	0.00	0.0 0.00 10	999	9.0 5.00 5	9.00	9.00	0.00
ž	0.0 8	0.0 0.0 8	0.00 8	0.0 0.00 8	0.0 8.00 8	0.00 8	0.0 8	0.00
3	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>a</u>	0.79 0.77 8	0.00	0.00	0.00	0.00	0.00 8	0.00	0.00
<u>e</u>	0.02	0.01	0.00	0.00	0.65 0.64 14	0.03	0.00	0.00
중	0.09	0.06 0.04 27	0.02 0.02 27	0.14 0.06 27	0.37 0.37 27	0.09	0.00 0.00 27	0.00
12	0.05	0.05 0.02 46	0.01	0.26 0.16 46	0.02	0.20	0.00 0.00 4	0.00
¥	0.32	0.68 0.40 17	0.33	0.05	0.00	0.06	0.00	0.00
	S	S	S	<u>s</u>	Ś	ဖွ	. છ	s.
	DENSITY SE NO. TOUS	DENSITY SE NO. TOWS						
DATE	13JUL- 18JUL	27 JUL - 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT - 230CT

Table C-196 Regional Standing Crops (in Thousands) of Bluefish Young of Year in Hudson River Estuary Determined From Fall Shoals Survey, 1992

Regions COMBINED	275 176 210	182 91 210	24 24 24 24 24 24 24 24 24 24 24 24 24 2	115 53 210	196 144 210	212 210 210 210	0 0 210	210
A	០០ជ	០០៥	001	001	០០ជ	០០ឯ	០០ជ	0012
ន	2100	2,00	200	2100	0012	0012	0 0 12	2100
SG	ဝဝည်	၀၀ ဆ	002	0025	ဝဝရွာ	ဝဝရွာ	002	002
9	០០ស	០០ឯ	០០វា	001	០០ស	001	005	0 0 2
£	005	005	၀၀ဥ	005	005	၀၀ဥ	005	00.0
¥	000	000	000	000	000	000	000	00
3	E	005	០០ជ	០០ជ	001	០០ជ	001	001
ŝ	163 160 8	000	000	000	000	008	008	000
4	m u ₹	222	002	004	136 133 14	6 25	004	00,4
5	14 5 27	6 7 72	2733	21 8 27	24 22	14 8 27	0 0 27	0 0 27
21	8 0 9 9	5 ~ 54	mm g	\$23	04	86 74 84	003	00%
¥	438	156 91 17	88 74	01 8 71	0 0 7	4 4 7	001	001
	Q w	2 0	Q 0	α σ	Q. 40	Q. W	ο 0	5. 40
	. Crop	. Crop	. Crop		. Crop		. Crop	. Crop
	S SE .		S S S	St. 86.	S S .			S 86 .
DATE	13JUL- 18JUL	27JUL- 01AUG	10AUG- 14AUG	24AUG- 28AUG	08SEP- 12SEP	21SEP- 25SEP	050CT- 090CT	190CT- 230CT

Table C-197 Regional Catch-Per-Unit-Effort (CPUE) of Bluefish in Hudson River Estuary Determined From Beach Seine Survey, 1992

Regions COMBINED	0.19 1.62 100	1.37 6.01 100	0.92 3.32 100	1.06 6.08 100	0.06 0.24 100	0.12 0.59 100	0.33 1.13 100	0.02 0.13 100	0.10 0.61 100	0.00
¥	0.00 0.00 12	0.00 0.00 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ន	0.00 19	0.00	0.00	0.00	0.0 0.0 0.0 0.0	0.00	9.00	0.00	0.00	0.00
98	0.00	0.00 0.00 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
χ	0.00 8	0.0 0.0 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
윺	0.00 8	0.0 0.00 8	0.00 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
꿆	0.00	0.0 0.0 8	0.0 0.0 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00 0.00	2.33 0.33 3	0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ş	0.00	6.67 5.24 3	4.00 2.52 3	5.60 5.60 5	0.00	0.00	0.20	0.00	0.40	0.00
4	0.00 0.00	3.67 2.73 3	1.67	2.20 1.71 5	0.00	0.00	0.60	0.00	0.40	0.00
5	1.71	2.29 0.92 7	3.14 1.12	1.07	0.21 0.11 14	0.21 0.11 14	0.71	0.21 0.11 14	0.07	0.00
72	0.55	1.55 0.53 11	1.9 5.1 11	1.04 0.30 24	0.54 0.21 24	1.00 0.55 24	2.08 0.97 24	0.08	0.08	0.00
¥	0.00 3.00	0.00	0.33	2.80 1.53 5	0.00	0.20	0.40	0.00 0.00 2	0.20	0.00
	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS	CPUE SE NO. TOWS				
DATE	23JUN- 26JUN	10160 - 10190	20JUL - 22JUL	O3AUG- O6AUG	17AUG- 20AUG	31AUG- 02SEP	14SEP- 16SEP	28SEP- 30SEP	120CT - 150CT	260CT- 280CT

Table C-198 Regional Standing Crops (in Thousands) of Bluefish Young of Year in Hudson River Estuary Determined From Beach Seine Survey, 1992

ູ ຄ										
Regions COMBINED	74 190	208 45 100	200 48 100	35 15 10 10	856	នេះខ	<u> </u>	5 4 6	5 ° 0	000
AL.	004	002	002	002	400	400	002	002	001	001
S	005	006	005	005	005	000	005	005	005	005
SG	ဝဝည	005	005	000	000	000	000	000	000	000
KG	ဝဝဆ	000	000	0010	00 in	00%	000	0010	0010	0010
윺	000	000	000	005	0010	000	001	0010	000	005
¥	000	000	000	00'10	00 M	0010	00%	005	0010	000
3	00m	Ω 4 m	00M	00%	000	000	000	000	000	000
£	00m	85 A to	1~m	សស	0 0 W	005	~~v	001		00 M
<u>-</u>	00M	35 W	សសស	8 5 5 5	00 IN	000	44 N	0010	4410	000
3	45	25 7	85 30 7	29 13 4	a w 4	ক দ ক	6 8 7	ი <u>ს 4</u>	202	002
12	82=	12,2	87 33 11	47 14 24	% ° %	522	24.53	4 E 4	4 m %	00%
¥	00M	00m	mmm	21 5	00 in	01 W ID	m n n	0010	00 N	00 M
	0 **	0 4	D 42	0 4	0 **					A
	Crop	Crop	Crop TOUS	Crop TOWS	Crop TOUS	Crop TOWS	Crop TOWS	Crop TOVS	Crop TOMS	Crop TOWS
	S 85.	SE SE	SE. NO.	Se.	St. SE.	St. SE. NO.	St. SE.	S S S	St. SG.	SE.
DATE	23JUN- 26JUN	- 10°60 - 10°60	20JUL- 22JUL	O3AUG- O6AUG	17AUG- 20AUG	31AUG- 02sep	14SEP- 16SEP	28SEP- 30SEP	120CT- 150CT	260CT- 280CT

APPENDIX D LENGTH FREQUENCY DISTRIBUTION

APPENDIX D

LIST OF TABLES

<u>Number</u>	<u>Title</u>
Table D-1	Length frequency distribution of larval and young-of-year striped bass in Hudson River estuary determined from Longitudinal River Ichthyoplankton Survey, 1992
Table D-2	Length frequency distribution of striped bass in Hudson River estuary determined from Fall Shoals Survey, 1992
Table D-3	Length frequency distribution of striped bass in Hudson River estuary determined from Beach Seine Survey, 1992
Table D-4	Length frequency distribution of larval and young-of-year white perch in Hudson River estuary determined from Longitudinal River Ichthyoplankton Survey, 1992
Table D-5	Length frequency distribution of white perch in Hudson River estuary determined from Fall Shoals Survey, 1992
Table D-6	Length frequency distribution of white perch in Hudson River estuary determined from Beach Seine Survey, 1992
Table D-7	Length frequency distribution of Atlantic tomcod in Hudson River estuary determined from Fall Shoals Survey, 1992
Table D-8	Length frequency distribution of Atlantic tomcod in Hudson River estuary determined from Beach Seine Survey, 1992
Table D-9	Length frequency distribution of larval and young-of-year American shad in Hudson River estuary determined from Longitudinal River Ichthyoplankton Survey, 1992
Table D-10	Length frequency distribution of American shad in Hudson River estuary determined from Fall Shoals Survey, 1992
Table D-11	Length frequency distribution of American shad in Hudson River estuary determined from Beach Seine Survey, 1992
Table D-12	Length frequency distribution of alewife in Hudson River estuary determined from Fall Shoals Survey, 1992
Table D-13	Length frequency distribution of alewife in Hudson River estuary determined from Beach Seine Survey, 1992
Table D-14	Length frequency distribution of blueback herring in Hudson River estuary determined from Fall Shoals Survey, 1992
Table D-15	Length frequency distribution of blueback herring in Hudson River estuary determined from Beach Seine Survey, 1992

APPENDIX D

LIST OF TABLES (Cont.)

Number

Title

- Table D-16 Length frequency distribution of bay anchovy in Hudson River estuary determined from Fall Shoals Survey, 1992
- Table D-17 Length frequency distribution of bay anchovy in Hudson River estuary determined from Beach Seine Survey, 1992
- Table D-18 Length frequency distribution of spottail shiner in Hudson River estuary determined from Fall Shoals Survey,
- Table D-19 Length frequency distribution of spottail shiner in Hudson River estuary determined from Beach Seine Survey, 1992
- Table D-20 Length frequency distribution of white catfish in Hudson River estuary determined from Fall Shoals Survey, 1992
- Table D-21 Length frequency distribution of weakfish in Hudson River estuary determined from Fall Shoals Survey, 1990

TABLE D-1 LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR STRIPED BASS IN HUDSON RIVER ESTUARY
DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1992

										www.		,			
DATES	0.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 7.9	8.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 17.9	18.0- 19.9	20.0- · 21.9	22.0- 23.9	24.0- 25.9	26.0- 27.9	28.0- 29.9
13APR-18APR	0	0	0	0	0	0	0	0	0	0	0	C	0	0	0
20APR-25APR	0	0	0	0	0	Ō	Č	Ŏ	ŏ	ŏ	ŏ	Õ	ŏ	Õ	ŏ
27APR-01MAY	0	0	0	0	0	0	0	Ö	Ò	Ŏ	ŏ	Ö	ŏ	Ŏ	ŏ
04MAY-08MAY	0	1	4	0	0	0	0	0	0	0	0	0	Ŏ	Ŏ	Ŏ
11MAY-15MAY	0	156	564	14	0	0	0	0	0	0	0	0	0	0	0
18MAY-22MAY 25MAY-30MAY	0	38	1243	425	0	0	0	0	0	0	0	0	0	0	0
01JUN-05JUN	0	103 18	1160 993	1105 863	24 207	0	0	0	0	0	0	0	0	0	0
08JUN-12JUN	Ö	124	1168	1124	480	2 128	0	0	0	0	0	0	0	0	0
15JUN-19JUN	Ŏ	14	852	1127	350	228	138	33	21	4	0	0	0	0	0
22JUN-26JUN	Ô	0	273	828	311	326	206	112	74	50	24	6	1	0	0
29JUN-03JUL	0	2	26	87	321	376	236	108	53	42	27	26	16	16	9
06JUL-10JUL	0	1	21	68	50	194	380	189	56	27	18	11	13	9	11
DATES	30.0- 31.9	32.0- 33.9	34.0- 35.9	36.0- 37.9	38.0- 39.9	40.0- 41.9	42.0- 43.9	44.0- 45.9	46.0- 47.9	48.0- 49.9	50.0- 51.9	52.0- 53.9	54.0- 55.9	56.0- 57.9	58.0- 59.9
13APR-18APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20APR-25APR	0	0	0	0	0	Ô	Ö	Ŏ	Ŏ	Ŏ	ŏ	ŏ	ŏ	ŏ	ŏ
27APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	Ö	Ŏ	Ŏ	Ŏ
04MAY-08MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11MAY-15MAY 18MAY-22MAY	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0
25MAY-30MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01JUN-05JUN	ŏ	Ö	Ŏ	Ď	Ö	0	0	Ö	0	ů	Ö	0	0	0	0
08JUN-12JUN	0	0	0	Ō	Ö	Ö	ŏ	ō	ŏ	Ŏ	ŏ	ŏ	ŏ	ŏ	ŏ
15JUN-19JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22JUN-26JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29JUN-03JUL 06JUL-10JUL	3 14	2	1 7	2 6	0	0	0 2	0	0	0	0	0	0	0 0	0
00005 10005	177	,				U			U	U	1.7	U	U	U	
			•	-		_	_	•		•	•	•	•	•	•
DATES	60.0- 61.9	62.0- 63.9	64.0- 65.9	66.0- 67.9	68.0- 69.9	70.0- 71.9	72.0- 73.9	74.0- 75.9	76.0- 77.9	78.0- 79.9	80.0- 81.9	82.0- 83.9	84.0- 85.9	86.0- 87.9	88.0- 89.9
DATES		63.9	64.0-			71.9	72.0- 73.9	74.0- 75.9	77.9	79.9	80.0- 81.9	83.9	85.9	87.9	88.0- 89.9
	61.9		64.0- 65.9	67.9	69.9		72.0-	74.0-			80.0-				88.0-
13APR-18APR 20APR-25APR 27APR-01MAY	61.9	63.9	64.0- 65.9 0 0	67.9 0	69.9 0	71.9	72.0- 73.9	74.0- 75.9	77.9 0	79.9 0	80.0- 81.9	83.9	85.9 0	87.9 0	88.0- 89.9
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY	61.9 0 0 0	63.9 0 0 0	64.0- 65.9 0 0	67.9 0 0 0	69.9 0 0 0	71.9 0 0 0 0	72.0- 73.9 0 0	74.0- 75.9 0 0	77.9 0 0 0	79.9 0 0 0	80.0- 81.9 0 0	83.9 0 0	85.9 0 0 0	87.9 0 0	88.0- 89.9 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY	61.9 0 0 0 0	63.9 0 0 0	64.0- 65.9 0 0 0	67.9 0 0 0 0	69.9 0 0 0	71.9 0 0 0 0	72.0- 73.9 0 0 0	74.0- 75.9 0 0 0	77.9 0 0 0 0	79.9 0 0 0 0	80.0- 81.9 0 0 0	83.9 0 0 0 0	85.9 0 0 0 0	87.9 0 0 0 0	88.0- 89.9 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY	61.9 0 0 0 0	63.9 0 0 0 0	64.0- 65.9 0 0 0	67.9 0 0 0 0	69.9 0 0 0 0	71.9 0 0 0 0 0	72.0- 73.9 0 0 0 0	74.0- 75.9 0 0 0	77.9 0 0 0 0 0	79.9 0 0 0 0 0	80.0- 81.9 0 0 0 0	83.9 0 0 0 0	85.9 0 0 0 0	87.9 0 0 0 0 0	88.0- 89.9 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY	61.9 0 0 0 0 0	63.9 0 0 0 0 0	64.0- 65.9 0 0 0 0	67.9 0 0 0 0	69.9 0 0 0 0	71.9 0 0 0 0 0	72.0- 73.9 0 0 0 0	74.0- 75.9 0 0 0 0	77.9 0 0 0 0 0	79.9 0 0 0 0 0	80.0- 81.9 0 0 0 0 0	83.9 0 0 0 0 0	85.9 0 0 0 0 0	87.9 0 0 0 0 0	88.0- 89.9 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY	61.9 0 0 0 0	63.9 0 0 0 0	64.0- 65.9 0 0 0	67.9 0 0 0 0	69.9 0 0 0 0	71.9 0 0 0 0 0	72.0- 73.9 0 0 0 0	74.0- 75.9 0 0 0	77.9 0 0 0 0 0	79.9 0 0 0 0 0	80.0- 81.9 0 0 0 0	83.9 0 0 0 0	85.9 0 0 0 0	87.9 0 0 0 0 0	88.0- 89.9 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN	61.9 0 0 0 0 0	63.9 0 0 0 0 0	64.0- 65.9 0 0 0 0 0	67.9 0 0 0 0 0	69.9 0 0 0 0 0	71.9 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0	74.0- 75.9 0 0 0 0 0	77.9 0 0 0 0 0	79.9 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0	83.9 0 0 0 0 0	85.9 0 0 0 0 0	87.9 0 0 0 0 0 0	88.0- 89.9 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN	61.9 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0	67.9 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0	71.9 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-12JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL	61.9 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0	71.9 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0	79.9	80.0- 81.9 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN	61.9 0 0 0 0 0 0 0 0	63.9	64.0- 65.9 0 0 0 0 0 0 0	67.9	69.9 0 0 0 0 0 0 0 0	71.9 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-12JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL	61.9 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0	71.9 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0	79.9	80.0- 81.9 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 90.0- 91.9	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 94.0- 95.9	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 98.0- 99.9	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 106.0-107.9+	79.9 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 0 98.0- 99.9	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 0 98.0- 99.9	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 98.0- 99.9	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 98.0- 99.9	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	71.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	63.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	71.9	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 25MAY-30MAY 05JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	92.0- 93.9	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	96.0- 97.9	98.0- 98.0- 99.9	71.9	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN 22JUN-26JUN	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	92.0- 93.9	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	96.0-97.9 00000000000000000000000000000000000	69.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	71.9	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 25MAY-30MAY 05JUN-12JUN 15JUN-19JUN 22JUN-26JUN 29JUN-03JUL 06JUL-10JUL DATES 13APR-18APR 20APR-25APR 27APR-01MAY 04MAY-08MAY 11MAY-15MAY 18MAY-22MAY 25MAY-30MAY 01JUN-05JUN 08JUN-12JUN 15JUN-19JUN	61.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	92.0- 93.9	64.0- 65.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	96.0- 97.9	98.0- 98.0- 99.9	71.9	72.0- 73.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.0- 75.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80.0- 81.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.9 0 0 0 0 0 0 0 0 0 0 0 0 0	85.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.9 0 0 0 0 0 0 0 0 0 0 0 0 0	88.0- 89.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-1 (cont.) LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR STRIPED BASS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1992

DATES	0.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 7.9	8.0- 9.9	10.0- 11.9		14.0- 15.9	16.0- 17.9	18.0- 19.9	20.0- 21.9	22.0- 23.9	24.0- 25.9	26.0- 27.9	28.0- 29.9
	_	_	_	_		_	_	_	_			_	_	_	_
20JUL-22JUL	0	0	1	2	1	2		7	8	11	4	3	0	3	1
04AUG-06AUG	0	0	0	0	0	1	1	0	0	0	1	0	0	2	2
18AUG-20AUG	0	0	0	0	0	0	-	0	0	1	0	2	1	1	2
01SEP-03SEP	0	0	0	0	0	0	_	0	0	0	0	0	0	0	0
15SEP-17SEP	0	0	0	0	0	0	0	. 0	0	0	0	0	0	0	0
28SEP-30SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120CT-140CT	0	0	0	0	0								0		
	0	457	6305	5643	1744	1257	973	449	212	135	74	48	31	31	25
	30.0-	32.0-	34.0-	36.0-	38.0-	40.0-	42.0-	44.0-	46.0-	48.0-	50.0-	52.0-	54.0-	56.0-	58.0-
DATES	31.9	33.9	35.9	37.9	39.9	41.9	43.9	45.9	47.9	49.9	51.9	53.9	55.9	57.9	59.9
20 44 20 44	•	•		•			,	-	•		•	•		•	•
20JUL-22JUL	2	0	1	0	9	1	4	3	0	1	0	0	0	0	0
04AUG-06AUG	2	0	1	0	4	2	2	1	4 2	1	2	1	0	1	0
18AUG-20AUG 01SEP-03SEP	0	0	1	1	1 1	0	0	0	1	'n	0	2	1	3	2
15SEP-17SEP	0	0	0	0	Ö	0	0	0	ņ	0	0	0	6	0	2
28SEP-30SEP	0	0	0	0	0	0	1	Ö	0	0	1	1	0	1	0
120CT-140CT	Ö	0	0	Ů	0	Ů	0	0	0	ñ	ė	Ó	8	6	ð
	-=====								======	=====	======				=====
	21	11	12	9	7	3	9	5	7	3	3	7	2	5	4
	60.0-	62.0-	64.0-	66.0-	68.0-	70.0-	72.0-	74.0-	76.0-	78.0-	80.0-	82.0-	84.0-	86.0-	88.0-
DATES	61.9	63.9	65.9	67.9	69.9	71.9	73.9	75.9	77.9	79.9	81.9	83.9	85.9	87.9	89.9
20 "" 22 ""	^	0		•	0	0	0	0	0	0	0		•		•
20JUL-22JUL 04AUG-06AUG	0	2	0	0	ů	0	0	0	0	0	0	0	0	0	0
18AUG-20AUG	i	0	3	0	1	0	0	1	0	0	Ö	0	0	0	0
01SEP-03SEP	1	1	2	1	•	0	0	2	6	3	2	2	2	1	Ö
15SEP-17SEP	'n	Ċ	Č	'n	á	0	ő	0	Õ	0	Õ	ō	ō	Ö	Ö
28SEP-30SEP	õ	ŏ	Ö	ŏ	ŏ	1	ŏ	ŏ	ĭ	1	Õ	Õ	1	ű	2
120CT - 140CT	ũ	ă	Õ	Õ	ŏ	ċ	ŏ	Ď	ò	ò	ŏ	ŏ	á	õ	õ
	=====	=====	======	=====	======	=====	=====	=====	=====	======		=====	=====	======	=====
	3	3	5	1	2	1	0	3	.7	4	2	2	3	1	2
	90.0-	92.0-	94.0-	96.0-	98.0-	100.0-	102.0-	104.0-	106.0-						
DATES	91.9	93.9	95.9	97.9	99.9	101.9	103.9	105.9	107.9+	N	MEAN	MIN	MED	MAX	SD
20JUL-22JUL	8	0	0	0	0	0	0	8	0	66	21.1	5.7	18.0	48.0	10.6
04AUG-06AUG	0	0	0	0	0	0	0	0	0	29	39.9	11.5	40.0	63.0	13.5
18AUG-20AUG	0	0	0	0	0	0	0	0	0	27	45.7	18.0	47.0	75.0	16.1
01SEP-03SEP	2	0	1	0	0	0	0	0	0	38	69.7	34.0	<i>7</i> 5.5	94.0	14.6
15SEP-17SEP	0	0	0	0	0	0	0	0	0	0	•	•	•	•	
28SEP-30SEP	1	0	0	0	0	0	1	1	1	14	78.0	42.0	81.5	106.0	21.0
120CT-140CT	0	0	0	0	0		0	0	0	0	•	•	•	•	•
	3	0	1	0	0	0	1	1	1	17660					
	3	U		U	U	U		ı		17000					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-2 LENGTH FREQUENCY DISTRIBUTION OF STRIPED BASS IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	5.0- 9.9	10.0- 14.9	15.0- 19.9	20.0- 24.9	25.0- 29.9					50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9	70.0- 74.9	75.0- 79.9
13JUL-18JUL	1	6	19	12	8	23	24	16	19	3	3	0	0	0	0
27JUL-01AUG	0	1	5	9	10	8	9	17	19	16	21	9	3	Ö	0
10AUG-14AUG	0	0	0	0	3	11	10	7	13	15	9	17	11	11	5
24AUG-28AUG	0	0	0	0	0	2	10 2 0	5	9	13	8	15	7	14	8
08SEP-12SEP	0	0	0	0	0	0	0	0	3	9	4	10	6	12	12
21SEP-25SEP	0	0	0	0	0	0	0	0	0	4	4	4	6	12	9
050CT-090CT	0	0	0	0	0	0	0	0	0	1	2	4	10	8	9
190CT-230CT	0	0	0	0	0	0	0	0	0	0	1	2	8	10	11
	=====	=====	=====	======	======	======	=====	=====	=====	=====	=====	======	=====	=====	======
	1	7	24	21	21	44	45	45	63	61	52	61	51	67	54
	80.0-	85.0-	90.0-	95.0-	100.0-	105.0-	110.0-	115.0-	120.0-						
DATES	84.9	89.9	94.9	99.9	104.9	109.9	114.9	119.9	124.9+	N	MEAN	MIN	MED	MAX	SD
13JUL-18JUL	0	0	0	0	0	0	0	0	0	134	32.7	9.0	34.0	57.0	11.7
27JUL-01AUG	0	0	0	0	0	0	0	0	0	130	44.1	13.0	46.0	69.0	13.5
10AUG-14AUG	2	0	0	0	0	0	0	0	0	116	54.1	28.0	53.5	80.0	14.1
24AUG-28AUG	12	3	2	1	0	0	0	0	0	105	64.0	30.0	63.0	97.0	14.3
08SEP-12SEP	9	5	4	1	1	0	1	1	0	78	71.8	45.0	72.0	116.0	14.5
21SEP-25SEP	13	10	3	5	6	3	2	0	0	82	79.8	50.0	80.0	110.0	14.9
050CT-090CT	5	8	3	7	6	5	2	1	0	71	83.0	54.0	81.0	118.0	15.5
190CT-230CT	10	8	8	12	8	7	5	4	0	94	88.4	58.0	88.5	117.0	15.3
	=====	=====	22222	=====	======	=====	=====	=====	=====	=====					
	51	34	20	26	21	15	10	6	0	810					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-3 LENGTH FREQUENCY DISTRIBUTION OF STRIPED BASS IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1992

DATES	15.0- 19.9	20.0- 24.9	25.0- 29.9	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9	70.0- 74.9	75.0- 79.9	80.0- 84.9	85.0- 89.9
DAILS	17.7	£4.7	27.7	J4.7	37.7	44.7	47.7	37.7	27.7	04.7	0,.,	14.7	,,,,	04.7	0,.,
23JUN-26JUN	4	14		4		0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	0	2	18	43		34	12	4	0	0	0	0	0	0	0
20JUL-22JUL	0	2	1	5	15	30	32	22	29	16	6	0	1	0	0
03AUG-06AUG	0	0	1	9	6	17	13	42	42	18	15	15	4	2	0
17AUG-20AUG	0	0	0	6	5	10	. 10	22	18	18	20	17	12	7	3
31AUG-02SEP	0	0	0	1	2	5	7	8	18	24	23	26	12	7	4
14SEP-16SEP	0	0	0	0	0	0	0	2	11	16	17	14	12	9	3
28SEP-30SEP	0	0	0	0	0	0	2	1	3	4	13	12	13	14	13
120CT-150CT	0	0	0	0	0	0	0	0	2	3	6	9	10	11	10
260CT-280CT	0	0	0	0	0	0	0	1	3	5	7	16	10	12	12
	22222	=====	=====	=====	=====	#2222	22222	=====	======	=====	=====	=====	=====	=====	
	4	18	33	68	91	96	76	102	126	104	107	109	74	62	45
	90.0-				110.0-										
DATES	94.9	99.9	104.9	109.9	114.9	119.9	124.9	129.9	134.9+	N	MEAN	MIN	MED	MAX	SD
23JUN-26JUN	0	0	0	0	0	0	0	0	0	35	24.6	18.0	24.0	34.0	4.1
06JUL-09JUL	0	0	0	0	0	0	0	0	0	176	36.5	23.0	36.0	53.0	5.8
20JUL-22JUL	0	0	0	0	0	0	0	0	0	162	49.3	22.0°	49.0	76.0	9.4
03AUG-06AUG	_														
	0	0	0	0	0	0	0	0	0	192	55.2	28.0	55.0	80.0	11.0
17AUG-20AUG	0	0	0	0	0	0	0	0	0 0	192 156	55.2 60.1	28.0 30.0	55.0 60.0	80.0 89.0	11.0 13.0
17AUG-20AUG 31AUG-02SEP	_	•	•	0 0 0	0 0 0	-	-	0 0 0	0 0 0						
***************************************	_	ŏ	ŏ	0 0 0 1	0 0 0 1	Ŏ	Ö	-	0 0 0	156	60.1	30.0	60.0	89.0	13.0
31AUG-02SEP	_	ŏ	ŏ	0 0 0 1 5	0 0 0 1 2	Ŏ	0	Ö	0 0 0 0	156 148	60.1 65.8	30.0 34.0	60.0 65.0	89.0 98.0	13.0 12.4
31AUG-02SEP 14SEP-16SEP	0 5 7	ŏ	ŏ	0 0 0 1 5 6	0 0 1 2 5	Ŏ	0	0	0 0 0 0 0	156 148 99	60.1 65.8 73.0	30.0 34.0 54.0	60.0 65.0 70.0	89.0 98.0 111.0	13.0 12.4 12.9
31AUG-02SEP 14SEP-16SEP 28SEP-30SEP	0 5 7	ŏ	0 0 3 5	0 0 0 1 5 6 4	0 0 1 2 5	Ŏ	0	0	0 0 0 0 0	156 148 99 117	60.1 65.8 73.0 83.1	30.0 34.0 54.0 47.0	60.0 65.0 70.0 82.0	89.0 98.0 111.0 119.0	13.0 12.4 12.9 15.7
31AUG-02SEP 14SEP-16SEP 28SEP-30SEP 120CT-150CT	0 5 7	ŏ	0 0 3 5	0 0 0 1 5 6 4	0 0 1 2 5 5 =======	Ŏ	0	0	0 0 0 0 0 0	156 148 99 117 79	60.1 65.8 73.0 83.1 85.9	30.0 34.0 54.0 47.0 56.0	60.0 65.0 70.0 82.0 83.0	89.0 98.0 111.0 119.0 115.0	13.0 12.4 12.9 15.7 15.5

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-4 LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR WHITE PERCH IN HUDSON RIVER ESTUARY
DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1992

DATES	0.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 7.9	8.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 17.9	18.0- 19.9	20.0- 21.9	22.0- 23.9	24.0- 25.9
13APR-18APR 20APR-25APR	0	0 0	0	0	0	0	0	0	0	0	0	0	0
27APR-01MAY	ő	ŏ	ŏ	Ö	Ö	0	0	ő	ŏ	Ö	Ď	Ö	ő
04MAY-08MAY	Õ	163	18	Õ	Ď	ŏ	Õ	ŏ	Ö	Õ	Õ	Õ	ŏ
11MAY-15MAY	ŏ	1431	214	Ŏ	Ŏ	ŏ	ŏ	ŏ	ŏ	õ	ō	Ŏ	ŏ
18MAY-22MAY	Ō	661	862	3	i	Ŏ	Ŏ	Ŏ	Ŏ	Ö	0	Ö	Ö
25MAY-30MAY	0	433	1355	352	5	0	0	0	0	0	0	0	0
O1JUN-O5JUN	0	186	932	662	69	1	0	0	0	0	0	0	0
08JUN-12JUN	0	638	861	969	432	28	1	0	0	0	0	0	0
15JUN-19JUN	0	304	1101	652	395	150	12	0	0	Ō	0	0	0
22JUN-26JUN 29JUN-03JUL	0	72 55	519 108	879 432	539 473	250 367	127 156	49 63	10 29	4 19	10	0 7	0 2
06JUL-10JUL	0	1	60	164	487	491	248	106	39	21	12	14	1
	26.0-	28.0-	30.0-	32.0-	34.0-	36.0-	38.0-	40.0-	42.0-	44.0-	46.0-	48.0-	50.0-
DATES	27.9	29.9	31.9	33.9	35.9	37.9	39.9	41.9	43.9	45.9	47.9	49.9	51.9
13APR-18APR	0	0	0	0	0	0	0	0	0	0	0	0	0
20APR-25APR	0	0	0	0	0	0	0 0	0	0	0	0	Ö	0
27APR-01MAY 04MAY-08MAY	0	0	0	0	0	Ö	Ö	0	ő	ő	Õ	Õ	Ö
11MAY-15MAY	0	0	Ö	Ö	0	ŏ	ŏ	ŏ	Õ	ŏ	ŏ	ŏ	Ŏ
18MAY-22MAY	ŏ	Ŏ	ŏ	ŏ	ŏ	Ŏ	Ŏ	ō	Ŏ	Ō	0	0	0
25MAY-30MAY	ŏ	Ŏ	Ŏ	Ō	0	Ô	0	0	0	0	0	0	0
01JUN-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0
08JUN-12JUN	0	0	0	0	0	0	0	0	0	0	0	0	0
15JUN-19JUN	0	0	0	0	0	0	0 0	0	0	0	0	0	0
22JUN-26JUN	0	0	0	0	υ 0	0	0	0	0	Ö	0	ŏ	Ŏ
29JUN-03JUL 06JUL-10JUL	0	0	0	ő	Ŏ	ŏ	ŏ	Ŏ	ō	Ŏ	Ō	0	0
	52.0-	54.0-	56.0-	58.0-	60.0-	62.0-	64.0-	66.0-	68.0-	70.0-	72.0-	74.0-	76.0-
DATES	53.9	55.9	57.9	59.9	61.9	63.9	65.9	67.9	69.9	71.9	73.9	75.9	77.9
13APR-18APR	0	0	0	0	0	0	0	0	0	0	0	0	0
20APR-25APR	0	0	0	0	0	0	0	0	Ö	0	Ď	Ŏ	Ŏ
27APR-01MAY	0	0	0	0	0	0	0	ŏ	ŏ	ŏ	Ŏ	Ŏ	Ŏ
04MAY-08MAY 11MAY-15MAY	0	0	0	Ö	ŏ	Õ	ŏ	ŏ	ŏ	Ŏ	Ö	0	0
18MAY-22MAY	Õ	ŏ	Ŏ	Ŏ	Ŏ	Ö	Ö	0	0	0	0	0	0
25MAY-30MAY	Ŏ	Õ	Ô	Ô	0	0	0	0	0	0	0	0	0
01JUN-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0
08JUN-12JUN	0	0	0	0	0	0	0	0	0	0	0	0	0
15JUN-19JUN	0	0	0	0	0	0	0	0	0	0	0	0	ŏ
29JUN-26JUN 29JUN-03JUL	0	0	0	0	0	0	0	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ
06JUL-10JUL	Ö	Ö	ŏ	Ö	ŏ	ŏ	ŏ	Ŏ	Ŏ	Ō	0	0	0
	78.0- 79.9	80.0- 81.9		.0- 3.9	84.0- 85.9+	N	MEAI	1	MIN	MED	MAX	SI	0
DATES	17.7	01.7		J.,				•					
13APR-18APR	0	0		0	0	0	•		•	•	•	•	
20APR-25APR	0	0		0	Ö	0	•		•	•	:		
27APR-01MAY 04MAY-08MAY	0	Č		Ö	ő	185	3.4	4	1.9	3.5	4.2	0.	
11MAY-15MAY	Ö	č		ŏ	ŏ	1766	3.5	5	2.0	3.4	5.1	0.	
18MAY-22MAY	Ŏ	Č)	0	0	1676	4.1		2.5	4.0	9.7	0.	
25MAY-30MAY	0	C)	0	0	2209	4.8		2.6	4.7	8.7	1.1	
01JUN-05JUN	0	Ç		0	0	1885	5.0		2.5	5.5	10.2	1.1 1.1	
08JUN-12JUN	0	(0	0	2962	5.8		2.2	5.9 5.8	12.0 13.4	2.	
15JUN-19JUN	0	0		0	0	2639	6.7		2.6 3.0	7.3	19.0	2.	
22JUN-26JUN	0	(0	0 0	2463 1725	7.8 9.4		2.7	9.0	24.1	3.	
29JUN-03JUL	0	(0 0	0	1648	10.		3.8	10.4	24.0	3.	
06JUL-10JUL	U	,	,	v	Ū	.0-0		-					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-4 (cont.) LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR WHITE PERCH IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1992

						_				•			
DATES	0.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 7.9	8.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 17.9	18.0- 19.9	20.0- 21.9	22.0- 23.9	24.0- 25.9
20JUL-22JUL	0	0	0	4	1	0	16	26	12	4	0	2	0
04AUG-06AUG	Õ	Ö	ŏ	ō	ò	ő	1	0	1	ō	Õ	1	1
18AUG-20AUG	Ď	Õ	ŏ	Õ	1	ő	Ó	ŏ	Ò	0	0	Ġ	1
01SEP-03SEP	Ö	0	0	Ŏ	ò	0	0	0	0	0	•	_	-
15SEP-17SEP	0	0	0	0	0	Ö	0	Ö	0	0	0	0	0
28SEP-30SEP	Ö	0	0	ů	Û	0	0	0	0	0	•	•	0
120CT-140CT	0	0	0	0	ŭ	Ů	0	0	•	•	0	0	0
12001 - 14001							U		0	0	0	0	0
	0	3944	6030	4117	2403	1287	561	244	91	######	======		======
	U	3744	0030	4117	2403	1207	201	244	91	48	22	24	5
	26.0-	28.0-	30.0-	32.0-	34.0-	36.0-	38.0-	40.0-	42.0-	44.0-	46.0-	48.0-	50.0-
DATES	27.9	29.9	31.9	33.9	35.9	37.9	39.9	41.9	43.9	45.9	47.9	49.9	51.9
20JUL-22JUL	1	2	0	0	0	0	0	0	0	0	0	0	•
04AUG-06AUG	ó	2	1	2	Û	2	0	-	-	-	•	_	0
18AUG-20AUG	0	3	Ó	• 1	2	1	_	1	0	0	1	0	0
01SEP-03SEP	0	3 0	0	1	2	ů	1	-	2	1	0	0	0
	0	-	•	-	_	_	4	2	2	0	1	1	2
15SEP-17SEP	•	0	0	0	0	0	0	0	0	0	0	0	0
28SEP-30SEP	0	0	0	0	0	0	0	0	0	0	0	0	1
120CT-140CT	0	0	0	0	0	0	0	0	0	0	0	0	0
	======	=====	=====	======	======	======	======	=====	======	======	**====	=1:====	======
	1	7	1	4	4	3	5	3	4	1	2	1	3
	52.0-	54.0-	56.0-	58.0-	60.0-	62.0-	64.0-	66.0-	68.0-	70.0-	72.0-	74.0-	76.0-
DATES	53.9	55.9	57.9	59.9	61.9	63.9	65.9	67.9	69.9	71.9	73.9	75.9	77.9
2010F-5510F	0	0	0	0	0	. 0	0	0	0	0	a	•	_
04AUG-06AUG	0	0	Ô	0	1	0	Ö	-	-	•	_	0	0
18AUG-20AUG	0	0	ů	0	Ó	Ŭ O	0	0	0	0	0	0	0
01SEP-03SEP	0	0	0	Ö	1	2	0	0	0	0	0	0	0
	•	0	0	υ 8	0		•	2	1	0	0	0	0
15SEP-17SEP	2	0	0	υ 0	•	0	0	0	0	0	0	0	0
28SEP-30SEP 120CT-140CT	0	1	n n	0	1 0	3	0	1	1	1	0	1	0
12001-14001		1	U	U	U	•	0	1	1	1	0	0	0
	2	1	0	0	3	5	##====	=====	======	======	======	###=##	======
	۲	ı	U	Ü	3)	0	4	3	2	0	1	0
	78.0-	80.0-	82.	.0- 8	34.0-		•						
DATES	79.9	81.9	83	3.9	35.9+	N	MEAN	P	4IN	MED	MAX	SI)
	_	_		_	_								
20JUL-22JUL	0	0		0	0	68	15.2		5.0	15.0	28.0	4.1	-
04AUG-06AUG	0	0		0	0	14	32.2		2.8	32.0	60.0	12.3	_
18AUG-20AUG	0	0		0	0	13	32.8	-	7.8	34.0	44.0	9.3	
01SEP-03SEP	0	0		0	. 0	21	47.7		2.0	43.0	68.0	11.9	•
15SEP-17SEP	0	0		0	0	2	52.5		2.0	52.5	53.0	0.7	7
28SEP-30SEP	0	0		0	1	10	66.3		1.0	64.5	84.0	8.8	3
120CT-140CT	0	0	1	0	0	4	64.8	54	-0	67.5	70.0	7.4	•
		=====			2222	=====							
	0	0)	0	1	19290							

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-5 LENGTH FREQUENCY DISTRIBUTION OF WHITE PERCH IN HUDSON RIVER ESTUARY
DETERMINED FROM FALL SHOALS SURVEY, 1992

	DATES	10.0- 14.9	15.0- 19.9	20.0- 24.9	25.0- 29.9	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9
-,-	13JUL-18JUL	8					2,,,						07.7
		0	32	20	17	8	1	0	0	0	0	0	Ų
	27JUL-01AUG	2	22	11	15	12	12	. 6	2	2	U	0	O
	10AUG-14AUG	Ü	1	4	13	15	13	11	4	0	1	1	0
-	24AUG-28AUG	0	0	0	3	11	20	12	10	10	4	3	Ō
	08SEP-12SEP	Ō	0	0	0	2	3	15	9	13	9	3	4
	21SEP-25SEP	C	0	0	0	0	1	1	6	9	10	6	3
	050CT-090CT	0	9	0	0	0	0	1	3	7	5	11	17
	190CT-230CT	0	0	0	0	0	0	1	4	4	6	10	18
		=====	222555	=====		***	=====		======	=====	=====	#2#22 2	202228
		10	55	35	48	48	50	47	38	45	35	34	42
		70.0-	75.0-	80.0-	85.0-	90.0-	95.0-						
	DATES	74.9	79.9	84.9	89.9	94.9	99.9+	N	MEAN	MIN	MED	MAX	SD
٠.	13JUL-18JUL	0	0	0	0	0	0	86	21.5	12.0	20.0	39.0	6.0
	27JUL-01AUG	0	0	0	0	0	0	84	27.8	12.0	27.0	52.0	9.6
_	10AUG-14AUG	0	0	0	0	0	0	63 ⁻	34.5	19.0	33.0	62.0	8.4
•	24AUG-28AUG	O	0	0	0	0	0	74	42.6	27.0	41.5	64.0	9.1
	08SEP-12SEP	2	1	Ō	0	Ó	0	62	50.6	33.0	50.5	77.0	10.0
	21SEP-25SEP	4	1	4	1	Ó	0	48	59.9	39.0	57.0	85.0	11.4
	050CT-090CT	11	6	9	2	Ō	Ö	73	66.8	44.0	68.0	88.0	10.1
-	190CT - 230CT	17	14	7	5	Õ	Ŏ	86	68.7	41.0	69.5	86.0	10.4
	.,	=====	======	=====	======	======	=====	=====					
		34	22	20	8	0	0	576					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-6 LENGTH FREQUENCY DISTRIBUTION OF WHITE PERCH IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1992

	20.0-	25.0-	30.0-	35.0-	40.0-	45.0-	50.0-	55.0-	60.0-	65.0-	70.0-
DATES	24.9	29.9	34.9	39.9	44.9	49.9	54.9	59.9	64.9	69.9	74.9
23JUN-26JUN	0	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	18	33	6	6	1	1	0	0	0	8	0
20JUL-22JUL	3	11	42	51	27	1	3	0	0	0	0
03AUG-06AUG	0	2	. 4	19	40	38	32	7	0	0	0
17AUG-20AUG	0	1	5	6	12	17	31	32	18	4	1
31AUG-02SEP	0	0	1	3	2	8	15	33	20	21	12
14SEP-16SEP	0	0	0	0	3	14	14	7	15	16	18
28SEP-30SEP	0	0	0	1	0	2	5	7	15	28	14
120CT-150CT	0	0	0	0	0	0	6	5	12	26	18
260CT-280CT	0	0	0	0	0 -	1	8	7	8	9	16
		======	=====	=====			======	=====		======	22222
	21	47	58	86	85	82	114	98	88	104	79
	75.0-	80.0-	85.0-	90.0-							
DATES	79.9	84.9	89.9	94.9+	N	MEAN	MIN	MED	MAX	SD	
23JUN-26JUN	0	0	0	0	0		•				
06JUL-09JUL	0	0	0	0	65	27.8	21.0	27.0	47.0	5.1	
20JUL-22JUL	0	0	0	0	138	35.5	23.0	35.0	53.0	5.1	
03AUG-06AUG	0	0	0	0	142	45.2	26.0	45.0	59.0	6.3	
17AUG-20AUG	0	0	0	0	133	52.6	28.0	53.0	70.0	8.7	
31AUG-02SEP	6	0	0	0	125	59.8	33.0	60.0	78.0	9.0	
14SEP-16SEP	19	4	2	0	115	64.1	41.0	65.0	87.0	11.4	
28SEP-30SEP	20	10	6	0	114	68.9	35.0	69.0	89.0	9.9	
120CT-150CT	18	10	2	0	99	69.7	51.0	69.0	89.0	8.4	
260CT-280CT	14	8	2	0	74	69.1	49.0	70.5	87.0	9.9	
	=====	=====	=====	======							
	77	32	12	0	1005						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-7 LENGTH FREQUENCY DISTRIBUTION OF ATLANTIC TOMCOD IN HUDSON RIVER ESTUARY
DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	45.0- 49.9		55.0- 59.9	60.0- 64.9	65.0- 69.9	70.0- 74.9	75.0- 79.9	80.0- 84.9	85.0- 89.9	90.0- 94.9		100.0- 104.9	105.0- 109.9	
13JUL-18JUL	1	0	0	0	0	0	1	2	27	27	26	20	16	5
27JUL-01AUG	0	Ō	ō	ŏ	ñ	Ď	1	7	24	32		30	22	10
10AUG-14AUG	Ö	Ö	Õ	ŏ	ă	Ď	'n	8	10	26	36	29	18	20
24AUG-28AUG	O	Ô	Ō	ŏ	ă	ก	ă	Ž	10	18	26	33	16	17
08SEP-12SEP	0	Ō	Ŏ	Ŏ	Ŏ	Õ	2	,	8	22	23	26	21	10
21SEP-25SEP	Ō	Ŏ	Ŏ	ŏ	ă	Õ	ก	5	11	14	31	26	28	18
050CT-090CT	Ô	Ō	Ō	ō	Ō	ñ	1	ñ	7	16	30	24	30	30
190CT-230CT	Ō	Ō	Ŏ	ŏ	Ŏ	ŏ	Ġ	Õ	10	5	14	23	22	23
	=====	=====	=====	=====	=====	======	======	22222		*****	======	======		*****
	1	0	0	0	0	0	5	27	107	160	209	211	173	133
	115 0	420.0	435 0	470 0	475 4	410.0								
	115.0-	120.0-	123.0-	130.0-	155.0-	140.0-	145.0-	150.0-						
DATES	119.9	124.9	129.9			144.9	145.0- 149.9	150.0- 154.9+	N	MEAN	MIN	MED	MAX	SD
DATES	119.9								N 129	MEAN	MIN 45.0	MED 96.0	MAX 120.0	\$D 9.5
	119.9		129.9	134.9	139.9	144.9	149.9	154.9+						
13JUL-18JUL	119.9		129.9	134.9 0	139.9	144.9	149.9	154.9+	129	96.4	45.0	96.0	120.0	9.5
13JUL-18JUL 27JUL-01AUG	119.9 3 3		129.9	134.9 0 0	139.9 0 0	144.9 0 0	149.9 0 0	154.9+	129 152	96.4 97.6	45.0 77.0	96.0 97.5	120.0 120.0	9.5 8.8
13JUL-18JUL 27JUL-01AUG 10AUG-14AUG	119.9 3 3 4		129.9	134.9 0 0 0 5 6	139.9 0 0	144.9 0 0	149.9 0 0	154.9+	129 152 157	96.4 97.6 100.0	45.0 77.0 81.0	96.0 97.5 99.0	120.0 120.0 127.0	9.5 8.8 9.8
13JUL-18JUL 27JUL-01AUG 10AUG-14AUG 24AUG-28AUG	119.9 3 3 4 11		129.9	134.9 0 0 0 5	139.9 0 0 0	144.9 0 0	149.9 0 0 0	154.9+	129 152 157 151	96.4 97.6 100.0 103.7	45.0 77.0 81.0 80.0	96.0 97.5 99.0 103.0	120.0 120.0 127.0 134.0	9.5 8.8 9.8 11.6
13JUL-18JUL 27JUL-01AUG 10AUG-14AUG 24AUG-28AUG 08SEP-12SEP	119.9 3 3 4 11	124.9 1 1 5 7 4	129.9	134.9 0 0 0 5 6	139.9 0 0 0 0 0 0	144.9 0 0	149.9 0 0 0	154.9+ 0 0 0 0	129 152 157 151 140	96.4 97.6 100.0 103.7 103.4	45.0 77.0 81.0 80.0 76.0 82.0 76.0	96.0 97.5 99.0 103.0 101.0 103.5 107.0	120.0 120.0 127.0 134.0 140.0 143.0 145.0	9.5 8.8 9.8 11.6 12.4 12.3 12.8
13JUL-18JUL 27JUL-01AUG 10AUG-14AUG 24AUG-28AUG 08SEP-12SEP 21SEP-25SEP	119.9 3 3 4 11 11 11	124.9 1 1 5 7 4 12	129.9	134.9 0 0 0 5 6	139.9 0 0 0 0 0	144.9 0 0	149.9 0 0 0	154.9+ 0 0 0 0	129 152 157 151 140 170	96.4 97.6 100.0 103.7 103.4 105.2	45.0 77.0 81.0 80.0 76.0 82.0	96.0 97.5 99.0 103.0 101.0 103.5	120.0 120.0 127.0 134.0 140.0	9.5 8.8 9.8 11.6 12.4 12.3
13JUL-18JUL 27JUL-01AUG 10AUG-14AUG 24AUG-28AUG 08SEP-12SEP 21SEP-25SEP 05OCT-09OCT	119.9 3 3 4 11 11 13 18	124.9 1 1 5 7 4 12 7	129.9 0 0 1 4 4 5 8	134.9 0 0 5 6 5 8	139.9 0 0 0 0 0 0	144.9 0 0	149.9 0 0 0	154.9+ 0 0 0 0	129 152 157 151 140 170 187	96.4 97.6 100.0 103.7 103.4 105.2 108.2	45.0 77.0 81.0 80.0 76.0 82.0 76.0	96.0 97.5 99.0 103.0 101.0 103.5 107.0	120.0 120.0 127.0 134.0 140.0 143.0 145.0	9.5 8.8 9.8 11.6 12.4 12.3 12.8

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-8 LENGTH FREQUENCY DISTRIBUTION OF ATLANTIC TOMCOD IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1992

	80.0-	85.0-	90.0-	95.0-	100.0-	105.0- 109.9	110.0- 114.9	115.0- 119.9	120.0- 124.9	125.0- 129.9	130.0- 134.9
DATES	84.9	89.9	94.9	99.9	104.9	109.9	114.7	117.7	164.7	167.7	134.7
23JUN-26JUN	3	3	6	2	0	1	0	0	0	0	0
06JUL-09JUL	Ō	4	11	2	5 '	1	0	0	0	0	0
20JUL-22JUL	Ō	1	0	0	2	0	0	0	0	0	0
03AUG-06AUG	Ó	0	1	6	2	2	0	0	0	0	0
17AUG-20AUG	0	2	2	6	8	2	3	2	1	2	0
31AUG-02SEP	0	2	1	3	5	2	3	2	0	2	1
14SEP-16SEP	0	0	2	1	- 4	6	2	1	4	0	0
28SEP-30SEP	Ō	1	1	1	2	0	0	1	1	0	0
120CT - 150CT	0	0	0	3	3	1	3	3	2	3	0
260CT-280CT	Ó	0	0	0	3	0	2	1	1	2	2
	22222	=====	=====	=====	=====	=====	*****	=====	22222	=====	22222
	3	13	24	24	34	15	13	10	9	9	3
	135.0-	140.0-	145.0-	150.0-							
DATES	139.9	144.9	149.9	154.9+	N	MEAN	MIN	MED	MAX	SD	
23JUN-26JUN	0	0	0	0	15	91.1	82.0	92.0	105.0	6.2	
06JUL-09JUL	Ó	0	0	0	23	94.2	85.0	93.0	105.0	5.3	
20JUL - 22JUL	Ŏ	Ó	0	0	3	97.7	87.0	102.0	104.0	9.3	
03AUG-06AUG	Ó	0	0	0	11	99.4	91.0	99.0	108.0	4.8	
17AUG-20AUG	Ò	0	0	0	28	104.1	85.0	103.0	129.0	11.1	
31AUG-02SEP	Ō	0	0	0	21	106.5	88.0	104.0	133.0	12.6	
14SEP-16SEP	0	0	0	0	20	108.0	93.0	106.5	124.0	9.2	
28SEP-30SEP	0	0	0	0	7	101.6	87.0	100.0	121.0	13.2	
120CT-150CT	1	3	0	0	22	117.2	95.0	116.5	144.0	14.9	
260CT-280CT	1	Ö	2	0	14	122.9	100.0	123.0	147.0	15.4	
	=====	=====	======	20222	======						
	2	3	2	0	164						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-9 LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1992

													, .,,,	•		
	DATES	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0-	19.0-	21.0-	23.0-	25.0-	27.0-	29.0-	31.0-	33.0-
*					12.7	14.7	10.9	18.9	20.9	22.9	24.9	26.9	28.9	30.9	32.9	34.9
	13APR-18APR 20APR-25APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	04MAY-08MAY	Õ	ŏ	ŏ	Õ	Ď	Õ	Ô	ű	0	0	0	0	0	0	Û
	11MAY-15MAY	0	65	37	3	Ö	ŏ	ő	ő	ŏ	ŏ	Ö	0	0	0	ß
	18MAY-22MAY	1	18	70	26	1	0	0	0	Ö	Ö	ŏ	Ö	Ŏ	ŏ	ŏ
	25MAY-30MAY	0	7	60	61	51	12	2	. 0	9	0	0	0	Ö	Ö	Ŏ
	NULCO-NULCO NULCO-NULSO	16 2	88 32	49	23	33	38	32	34	9	0	G	0	0	0	0
	15JUN-12JUN	0	32 7	57 5	5 12	4 13	9	11	15	16	2	0	0	0	0	Q
	22JUN-26JUN	ŏ	3	Ó	0	13	30 5	41 16	33 27	17 24	32 31	24 41	14 37	3 13	1	0
	29JUN-03JUL	0	Ō	Ŏ	Ŏ	i	4	7	21	31	34	29	19	23	13 19	28 30
·	06JUL-10JUL	0	0	0	0	0	0	1	3	3	7	13	22	18	15	19
		35.0-	37.0-	39.0-	41.0-	43.0-	45.0-	47.0-	49.0-	51.0-	53.0-	55.0-	57 O	E0 0	/4 O	47.0
	DATES	36.9	38.9	40.9	42.9	44.9	46.9	48.9	50.9	52.9	54.9	56.9	57.0- 58.9	59.0- 60.9	61.0- 62.9	63.0- 64.9
	47.00 40.00	_	_											00.7	UL.,	U4.7
	13APR-18APR 20APR-25APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	04MAY-08MAY	ő	ŏ	0	Õ	0	0	0	0	0	0	0	0	0	0	0
	11MAY-15MAY	Ö	Ō	Ŏ	ŏ	ŏ	ŏ	ŏ	ő	ŏ	ŏ	ő	Ö	Ö	Ö	å
	18MAY-22MAY	0	0	0	0	0	0	0	0	Ō	Ŏ	ō	Ŏ	ō	ŏ	ŏ
	25MAY-30MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01JUN-05JUN 08JUN-12JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15JUN-19JUN	1	0	0	D D	0	0	0	0	0	0	0	0	0	0	0
	22JUN-26JUN	20	10	7	1	1	0	1	0	0	Û	0	Ö	Ö	0	o G
	29JUN-03JUL	35	28	18	24	17	18	12	11	2	4	ĭ	ŏ	ŏ	ŏ	Ö
	06JUL-10JUL	21	21	22	26	26	29	24	17	33	26	17	10	5	1	0
		65.0-	67.0-	69.0-	71.0-	73.0-	75.0-	77.0-	79.0-	81.0-	83.0-	85.0-	87.0-	89.0-	91.0-	93.0-
	DATES	66.9	68.9	70.9	72.9	74.9	76.9	78.9	80.9	82.9	84.9	86.9	88.9	90.9	92.9	94.9
	47400 40400	_	•	•	•		_	_	_	_	_	_	_	_	_	_
	13APR-18APR 20APR-25APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0 6	0
	27APR-01MAY	0	ő	Ö	0	0	0	0	0	0	0	0	0	0	0	0
	04MAY-08MAY	Ö	Ŏ	Ŏ	ŏ	Ö	ō	õ	Ŏ	ŏ	ŏ	Ŏ	ŏ	ŏ	ŏ	ŏ
	11MAY-15MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Ô
	18MAY-22MAY	Ō	0	0	0	0	0	0	0	0	C	0	0	0	0	0
	25MAY-30MAY	0	6 0	0 0	0	0	0	0	0	0	0	0	0	0	0	0
	01JUN-05JUN 08JUN-12JUN	ů	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0
	15JUN-19JUN	ŏ	Õ	ŏ	ŏ	ő	ŏ	ŏ	0	0	Ö	0	0	ŏ	Ď	Ŏ
	22JUN-26JUN	0	0	Ō	Ō	Ŏ	Ŏ	Ö	Ō	Ŏ	ō	Ŏ	ō	Ŏ	Õ	ŏ
	29JUN-03JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06JUL-10JUL	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
_		95.0-	97.0-	- 99	.0- 16	01.0-	103.0-	105.0	0-							
	DATES	96.9	98.9			02.9	104.9	106.		N	MEAN	MII	N I	MED	MAX	SD
	13APR-18APR	0	(n	0	0	0		0	0						
_	20APR-25APR	0		0	Ŏ	Ö	ő		Ö	Ö	•	•		•	•	•
	27APR-01MAY	Ŏ	ì		ō	ŏ	ŏ		Ö	ŏ	:	:			•	•
	04MAY-08MAY	0	(0	0	0		0	0				•	•	•
	11MAY-15MAY	0	Ç	9	0	0	0		0	105	8.9	7.3		3.6	11.0	0.9
	18MAY-22MAY	0	0		0	0	0		0	116	10.1	6.7		2.2	13.4	1.2
	25MAY-30MAY 01JUN-05JUN	0	0) 1	0	0	0		0	193 324	12.0 12.6	7.8 5.6		1.9 2.1	17.4 21.9	1.9 4.6
	08JUN-12JUN	Ö	Č	ó	Ö	ŏ	ŏ		Ö	156	13.1	6.8		0.0	24.8	5.2
	15JUN-19JUN	Ö	0)	0	Ö	0		Ō	240	19.9	7.2		9.6	35.0	5.3
_	22JUN-26JUN	0	0)	0	0	0		0	284	26.9	8.9	5 20	5.2	48.0	6.4
	29JUN-03JUL	0	0)	0	0	0		0	401	32.5	14.2		2.0	55.0	9.1
	06JUL-10JUL	0	C	J	0	0	0		0	384	41.6	17.1	: 42	2.0	66.0	10.0

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-9(cont.) LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1992

	5.0-	7.0-	9.0-	11.0-	13.0-	15.0-	17.0-	19.0-	21.0-	23.0-	25.0-	27.0-	29.0-	31.0-	33.0-
DATES	6.9	8.9	10.9	12.9	14.9	16.9	18.9	20.9	22.9	24.9	26.9	28.9	30.9	32.9	34.9
20JUL-22JUL	0	0	0	0	0	. 0	0	0	0	0	1	1	0	0	0
04AUG-06AUG	0	0	0	0	0		0	0	0	0	0	0	0	0	0
18AUG-20AUG	0	0	0	0	0	_	0	0	0	0	0	0	0	0	0
01SEP-03SEP	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
15SEP-17SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28SEP-30SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120CT-140CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19	220	278	130	104	98	110	133	100	106	108	93	57	48	77
	35.0-	37.0-	39.0-	41.0-	43.0-	45.0-	47.0-	49.0-	51.0-	53.0-	55.0-	57.0-	59.0-	61.0-	63.0-
DATES	36.9	38.9	40.9	42.9	44.9	46.9	48.9	50.9	52.9	54.9	56.9	58.9	60.9	62.9	64.9
20JUL-22JUL	1	1	0	2	2	4	6	3	5	6	5	8	9	10	6
04AUG-06AUG	0	0	0	0	1	0	4	2	3	6	5	6	4	6	4
18AUG-20AUG	0	0	0	0	0	. 0	0	0	0	3	3	4	6	10	2
01SEP-03SEP	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1 0
15SEP-17SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28SEP-30SEP	0	0	0	0	0	0	υ 0	0	0	0	0	0	0	0	0
120CT-140CT	0	0	0	0	U		U							======	
	78	60	47	53	47	51	47	33	43	45	31	29	24	29	13
	70	80	47	23	47	,	41	33	43	43	٠, ٦,	27	24	2,7	13
	65.0-	67.0-	69.0-	71.0-	73.0-	75.0-	77.0-	79.0-	81.0-	83.0-	85.0-	87.0-	89.0-	91.0-	93.0-
DATES	66.9	68.9	70.9	72.9	74.9	76.9	78.9	80.9	82.9	84.9	86.9	88.9	90.9	92.9	94.9
20JUL-22JUL	6	5	0	1	0	0	1	0	0	0	0	0	0	0	0
04AUG-06AUG	5	2	2	3	Ö	1	0	0	0	0	0	0	0	0	0
18AUG-20AUG	3	2	2	0	1	3	0	1	0	1	0	0	9	0	1
01SEP-03SEP	3	3	5	2	2	0	0	0	1	0	0	1	0	0	0
15SEP-17SEP	1	3	3	0	0	0	0	0	1	0	0	0	1	2	0
28SEP-30SEP	0	1	1	0	3	0	1	3	0	1	2	0	2	0	0
120CT-140CT	0	0	0	2	0	1	1	0	1	2	0	2	2	2	1
	19	16	13	8	6	5	3	4	3	4	2	3	5	4	2
	95.0-	97.0	- 99	.0- 1	01.0-	103.0-	105.	.0-							
DATES	96.9	98.			102.9	104.9	106.		N	MEAN	MI	IN	MED	MAX	SD
20JUL-22JUL	0		0	0	0	0	•	0	89	56.0	20.	.9 :	8.0	77.0	9.9
04AUG-06AUG	0		0	0	0	0)	0	56	59.2	43.	.0 .5	9.0	76.0	7.3
18AUG-20AUG	0	(Ō	0	0	0)	0	44	63.8	53.	.0 6	52.0	94.0	8.4
01SEP-03SEP	0		Ô	0	0	0)	0	24	68.3	57.	.0 (8.0	88.0	6.6
15SEP-17SEP	0		1	0	0	1		0	14	78.0	63.	.0 6	59.5	103.0	14.0
28SEP-30SEP	0	1	0	0	1	0)	1	16	82.1	67.		79.5	105.0	10.7
120CT-140CT	1		1	3	1	0	•	1	21	89.2	72.	.0 8	39.0	106.0	9.8
	======	=====	= ===	====	====		====		====						
	1	;	2	3	2	1		2	2467						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-10 LENGTH FREQUENCY DISTRIBUTION OF AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	30.0- 34.9	35.0- 39.9	40.0- 44.9		0.0- ! 54.9	55.0- 59.9	60.0 64.			75.0- 79.9	80.0- 84.9	85.0- 89.9	90.0- 94.9	95.0- 99.9	
13JUL-18JUL	1	0	12	20	30	33	1	7 5	. 1	0	0	O	0	0	
27JUL-01AUG	0	0	3	7	17	23	1			3	2	1	ŏ	0	
10AUG-14AUG	0	0	0	3		12	ż			4	1	,	ň	ŏ	
24AUG-28AUG	0	0	0	0	5 2 0	6	2			7	Ś	5	1	1	
08SEP-12SEP	0	0	0	Ö	ō	ž	_	5 19		9	Ś	- -	i	'n	
21SEP-25SEP	0	0	0	Ö	Ŏ	ō		4 12		17	10	7	ż	Ď	
050CT-090CT	0	0	0	Ô	Ō	Õ	- 1	1	3	9	10	Ž	1	2	
190CT-230CT	0	0	0	Ö	Ŏ	ă		5	7	15	11	15	12	10	
	=====	====== :	===== =	#### # #	==== ==	====	=====	= ======	=====	======	===== :	,, ====== =		10 22222	
	1	0	15	30	54	76	93	3 100	91	64	44	33	18	13	
	100.0-	105.0-	110.0-	115.0-	120.0)- 12	5.0-	130.0-							
DATES	104.9	109.9	114.9	119.9	124.9		9.9	134.9+	N	MEAN	MII	ME	D 1	KAX	SD
13JUL-18JUL	0	0	0	0		0	0	0	125	53.9	31.0	54.	0 7	1.0	6.9
27JUL-01AUG	0	0	0	0		0	0	0	105	60.6				5.0	8.7
10AUG-14AUG	9	0	0	0		0	0	0	79	63.8				5.0	7.6
24AUG-28AUG	0	0	0	0		0	0	0	96	67.9	51.0		-	5.0	7.9
08SEP-12SEP	0	0	1	0		0	0	0	72	71.9	59.0			2.0	8.2
21SEP-25SEP	1	0	0	0		0	0	0	72	75.7	63.0	75.	0 10	1.0	8.0
050CT-090CT	2	1	2	0		0	0	0	35	84.3	68.0			1.0	11.0
190CT-230CT	4	3	0	3		0	1	0	87	86.7	63.0			5.0	12.7
	=====	=====	=====	======	=====	= ==	====	=====	=====						
	7	4	3	3		0	1	0	671						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-11 LENGTH FREQUENCY DISTRIBUTION OF AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1992

	20.0-	25.0-	30.0-	35.0-	40.0-	45.0-	50.0-	55.0-	60.0-	65.0-	70.0-	75.0-
DATES	24.9	29.9	34.9	39.9	44.9	49.9	54.9	59.9	64.9	69.9	74.9	79.9
23JUN-26JUN	1	11	43	65	25	0	0	0	0	0	0	0
06JUL-09JUL	Ó	4	6	18	58	36	40	23	5	0	0	0
20JUL-22JUL	Ó	0	5	14	47	25	36	25	3	2	8	3
03AUG-06AUG	0	0	0	0	12	31	66	65	25	20	11	3
17AUG-20AUG	0	0	0	1	1	4	23	49	23	16	6	1
31AUG-02SEP	0	0	0	0	0	0	6	20	53	40	18	5
14SEP-16SEP	Ö	0	0	0	0	0	0	8	30	63	34	10
28SEP-30SEP	Ö	0	0	9	0	0	0	1	2	24	55	38
120CT-150CT	Ô	Ó	0	0	0	0	0	1	0	7	38	57
260CT-280CT	Ô	0	0	0	0	0	0	0	2	12	36	44
	======	20222		=====	=====	======	=====	=====	=====	======	=====	======
	1	15	54	98	143	96	171	192	143	184	206	161
	80.0-	85.0-	90.0-	95.0-	100.0-	105.0-						
DATES	84.9	89.9	94.9	99.9	104.9	109.9+	N	MEAN	MIN	MED	MAX	SD
23JUN-26JUN	0	0	0	0	0	0	145	35.4	23.0	36.0	43.0	3.9
06JUL-09JUL	0	0	0	0	0	0	190	46.2	27.0	45.0	64.0	7.5
20JUL-22JUL	2	0	2	1	0	0	177	50.6	32.0	49.0	95.0	11.6
03AUG-06AUG	3	0	0	0	.0	0	248	56.5	40.0	55.5	81.0	7.9
17AUG-20AUG	0	2	1	0	0	0	138	59.6	37.0	59.0	92.0	7.5
31AUG-02SEP	4	1	0	0	0	0	154	64.6	50.0	64.0	85.0	6.0
14SEP-16SEP	2	2	0	0	0	0	153	67.5	57.0	67.0	88.0	5.4
28SEP-30SEP	17	10	3	0	1	0	151	75.1	57.0	74.0	102.0	6.6
120CT-150CT	47	17	4	2	1	0	174	78.6	55.0	78.0	101.0	6.2
260CT-280CT	23	8	2	2	0	0	129	76.5	63.0	76.0	97.0	6.2
	======			======	2	0	1659					
	98	40	12	5	4	U	1027					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-12 LENGTH FREQUENCY DISTRIBUTION OF ALEWIFE IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

-	DATES	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9	70.0- 74.9	75.0- 79.9	80.0- 84.9	85.0- 89.9	90.0- 94.9
	13JUL-18JUL	0	0	3	8	10	7	1	1	0	0	0	0	0
	27JUL-01AUG	0	0	1	4	12	2	7	10	2	2	1	Õ	ň
	10AUG-14AUG	1	4	1	1	0	1	4	9	3	4	3	Ŏ	ň
	24AUG-28AUG	0	0	0	0	Ò	Ž	Ò	2	2	6	9	15	Š
	08SEP-12SEP	0	0	0	0	1	4	2	1	1	Ĩ	Ö	2	2
	21SEP-25SEP	0	0	0	0	0	1	0	0	1	Ó	1	4	6
	050CT-090CT	0	0	0	0	1	0	0	1	Ó	1	2	1	7
	190CT-230CT	0	0	0	1	1	0	1	0	5	3	7	6	6
		**====	=====	=======================================	===== =	===== =	Z2222	=====	=====	======	=====		======	
		1	4	5	14	25	17	15	24	14	17	23	28	26
	DATES	95.0- 99.9	100.0- 104.9	105.0- 109.9	110.0- 114.9	115.0 119.9		0.0- 4. 9+	R	MEAN	MIN	MED	MAX	SD
								***	••				100	•
	13JUL-18JUL	0	0	0	0		0 -	0	30	51.9	43.0	51.0	69.0	5.9
	27JUL-01AUG	0	0	0	0		0	0	43	60.1	42.0	61.0	84.0	
	10AUG-14AUG	0	0	0	0		0	0	31	62.9	32.0	67.0	81.0	14.9
	24AUG-28AUG	0	0	0	0		0	0	41	82.0	56.0	84.0	93.0	8.8
	08SEP-12SEP	0	0	0	0		0	0	16	68.4	54.0	62.0	94.0	14.6
	21SEP-25SEP	9	8 8	1	0		0	0	31	93.8	59.0	97.0	106.0	
	050CT-090CT	4	8	4	0		0	0	29	93.6	54.0	97.0	108.0	
	190CT-230CT	7	12	4	0		1	0	54	89.8	48.0	91.0	116.0	14.0
			=====		======	=====	= ==		=====					
		20	28	9	0		1	0	275					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-13 LENGTH FREQUENCY DISTRIBUTION OF ALEWIFE IN HUDSON RIVER ESTUARY
DETERMINED FROM BEACH SEINE SURVEY, 1992

	35.0-	40.0-	45.0-	50.0-	55.0-	60.0-	65.0-	70.0-	75.0-	80.0-	85.0-	90.0-	95.0-
DATES	39.9	44.9	49.9	54.9	59.9	64.9	69.9	74.9	79.9	84.9	89.9	94.9	99.9
23JUN-26JUN	0	0	0	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	0	50	64	23	4	0	0	0	0	0	0	0	0
20JUL-22JUL	0	32	29	8	4	5	8	2	0	0	0	0	0
03AUG-06AUG	1	0	3	12	6	5	3	13	0	0	0	0	0
17AUG-20AUG	0	0	0	0	2	5	2	0	1	0	0	0	0
31AUG-02SEP	0	0	0	0	1	3	0	5	4	6	2	1	0
14SEP-16SEP	0	0	0	0	0	0	4	4	4	2	2	0	0
28SEP-30SEP	0	C	0	0	0	1	1	3	8	10	6	4	3
120CT-150CT	0	0	0	0	1	0	0	1	1	0	0	0	0
260CT-280CT	0	0	0	0	0	0	0	1	3	3	0	0	0
	=====	=====		======	===== =	=====	****	=====	=====	======	======	*=====	
	1	82	96	43	18	19	18	29	21	21	10	5	3
	100.0-	105.0-	110.0-	115.0	- 120.0	- 12	5.0-						
DATES	104.9	109.9	114.9	119.9	124.9	12	9.9+	N	MEAN	MIN	MED	MAX	(SD
23JUN-26JUN	0	0	0	(0	0	0	0	•	•	•	•	•
06JUL-09JUL	0	0	0		0	0	0	141	46.1	41.0	46.0	58.0	
20JUL-22JUL	0	0	0	1	0	0	0	89	49.4	41.0	46.0	71.0	
03AUG-06AUG	. 0	0	0	(C	0	0	43	60.0	38.0	59.0	73.0	
17AUG-20AUG	0	0	0	(•	0	0	10	63.6	56.0	62.0	78.0	
31AUG-02SEP	0	0	0	(0	0	0	22	76.2	58.0	77.5	92.0	
14SEP-16SEP	0	0	0	(0	0	0	16	75.2	65.0	74.5	89.0	
28SEP-30SEP	0	0	1		C	0	0	37	82.9	63.0	83.0	110.0	
120CT-150CT	0	0	0		0	D	0	3	68.3	59.0	70.0	76.0	
260CT-280CT	0	0	0		0	1	0	8	83.4	70.0	79.5	124.0	16.8
	=====	=====	=====	=====	= =====								
	0	0	1	(0	1	0	369					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-14 LENGTH FREQUENCY DISTRIBUTION OF BLUEBACK HERRING IN HUDSON RIVER ESTUARY
DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9	70.0- 74.9	75.0- 79.9
13JUL-18JUL	0	0	104	30	0	0	Ö	0	0	0
27JUL-01AUG	0	0	31	27	57	43	5	ŏ	Õ	ň
10AUG-14AUG	1	16	30	18	58	24	6	4	ŏ	ŏ
24AUG-28AUG	0	1	8	25	37	48	20	11	3	ž
08SEP-12SEP	0	0	0	19	34	36	27	12	9	3
21SEP-25SEP	0	0	Ö	23	23	23	33	23	17	~ ~
050CT-090CT	0	0	Ō	6	41	36	15	9	8	13
190CT-230CT	0	0	0	Ō	31	40	17	19	17	26
	=====	======	======	=====	=====	=====	*****	=====	=====	======
	1	17	173	148	281	250	123	78	54	49
	80.0-	85.0-	90.0-	95.0-						
DATES	84.9	89.9	94.9	99.9+	N	MEAN	MIN	MED	MAX	SD
13JUL-18JUL	0	0	0	0	134	43.1	40.0	42.0	49.0	2.1
27JUL-01AUG	0	0	0	0	166	51.0	41.0	52.0	62.0	5.6
10AUG-14AUG	0	0	0	0	163	49.8	33.0	52.0	67.0	7.4
24AUG-28AUG	1	0	0	0	165	55.9	38.0	56.0	80.0	7.7
08SEP-12SEP	1	0	0	0	150	58.0	45.0	58.0	84.0	7.7
21SEP-25SEP	2	0	0	0	152	60.1	45.0	61.0	81.0	8.4
050CT-090CT	9	1	0	0	140	60.8	45.0	57.0	85.0	10.3
190CT-230CT	22	13	0	1	196	66.6	50.0	64.5	95.0	11.4
	=====	200002	======	22222	=====					
	35	14	0	1	1266					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-15 LENGTH FREQUENCY DISTRIBUTION OF BLUEBACK HERRING IN HUDSON RIVER ESTUARY
DETERMINED FROM BEACH SEINE SURVEY, 1992

	30.0-	35.0-	40.0-	45.0-	50.0-	55.0-	60.0-	65.0-	70.0-	75.0-
DATES	34.9	39.9	44.9	49.9	54.9	59.9	64.9	69.9	74.9	79.9
23JUN-26JUN	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	Õ	Ö	71	10	0	0	1	0	0	0
20JUL-22JUL	Ŏ	0	71	56	26	4	2	0	0	0
03AUG-06AUG	6	35	37	42	48	24	4	0	0	0
17AUG-20AUG	Ō	2	8	27	35	12	3	4	2	0
31AUG-02SEP	Ô	0	2	16	47	21	5	4	3	0
14SEP-16SEP	Ö	Ó	3	20	27	14	9	3	2	0
28SEP-30SEP	Ŏ	Ó	1	10	42	24	7	17	11	13
120CT-150CT	Ó	0	0	1	25	23	11	9	9	5
260CT-280CT	0	0	1	5	54	42	11	7	3	6
	=====	======	=====	======	=====		======	=====	22:::::	=====
	6	37	194	187	304	164	53	44	30	24
	80.0-	85.0-	90.0-	95.0-						
DATES	84.9	89.9	94.9	99.9+	N	MEAN	MIN	MED	MAX	SD
23.JUN-26.JUN	0	0	0	0	0			•		•
06JUL-09JUL	Ó	0	0	0	82	42.7	41.0	42.0	63.0	2.8
20JUL-22JUL	Ō	Ó	0	0	161	46.1	41.0	45.0	64.0	4.6
03AUG-06AUG	Ō	Ô	0	0	201	46.9	33.0	47.0	64.0	7.5
17AUG-20AUG	0	0	0	0	94	51.5	36.0	51.0	71.0	6.6
31AUG-02SEP	1	Ô	0	0	101	54.2	41.0	53.0	80.0	6.4
14SEP-16SEP	Ô	0	0	0	80	53.8	43.0	53.0	74.0	6.5
28SEP-30SEP	3	Ö	0	0	129	60.0	43.0	56.0	82.0	9.7
120CT - 150CT	11	7	2	0	105	64.7	48.0	61.0	93.0	12.0
260CT-280CT	1	0	0	0	137	57.2	43.0	56.0	84.0	7.0
	=====	=====	=====	=====	=====					
	16	7	2	0	1090					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-16 LENGTH FREQUENCY DISTRIBUTION OF BAY ANCHOVY IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	10.0- 14.9	15.0- 19.9	20.0- 24.9	25.0- 29.9	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9
13JUL-18JUL	7	22	42	35	4	0	0	0	0	0
27JUL-01AUG	1	35	53	50	19	Š	7	ŏ	Õ	Ö
10AUG-14AUG	1	4	43	41	22	10	19	3	0	0
24AUG-28AUG	0	3	17	40	34	28	15	15	4	0
08SEP-12SEP	Ō	1	23	19	24	32	35	29	15	1
21SEP-25SEP	Ō	Ó	11	8	23	28	49	40	17	
050CT-090CT	Ŏ	Ŏ	2	4	13	24	48	33	15	6
190CT-230CT	Ö	Ō	ō	Ž	9	23	38	24	18	5
	=====	=====	=====	=====	======	=====	=====	22222	======	
	9	65	191	201	148	153	211	144	69	16
	60.0-	65.0-	70.0-							
DATES	64.9	69.9	74.9+	N	MEAN	MIN	MED	MAX	SD	
13JUL-18JUL	0	0	0	110	22.2	10.0	23.0	33.0	4.9	
27JUL-01AUG	0	0	0	173	24.8	14.0	24.0	43.0	6.2	
10AUG-14AUG	0	0	0	143	28.9	12.0	27.0	48.0	7.4	
24AUG-28AUG	0	0	0	156	33.1	16.0	32.0	53.0	8.1	
08SEP-12SEP	0	0	0	179	37.2	15.0	38.0	55.0	9.2	
21SEP-25SEP	1	0	0	181	40.5	20.0	42.0	62.0	8.5	
050CT-090CT	0	0	0	145	42.2	20.0	43.0	59.0	7.0	
190CT-230CT	0	0	0	121	42.9	27.0	42.0	58.0	6.6	
	=====	=====	=====	=====		_: - -				
	1	0	0	1208						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Nedian length, MAX = Maximum length, SD = Standard deviation

TABLE D-17 LENGTH FREQUENCY DISTRIBUTION OF BAY ANCHOVY IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1992

DATES	15.0- 19.9	20.0- 24.9	25.0- 29.9	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9
DATES	17.7	24.7	_,,,	54.7	•				
23JUN-26JUN	1	0	0	0	0	0	0	0	0
06JUL-09JUL	0	0	0	0	0	0	0	0	0
20JUL-22JUL	Ó	0	1	0	0	0	0	0	0
03AUG-06AUG	0	0	2	3	7	11	5	0	0
17AUG-20AUG	3	5	5	5	11	5	1	0	0
31AUG-02SEP	0	0	1	0	8	13	13	4	0
14SEP-16SEP	0	0	0	0	1	8	14	8	0
28SEP-30SEP	0	0	0	1	7	15	26	11	5
120CT - 150CT	0	0	0	0	0	4	16	7	4
260CT-280CT	Ö	0	0	0	0	3	6	7	1
	=====	=====	======	=====	======	=====	======	=====	=====
	4	5	9	9	34	59	81	37	10
	60.0-	65.0-							
DATES	64.9	69.9+	N	MEAN	MIN	MED	MAX	SD	
23JUN-26JUN	0	0	1	18.0	18.0	18.0	18.0	•	
06JUL-09JUL	0	0	0	•	•	•	•	•	
20JUL-22JUL	0	0	1	29.0	29.0	29.0	29.0	•	
03AUG-06AUG	0	0	28	39.6	27.0	41.0	49.0	5.3	
17AUG-20AUG	0	0	35	32.2	18.0	34.0	45.0	7.8	
31AUG-02SEP	0	0	39	43.2	29.0	44.0	53.0	5.0	
14SEP-16SEP	0	0	32	47.2	39.0	47.5	60.0	4.7	
28SEP-30SEP	0	0	65	46.2	33.0	46.0	57.0	5.4	
120CT-150CT	1	1	33	49.8	40.0	49.0	65.0	5.5	
260CT-280CT	0	0	17	49.1	41.0	49.0	55.0	4.2	
	22222	=====	======						
	1	1	251						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-18 LENGTH FREQUENCY DISTRIBUTION OF SPOTTAIL SHINER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

	25.0-	30.0-	35.0-	40.0-	45.0-	50.0-	55.0-	60.0-	65.0-
DATES	29.9	34.9	39.9	44.9	49.9	54.9	59.9	64.9	69.9
13JUL-18JUL	1	0	1	0	0	0	0	0	0
27JUL-01AUG	0	0	1	3	2	ũ	ŏ	ŏ	ň
10AUG-14AUG	0	0	0	Ō	0	Õ	ŏ	ň	ñ
24AUG-28AUG	0	0	0	0	1	2	Ď	ŏ	ň
08SEP-12SEP	0	0	0	0	Ó	õ	Ď	ň	ň
21SEP-25SEP	0	0	0	0	Ö	ŏ	ñ	ñ	1
050CT-090CT	0	0	0	Ó	Ō	Ď	ŏ	ñ	,
190CT-230CT	0	0	0	0	Ō	Ŏ	ì	3	2
	=====	=====	=====		=====	======	******	======	=====
	1	0	2	3	3	2	1	3	5
	70.0-	<i>7</i> 5.0-	80.0-						
DATES	74.9	79.9	84.9+	N	MEAN	MIN	MED	MAX	SD
13JUL-18JUL	0	0	0	2	32.5	28.0	32.5	37.0	6.4
27JUL-01AUG	0	0	0	6	42.7	39.0	42.0	48.0	3.4
10AUG-14AUG	0	0	0	0			-		
24AUG-28AUG	0	0	0	3	51.0	48.0	52.0	53.0	2.6
08SEP-12SEP	0	0	0	0 -		•	•		-
21SEP-25SEP	0	0	0	1	66.0	66.0	66.0	66.0	-
050CT-090CT	0	0	0	2	67.0	66.0	67.0	68.0	1.4
190CT-230CT	2	3	0	11	68.8	58.0	69.0	78.0	6.5
	=====	======		=====					
	2	3	0	25					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-19 LENGTH FREQUENCY DISTRIBUTION OF SPOTTAIL SHINER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1992

D.1750	15.0-	20.0-	25.0-	30.0-	35.0-	40.0-	45.0-	50.0-	55.0-	60.0-	65.0-
DATES	19.9	24.9	29.9	34.9	39.9	44.9	49.9	54.9	59.9	64.9	69.9
23JUN-26JUN	2	0	2	2	0	0	0	0	0	0	0
06JUL-09JUL	0	1	12	15	3	Ď	Ď	ň	ň	ň	ŏ
20JUL-22JUL	0	1	4	13	48	54	8	ŏ	ň	ň	ñ
03AUG-06AUG	0	0	0	3	9	14	18	13	1	ň	ň
17AUG-20AUG	0	0	Ō	Ō	1	7	19	31	19	ž	ŏ
31AUG-02SEP	0	0	Ó	Ó	Ó	1	7	11	20	13	11
14SEP-16SEP	0	0	0	1	0	6	7	10	16	10	10
28SEP-30SEP	0	0	0	0	0	0	Ö	1	13	18	13
120CT-150CT	0	0	0	0	0	0	0	1	10	15	14
260CT-280CT	0	0	0	0	0	0	0	1	5	8	9
	=====	=====	22222	======	=====	=====	=====	=====		======	=====
	2	2	18	34	61	82	59	68	84	67	57
	70.0-	75.0-	80.0-	85.0-							
DATES	74.9	79.9	84.9	89.9+	N	MEAN	MIN	MED	MAX	SD	
23JUN-26JUN	0	0	0	0	6	25.7	17.0	27.5	33.0	6.3	
06JUL-09JUL	0	0	0	0	31	30.6	23.0	30.0	39.0	3.5	
20JUL-22JUL	0	0	0	0	128	38.9	23.0	39.0	47.0	4.4	
03AUG-06AUG	0	0	0	0	58	44.9	30.0	45.0	57.0	5.9	
17AUG-20AUG	0	0	0	0	81	51.2	38.0	51.0	62.0	5.1	
31AUG-02SEP	1	0	0	0	72	58.1	44.0	58.5	71.0	6.2	
14SEP-16SEP	0	0	0	0	62	56.0	32.0	57.5	68.0	8.2	
28SEP-30SEP	13	2	1	0	62	64.7	54.0	64.0	80.0	6.2	
120CT - 150CT	11	4	1	0	59	65.4	51.0	65.0	82.0	6.6	
260CT-280CT	11	5	4	0	47	67.8	52.0	67.0	83.0	7.5	
	======	=====	=====	=====	======						
	36	11	6	0	606						

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-20 LENGTH FREQUENCY DISTRIBUTION OF WHITE CATFISH IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	20.0- 24.9	25.0- 29.9	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9	70.0- 74.9
13JUL-18JUL	5	0	0	1	0	0	0	0	0	0	0
27JUL-01AUG	0	0	1	1	0	0	0	0	0	Ō	0
10AUG-14AUG	0	1	0	2	0	1	0	0	Ō	Ō	0
24AUG-28AUG	0	0	0	0	0	Ó	1	Ö	Ö	1	Ŏ
08SEP-12SEP	0	0	0	0	1	2	Ô	Ō	1	2	i
21SEP-25SEP	0	0	0	0	0	ō	Ō	Ō	1	ō	Ď
050CT-090CT	0	0	0	Ó	0	1	Ō	Ó	Ó	1	1
190CT-230CT	0	0	0	0	0	Ò	0	Ó	Ĭ	Ò	Ó
	*==#==	=====	=====	=====	=====	=====	# ###	22222	22222	######################################	=====
	5	1	1	4	1	4	1	0	3	4	2
	75.0-	80.0~	85.0-	90.0-	95.0-						
DATES	79.9	84.9	89.9	94.9	99.9+	N	MEAN	MIN	MED	MAX	SD
13JUL-18JUL	0	٥	0	0	0	6	23.8	20.0	21.0	38.0	7.0
27JUL-01AUG	0	0	0	0	0	2	32.5	30.0	32.5	35.0	3.5
10AUG-14AUG	0	0	0	0	0	4	38.0	29.0	38.5	46.0	7.0
24AUG-28AUG	0	0	0	0	0	2	59.0	50.0	59.0	68.0	12.7
08SEP-12SEP	0	1	0	1	0	9	64.0	43.0	66.0	91.0	16.5
21SEP-25SEP	0	2	2	0	0	5	80.2	61.0	84.0	87.0	10.8
050CT-090CT	1	2	3	1	0	10	77.7	45.0	83.0	92.0	13.6
190CT-230CT	1	2	3	2	Ó	9	82.6	62.0	85.0	92.0	9.1
	22222	225225	======	=====	=====						
	2	7	8	4	0	47					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-21 LENGTH FREQUENCY DISTRIBUTION OF WEAKFISH IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1992

DATES	5.0- 9.9	10.0- 14.9	15.0- 19.9	20.0- 24.9	25.0- 29.9	30.0- 34.9	35.0- 39.9	40.0- 44.9	45.0- 49.9	50.0- 54.9	55.0- 59.9	60.0- 64.9	65.0- 69.9
DALLO	,.,	14.7	.,,,	L-1.7	67.7	34.7	27.7	77.7	47.7	24.7	27.7	V4.7	07.7
13JUL-18JUL	0	0	0	0	0	0	1	0	0	0	0	0	C
27JUL-01AUG	Ō	1	5	2	Õ	1	1	Ö	Ŏ	Ŏ	i	1	Ö
10AUG-14AUG	1	Ò	1	3	5	6	11	18	6	4	i	3	Ď
24AUG-28AUG	1	1	2	Ö	1	Ō	4	4	8	10	8	8	8
08SEP-12SEP	Ó	0	Ō	Ó	0	4	10	8	6	5	6	1	1
21SEP-25SEP	0	0	0	0	0	0	0	4	5	10	12	4	5
050CT-090CT	Ō	Ö	0	Ō	Ō	Ō	0	Ö	1	2	0	1	4
190CT-230CT	0	Ô	0	0	Ō	Ō	Ō	Ö	0	0	Ō	Ó	Ó
	=====	======	======	=====	=====	=====	=====	======	=====	=====	=====	*****	======
	2	2	8	5	6	11	27	34	26	31	28	18	18
	70.0-	75.0-	80.0-	85.0-	90.0-	95.0-	100.0-	105.0-	110.0-	115.0-	120.0-	125.0-	130.0-
DATES	74.9	79.9	84.9	89.9	94.9	99.9	104.9	109.9	114.9	119.9	124.9	129.9	134.9
13JUL-18JUL	0	0	0	0	0	0	0	0	0	0	0	0	0
27JUL-01AUG	0	1	0	0	0	0	0	0	0	0	0	0	0
10AUG-14AUG	0	9	1	1	0	0	0	1	0	0	0	0	Û
24AUG-28AUG	6	11	1	2	0	0	0	0	0	0	0	0	0
08SEP-12SEP	2	7	7	3	4	2	1	2	0	0	0	0	0
21SEP-25SEP	0	1	2	0	2	4	3	5	1	2	2	0	2
050CT-090CT	8	3	3	2	1	0	0	1	1	Ð	2	1	3
190CT-230CT	0	1	1	2	0	1	0	0	2	0	1	1	3
	=====	======	=====	=====	=====	=====	=====	=====	=====	======	=====	=====	=====
	16	24	15	10	7	7	4	9	4	2	5	2	8
	135.0-	140.0-					50.0-						
DATES	139.9	144.9	149.9	154.9	9 159	.9 16	4.9+	N	MEAN	MIN	MED	MAX	c sd
13JUL-18JUL	0	0		0	0	0	0	1	38.0	38.0	38.0		
27JUL-01AUG	0	0		0	0	0	0	13	30.7	13.0	20.0		
10AUG-14AUG	0	0		0	0	0	0	62	41.6	9.0	40.0		
24AUG-28AUG	0	0		0	0	0	0	75	57.7	9.0	58.0		
08SEP-12SEP	0	0		0	0	0	0 -	70	61.4	32.0	56.5		
21SEP-25S.EP	C	0		1	0	0	0	66	74.0	40.0	61.5		
050CT-090CT	0	2		0	1	0	0	37	88.5	45.0	77.0		
190CT-230CT	0	1		2	0	1	0	16	117.9	75.0	122.5	158.0	25.4
	======	======			===	=== ==	:==== :	=====					
	0	3		3	1	1	0	340					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

APPENDIX E

NUMBER OF FISH COLLECTED

IN

ICTHYOPLANKTON SURVEY

BEACH SEINE SURVEY

FALL SHOALS SURVEY

TABLE E-1 TOTAL NUMBER OF FISH COLLECTED IN THE LONG RIVER ICHTHYOPLANKTON SURVEY, 1988-1992.

	92	555	465,613	400	10,558	30,496	7,246	23,035	462,382	827	10	1 - π	- (44,337	42	•	137	ო		•	52	265,656		• «	r -	1	131	7	124		•		-	535	•	22	, ·	179	2.576	
CTION	91	2,727	250, 755	22,126	40,804	28,397	17,620	2,494	359,994	1,372	40	:	. ~	908,378	58	•	2,059	m		•	92	147,232	LC.	, c	2	• •	040 040	- :	40	7	•	٠	ო	ო	•	16		1	1.764	
YEAR OF DATA COLLECTION	06	09	114,369	3121/1	38,431	1,230	955	6,838	264,907	848	29	,		13,591		•	102	2		F	87	157,348	•	. 6) -	4	•	• :	46	•	12	•	4	ß	7	•	•	•	6.839	•
YEAR OF	68	624	423, 142	2	37,397	2,568	13,473	767	225,498	917		2.274		589,469	101	•	153	٠		•	100	198,953			1		100	• !	65	•		•	2	82	-1	217	-	50	1.736	
	88	8,200	538,802	11	25,414	4,992	2,180	24,693	61,072	789	152	1 1 1 m	v	301,192	86	-	1,135	Э		2	77	138,753	•		4		067	• (30	•	•	•	•	•	•	113	•	48	470	19
	6 2 4 2	ALEWIFE	ALCOA UNIDENTIFIED	ATLANTIC STURGEON	ATLANTIC TOMCOD	BLUEBACK HERRING	MORONE UNIDENTIFIED	RAINBOW SMELT	STRIPED BASS	AMERICAN EEL	ATLANTIC STIVERSIDE	BANDED KILITETSH	FOURSPINE STICKLEBACK	HOGCHOKER	INLAND SILVERSIDE	MUMMICHOG	NORTHERN PIPEFISH	SHORTNOSE STURGEON	THREESPINE	STICKLEBACK	WHITE CATFISH	WHITE PERCH	BLUEGILL	BROWN BILLINEAU	BROWN TROUT	TOOM THOU	CAMPAGE AND THE PARTY OF THE PA	CALUSIONIDAE UNIDENT.	CENTRARCHID UNIDENT	CHANNEL CATFISH	COMMON SHINER	FRESHWATER DRUM	FUNDULUS SP.	GIZZARD SHAD	GOLDEN SHINER	GOLDFISH	LARGEMOUTH BASS	LOGPERCH	MINNOW UNIDENTIFIED	NORTHERN HOGSUCKER
	alloas	ANADROMOUS								CATADROMOUS	ESTUARTNE												FRESHWATER																	

TABLE E-1 TOTAL NUMBER OF FISH COLLECTED IN THE LONG RIVER ICHTHYOPLANKTON SURVEY, 1988-1992. (CONTINUED)

	95		•	-1	23	45	2,836		l +	369	4	157	842	404	•	1,341,076	10	147	46	124	•	4,221	691	26,599	12	248	14	2	73	10	•	7	•	9	44	19	71	•	40	က	د ب
SCTION	91		8	•	•	83	1,566			157	4	•	1,177	1,301		3,831,982		151	27	29	-	1,955	404	78,349		521	რ	•	80	10	279	19	٠	S	41	4	91	•	19	4	234
YEAR OF DATA COLLECTION	06		•	•	7	55	2,290		44	610	7	•	9.	671		900,354		165	18	54	•	•	2	22,569		167	•	193	1,619	•	32	17	•	7	•	•	1	2	-	٠	• •
YEAR OF	83			•	ო	96	2,805	26	10	325	80	•	178	12	•	444,854	•	54	18	72	4	1,429	209	5,593		387	8	7	44	118	5	2	•	7	19	•	٠	٠	-	1	• 4
	88		132	•	•	09	2,898			152	48	•	522	9	•	2,852,331	•	85	143	132	-	11,129	108	6,007	• ·	605	60	12	279	•	1	40	129	0	110	Н	38	•	62	8	43
		NAME	PUMPKINSEED	ROCK BASS	SMALLMOUTH BASS	SPOTTAIL SHINER	TESSELATED DARTER	WALLEYE	WHITE SUCKER	YELLOW PERCH			ATLANTIC HERRING	ATLANTIC MENHADEN	ATLANTIC NEEDLEFISH	BAY ANCHOVY	BLACKCHEEK TONGUEFISH	BLUEFISH	BUTTERFISH	CONGER EEL	CREVALLE JACK	CUNNER	FOUR BEARDED ROCKLING	GOBIIDAE	GOOSEFISH	GRUBBY	INSHORE LIZARDFISH	MENIDIA SP.	NAKED GOBY	NORTHERN KINGFISH	NORTHERN PUFFER	NORTHERN SEAROBIN	NORTHERN STARGAZER	ROCK GUNNEL	ROUGH SILVERSIDE	SEABORD GOBY	SMALLMOUTH FLOUNDER	SPOT	SPOTTED HAKE	STRIPED CUSKEEL	STRIPED KILLIFISH STRIPED SEAROBIN
		GROUP	FRESHWATER								MARINE																														

TABLE E-1 TOTAL NUMBER OF FISH COLLECTED IN THE LONG RIVER ICHTHYOPLANKTON SURVEY, 1988-1992. (CONTINUED)

	92	18	1,206	794	18,496
CTION	91	39	6,821	340	113,576
FAR OF DATA COLLECTION	06	н .	122,082	64	35,057
YEAR OF	68	3.432	2,602	178	7,029
	88	1.205	1,586	006	47,052
	<u> </u>	SUMMER FLOUNDER	WEAKFISH WINDOWDANE FLOUNDER	WINTER FLOUNDER	IELLOWIALL FLOONDER UNIDENTIFIED
	aicad	MARINE			UNIDENTIFIED

SAMPLING STATISTICS FOR LONG RIVER ICHTHYOPLANKTON SURVEY, 1988-1992

		IEAR OF DATA COLLECTION	A COLLECT	N C C		
	88	. 68	06	91	92	
START DATE	18APR88	17APR89	19APR90	15APR91	13APR92	
END DATE	25AUG88	23AUG89	16AUG90	170CT91	140CT92	
TOTAL VOLUME SAMPLED	524,777	519,252	419,294	537,825	632,978	
NUMBER OF SAMPLES	1,663	1.641	1,561	1,991	1.986	

TOTAL NUMBER OF FISH COLLECTED IN THE BEACH SEINE SURVEY, 1985-1992. TABLE E-2

	92	870 3,490 15,366	328	29,105		6,156	127	6,668	1,243	15	329	128	51	5	1	18	9,497	20	61	40	90	29	-	• •	- 7	r 00	158	787	1	52	1	• 1	2 602	1
	91	2,323 38,966 15,771	46	40,731	• ಬ	10,813	208	17,291	3,232	24	652	183	504		4	25	10,033	12	69	42	111	64	٠	•	۰α	o on	22	672	33	85	•	134	1,195	>>++
	06	925 10,853 12,261	115	43,555	. 2	906'9	81	8,383	.1,513	11	150	100	989	S V.		23	8,485	80	68	10	57	106	• (n	. =		28	817	m	34	٠	• ,	124	
COLLECTION	89	439 8,346 13,026	81	19,037		5,585	107	989	1,948	12	797	2.34 6.8	156)) ;	4	99	11,407	10	159	28	98	100	7		•		7	640	1	51	٠	•	633)))
OF DATA	88	675 21,022 10,780	230	36,245		6,151	151	6,760	4,917	194	305 406	406	297	; ;	ო	101	14,607	10	355	53	133	351		• •	20		10	919	97	57	٠	• (1.070	› · ·
YEAR	87	515 5,685 7,641	209	31,373		11,987	125	1,459	4,369	296	312	140 496	348))	10	98	12,303	52	16	12	18	388	•	•	• K	, •	100	647	16	44	•	9,	1 609))
	86	818 2,529 14,716	148	12,522	•	1,854	163	4,406	3,514	525	9/2	n &	166) } {	17	83	12,082	47	57	41	102	327	•	•	• 4	. 2	13	1,223	25	7.1	•	9	496) -
	85	1,272 8,272 9,171	243	25, 362		1,413	315	1,197	5,959	359	1,033	4 04	844		2	52	9,938	•	64	9	20	673	•	•	• 4	• •	m	460	1.4	44	•	7	740	.
	E	ALEWIFE ALCSA UNIDENTIFIED AMERICAN SHAD	ATLANTIC STURGEON ATLANTIC TOMCOD	MORONE INTOENTIFIED	RAINBOW SMELT	STRIPED BASS	AMERICAN EEL	ATLANTIC SILVERSIDE	BANDED KILLIFISH	FOURSPINE STICKLEBACK	HOGCHOKEK	MUMMICHOG	NORTHERN PIPEFISH	THREESPINE	STICKLEBACK	WHITE CATFISH	WHITE PERCH	BLACK CRAPPIE	BLUEGILL	BROWN BULLHEAD	CARP	CENTRARCHID UNIDENT	CHAIN PICKEREL	COMMON CUINED	EMERALD SHINER	FALLFISH	GIZZARD SHAD	GOLDEN SHINER	GOLDFISH	LARGEMOUTH BASS	LOGPERCH	MINNOW UNIDENTIFIED	NORTHERN HOGSUCKER PUMPKINSEED	111111111111111111111111111111111111111
	ailCas	ANADROMOUS					CATADROMOUS	ESTUARINE										FRESHWATER																

TOTAL NUMBER OF FISH COLLECTED IN THE BEACH SEINE SURVEY, 1985-1992. (CONTINUED) TABLE E-2

	92		259		•	89	28	7,727	m	929	-	21	23	-	415	6	8,729	375	- 1	53	+	• 1	80	• ;	22	2	•	•	٠.	⊣ ¢	7	• &	•	2	•	•	-	56	H	-	•	35
	91		200	22	•	387	25	12,385	•	2,385	7	12	27	•	678	476	4,669	314	• !	28	٠,	⊣ ;	14	• •	14	42	0 0	ω.	-1	•	•	29	•	8	•		34	46	31	111	1	154
	06		91	•	2	6	21	5,500	•	479	-4	15	12	26	1,063	96	4,134	348		. 32	• ·		•	٠١	7	4	•	•	•	• •	,		•	-1		•	•	2	9	27	•	23
COLLECTION	68		111	m	•	2	25	5,129	•	415	•	Ó	34	٠	159	41	9,507	224	٠	40	•	•	- (m ·	4	H	•	•	•	• •	n.	•	•	•	•	•	•	2	•	•	•	60
YEAR OF DATA COLLECTION	88		160	12		119	28	5,407	•	1,697	m	32	49	•	66	48	3,989	280	4	22	•	•	-	•	4	φ,	т	•	•	• 0	238	19	•	32	•	•	က	7	20	2	•	41
YEAF	87		185	-	•	23	80	4,452	•	820	-	17	44	•	30	54	3,746	533	•	e	•	•	•	• ;	11		•	•	•	• 6	67	• (4	•	•	•	₹	2	•	m	29
	86		158	8	2	13	25	5,177		1,372	4	16	67	Н	834	77	4,155	400	•	10	•	٠	•	•	o (ω,	- (2	•	. •	7*	•	. •	106	•	٠	16	45	S	ĸ	•	80
	85		115	9	1	e	7	5,316		1,198	•	7	22	•	118	92	4,081	567	•	7.1	٠	•	٠	•	20	20	2	•		• 10	cc C	· <u>~</u>	=-	35	•	-	ഗ	48	2	72		282
			REDBREAST SUNFISH		SATINFIN SHINER		SMALLMOUTH BASS	SPOTTAIL SHINER	-	TESSELATED DARTER	WHITE CRAPPIE	WHITE SUCKER	YELLOW PERCH	ATLANTIC CROAKER			BAY ANCHOVY	BLUEFISH	BUTTERFISH	CREVALLE JACK	CUNNER	GOOSEFISH	INSHORE LIZARDFISH	MOONFISH	മ				NORTHERN STARGAZER	PERMIT	ROUGH SILVERSIDE	STIVER PERCH	SMALLMOUTH FLOUNDER	SPOT	SPOTTED HAKE	STRIPED ANCHOVY	STRIPED SEAROBIN	SUMMER FLOUNDER	TAUTOG	WEAKFISH	WINDOWDANE FLOUNDER	WINTER FLOUNDER
		GROUP	FRESHWATER											MARTNE																												

TOTAL NUMBER OF FISH COLLECTED IN THE BEACH SEINE SURVEY, 1985-1992. (CONTINUED) TABLE E-2

SAMPLING STATISTICS FOR BEACH SEINE SURVEY, 1985-1992

YEAR OF DATA COLLECTION

91 92	24JUN91 23JUN92 01NOV91 28OCT92 1,000 1,000
90	18JUN90 24OCT90 1,000
88	13JUN89 02NOV89 1,100
88	14JUN88 03NOV88 1,100
87	24JUN87 13NOV87 1,101
98	15JUL86 21NOV86 1,000
85	16JUL85 21NOV85 1,000
	START DATE END DATE NUMBER OF SAMPLES

TABLE E-3 TOTAL NUMBER OF FISH COLLECTED IN THE FALL (SHOALS SURVEY, 1985-1992.

GROUP ANADROMOUS

CATADROMOUS

ESTUARINE

	/		200	40.00	אסנהסמוויסס ההאס פס פהפט			
			IEA	K OF DATA	COLLECTION			
e de la companya de l	85	98	87	88	68	06	91	92
name Alewife	1,142	554	702	379	327	459	994	790
ALOSA UNIDENTIFIED	3,341	282	2,591	4,193	4,331	3,543	1,276	10,650
AMERICAN SHAD	1,717	2,166	176	1,483	3,646	1,323	1,291	3,406
	96	184	149	117	63	9	10	11
	5,083	10,046	7,908	8,210	14,060	1,105	4,914	7,299
	41,919	6,525	18,596	37,957	22,112	15,982	55,299	38,090
MORONE UNIDENTIFIED	-	•	•	•	ო	2	•	•
RAINBOW SMELT	126	389	429		34	216	256	2,550
STRIPED BASS	888	2,348	11,633	18,679	8,472	3,624	4,672	3,773
AMERICAN EEL	1,872	2,906	2,254	2,076	1,444	342	984	1,392
ATLANTIC SILVERSIDE	•	2	•	m	H	2	18	2
-	7.8	12	~	ď	ď	•	•	
FOURSPINE STICKLEBACK	•	ا ا)		, ,	•
	89,948	108,036	89,042	74,672	73,613	22,760	42.916	62,358
INLAND SILVERSIDE	•		• ·			7	•	•
MUMMICHOG	•	•	•	•	•	4	•	•
NORTHERN PIPEFISH	40	13	22	25	12	4	16	14
SHORTNOSE STURGEON	16	c c	11	20	12	2	18	
WHITE CATFISH	721	677	775	806	740	352	547	172
WHITE PERCH	19,721	31,771	27,008	25,760	20,106	5,381	11,019	13,832
			•		•		•	(
BLUEGILL	• [• 60	- 00	• •	T (٠٢	101	, ,
CARP	70	121	104 104	T/T	7/7	`-	C7T	, , T
CENTER DECUTE HINTDENE		0 4) -	* <	7	4	•	•
CHANNEL CATETON	4	rư	101	ro	. د	• -	• •	٠,
EMERALD SHINER	•) ·	.	•	- T	4	•	-
FRESHWATER DRUM		• •	•	•	ł m	•	•	• -
GIZZARD SHAD	4	· vo	œ	۰ ۵	• œ			
GOLDEN SHINER	•	-	•	•	•		•	29
GOLDFISH	•	•	٠	•	H	•	•	-
MINNOW UNIDENTIFIED	48	•	•	•	•	•	•	•
PUMPKINSEED	57	2	13	Ŋ	1	9	12	8
REDBREAST SUNFISH	н	•	•		2	•	•	•
ROCK BASS	•	-	•	•	•	•	•	•
SATINFIN SHINER	•	•	•	•	•	П	•	•
~	•	-	•	•	•	•	•	•
SMALLMOUTH BASS	•	•	. •	•	-	-	•	•
SPOTTAIL SHINER	244	685	333	369	102	43	404	259
	89	747	197	370	120	10	187	225
	-	80	4	2	-		•	•
YELLOW PERCH		, .	٠ ج	1		•	•	•
	1	•	i	•	•		•	•

FRESHWATER

TABLE E-3 TOTAL NUMBER OF FISH COLLECTED IN THE FALL SHOALS SURVEY, 1985-1992. (CONTINUED)

GROUP MARINE

			YEP	YEAR OF DATA COLLECTION	COLLECTION			
	85	86	87	88	68	06	91	92
NAME						•	ľ	I V
ATLANTIC CROAKER	1	4	7	•		4	•	4
	51	139	19	6	38	129	478	122
ATLANTIC NEEDLEFISH	•	•	•	-	•	7	-	•
BAY ANCHOVY	27,902	20,988	39,348	59,244	41,475	16,465	44,815	37,264
BLUEFISH	09	51		116	62	82	28	82
BUTTERFISH	61	106	48	110	81	43	35	141
CONGER EEL	•	•	•	14			;	•
CREVALLE JACK	2	-	⊣	10	8	7	m	• •
CUNNER	•	•	٠	•	•	-		
GOBIIDAE	•	•	•	4	•		•	38
GRUBBY	•	•	•	2		•	•) ·
INSHORE LIZARDFISH	-	•	•	-	4			7
MOONFISH	•	-	8	•	ស	•		٠
NAKED GOBY	ო	9	47	6	21		7	30
	6	9	•	20	ო	m	10	2
NORTHERN PUFFER	6	7	വ	က	2	٠	36	ım
	٠	2	7	21	ო	16	7	12
NORTHERN STARGAZER		•	٠	20	•	4	ო	10
OYSTER TOADFISH	•	•	•	٠	•	•	•	
ROUGH SILVERSIDE	-	•	რ	-	•	•		l en
SEABORD GOBY	•	•	•	12	•	•	2	. •
SILVER PERCH	•	•	•	13	•	•	-	• •
SMALLMOUTH FLOUNDER	•	٠	•	8	•	•		
SPOT	വ	14	-	1,257	•		. 2	
SPOTTED HAKE	2	-	•	•	•	•	m	32
STRIPED ANCHOVY	•	•	•	•	•	•		
STRIPED CUSKEEL	က	•	•	٦	•	•	-	8
STRIPED SEAROBIN	321	148	10	101	25	26	310	54
SUMMER FLOUNDER	232	447	58	7	42	35	102	56
TAUTOG	٠	•	•	2	٠	m	•	٦
WEAKFISH	2,214	1,482	749	3,777	2,842	770	5,878	756
WINDOWPANE FLOUNDER		1	Ω	17		ഗ	6	32
WINTER FLOUNDER	226	196	92	39	23	13	28	36

SAMPLING STATISTICS FOR FALL SHOALS SURVEY, 1985-1992

92	.3JUL1992 :3OCT1992 .,865,365
91	22JUL1985 21JUL1986 13JUL1987 18JUL1988 17JUL1989 09JUL1990 15JUL1991 13JUL1992 14NOV1985 02DEC1986 05NOV1987 280CT1988 260CT1989 17OCT1990 25OCT1991 23OCT1992 1,886,745 2,298,278 2,035,357 1,826,628 1,590,047 1,252,910 1,707,237 1,865,365 1,802 2,098 1,958 1,600 1,600 1,600 1,600 1,600
06	09JUL1990 17OCT1990 1,252,910 1,680
89	17JUL1989 26OCT1989 1,590,047 1,679
88	18JUL1988 28OCT1988 1,826,628 1,680
87	13JUL1987 05NOV1987 2,035,357 1,958
986	21JUL1986 02DEC1986 2,298,278 2,098
85	22JUL1985 14NOV1985 1,886,745 1,802
	START DATE END DATE TOTAL VOLUME SAMPLED NUMBER OF SAMPLES

YEAR OF DATA COLLECTION

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