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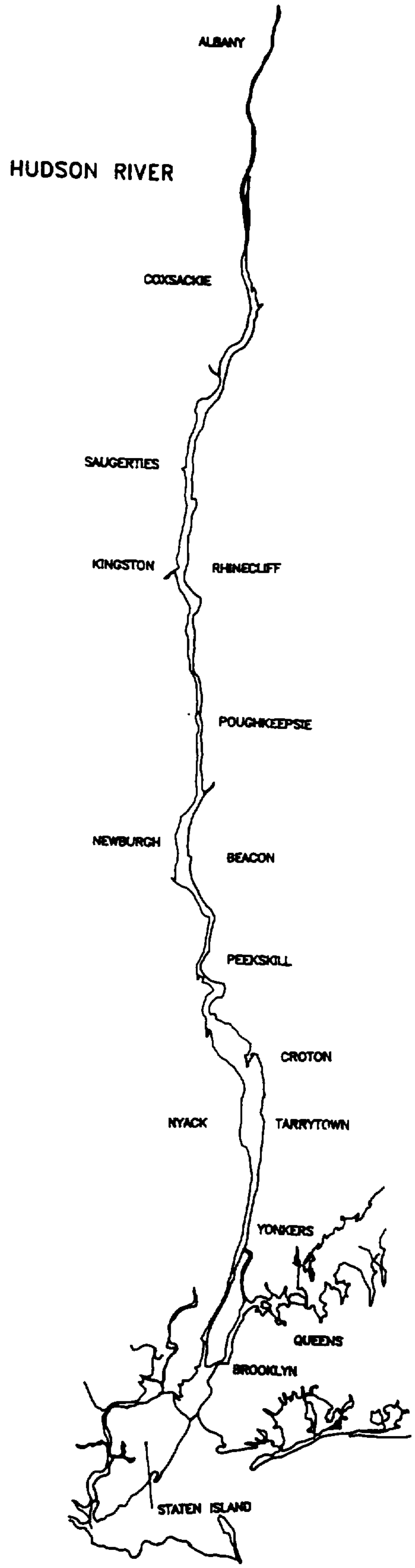

1993 YEAR CLASS REPORT

for the Hudson River Estuary Monitoring Program

Prepared by

Consolidated Edison Company of New York, 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.

Con Edison

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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 9 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 3 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.

The 1985 Year Class Report (Versar 1987) described the results from the 1985 Longitudinal River Ichthyoplankton Survey (LRS), Fall Shoals Survey (FSS), and Beach Seine Survey (BSS). 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 4 species.

The 1986 and 1987 Year Class Report (LMS 1989) described the results from the 1986 and 1987 LRS, FSS, and BSS. 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 LRS, FSS, and BSS. 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 1992 Year Class Report (Con Edison 1996) presented results from the 1992 LRS, FSS, and BSS. The report described the physical/chemical parameter patterns in the Hudson River estuary and the spatiotemporal distribution of 16 selected species of fish. Three additional species (bluefish, hogchoker, and gizzard shad) were added to the 1992 report since they were of interest to the New York State Department of Environmental Conservation (NYSDEC).

The present report adds to the historical database by describing the results of the LRS, FSS, and BSS for 1993. The 1993 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 1993.

- Describe the distribution and abundance of 16 selected species of fish (Table 1-1) in the Hudson River estuary in 1993 and provide information on length frequency when available.

This report is organized into four chapters with supporting appendixes. 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 Estimates; Appendix D - Length Frequency Distribution; Appendix E - Numbers of Fish/Species Collected in the Ichthyoplankton, Beach Seine, and Fall Shoals Sampling Programs, 1988-1993; and Appendix F - Sturgeon Ichthyoplankton, 1974-1994.

TABLE 1-1 FISH SPECIES[a] TREATED IN DEPTH IN THE 1993 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	*Ameiurus catus*
White perch	*Morone americana*

a. Species identified by NYSDEC of interest for discharge permitting purposes.
b. Names recognized by American Fisheries Society (Robins et al. 1991).

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 (YOY), 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:

1. **Longitudinal River Ichthyoplankton Survey**—The entire length of the Hudson River estuary, from River Mile (RM) 1 at the Battery in Manhattan to RM 152 at the Federal Dam in Troy, was sampled to provide ichthyoplankton data that would allow calculations of standing crop, temporal, and geographic indices 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.

2. **Fall Shoals Survey**—Samples were collected every other week from the George Washington Bridge (RM 12) to the Troy Dam in mid-summer and fall. The objective was to provide data on YOY fish that would allow calculation of standing crop, temporal, and geographic indices for selected Hudson River fish species. The target species were Atlantic tomcod, American shad, striped bass, and white perch.

3. **Beach Seine Survey**—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 YOY 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 YOY 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 (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 has been sampled since 1988. 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:

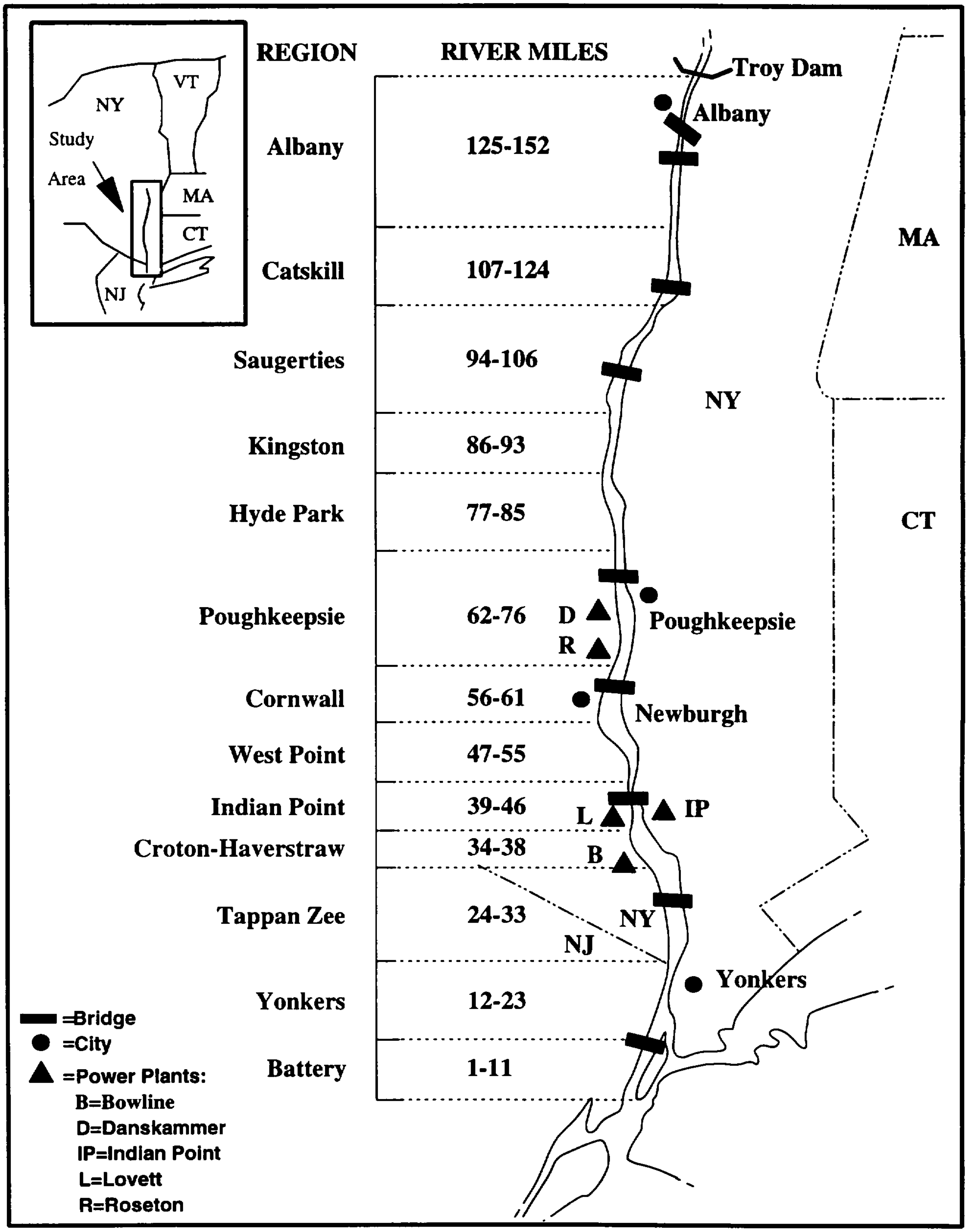


Figure 2-1. Location of 13 geographic regions (with river mile boundaries) sampled during 1993 field sampling programs in the Hudson River estuary.

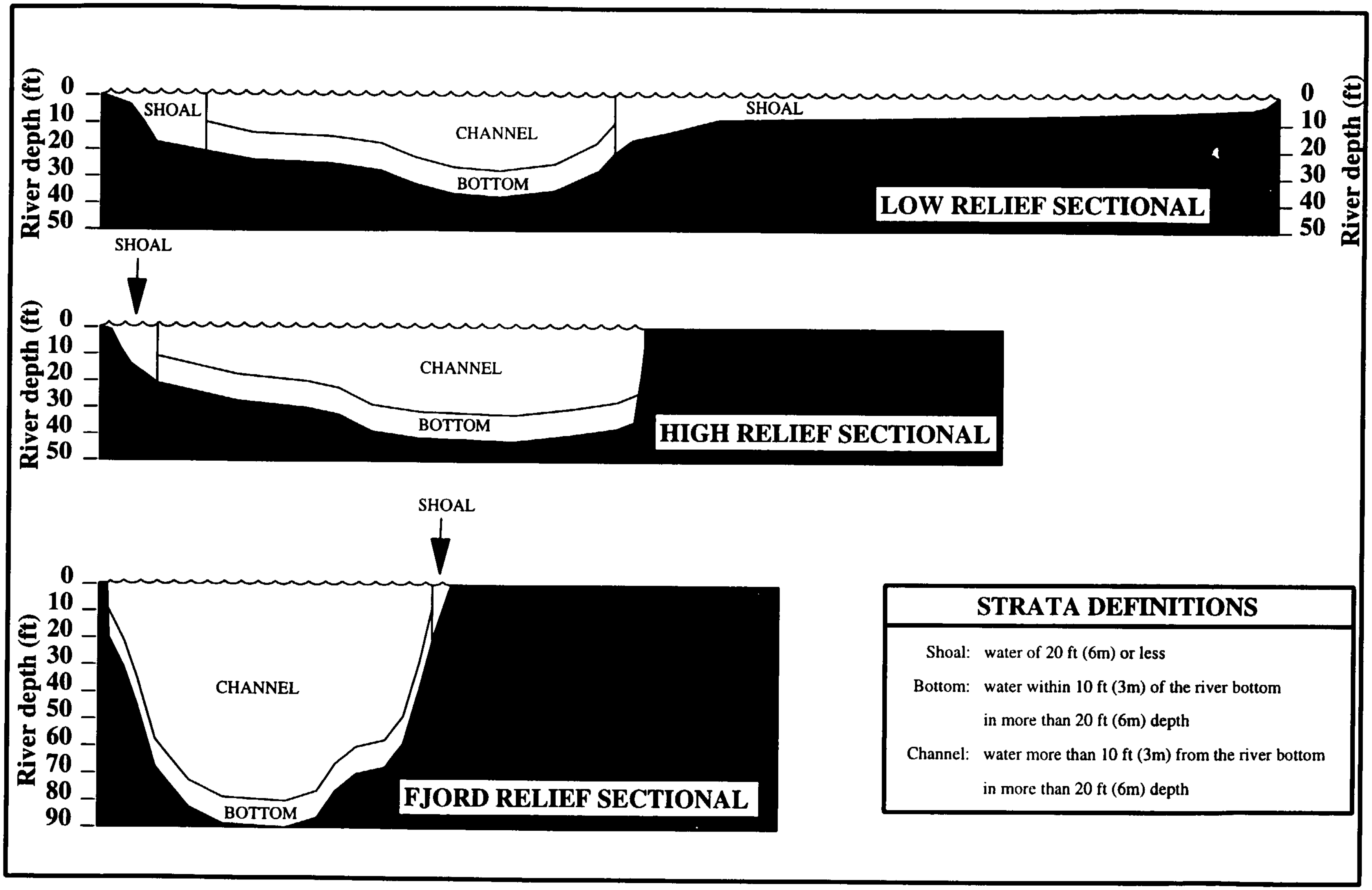


Figure 2-2. Cross sections of the Hudson River estuary showing locations and typical proportional relationships of the shoal, bottom, and channel strata.

- **Shore**—That portion of the Hudson River estuary extending from the shore to a depth of 10 ft (the stratum defined only for BSS).

- **Shoal**—That portion of the Hudson River estuary extending from the shore to a depth of 20 ft at mean low tide.

- **Bottom**—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.

- **Channel**—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 was 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 (12 April through 6 June) or in the Hyde Park through Albany regions during the final 7 weeks of the LRS (12 July through 5 October). A minimum of three samples was assigned to each stratum in each region for the FSS and a minimum of three samples was also taken in each region for the BSS. The strata actually sampled in each region during the 1993 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 1993 LRS covered 26 weeks from 12 April to 5 October (Table 2-2 and Figure 2-3) 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 12 July and ending the week of 4 October, sampling was conducted biweekly between RM 1 and 76. Between 24 May and 9 July, approximately 20 additional 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.

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 1993 LRS sampling program was scheduled as five separate multiweek efforts. The first, which covered the last 3 weeks

TABLE 2-1 STRATA SAMPLED WITHIN THE 13 GEOGRAPHIC REGIONS OF THE HUDSON RIVER ESTUARY DURING 1993

Region	Abbreviation	River Miles	River Kilometers	1993 Survey Shore	1993 Survey Shoal	1993 Survey Channel	1993 Survey Bottom
Battery	BT	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-Haverstraw	CH	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	X
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.

TABLE 2-2 SUMMARY OF 1993 HUDSON RIVER SURVEYS

Program Phase	Sampling Schedule Start Date	Sampling Schedule End Date	Number of River Runs	Sampling Frequency	Strata Sampled	Sample Number Collection Projected	Sample Number Collection Actual	Sample Number Lab Analysis	Sampling Gear
Longitudinal River Ichthyoplankton Survey	12 APR	5 OCT	20	Weekly/ Biweekly	Shoal	502	502	415	1.0-m^2 net on epibenthic sled or 1.0-m^2 Tucker trawl
					Channel	1,687*	1,686	787	1.0-m^2 Tucker trawl
					Bottom	1,157	1,157	785	1.0-m^2 net on epibenthic sled
Fall Shoals Survey	19 JUL	29 OCT	8	Biweekly	Shoal	512	512		3.0-m beam trawl
					Channel	440	440		1.0-m^2 Tucker trawl
					Bottom	728	728		3.0-m beam trawl
Beach Seine Survey	28 JUN	5 NOV	10	Biweekly	Shore	1,000	1,000		30.5-m beach seine

* Includes 141 samples collected for striped bass otolith analysis.

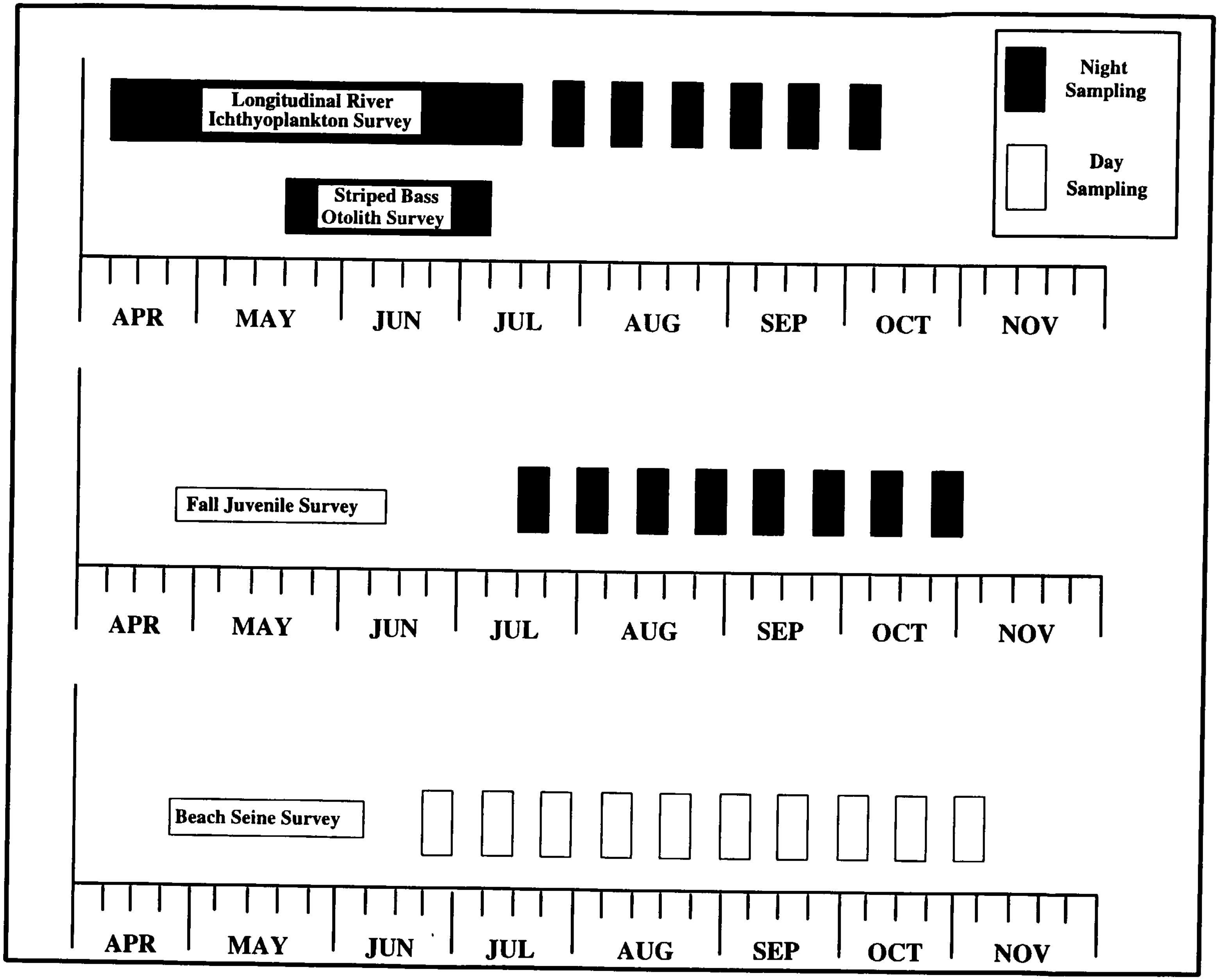


Figure 2-3. Sampling schedule for 1993.

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 (YSL). 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 (PYSL). The LRS sampling program concluded with a 13-week period, sampled biweekly, from the middle of July to early 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 2-3. During 1993, 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-m^2 Tucker trawl (Figure 2-4) to sample the channel strata, an epibenthic sled-mounted 1.0-m^2 net similar in design to the Tucker trawl (Figure 2-5) to sample the bottom strata, and both gear types to sample the shoal strata. Table 2-4 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 percent of the container volume. The containers were filled with 10 percent formalin.

In situ measurements of water temperature (°C), dissolved oxygen (mg/L), 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 1993 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 1993 LRS, 2,899 samples were scheduled, with 2,900 samples actually collected. In the first week of the LRS (week of April 12), dissolved oxygen was not measured due to problems with the instruments.

Ichthyoplankton samples collected for striped bass otolith aging were handled in the same manner as regularly scheduled LRS samples except that the preservative was 95 percent ethanol. Within 48 hours, the samples were drained and placed in fresh 95 percent ethanol.

TABLE 2-3 SUMMARY OF 1993 SAMPLE COLLECTION INFORMATION BY RIVER REGION AND STRATUM FOR THE LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

	3-Week Period From 12 APR To 1 MAY					2-Week Period From 3 MAY To 16 MAY					3-Week Period From 17 MAY To 6 JUN				
	Shoal		Channel	Bottom		Shoal		Channel	Bottom		Shoal		Channel	Bottom	
Region	Sled	Trawl	Trawl	Sled	Total	Sled	Trawl	Trawl	Sled	Total	Sled	Trawl	Trawl	Sled	Total
Battery	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yonkers	6	6	9	9	30	4	2	6	6	18	6	3	9	9	27
Tappan Zee	12	9	12	12	45	4	2	6	8	20	6	3	12	12	33
Croton-Haverstraw	18	12	12	12	54	8	4	12	6	30	9	6	14	12	41
Indian Point	6	6	9	9	30	6	2	50	14	72	6	3	48	18	75
West Point	--	--	9	9	18	--	--	62	8	70	--	--	79	21	100
Cornwall	9	6	9	9	33	6	4	10	24	44	9	6	19	27	61
Poughkeepsie	--	--	9	9	18	--	--	20	20	40	--	--	76	48	124
Hyde Park	--	--	21	9	30	--	--	22	18	40	--	--	42	21	63
Kingston	--	--	18	24	42	--	--	14	12	26	--	--	18	12	30
Saugerties	--	--	18	30	48	--	--	6	6	12	--	--	9	15	24
Catskill	--	--	30	60	90	--	--	6	6	12	--	--	9	9	18
Albany	--	--	45	96	141	--	--	10	10	20	--	--	9	9	18
Total	51	39	201	288	579	28	14	224	138	404	36	21	344	213	614

	5-Week Period From 7 JUN To 9 JUL					13-Week Period From 12 JUL To 5 OCT				
	Shoal		Channel	Bottom		Shoal		Channel	Bottom	
Region	Sled	Trawl	Trawl	Sled	Total	Sled	Trawl	Trawl	Sled	Total
Battery	--	--	19	11	30	--	--	56	20	76
Yonkers	10	10	35	30	85	14	14	49	21	98
Tappan Zee	10	10	33	25	78	28	21	28	21	98
Croton-Haverstraw	15	10	40	30	95	42	28	28	21	119
Indian Point	15	10	100	25	150	14	14	21	21	70
West Point	--	--	150	40	190	--	--	21	21	42
Cornwall	10	10	80	60	160	14	14	21	21	70
Poughkeepsie	--	--	90	35	125	--	--	21	21	42
Hyde Park	--	--	55	25	80	--	--	--	--	--
Kingston	--	--	30	20	50	--	--	--	--	--
Saugerties	--	--	10	20	30	--	--	--	--	--
Catskill	--	--	15	15	30	--	--	--	--	--
Albany	--	--	15	15	30	--	--	--	--	--
Total	60	50	672	351	1133	112	91	245	167	615

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

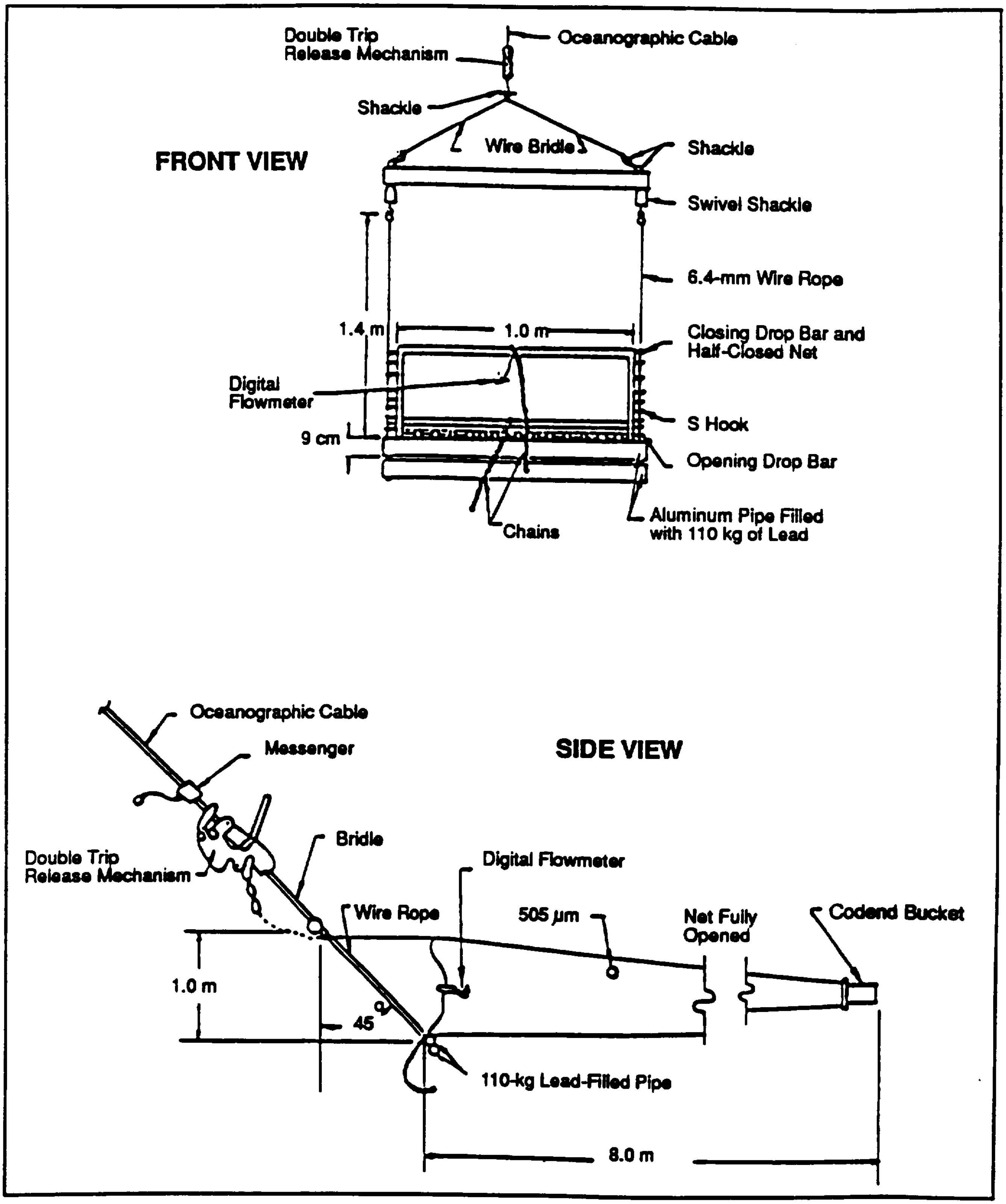


Figure 2-4. Design and dimensions of 1.0-m^2 Tucker trawl.

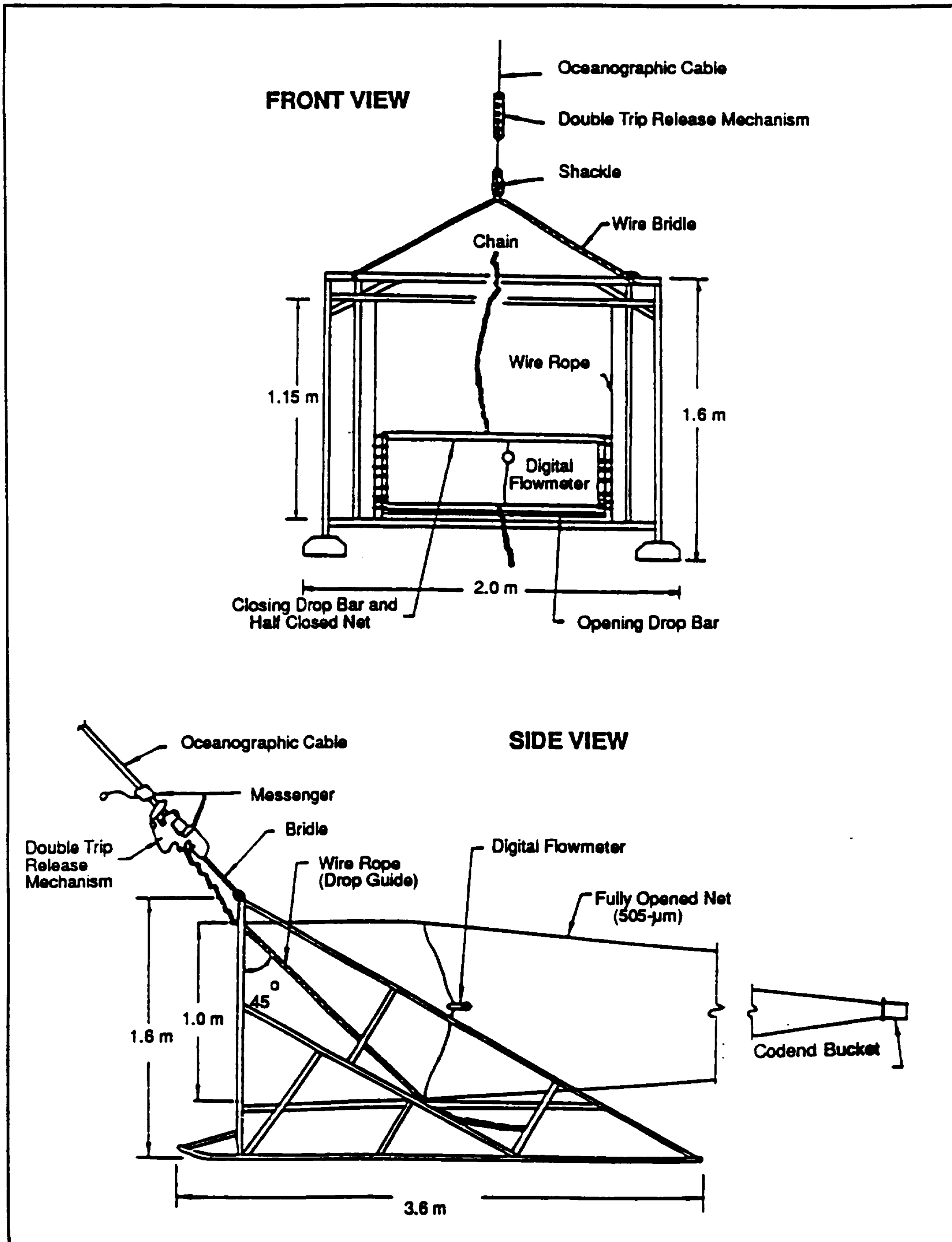


Figure 2-5. Design and dimensions of 1.0-m^2 Tucker trawl mounted on an epibenthic sled.

TABLE 2-4 SPECIFICATIONS OF SAMPLING GEAR USED DURING THE 1993 LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

1.0-m^2 Tucker Trawl	
Length	8.0 m
Mouth (width)	1.0 m
Mouth (height)	1.4 m
Mesh size	505 μm
Net material	Nytex (monofilament nylon)
Collection cup	
Length	30 cm
Length with net-retaining ring	37 cm
Mesh size	505 μm
Net material	Nytex (monofilament nylon)

1.0-m^2 Net Mounted on Epibenthic Sled	
Length	8.0 m
Mouth (width)	1.0 m
Mouth (height)	1.4 m
Mesh size	505 μm
Net material	Nytex (monofilament nylon)
Collection cup	
Length	30 cm
Length with net-retaining ring	37 cm
Mesh size	505 μm
Net material	Nytex (monofilament nylon)

TABLE 2-5 WATER QUALITY SAMPLING LOCATIONS DURING THE 1993 LONGITUDINAL RIVER ICHTHYOPLANKTON AND FALL SHOALS SURVEYS

River Region	Scheduled Sampling Locations (RM) Shoals*	Channel	Number of Water Quality Samples Scheduled Per Region Per River 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**

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

** For weeks when LRS sampling was not conducted north of Poughkeepsie (RM 76), the total number of water quality samples scheduled per river run was 104.

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

2.2.2 Laboratory Methods

In 1993, 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 1,987, comprising 62 percent of the collected samples (excluding those collected for otolith analysis).

In 1993, as in previous years, splitting (or subsampling) was permitted. A trained technician first determined, by visual inspection, if the sample needed splitting. 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 PYSL 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 YSL, PYSL, and juveniles of striped bass, white perch, and unidentified *Morone*) was sorted from the entire sample and a minimum of 50 non-*Morone* larvae was also sorted. Because some of the more difficult distinctions between species (e.g., striped bass versus 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., YSL, PYSL, and YOY 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 11 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., YSL, PYSL, and YOY combined) of all species combined.

TABLE 2-6 SUMMARY OF 1993 SAMPLE ANALYSIS INFORMATION BY RIVER REGION AND STRATUM FOR THE LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY

	3-Week Period From 12 APR To 1 MAY					2-Week Period From 3 MAY To 16 MAY					3-Week Period From 17 MAY To 6 JUN				
	Shoal		Channel	Bottom		Shoal		Channel	Bottom		Shoal		Channel	Bottom	
Region	Sled	Trawl	Trawl	Sled	Total	Sled	Trawl	Trawl	Sled	Total	Sled	Trawl	Trawl	Sled	Total
Battery	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yonkers	6	6	9	9	30	4	2	6	6	18	6	3	9	9	27
Tappan Zee	8	4	12	12	36	4	2	6	8	20	5	3	12	12	32
Croton-Haverstraw	10	5	12	12	39	5	1	6	6	18	9	6	12	12	39
Indian Point	6	6	9	8	29	6	2	10	8	26	6	3	9	9	27
West Point	--	--	9	9	18	--	--	12	8	20	--	--	15	12	27
Cornwall	9	6	9	9	33	6	4	10	12	32	9	6	15	15	45
Poughkeepsie	--	--	9	9	18	--	--	10	10	20	--	--	12	9	21
Hyde Park	--	--	12	9	21	--	--	12	10	22	--	--	18	12	30
Kingston	--	--	9	12	21	--	--	8	6	14	--	--	9	11	20
Saugerties	--	--	9	15	24	--	--	6	6	12	--	--	9	15	24
Catskill	--	--	15	12	27	--	--	6	6	12	--	--	9	9	18
Albany	--	--	9	18	27	--	--	10	10	20	--	--	9	9	18
Total	39	27	123	134	323	25	11	102	96	234	35	21	138	134	328

	5-Week Period From 7 JUN To 9 JUL					13-Week Period From 12 JUL To 5 OCT				
	Shoal		Channel	Bottom		Shoal		Channel	Bottom	
Region	Sled	Trawl	Trawl	Sled	Total	Sled	Trawl	Trawl	Sled	Total
Battery	--	--	19	11	30	--	--	28	20	48
Yonkers	10	10	20	15	55	14	14	28	21	77
Tappan Zee	10	10	25	25	70	15	13	28	21	77
Croton-Haverstraw	15	10	15	15	55	23	12	27	21	83
Indian Point	15	10	15	25	65	14	14	21	21	70
West Point	--	--	25	20	45	--	--	21	21	42
Cornwall	10	10	15	30	65	14	14	21	21	70
Poughkeepsie	--	--	15	20	35	--	--	21	21	42
Hyde Park	--	--	25	24	49	--	--	--	--	--
Kingston	--	--	15	20	35	--	--	--	--	--
Saugerties	--	--	10	20	30	--	--	--	--	--
Catskill	--	--	15	15	30	--	--	--	--	--
Albany	--	--	15	14	29	--	--	--	--	--
Total	60	50	229	254	593	80	67	195	167	509

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:

$$\text{chi square} = \frac{(O_1 - E)^2}{E} + \frac{(O_2 - E)^2}{E} + \frac{(O_3 - E)^2}{E}$$

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:

Life Stage	Description
Egg	Embryonic stage from spawning to hatching
YSL	From hatching to development of a complete and functional digestive system
PYSL	From development of a complete digestive system to acquisition of a full complement of adult fin rays
YOY	From acquisition of a full complement of adult fin rays to 31 December of the year spawned

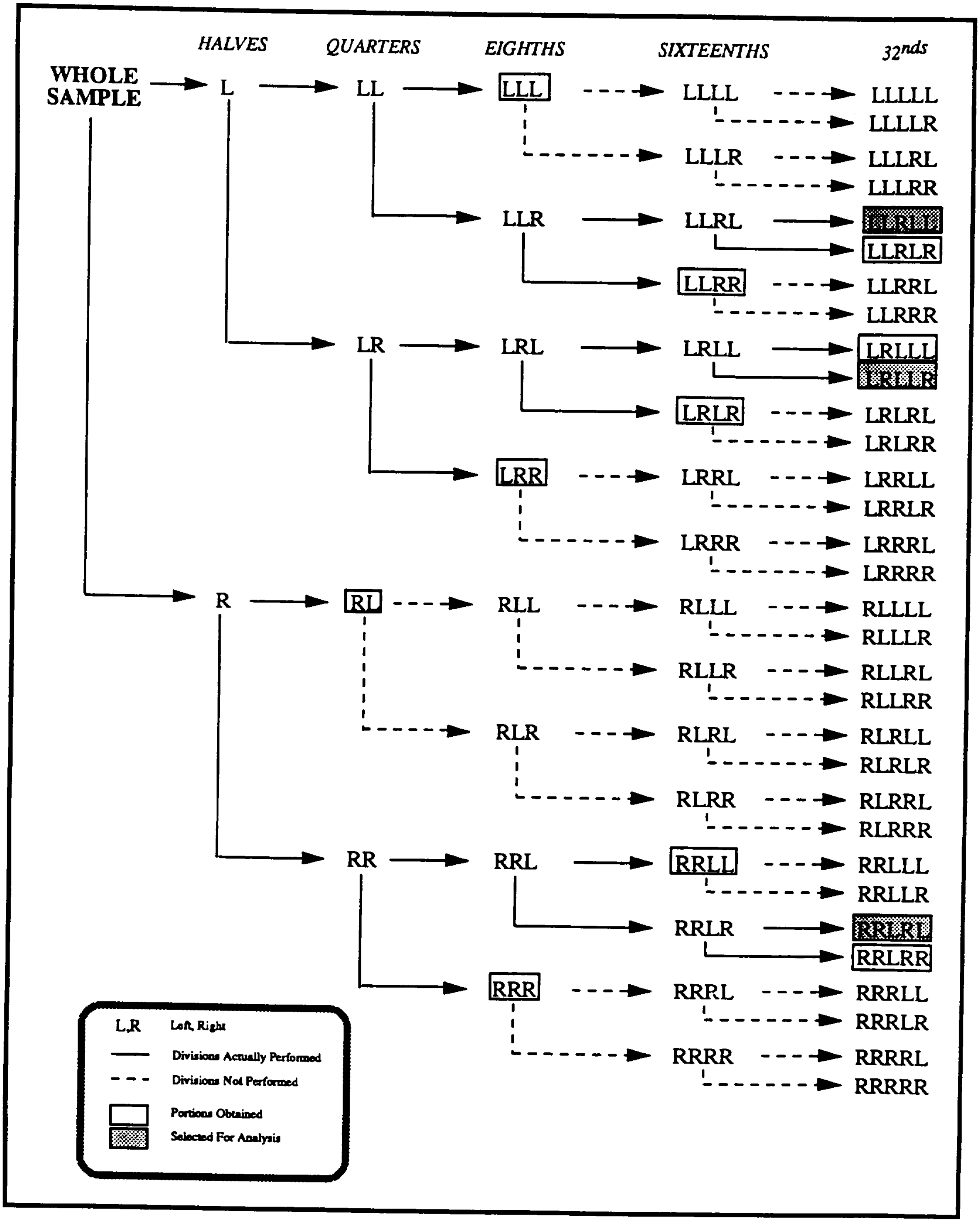


Figure 2-6. Conceptual diagram of the splitting process.

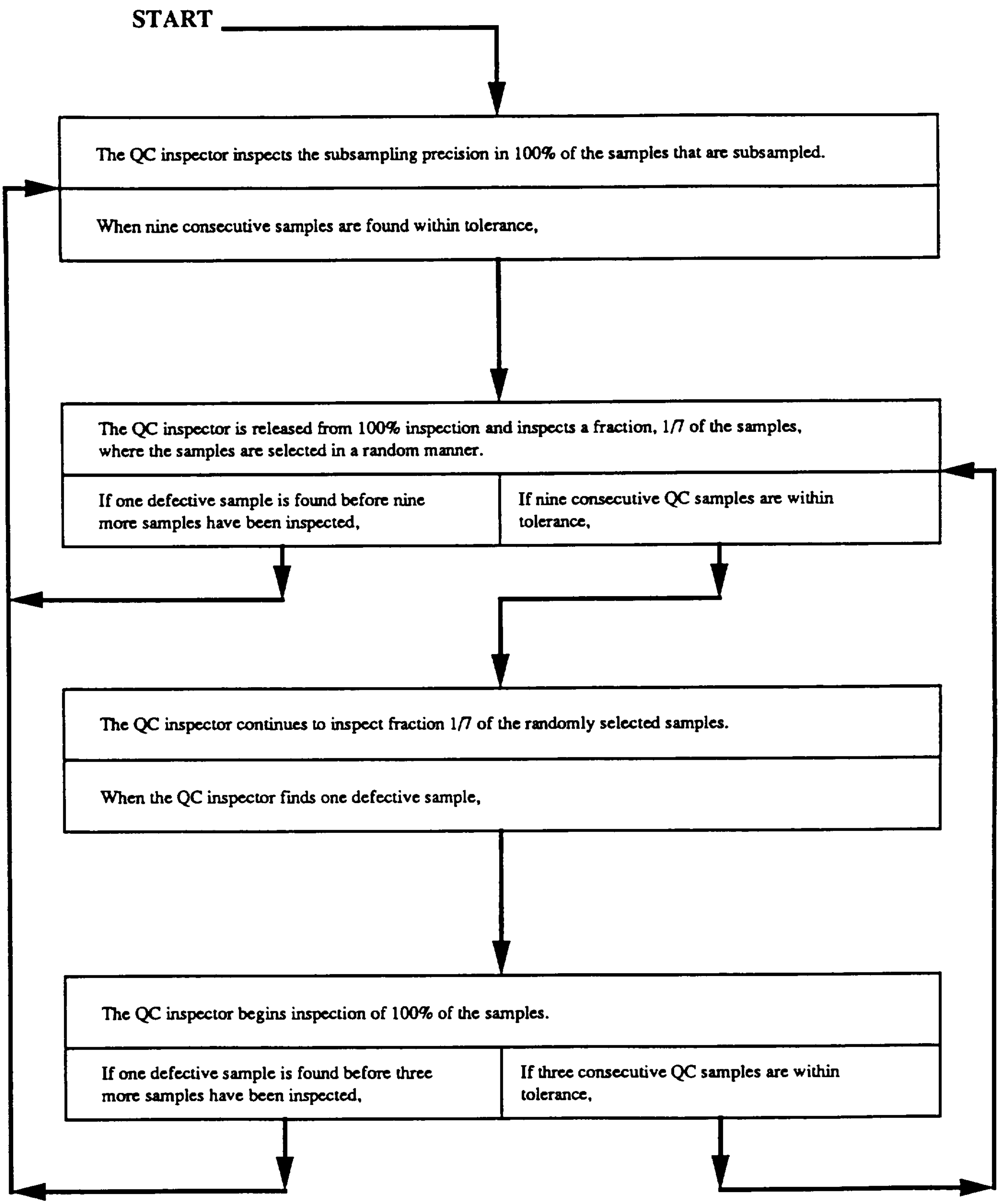


Figure 2-7. Inspection plan for evaluation of splitting precision.

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 number were obtained; life stages to be included were YSL, PYSL, and YOY. 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 YSL and PYSL (total length) were measured to the nearest 0.1 mm and YOY 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 1993 CSP-1 Quality Assurance/Quality Control Program are contained in Appendix A.

2.3 FALL SHOALS SURVEY

2.3.1 Field Methods

A 1.0-m^2 Tucker trawl and a 3.0-m beam trawl were used to collect YOY 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 was adjusted as necessary to achieve and maintain a 45° wire angle; the resultant tow speed was recorded. The beam trawl was towed at a speed of approximately 1.5 m/second.

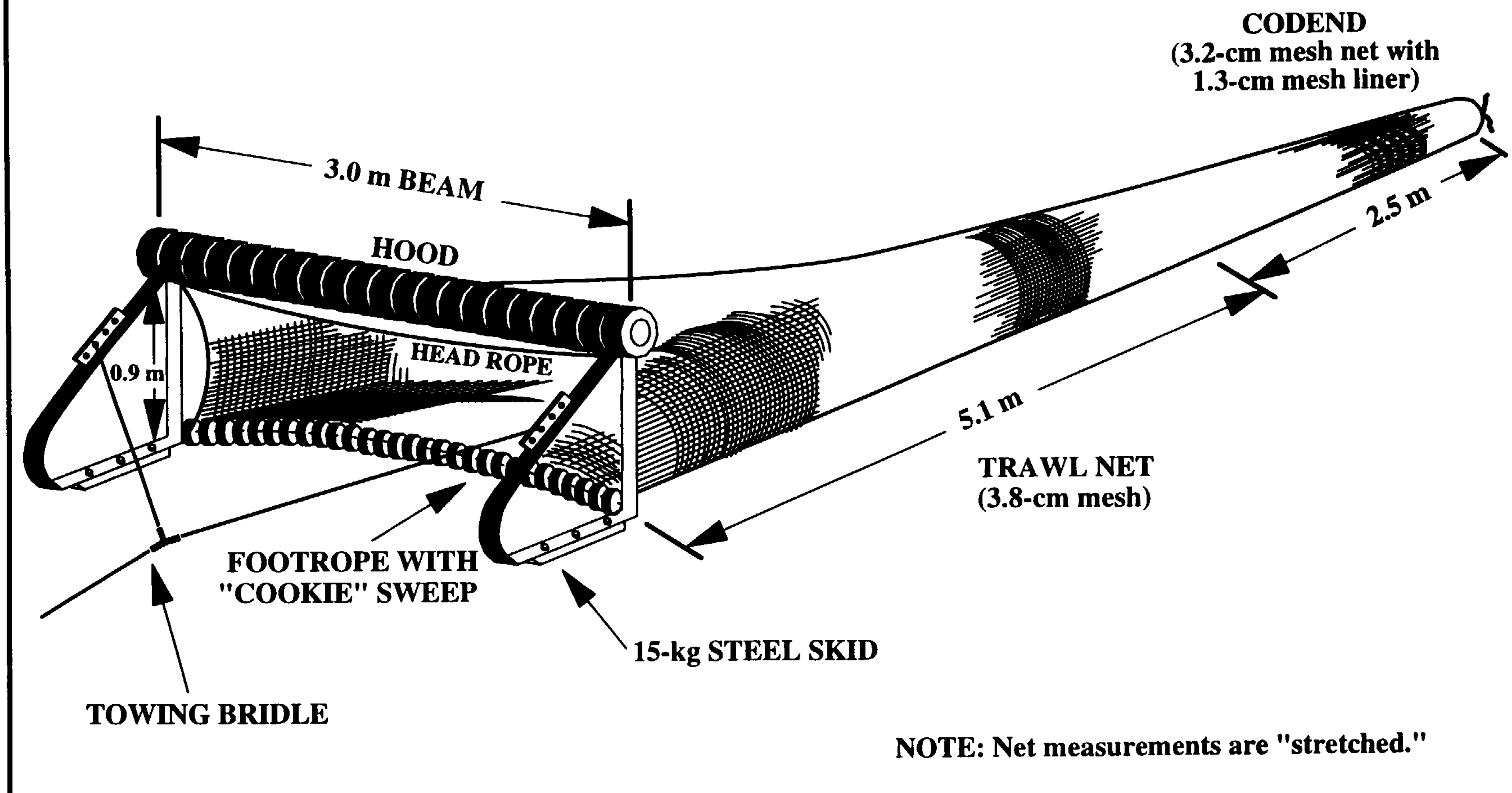


Figure 2-8. Design and dimensions of the 3.0-m beam trawl used in the 1993 Fall Shoals Survey.

TABLE 2-7 SPECIFICATIONS OF SAMPLING GEAR USED DURING THE 1993 FALL SHOALS 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

Tow speed was established and maintained by use of an electronic flowmeter mounted along the side of the research vessel and equipped with an on-deck 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 1993 FSS biweekly sampling program covered 15 weeks from 19 July to 29 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 1993 FSS. In 1993, 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/L), 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 1993 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 1993 FSS, 1,336 samples were scheduled and 1,336 samples were actually collected, or 100.0 percent of the number of samples scheduled for collection.

Samples collected during the first two sampling periods (River Runs 1 and 2) for the 1993 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 YOY *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 1993, 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 10 of the BSS. Also for the BSS during River Runs 1 through 3, the Yonkers through West Point regions 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

TABLE 2-8 NUMBER OF BIWEEKLY SAMPLES COLLECTED DURING THE 1993 FALL SHOALS SURVEY

Region	19 July - 29 October Strata: Shoal (Beam Trawl)	Channel (Tucker Trawl)	Bottom (Beam Trawl)	Total
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
Cornwall	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*

* All samples collected at night.

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

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 YOY length limit ("Division 1"), which was obtained from the field contractor 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 field 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 total length 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 YOY fish in the shore zone of each region, except the Battery 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

TABLE 2-9 SPECIFICATIONS OF SAMPLING GEAR USED DURING THE 1993 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
Sampling area	450 m^2

seine was then hauled, clockwise if possible, in a semicircular path toward shore. The complete tow swept an area of approximately 450 m^2 (TI 1981). All BSS samples were collected on a diurnal schedule during alternate weeks of the FSS.

The 1993 BSS biweekly sampling program was conducted from 28 June through 5 November (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 1993 BSS are presented in Table 2-10. All of the scheduled 1,000 samples projected for collection in 1993 were collected.

Measurements of water temperature (°C), dissolved oxygen (mg/L), 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 1993 BSS, 1,000 samples were scheduled and 1,000 samples were actually collected.

YOY fishes collected during the first three beach seine river runs in 1993 were processed in the laboratory because of the difficulty in distinguishing species at the YOY life stage, adults were processed in the field. All samples collected following River Run 3 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 1993 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 NYSDEC.

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 are not required. The maximum deviation between this equation and the previous equation is 0.1 percent (TI 1976).

TABLE 2-10 NUMBER OF BIWEEKLY SAMPLES COLLECTED DURING THE 1993 BEACH SEINE SURVEY

28 June - 5 November

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	127
Albany	85
Total	1,000

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

where

W_{lw} = Weighted mean of a physical/chemical parameter at sampling location l 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 l during week w

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

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

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.

$$\text{Salinity} = -100\, ln \left(1 - C_{25}/178.5 \right) \quad (3)$$

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 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./m^3 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	Its Volume Was Added To This Stratum
Shoal	Bottom
Bottom	Channel

$$D_{ikrw} = \frac{C_{ikrw}}{V_{ikrw}} \tag{4}$$

where

D_{ikrw} = Density (for a life stage and species)/m^3 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_{ikrw} = Volume sampled (m^3) by sample i in stratum k in region r during week w.

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

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.

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

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.

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

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.

* 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.

TABLE 2-11 STRATUM AND REGION VOLUMES (m^3) AND SURFACE AREAS (m^2) USED IN ANALYSIS OF 1993 HUDSON RIVER ESTUARY DATA

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

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

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

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 (catch-per-unit-effort [CPUE]) by life stage and species. The average CPUE for a region and its standard error were calculated using Equations 9 and 10:

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

where

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

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

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

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

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 value because no adjustment was applied for collection efficiency.

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

where

SC_{krw} = Standing crop index 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.

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

where

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

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

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

where

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

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

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

where

** 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.

$SE(SC_{rw})$ = 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.

$$SC_w = \sum_{r=1}^{12} SC_{rw} \tag{15}$$

where

SC_w = Standing crop index for week w. For the LRS, regional standing crop indices include the Battery Region (Region 0).

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

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

where

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

$SE(SC_{rw})$ = Standard error of regional standing crop index calculated in Equations 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 standing crops (Equations 15 and 16).

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

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 (m^2) of the shore zone in region r

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

$$SE(SC_{rw}) = \frac{[SE(C_{rw})](A_r)}{A} \qquad (18)$$

where

$SE(SC_{rw})$ = Standard error of standing crop index 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. To allow comparisons of 1993 data with historical data, only data from samples collected from Weeks 18 to 27 (where Week 1 begins with the first Monday in January) were used for LRS (except for bay anchovy which used Weeks 18-40); data from Weeks 33 to 40 were used for the FSS and BSS. In all cases, data were used only when Regions 1-12 were sampled (except for bay anchovy which included Region 0).

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

The periods used for the LRS and BSS spanned 1974-1993, whereas the time period for the FSS extended from 1979 (when the FSS sampled the river from RM 12 to RM 152) through 1993. Temporal and geographic indices for bay anchovy from the LRS used the period from 1989 to 1993, when the sampling design included the Battery region.

A geographic index that collapses data over weeks was calculated for LRS, FSS, and BSS data as the relative standing crop in each region. This geographic index was calculated as follows:

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

where

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

SC_{rwy} = Regional standing crop index for region r in week w in year y calculated in Equations 13 or 17

n_y = Number of weeks sampled in year y.

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

$$T_{wy} = \frac{SC_{wy}}{\sum_{w=1}^{n_y} SC_{wy}} \tag{20}$$

where

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

SC_{wy} = Weekly standing crop index 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 1993 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 for the Green Island Dam near Troy, New York, and daily water temperature data from the Poughkeepsie Waterworks are discussed. Physical and chemical parameters are presented in Appendix B.

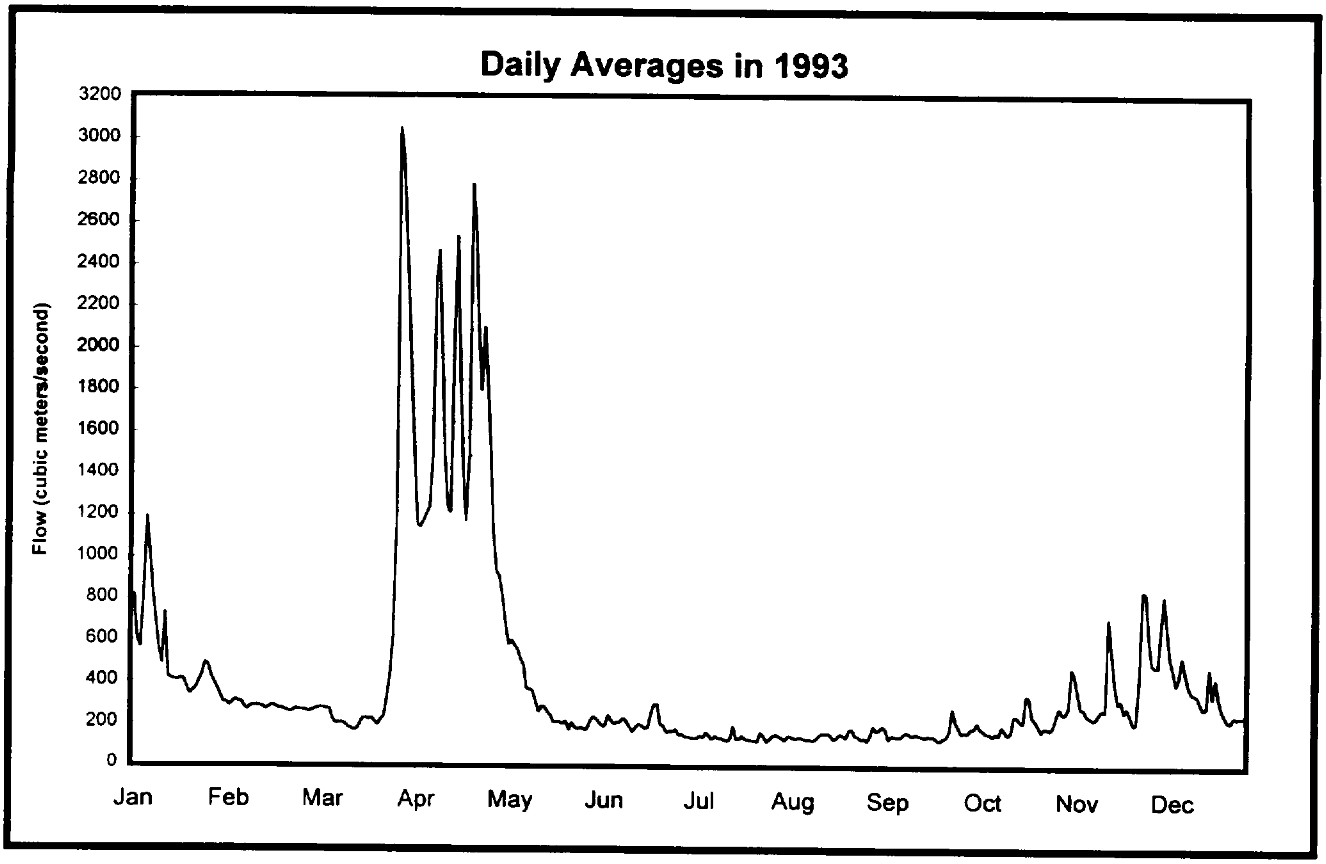
3.1 GREEN ISLAND DAM FLOWS

During 1993, daily freshwater flow as estimated by the U.S. Geological Survey for the gauging station at Green Island, New York, ranged from approximately 200 to 3,000 m^3/sec/day (Figure 3-1). The primary peak in daily flows occurred between late March and April with flows of 1,200-3,000 m^3/sec/day. Secondary peaks occurred in January (approximately 1,100 m^3/sec/day) and late November - early December (approximately 800 m^3/sec/day). Periods of low daily flow averages of 100-200 m^3/sec/day occurred from mid-May through October (Figure 3-1, Appendix Table B-1). The 1993 monthly freshwater flow rates differed from the long-term monthly average (1947-1992) flow rates due to exceptionally higher than average flows occurring in late March and April (Figure 3-1). The monthly mean flow of 1,749 m^3/sec/day in April 1993 was the highest recorded since 1947. Discharge peaked at 3,056 m^3/sec/day on 30 March and did not fall below 1,100 m^3/sec/day until 1 May (Table B-1). For the remainder of 1993, monthly mean flows were slightly below the long-term monthly mean flows.

3.2 POUGHKEEPSIE WATERWORKS TEMPERATURES

Long-term (1951-1993) daily temperature records are available from the Poughkeepsie Waterworks, located just north of the City of Poughkeepsie, New York, at RM 76. The lowest recorded temperature in 1993 was 0.6°C in January. Water temperatures in 1993 remained relatively low (<3°C) through March. Water temperature began increasing in April and reached a high of 26.3°C in mid-July. Temperatures started to decline in mid-September (Figure 3-2, Table B-4).

The 1993 mean water temperature profile generally resembles the long-term pattern (Figure 3-2). However, from March through mid-April water temperatures recorded during 1993 were well below the long-term average and approached the long-term minimum. By May, contrastingly, 1993 water temperatures were well above the long-term average and even exceeded the long-term maximum. During the early and late summer season, water temperatures were again above the long-term average. Fall temperatures were on par with the 1951-1992 long-term average.



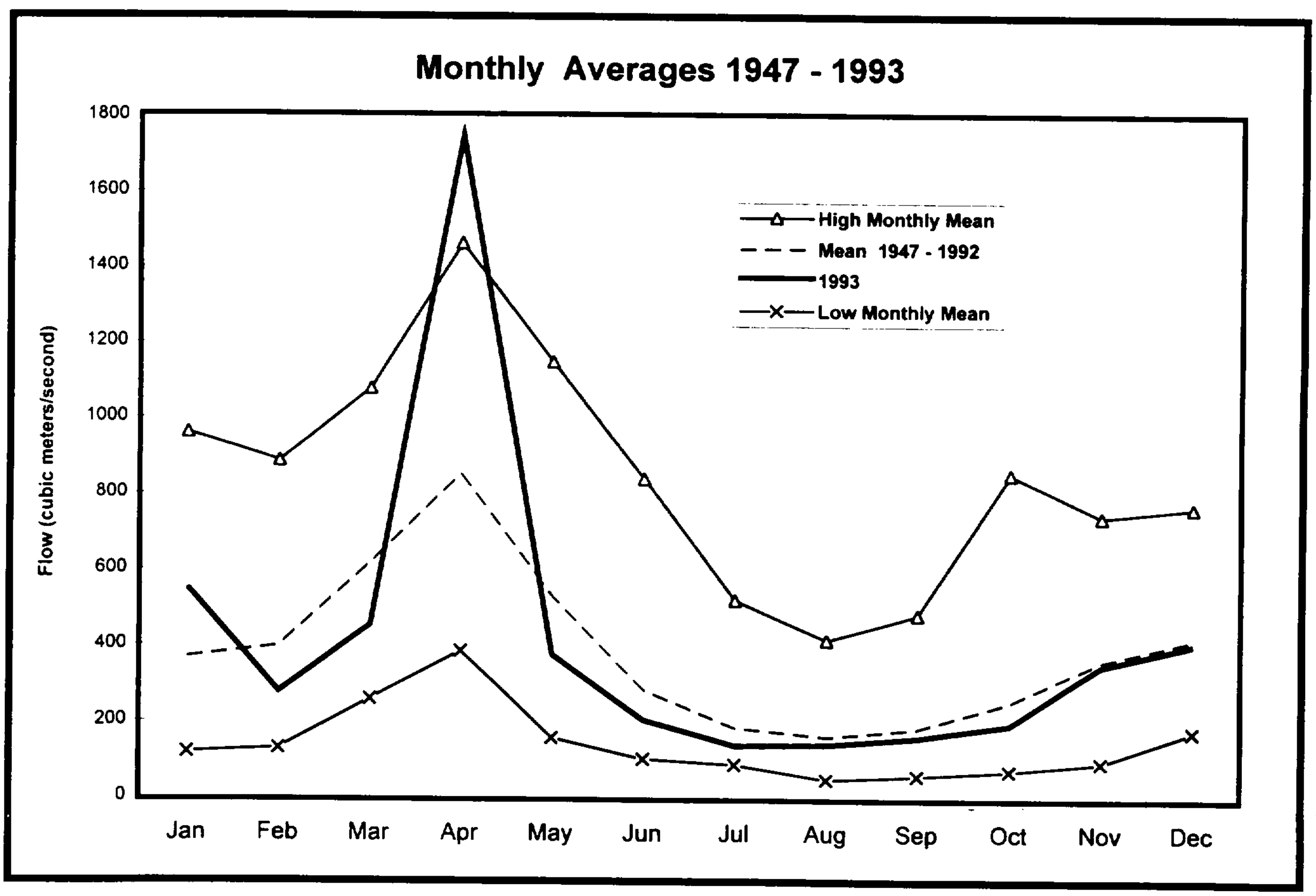


Figure 3-1. Hudson River daily average flow rate in 1993 and monthly average flow rates from 1947 to 1993, Green Island Dam, Troy, New York.

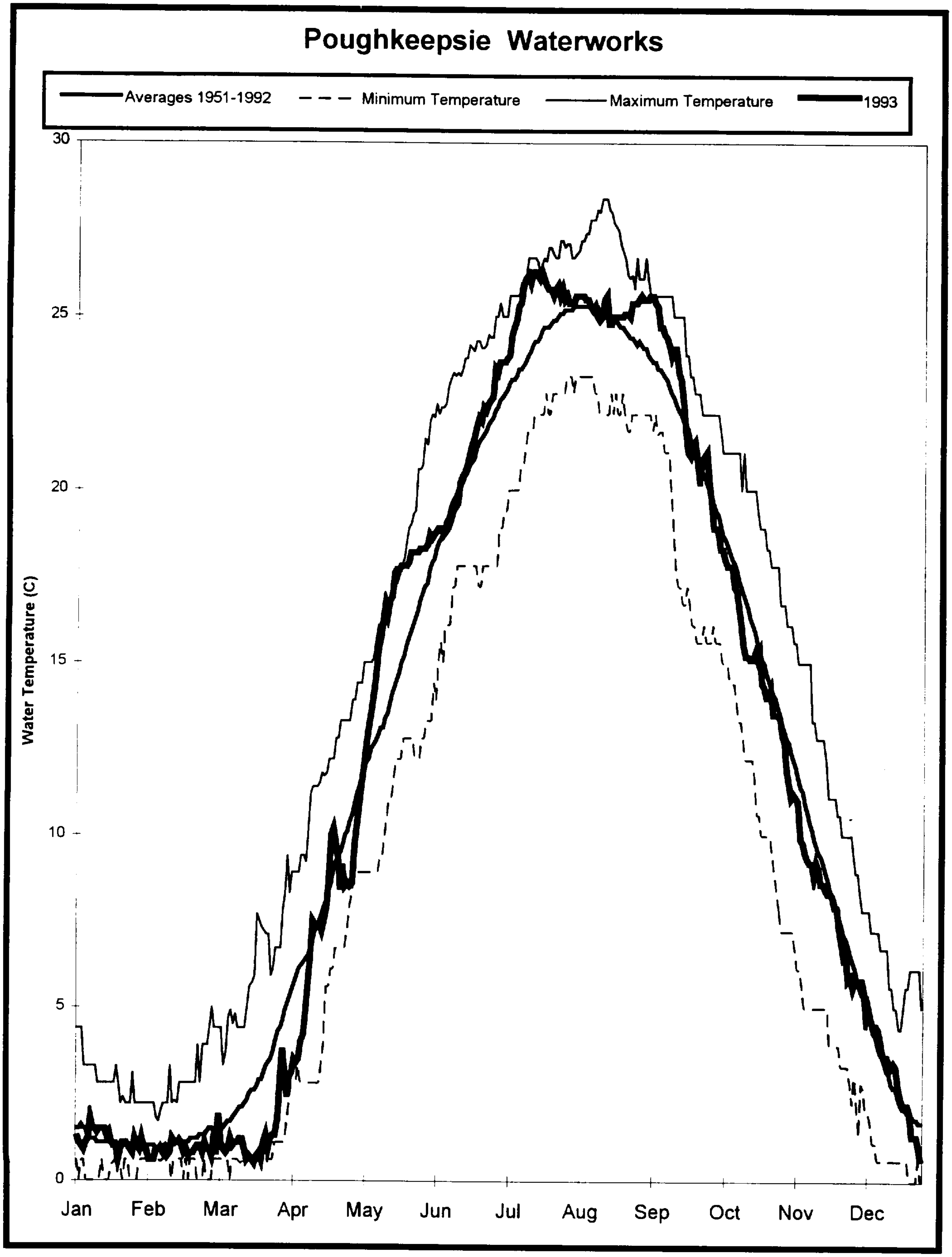


Figure 3-2. Seasonal variations in water temperature from 1951 to 1993.
Source: Poughkeepsie Waterworks.

3.3 HUDSON RIVER SURVEYS

3.3.1 Spatiotemporal Pattern in Temperature

Mean weekly water temperature measured during the 1993 LRS/FSS increased from the beginning of sampling in April until July, remained relatively constant throughout the summer, 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 Poughkeepsie Waterworks. Weekly mean temperatures measured during the LRS/FSS were similar to concurrent Poughkeepsie Waterworks temperatures. Peak river temperatures occurred during July and August, as with Poughkeepsie Waterworks, when the river-wide mean temperature was approximately 25°C and regional mean values were between 22.9 and 27.5°C (Table B-5). Lowest values occurred during the first week of sampling when the mean river-wide temperature was 4.8°C (Poughkeepsie Waterworks daily temperatures were 7.2-7.9°C) and regional mean temperatures ranged from 3.1 to 6.4°C.

Temporal patterns in the 1993 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 in the spring and summer than were recorded during the LRS/FSS (Figure 3-3). Mean weekly regional temperatures reached a peak of over 29°C in the Tappan Zee and Indian Point regions during the 12 July sampling week (Table B-6). BSS mean temperatures decreased steadily from the end of summer into fall, generally on par with but slightly lower than LRS/FSS temperatures. Minimum mean temperatures of 7°C were recorded from the uppermost river regions during the last week of sampling that began on 1 November.

3.3.2 Spatiotemporal Pattern in Salinity

Seasonal variations in salinity in 1993 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. Because of the exceptionally high freshwater flow in April 1993, salinity values were generally around 0.1 ppt throughout the Hudson River estuary during April (Figure 3-4, Table B-7).

Salinity in the lower river regions quickly increased after freshwater flow declined in mid-May and remained high through 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 salinities over 10 ppt in the Yonkers region from mid-May until the end of sampling, and contributed to a salinity of almost 1 ppt in the Poughkeepsie region in July and August (Figure 3-4, Table B-7).

The spatiotemporal pattern of salinity observed during the 1993 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 (0.5-11.6 ppt from Poughkeepsie to Yonkers) were recorded during the week of 26 July and lowest values (0.2-6.6 ppt from Poughkeepsie to Yonkers) were observed during the final week of sampling beginning on 1 November. Actual salinity

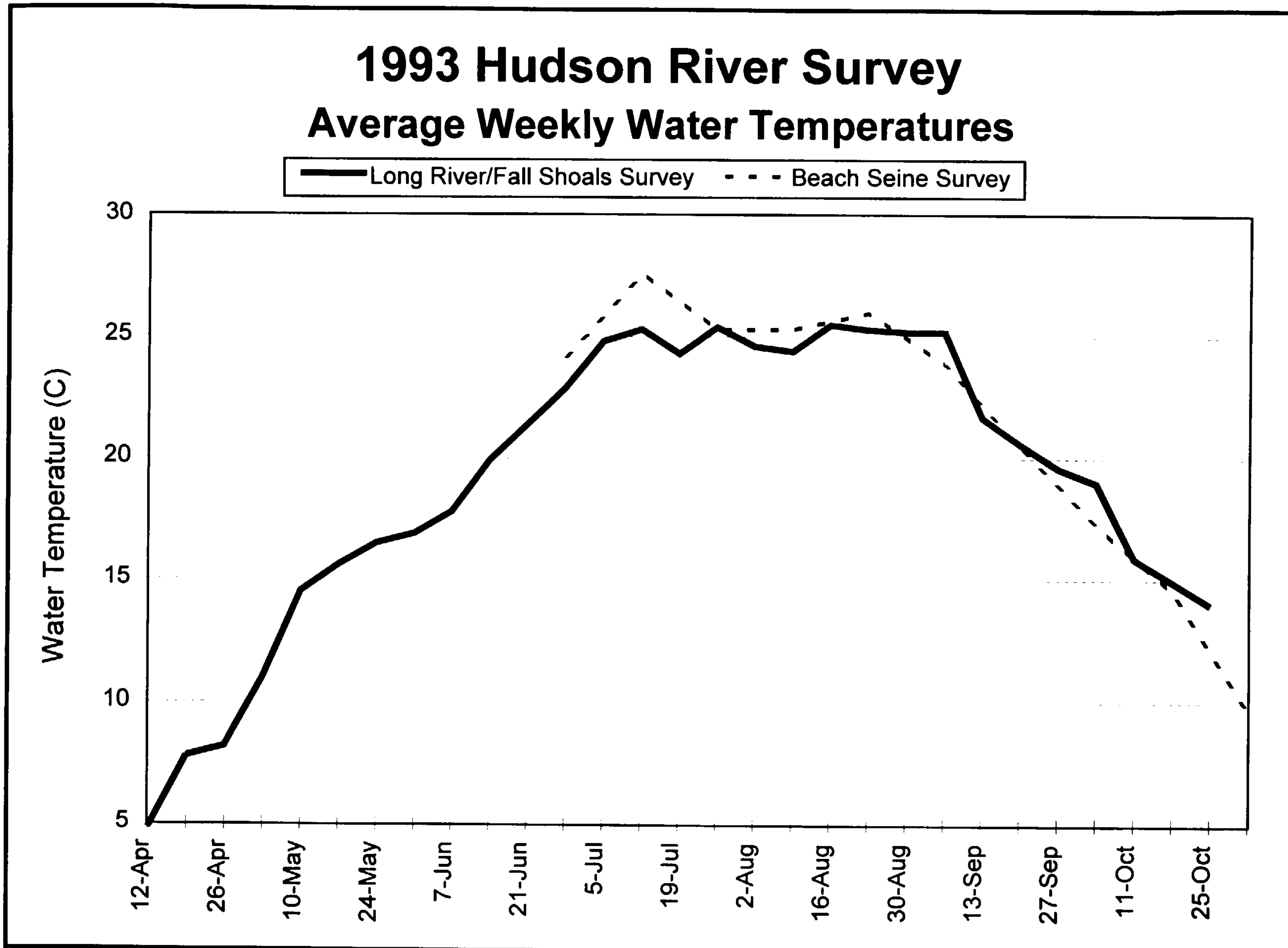


Figure 3-3. Seasonal variations in water temperature from the Hudson River surveys, RM 12 - RM 152.

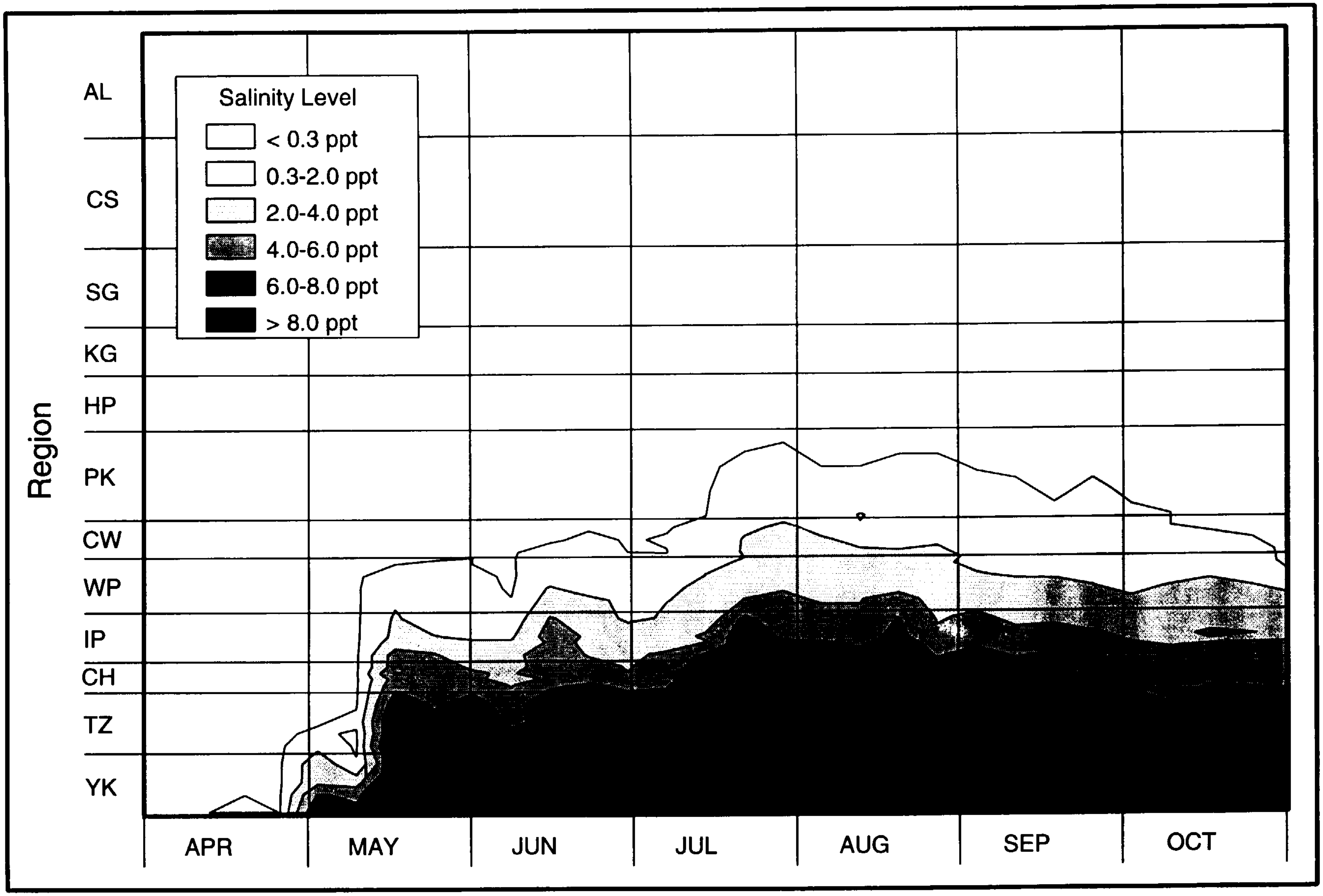


Figure 3-4. Seasonal variations in salinity based on the 1993 Longitudinal River Ichthyoplankton and Fall Shoals surveys, average weekly values, RM 12 - RM 152.

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.

3.3.3 Spatiotemporal Pattern in Dissolved Oxygen

As temperatures rose in the Spring and Summer of 1993, dissolved oxygen, as recorded in the LRS/FSS, declined from peak mean weekly regional values of 10.8-12.8 mg/L on 19 April to minimum mean levels of 4.3-8.2 mg/L on 6 September and 4 October when temperatures and salinity were elevated (Figure 3-5, Table B-9).

Percent oxygen saturation relates the theoretical limit of oxygen saturation, based on temperature and salinity, to the observed dissolved oxygen concentrations. Mean weekly regional percent saturation based on measurements taken during the LRS/FSS was usually above 85 percent during the spring. Percent saturation declined slightly in the summer, but still generally averaged above 75 percent. Individual mean weekly regional values never dropped below 47.2 percent, the minimum recorded during the week of 4 October from the Tappan Zee region.

Data collected in the 1993 BSS (Figure 3-5, Table B-12) indicated slightly higher mean regional dissolved oxygen and percent oxygen saturation than recorded in the LRS/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.

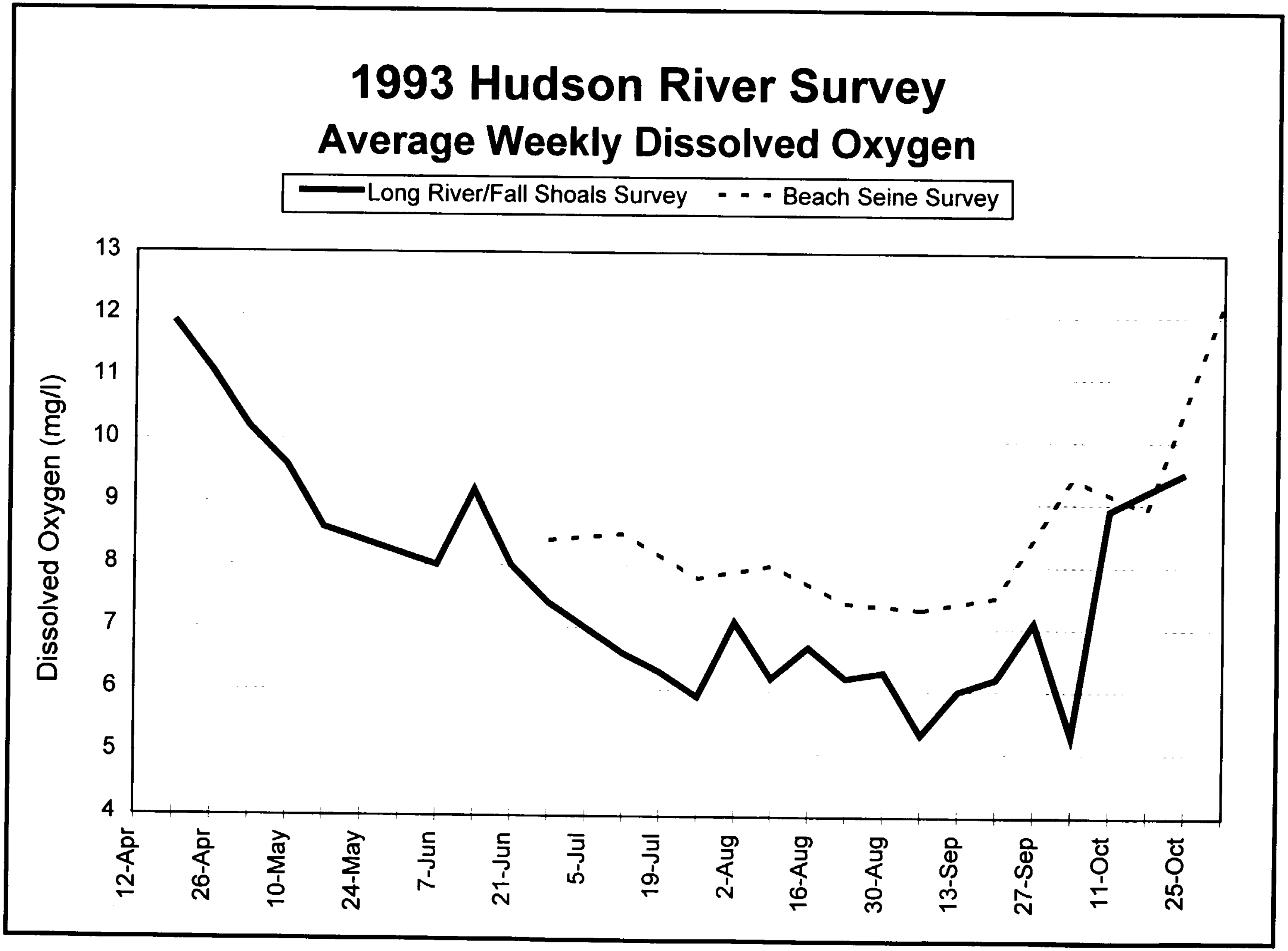


Figure 3-5. Seasonal variations in dissolved oxygen from the Hudson River surveys, RM 12 - RM 152.

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

4.1 FISH COMMUNITY

4.1.1 General Description of the Fish Community

The fish community of the Hudson River 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 River estuary's species diversity is enhanced by its mid-latitude location on the Atlantic Coast. Southern tropical marine forms enter the Hudson River 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 3 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 River 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 benthic 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 River 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 River 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.

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 River, 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 1993 (Table 4-1) with no apparent trend. Total number of fish collected by species in the LRS, BSS, and FSS sampling efforts between 1988 and 1993 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. There were no new freshwater species recorded in 1993.

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. One new marine species, the spotted goatfish, was recorded in 1993.

Twenty-nine out of the 86 species recorded during 1993 were collected in all three sampling surveys, while 37 of the remaining 57 species were collected in only one of the surveys (Table 4-2). Of the 31 freshwater species, 17 (55 percent) of them were collected only in the BSS. Aside from catches of freshwater and "undetermined" fish, nearly equivalent numbers of taxa were collected in all three surveys.

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

TABLE 4-1 - SPECIES COMPOSITION OF FISH COLLECTED DURING HUDSON RIVER STUDIES FROM 1974 TO 1993

Common Name	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Fresh Water																				
Banded killifish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black bullhead				X				X			X	X								
Black crappie	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Blacknose dace	X	X	X	X	X	X	X					X		X	X					
Bluegill		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bluntnose minnow	X	X	X	X	X	X	X													
Bridle shiner	X		X						X											
Brook stickleback	X	X	X	X				X								X				
Brook trout				X	X													X		
Brown bullhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brown trout			X	X	X	X	X	X				X					X	X	X	
Carp			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Central mudminnow			X				X							X						
Chain pickerel	X	X	X	X	X	X	X	X	X		X					X			X	
Channel catfish	X							X					X	X	X	X	X	X	X	X
Comely shiner	X						X													X
Common shiner	X	X	X	X	X	X	X	X		X					X		X		X	X
Creek chub		X	X	X	X	X	X			X		X						X		X
Cutlips minnow	X	X	X	X	X	X									X	X				
Eastern mudminnow		X					X													
Emerald shiner	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fallfish		X	X	X	X	X	X	X	X	X				X				X	X	X
Fathead minnow	X	X	X	X	X	X	X					X	X			X				
Freshwater drum																X			X	X
Gizzard shad	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Golden shiner	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Goldfish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Grass pickerel	X				X												X			
Green sunfish		X		X			X								X					
Largemouth bass	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Logperch	X		X	X		X	X			X					X	X			X	X
Longear sunfish																	X			
Longnose dace		X	X	X	X				X			X								
Margined madtom														X				X		
Mimic shiner	X																			
Northern hog sucker	X		X	X	X		X	X			X			X	X		X	X	X	
Northern pike	X	X	X	X	X	X	X		X				X	X	X	X	X	X	X	X
Pugnose shiner																		X		
Pumpkinseed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rainbow trout						X														
Redbreast sunfish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Redfin pickerel	X	X	X	X	X	X	X	X	X		X				X			X		
Rock bass	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Rosyface shiner	X																			
Satinfin shiner	X	X	X	X	X	X	X				X	X	X		X		X			X
Shield darter							X													
Silvery minnow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Smallmouth bass	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 4-1 (Continued)

Common Name	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Spotfin shiner	X	X	X	X	X	X	X	X			X	X	X	X	X					X
Spottail shiner	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Swallowtail shiner																			X	
Tessellated darter	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tiger muskellunge																			X	
Trout perch	X	X	X	X	X	X					X									
Walleye			X	X	X	X				X	X			X		X		X	X	X
White bass				X																
White catfish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
White crappie	X	X	X	X	X	X	X	X			X		X	X	X		X	X	X	
White sucker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow bullhead		X						X								X				
Yellow perch	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total	39	39	42	44	40	38	40	32	25	25	29	28	27	29	32	30	29	31	33	31
Marine																				
American sandlance													X	X	X	X	X	X	X	
Ammodytes sp.		X	X	X	X	X	X	X				X								
Atlantic cod							X							X	X					
Atlantic croaker			X	X		X						X	X	X		X	X		X	X
Atlantic herring		X	X		X	X			X				X	X	X	X	X	X	X	X
Atlantic mackerel															X			X	X	
Atlantic menhaden	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Atlantic needlefish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Atlantic silverside	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bay anchovy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black seabass					X							X			X					
Blackcheek tonguefish																			X	
Bluefish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Butterfish	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X
Conger eel						X		X	X	X	X	X	X	X	X	X	X	X	X	X
Crevalle jack	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cunner									X	X	X	X	X		X	X	X	X	X	X
Fourbeard rockling						X	X								X	X	X	X	X	X
Fourspot flounder	X						X	X			X	X	X		X	X	X			
Goosefish																		X	X	
Gray snapper							X					X	X	X				X		
Grubby													X		X	X	X	X	X	X
Hickory shad		X			X	X				X			X							
Inshore lizardfish	X					X	X	X			X	X			X	X		X	X	X
Longhorn sculpin	X	X								X						X				X
Lookdown	X	X	X	X		X	X	X				X	X	X	X	X	X			
Moonfish			X										X	X		X			X	
Naked goby	X		X								X	X	X	X	X	X	X	X	X	X
Northern kingfish	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Northern pipefish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Northern puffer		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Northern searobin			X		X		X	X	X		X		X	X	X	X	X	X		X
Northern stargazer	X						X		X	X	X	X			X		X	X	X	X

TABLE 4-1 (Continued)

Common Name	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Orangespotted filefish													X							
Oyster toadfish																			X	
Permit																			X	X
Pollack		X																		
Red hake	X		X			X	X	X			X	X			X	X	X		X	X
Rock gunnel			X	X											X	X	X	X	X	
Rough silverside		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Scup	X																			
Seahorse															X		X	X		
Sea raven							X													
Searobin Unidentified		X	X		X		X	X							X		X	X		
Seaboard goby		X	X				X								X			X	X	X
Sharptail goby																	X			
Sheepshead								X												
Silver hake	X	X		X									X		X	X	X	X		
Silver perch	X					X					X	X	X		X			X	X	X
Smallmouth flounder						X	X		X		X	X			X		X	X	X	X
Spanish mackerel																	X	X		X
Speckled worm eel					X		X				X			X	X					
Spot	X	X	X	X			X		X	X		X	X	X	X		X	X	X	X
Spotfin butterflyfish									X			X								
Spotfin mojarra									X											
Spotted goatfish																				X
Spotted hake							X			X	X	X	X	X	X	X	X	X	X	X
Striped anchovy		X				X			X			X							X	X
Striped cuskeel							X					X	X	X	X	X		X	X	X
Striped killifish			X																X	
Striped mullet	X		X	X		X	X	X	X	X	X	X	X	X	X			X		
Striped burrfish													X							
Striped searobin		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Summer flounder	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Tautog		X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Weakfish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
White mullet	X	X	X	X	X	X	X		X	X	X	X	X			X	X	X		X
Windowpane	X	X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X
Winter flounder	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellowtail flounder	X																		X	
Total	27	29	29	24	22	31	37	28	29	24	32	39	40	32	45	37	40	43	44	40
Estuarine																				
Fat sleeper													X							
Fourspine stickleback	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hogchoker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inland silverside	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mummichog	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Shortnose sturgeon	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Threespine stickleback	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
White perch	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 4-1 (Continued)

Common Name	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Total	7	6	7	7	6	7	7	7	7	7	7	7	8	7	7	7	7	7	7	7
Catadromous																				
American eel	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Anadromous																				
Alewife	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American shad	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Atlantic sturgeon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Atlantic tomcod	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Blueback herring	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rainbow smelt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sea lamprey	X	X				X	X	X			X				X		X			
Striped bass	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total	8	8	7	7	7	8	8	8	7	7	8	7	7	7	8	7	8	7	7	7
All Categories																				
Total	82	83	85	82	75	84	93	75	68	64	76	81	82	75	93	82	85	89	92	86

TABLE 4-2 SPECIES COMPOSITION OF FISH COLLECTED IN EACH OF THE HUDSON RIVER SURVEYS DURING 1993

Common Name	BSS	FSS	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
Total	6	7	7
Catadromous			
American eel	X	X	X
Total	1	1	1
Estuarine			
Fourspine stickleback	X	X	X
Hogchoker	X	X	X
Inland silverside	X		X
Mummichog	X		
Shortnose sturgeon		X	X
Threespine stickleback	X		
White perch	X	X	X
Total	6	4	5
Freshwater			
Banded killifish	X	X	
Black crappie	X		
Bluegill	X	X	
Brown bullhead	X	X	X
Carp	X	X	

TABLE 4-2 (Continued)

Common Name	BSS	FSS	LRS
Freshwater (Cont.)			
Channel catfish		X	
Comely shiner	X		
Common shiner	X		
Creek chub	X		
Emerald shiner	X		
Fallfish	X		
Freshwater drum		X	
Gizzard shad	X	X	
Golden shiner	X		X
Goldfish	X		
Largemouth bass	X		
Logperch	X	X	X
Northern pike	X		
Pumpkinseed	X	X	
Redbreast sunfish	X		
Rock bass	X		
Satinfin shiner	X		
Silvery minnow	X		
Smallmouth bass	X		
Spotfin shiner	X		
Spottail shiner	X	X	X
Tessellated darter	X		X
Walleye			X
White catfish	X	X	X
White sucker	X		
Yellow perch	X		
Total	28	11	7

TABLE 4-2 (Continued)

Common Name	BSS	FSS	LRS
Marine			
Atlantic croaker		X	
Atlantic herring		X	
Atlantic menhaden	X	X	X
Atlantic needlefish	X		
Atlantic silverside	X	X	X
Bay anchovy	X	X	X
Bluefish	X	X	X
Butterfish	X	X	X
Conger eel			X
Crevalle jack	X	X	
Cunner			X
Fourbeard rockling			X
Grubby		X	X
Inshore lizardfish	X	X	X
Longhorn sculpin		X	X
Naked goby	X	X	X
Northern kingfish	X	X	X
Northern pipefish	X		X
Northern puffer	X	X	X
Northern searobin		X	X
Northern stargazer	X	X	
Permit	X		
Red hake			X
Rough silverside	X	X	X
Seabord goby			X
Silver perch	X		
Smallmouth flounder		X	X
Spanish mackerel	X	X	X
Spot	X	X	X

TABLE 4-2 (Continued)

Common Name	BSS	FSS	LRS
Marine (Cont.)			
Spotted goatfish	X		
Spotted hake		X	X
Striped anchovy	X		
Striped cuskeel			X
Striped searobin	X	X	X
Summer flounder	X	X	
Tautog			X
Weakfish	X	X	X
White mullet	X		
Windowpane		X	X
Winter flounder	X	X	X
Total	25	26	29
Undetermined			
Centrarchidae	X		X
Clupeidae	X	X	X
Cyprinidae			X
Fundulus sp.			X
Gobiidae			X
Menidia sp.			X
Morone sp.			X
Catostomidae			X
Total	2	1	8

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 60-65 °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 1-4 days, depending on temperature, 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 1993, striped bass YSL were most abundant mid-river, where the eggs were also most abundant (Figure 4-1). In other years, however, a difference in egg and yolk-sac distribution, with the peak in yolk-sac further upriver than the peak in eggs, was 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).

Transformation to the PYSL stage occurs from 4 to 9 days after hatching, when the larvae are 1/4 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 1/2 in. long. During 1993, 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 1993 spatiotemporal distribution pattern seen in both the LRS (Figure 4-2), and BSS and FSS (Figure 4-3). Larger juveniles, over 2-1/2 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 1993, with larger numbers evident in the middle estuary (Figure 4-4).

Comparing the temporal distribution of early life stages of striped bass in 1993 with previous years (1974-1992), peak egg density in 1993 occurred within the historical range (Figure 4-5). YSL and PYSL peak abundance in 1993 likewise was in the middle of the historical trend. YOY striped bass abundance in 1993 appears to occur much early than the historical range, but this is an anomalous collection. Most of the YOY were collected later in 1993, beyond the temporal limits of this comparison.

Striped bass eggs in the 1993 LRS were primarily in the Cornwall, Poughkeepsie, and Hyde Park regions (Figure 4-6). The proportions of eggs in these three regions were slightly higher than those

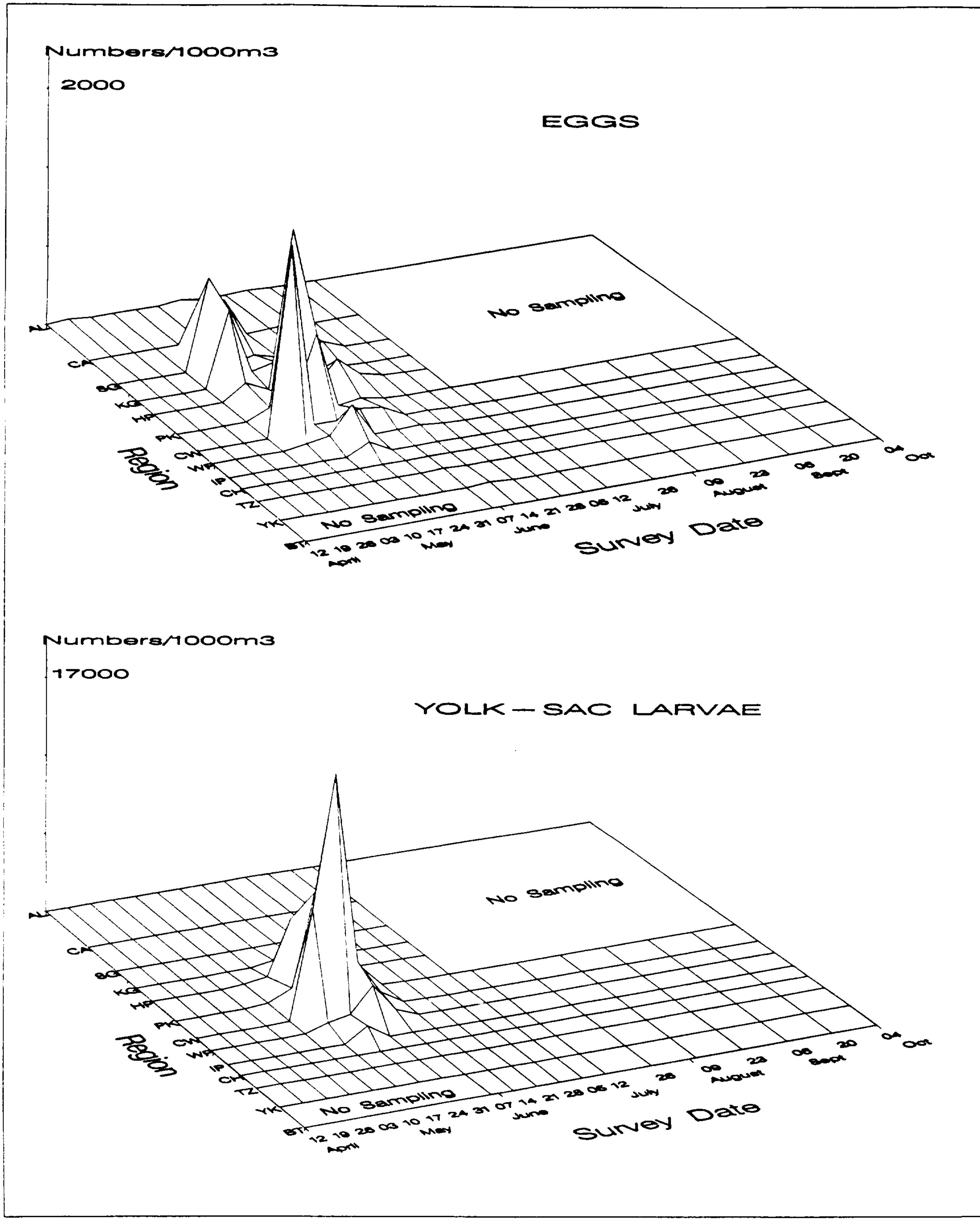


Figure 4 – 1. Spatiotemporal distribution of egg and yolk – sac stages of striped bass in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

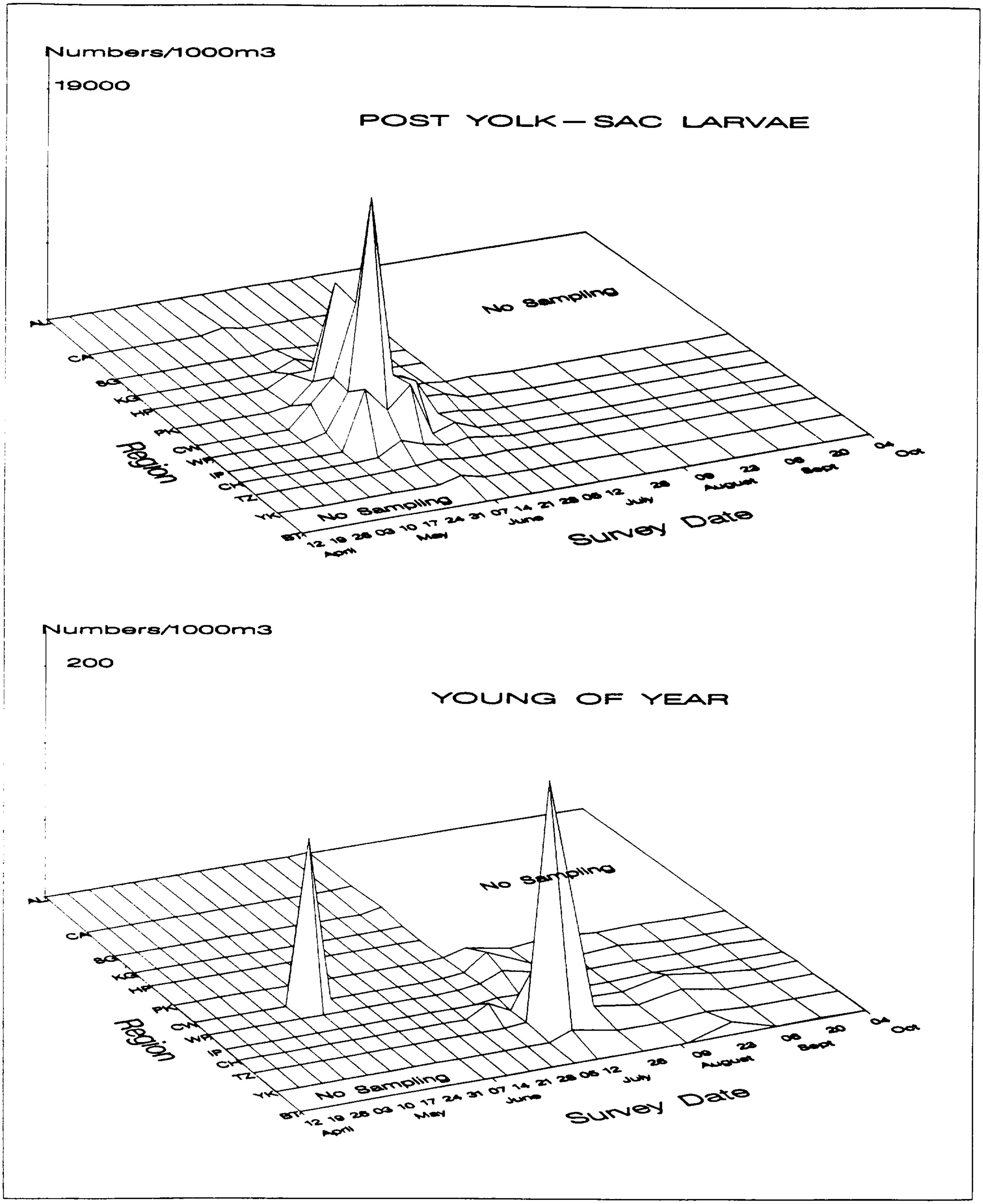


Figure 4-2. Spatiotemporal distribution of post yolk-sac and young-of-year stages of striped bass in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

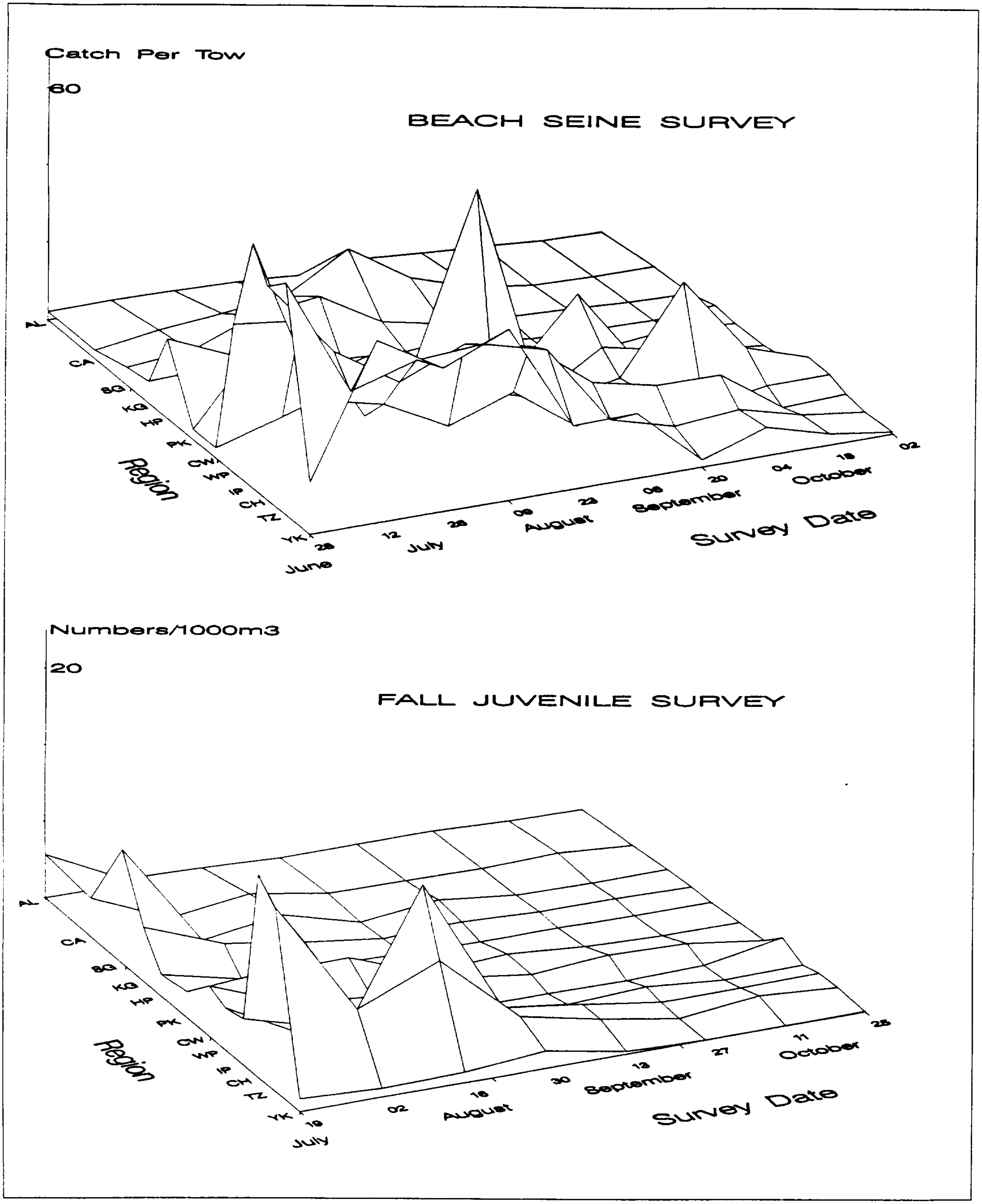


Figure 4-3. Spatiotemporal distribution of young-of-year striped bass in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

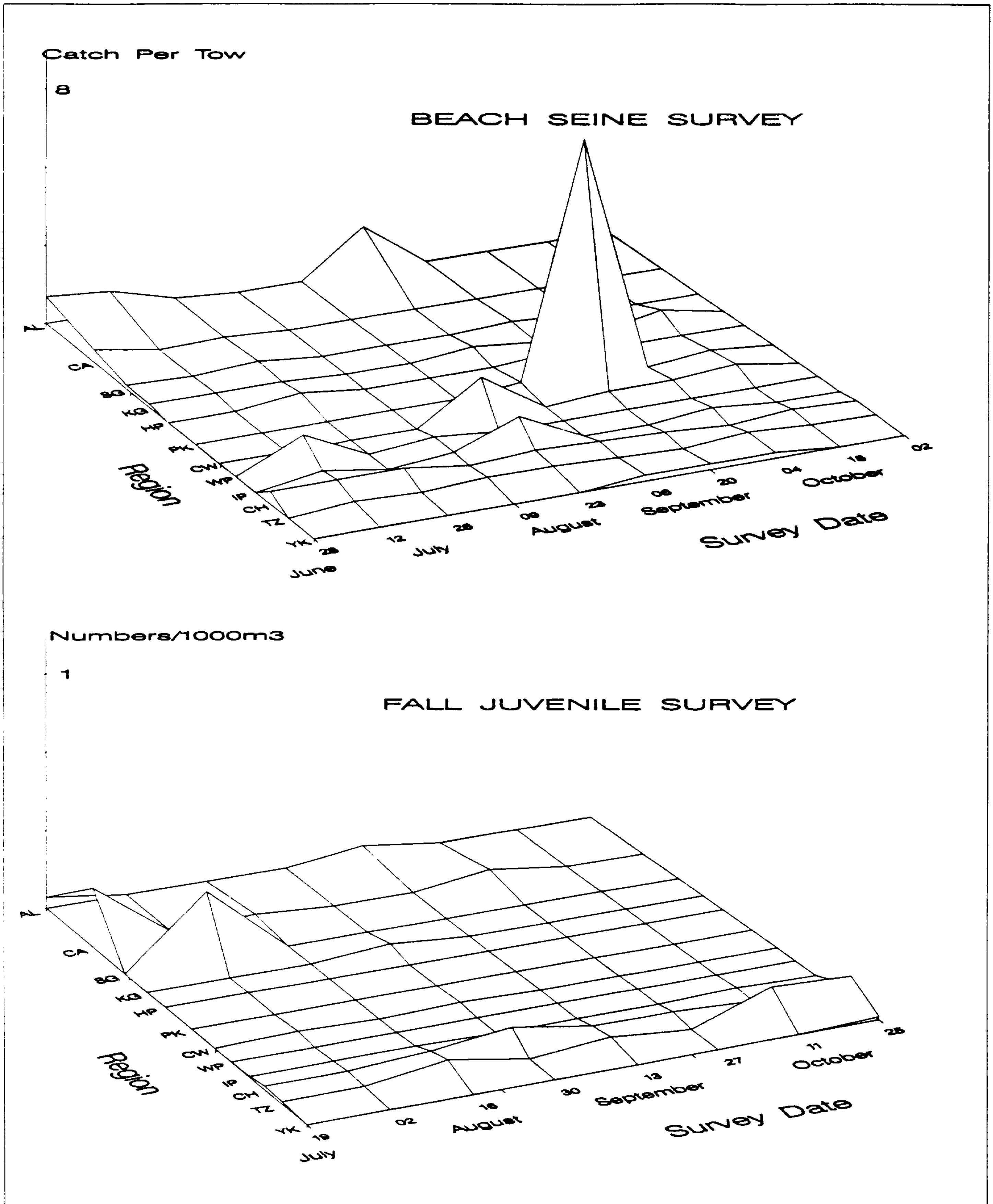


Figure 4 – 4. Spatiotemporal distribution of yearling and older striped bass in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

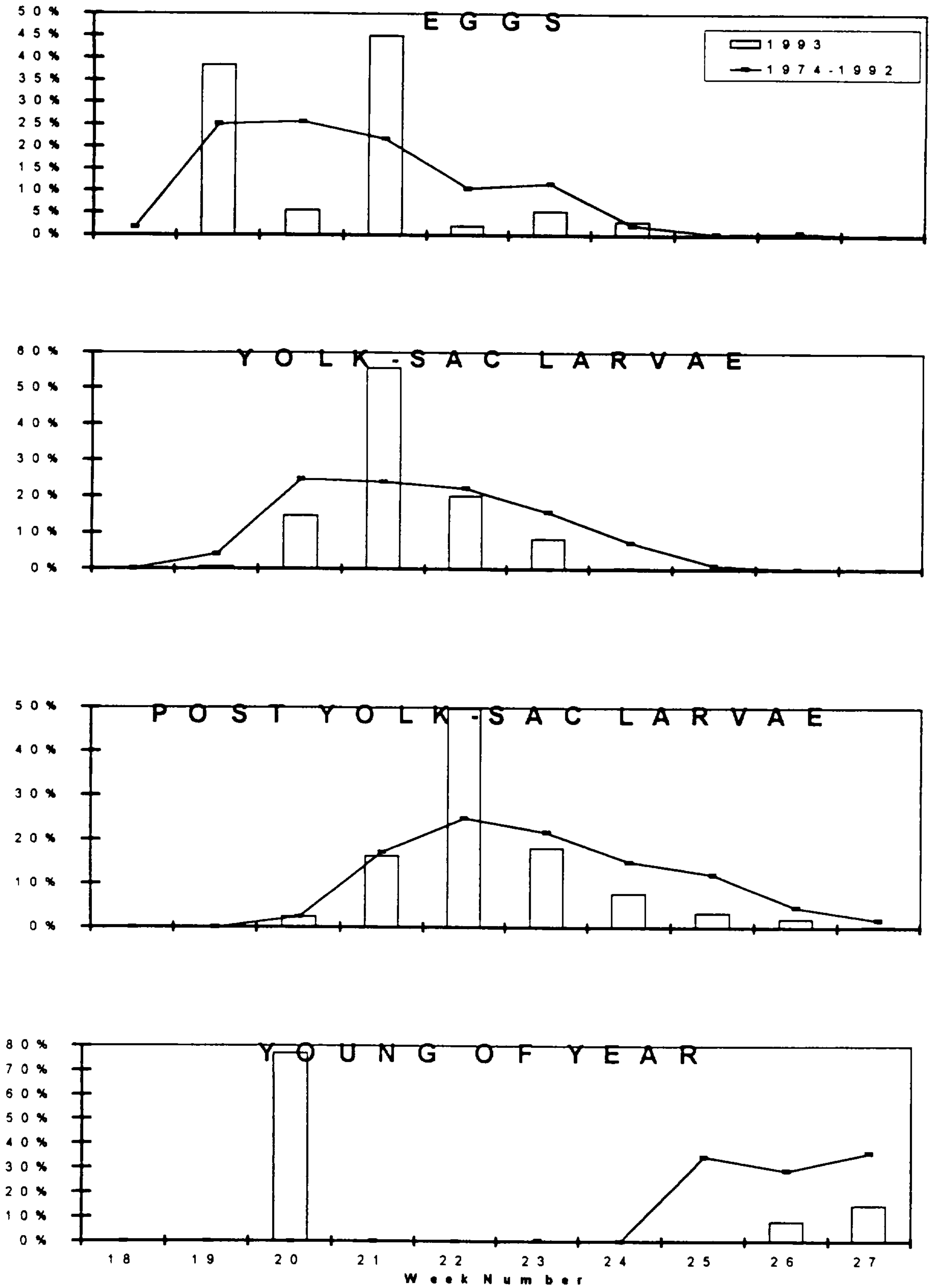


Figure 4-5. Temporal distribution indices for striped bass collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1974 - 1993.

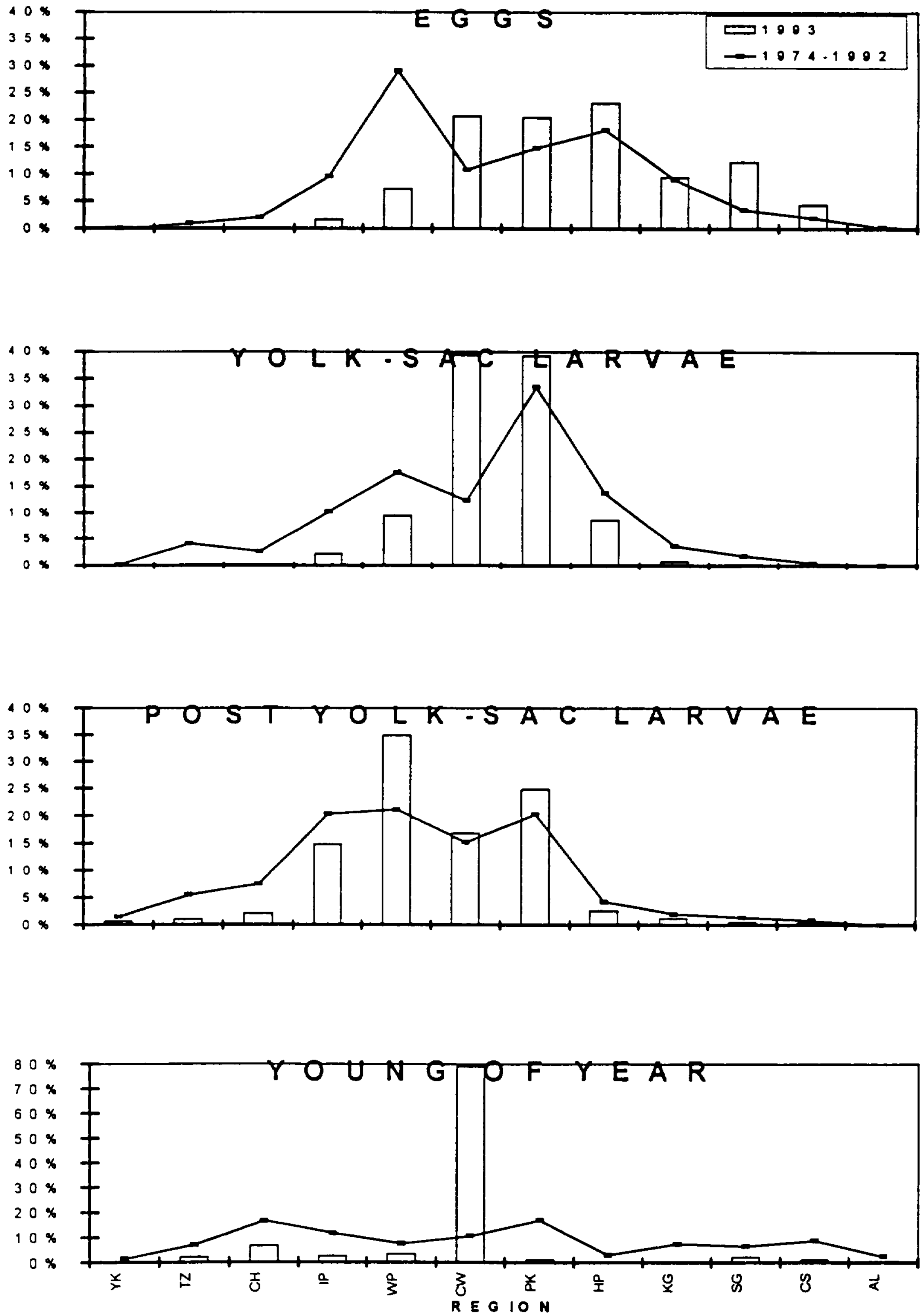


Figure 4-6 Geographical distribution indices for early life stages of striped bass collected during Longitudinal River Ichthyoplankton surveys of the Hudson River Estuary, 1974 - 1993.

observed in the historical trend, but a lower proportion of eggs was found in the West Point region during 1993. The YSL and PYSL distribution was generally consistent with the pattern seen across years of greatest distribution in the middle estuary. The early anomalous collection of YOY in 1993 occurred in the Cornwall region, but later occurrences of YOY in 1993 were distributed throughout the Hudson River estuary as in previous years.

The 1993 geographical distribution of YOY, 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 1992).

Weekly length statistics for striped bass from yolk-sac through juvenile life stages collected in 1993 show a rapid growth period in early July and steady growth thereafter through the end of BSS/FSS collections in November (Figure 4-8, 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.

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.

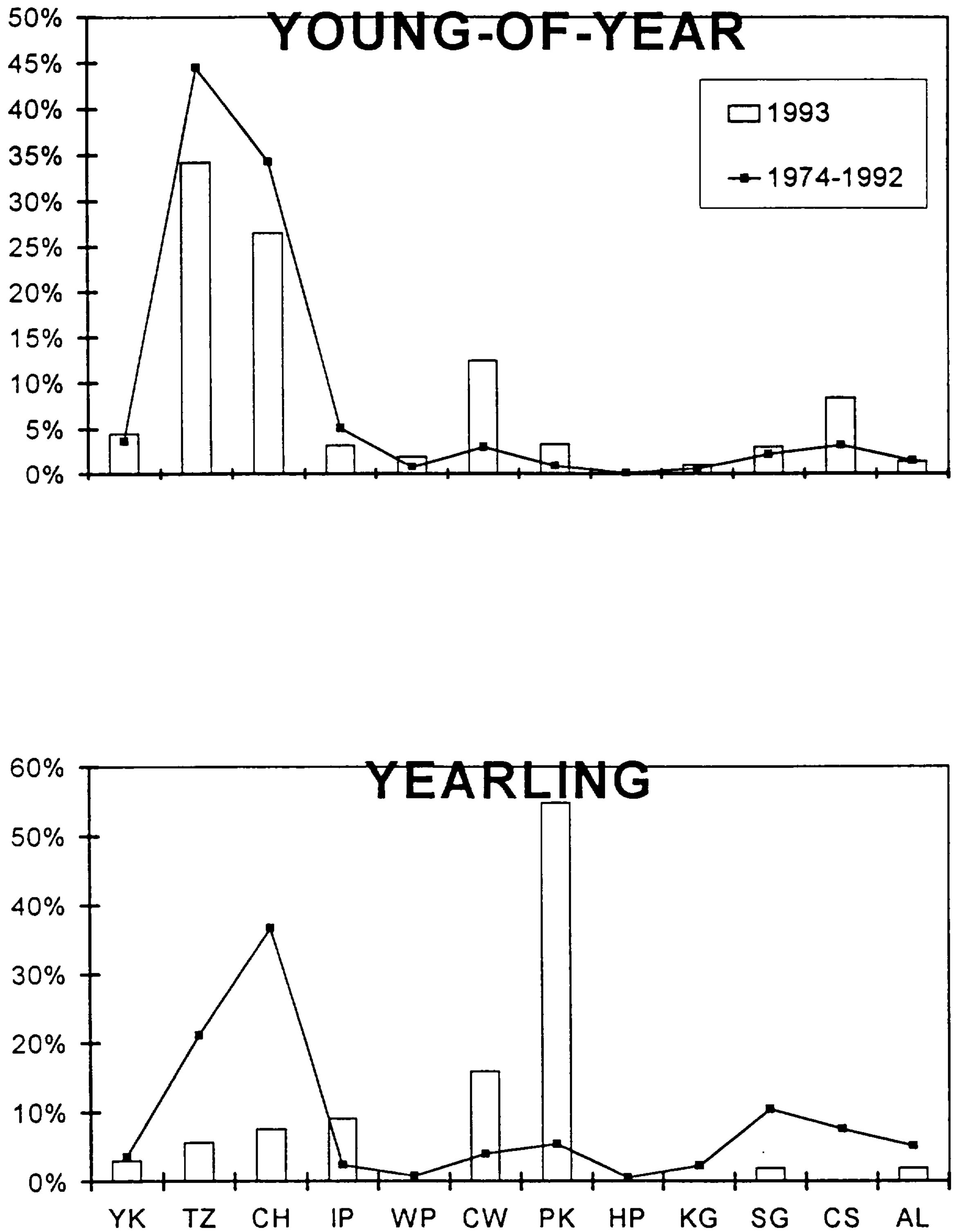


Figure 4-7 Geographical distribution indices for young-of-year and yearling striped bass collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1993.

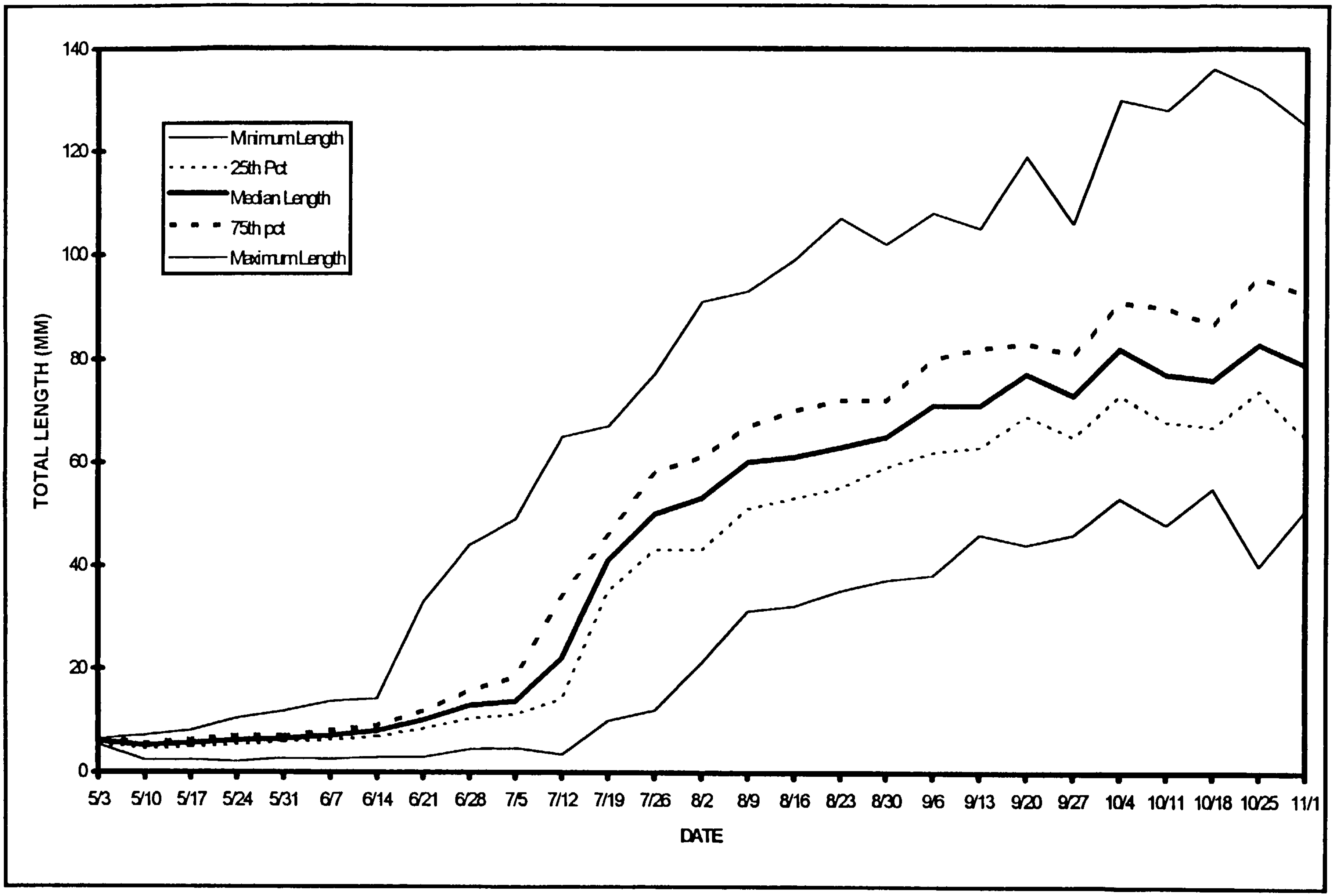


Figure 4-8. Weekly length statistics for striped bass larvae and young-of-year in the Hudson River estuary, 1993.

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 1993, white perch eggs were most abundant in the upper estuary (Figure 4-9).

Hatching occurs in 1.5-6 days, with development occurring faster at higher temperatures. Newly hatched YSL are from 1/16 to 1/8 in. long. They remain on or near the bottom for 3-5 days and do not move about actively until the yolk-sac is absorbed (Mansueti 1964). White perch YSL were abundant in the upper and middle estuary during 1993, in the same areas 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 1993, 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 1993, YOY fish were found primarily in the middle estuary between the Hyde Park and Cornwall regions, but occurred throughout the entire estuary (Figure 4-11). 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 1993 BSS and FSS, yearling and older white perch were almost evenly distributed throughout the Hudson River (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 1993 with previous years (1974-1992), the 1993 distribution was concentrated in the earlier weeks of occurrence during mid-May rather than in the later weeks (Figure 4-13). However, the initial occurrence for eggs and YSL in 1993 was one week later than in the long-term record, whereas PYSL distribution was earlier than the historical trend (Figure 4-13).

White perch eggs in the 1993 LRS were primarily in the Kingston, Saugerties, and Catskill regions which is consistent with that observed in the historical trend (Figure 4-14). YSL and PYSL distributions in 1993 were also consistent with patterns seen across years with the majority of larvae between Poughkeepsie and Saugerties.

The 1993 geographical distribution of YOY 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 the mid-river regions of Cornwall and Poughkeepsie and the upriver regions of Saugerties and Catskill (Figure 4-15). This is the same pattern that was observed in 1992 (Con Edison 1996).

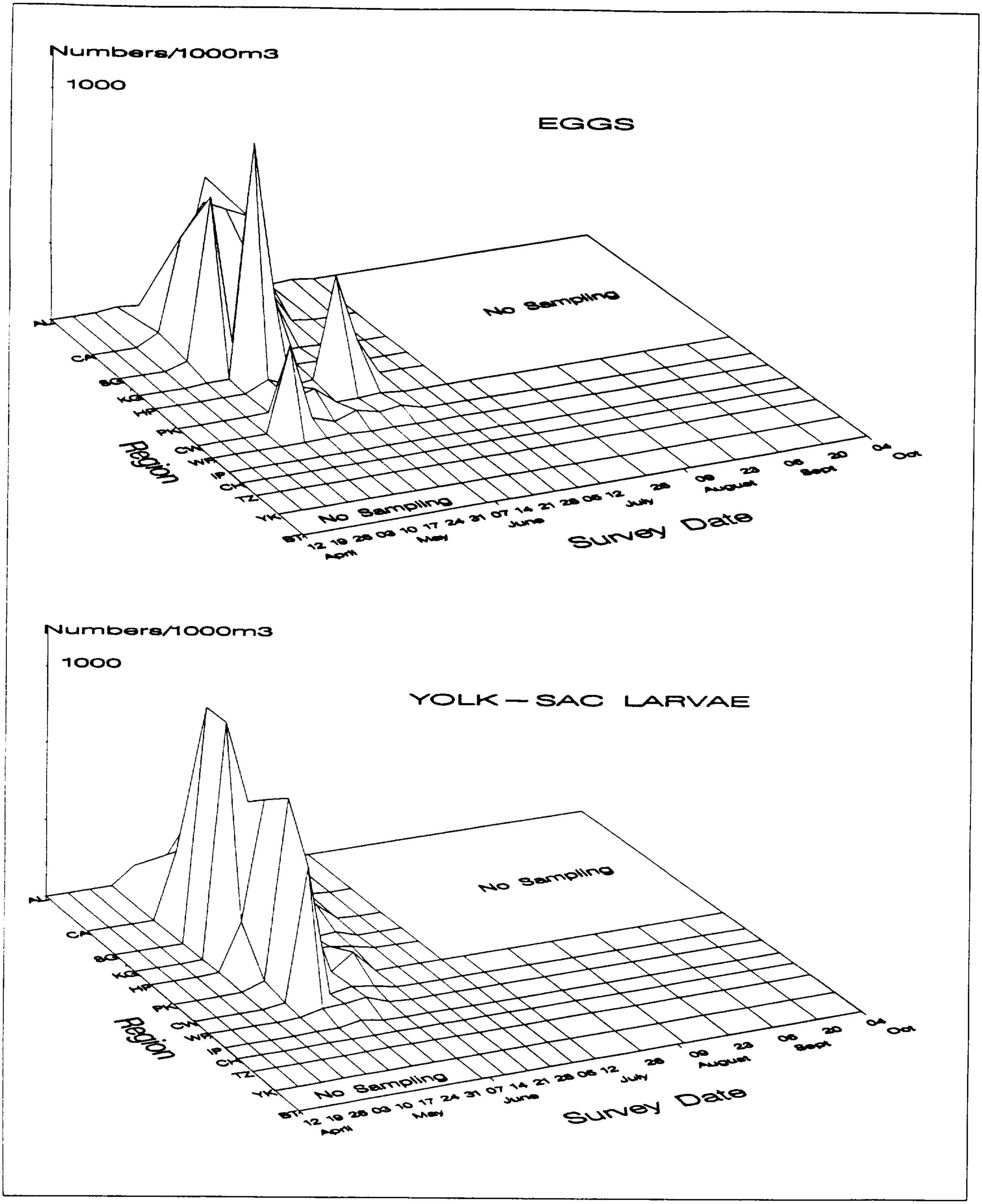


Figure 4 – 9. Spatiotemporal distribution of egg and yolk – sac stages of white perch in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

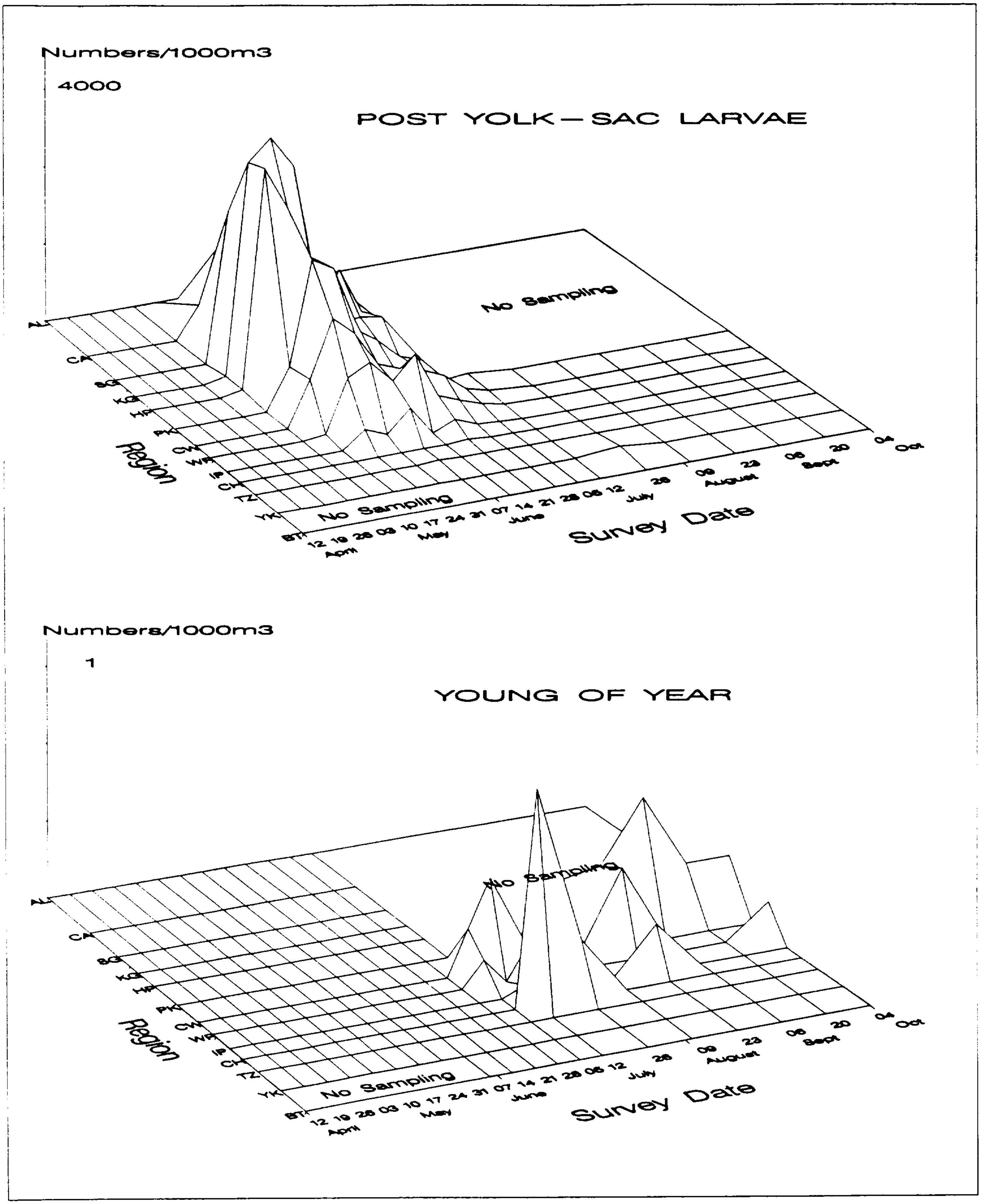


Figure 4–10. Spatiotemporal distribution of post yolk–sac and young–of–year stages of white perch in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

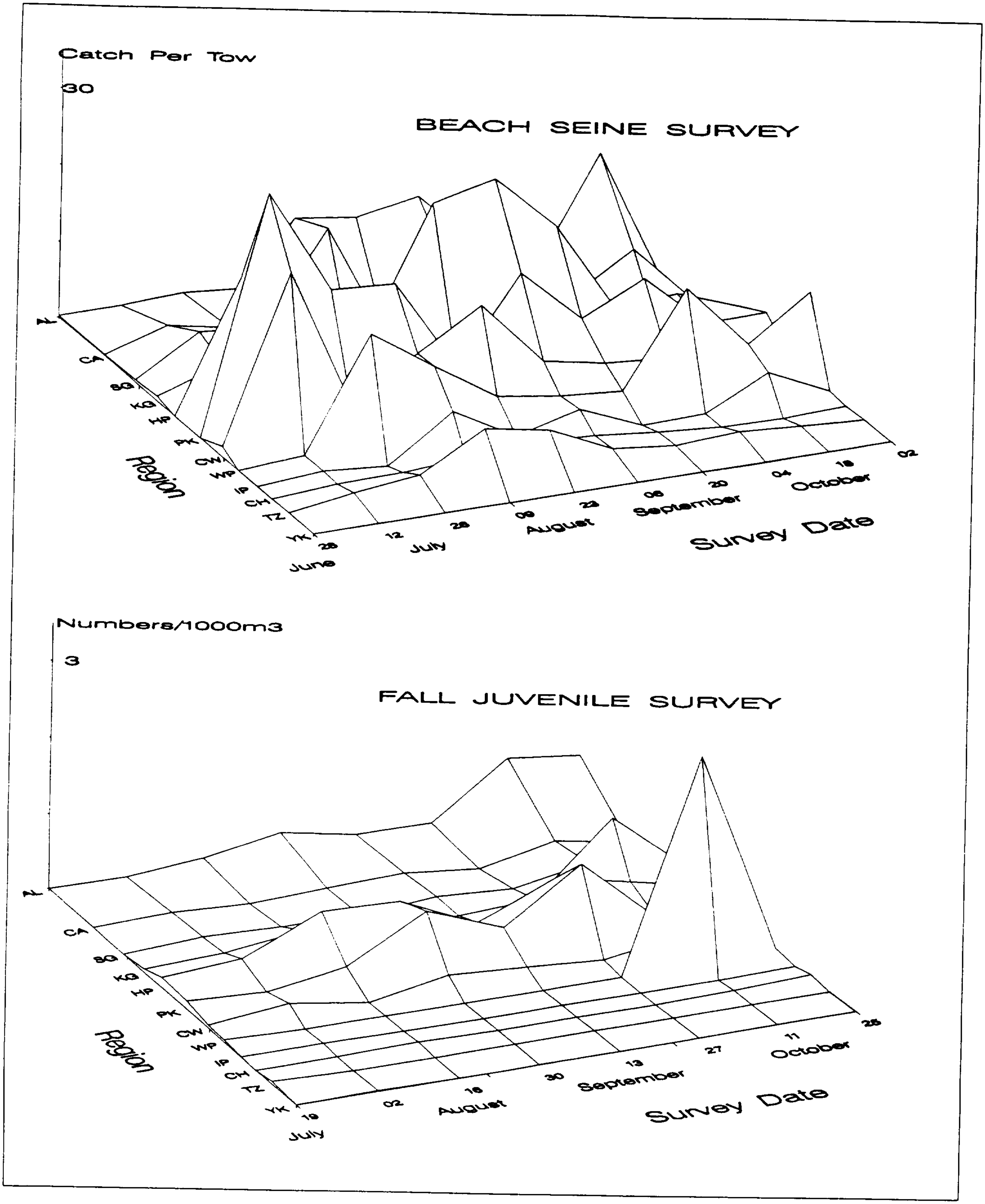


Figure 4-11. Spatiotemporal distribution of young-of-year white perch in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

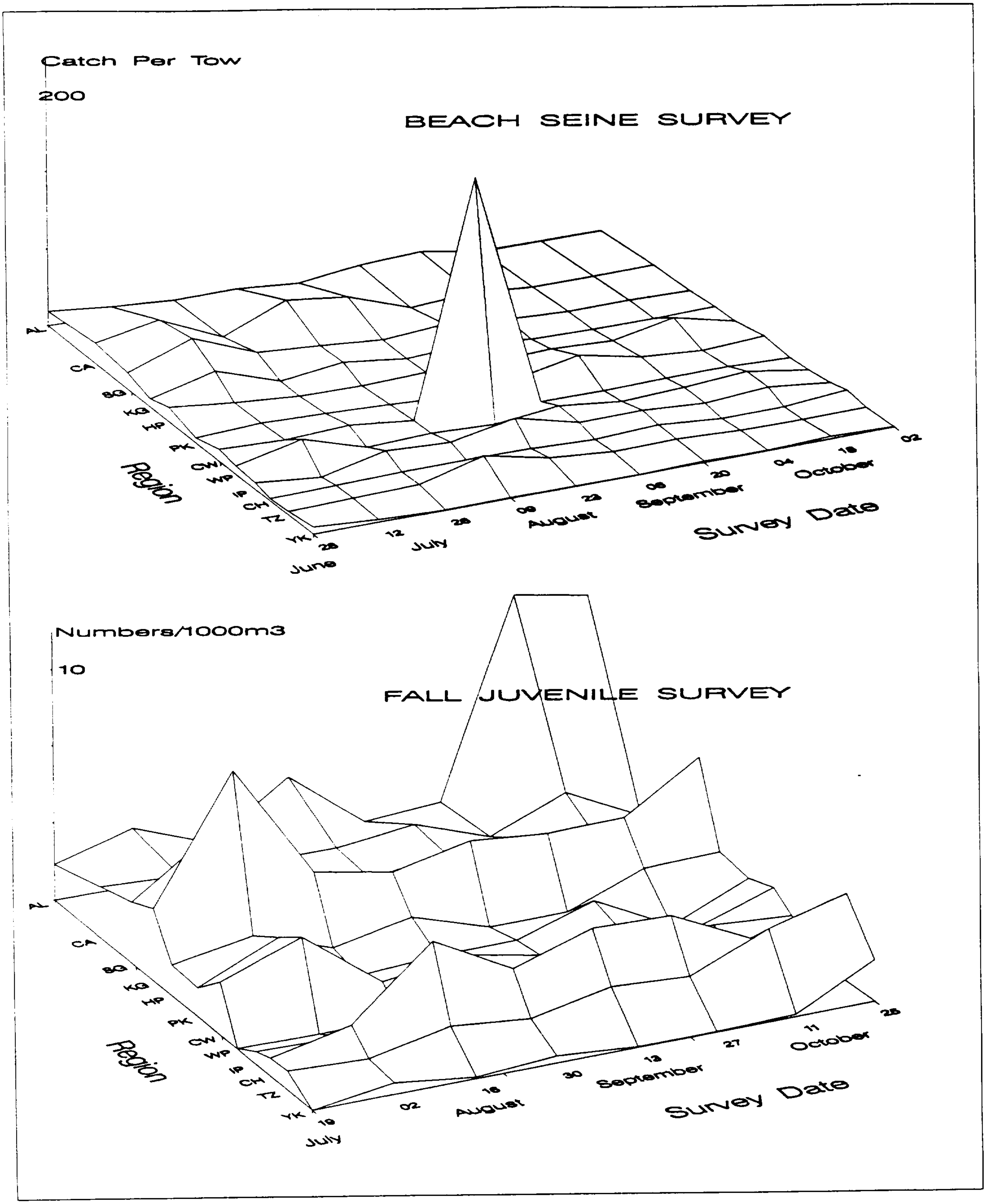


Figure 4–12. Spatiotemporal distribution of yearling and older white perch in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

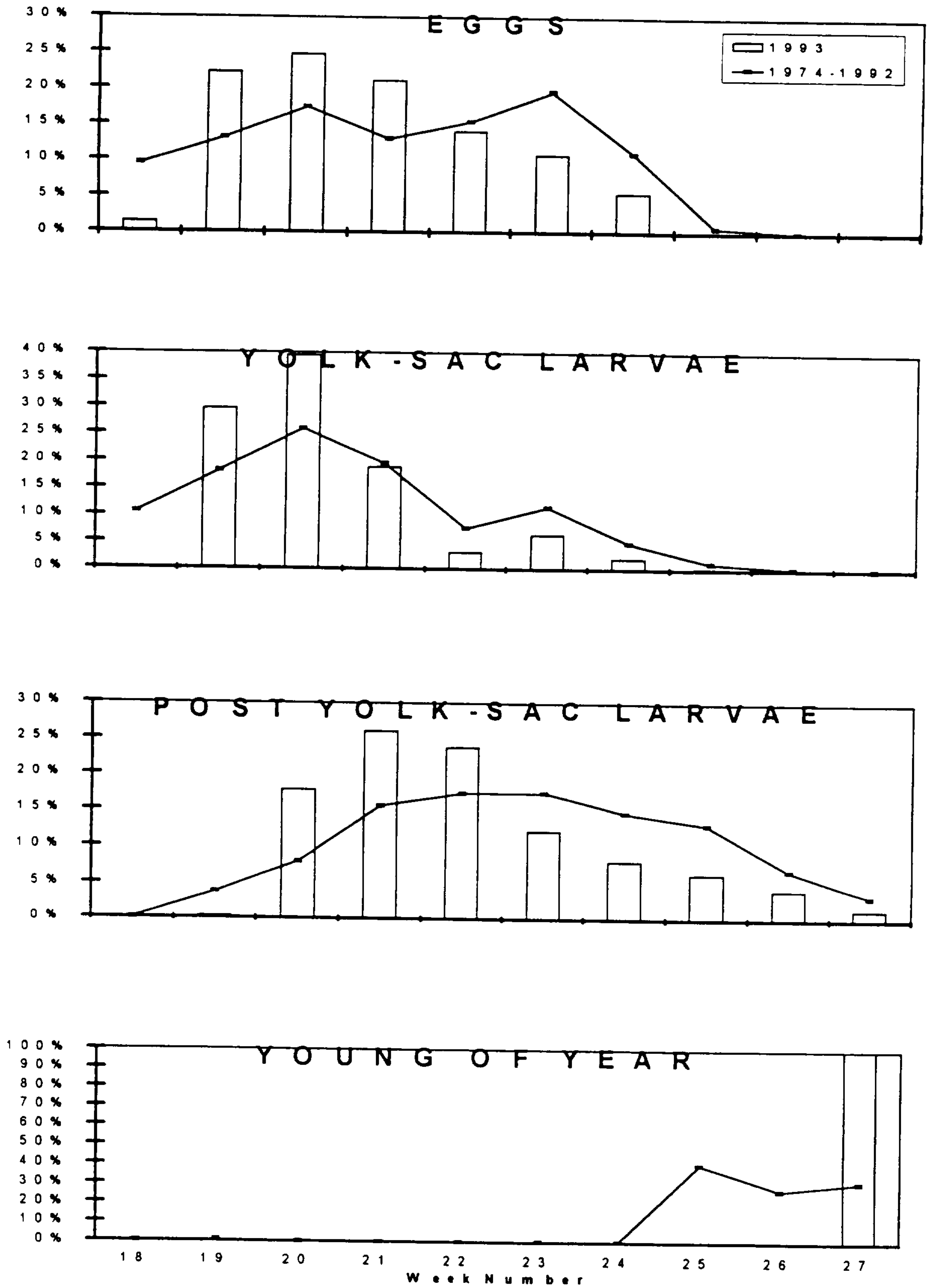


Figure 4-13 Temporal distribution indices for early life stages of white perch collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1993.

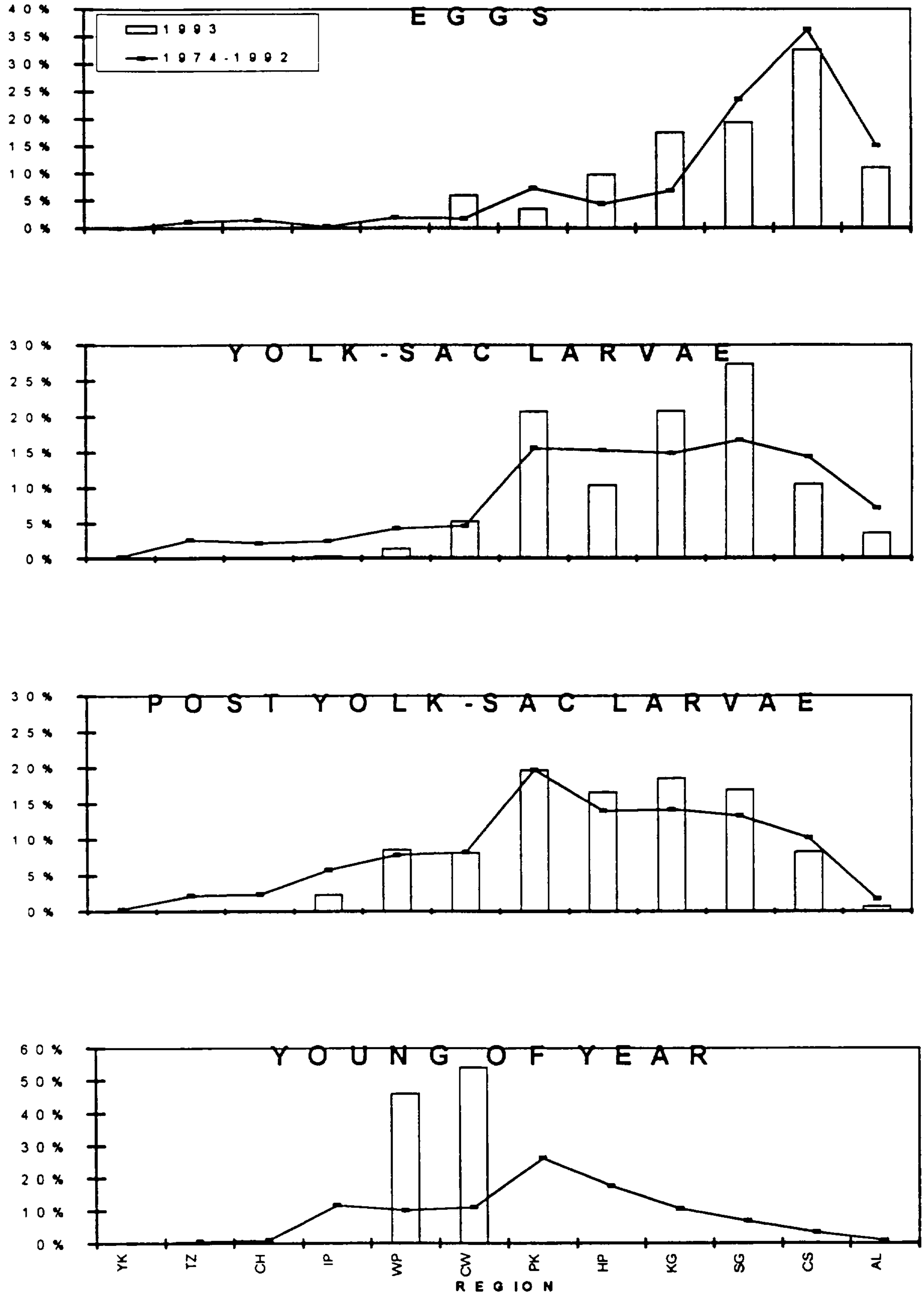


Figure 4-14 Geographical distribution indices for early life stages of white perch collected during Longitudinal River Ichthyoplankton surveys of the Hudson River Estuary, 1974 - 1993

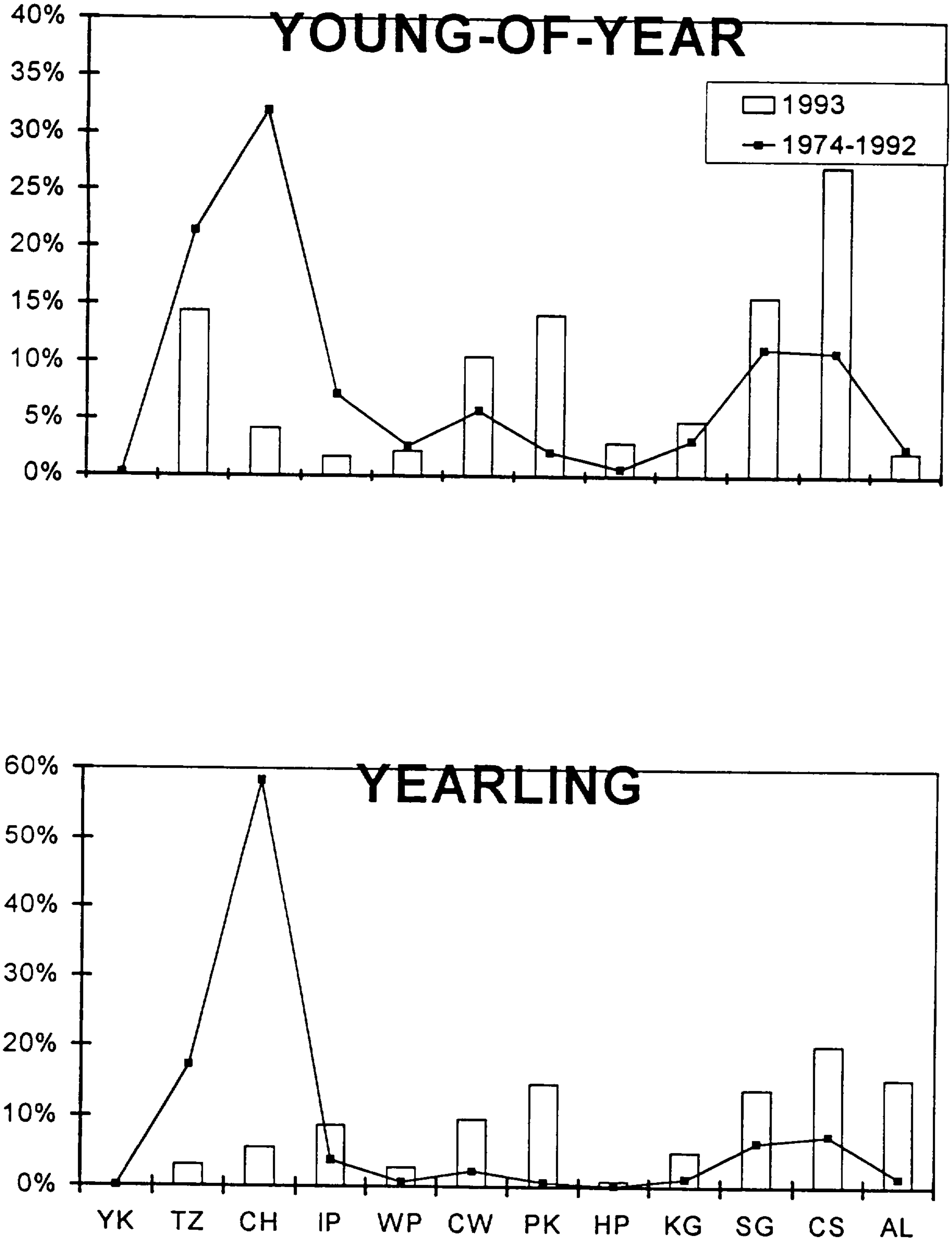


Figure 4-15 Geographical distribution indices for young-of-year and yearling white perch collected during Beach Seine Surveys of the Hudson River Estuary, 1974 - 1993.

Weekly length statistics for white perch from yolk-sac through juvenile life stages collected in 1993 show a rapid growth period beginning in early July and steady growth through the end of BSS/FSS collections in November (Figure 4-16, Appendix Tables D-4 through D-6).

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 mid-winter. 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.

Atlantic 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 1/4 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 1993, no YSL were collected in ichthyoplankton samples. However, during 1993, 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 1993, mainly in the West Point through Yonkers 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 1993, the BSS collected juvenile Atlantic tomcod primarily in the Tappan Zee region whereas in the FSS they were collected upriver in the Croton-Haverstraw, Cornwall, and West Point regions (Figure 4-18). Few yearling and older Atlantic tomcod were collected in the BSS; however, FSS data indicated that this life stage was present in the lower estuary throughout the summer (Figure 4-19).

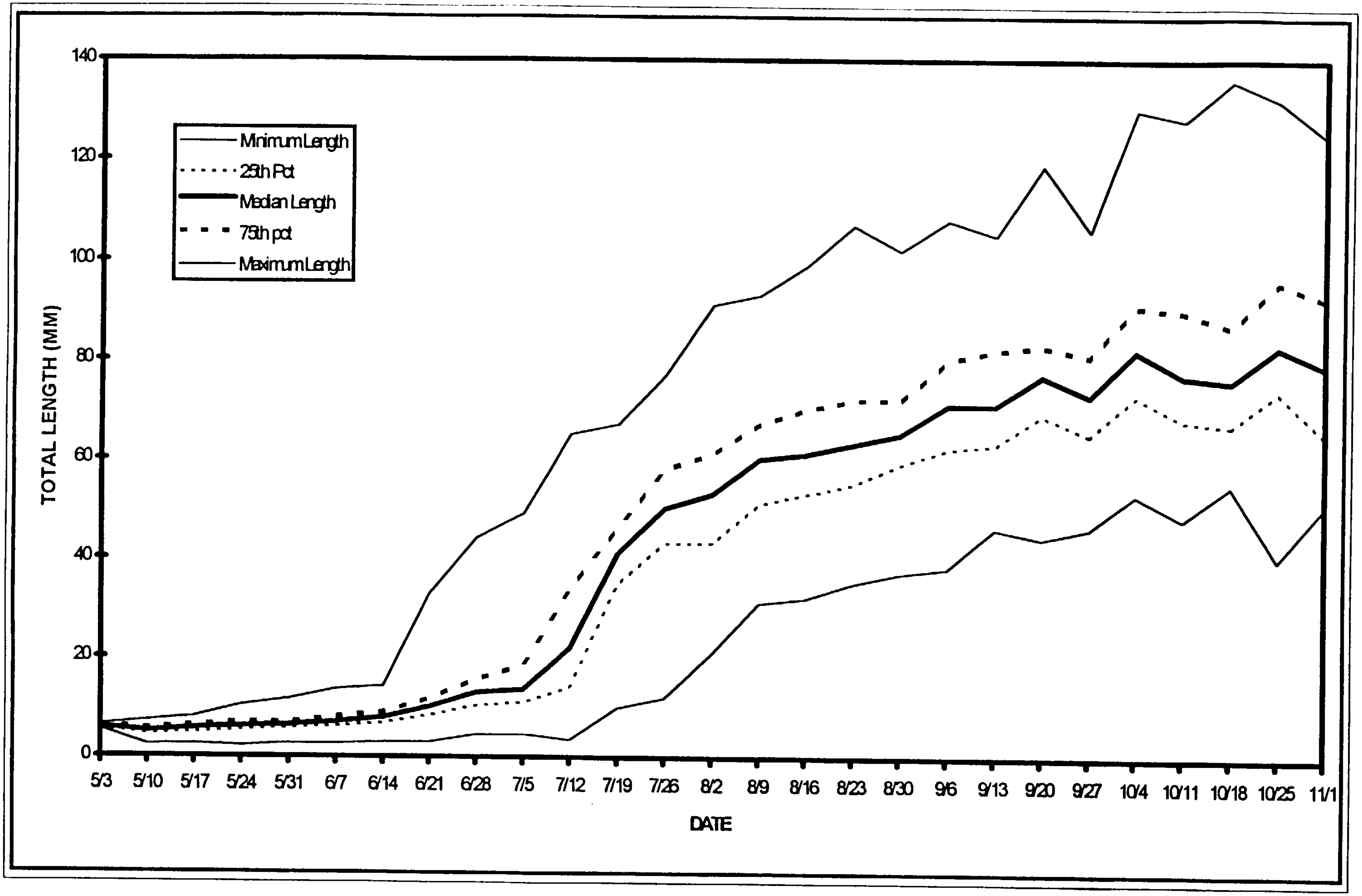
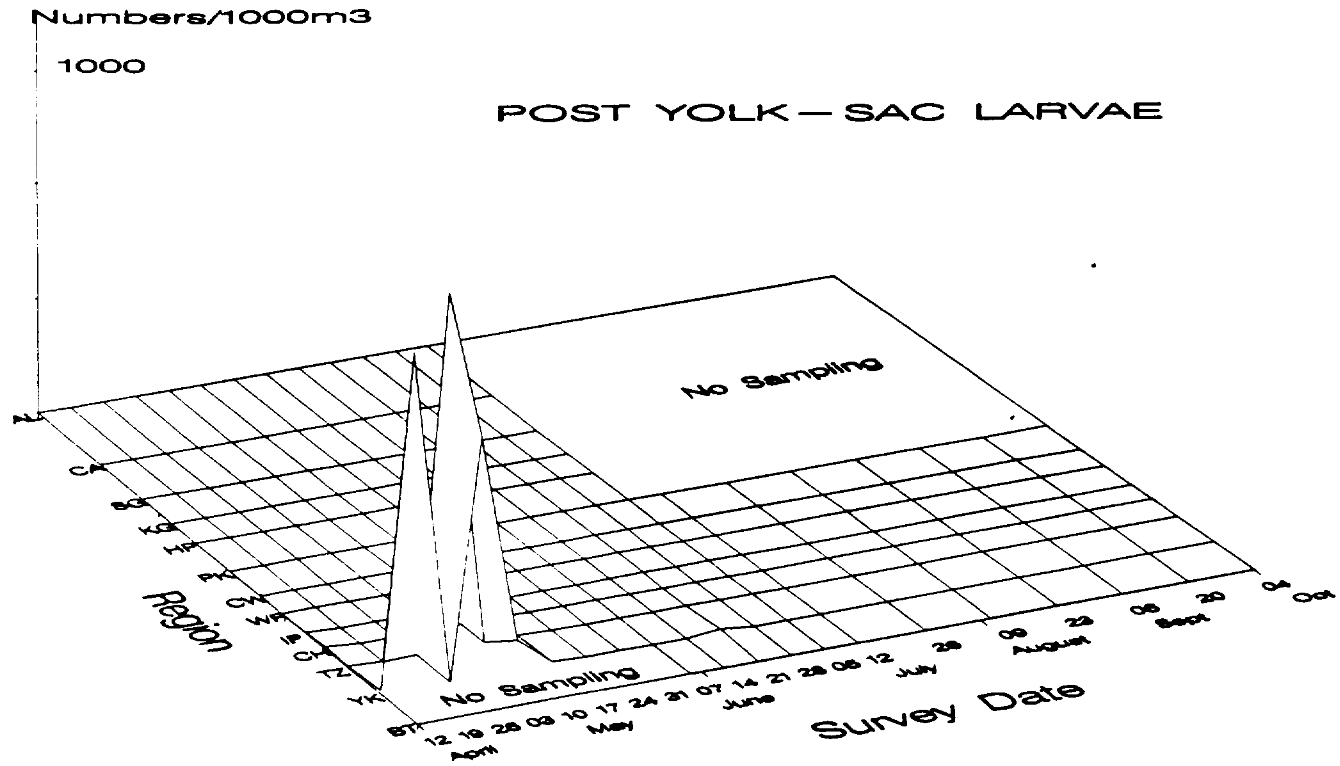


Figure 4-16. Weekly length statistics for white perch larvae and young-of-year in the Hudson River estuary, 1993.



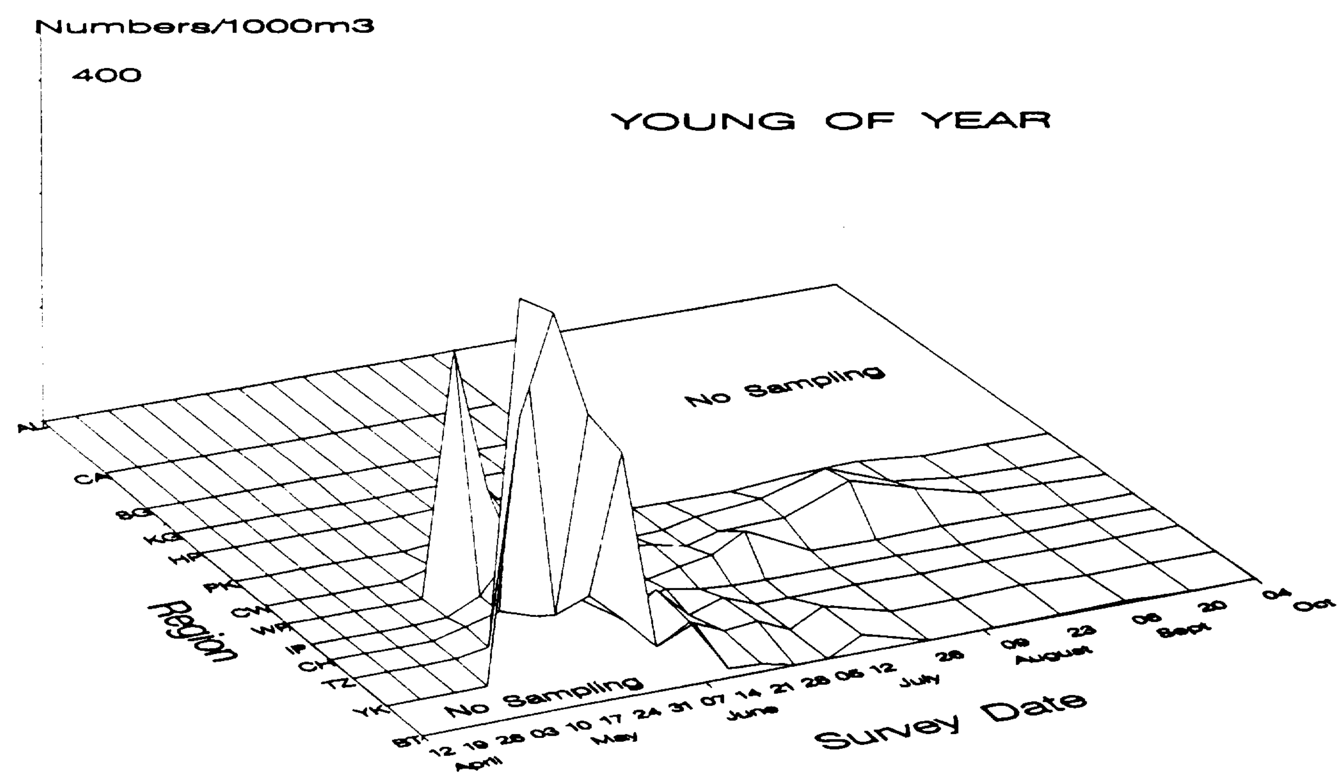


Figure 4–17. Spatiotemporal distribution of post yolk–sac and young–of–year stages of Atlantic tomcod in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

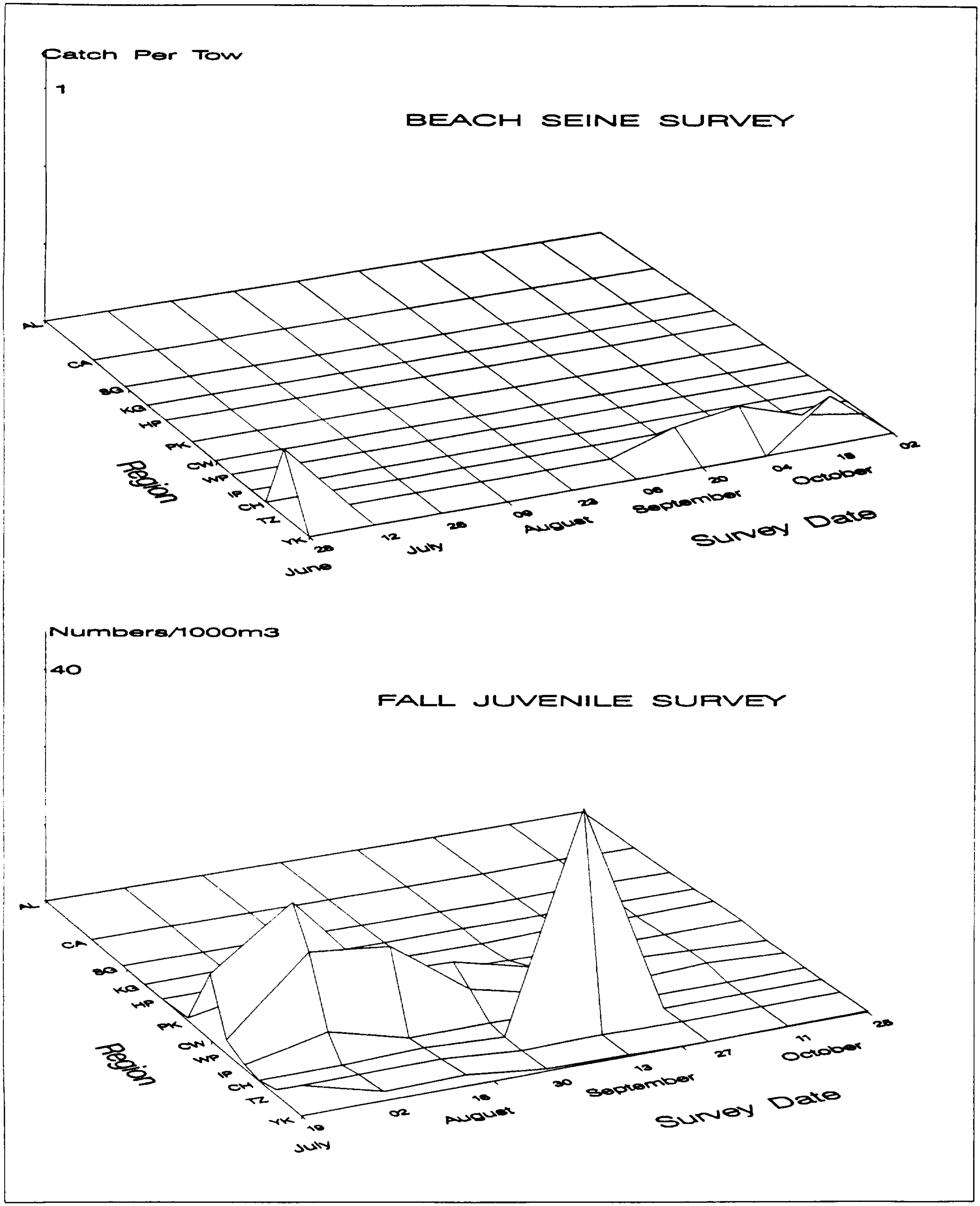


Figure 4–18. Spatiotemporal distribution of young–of–year Atlantic tomcod in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

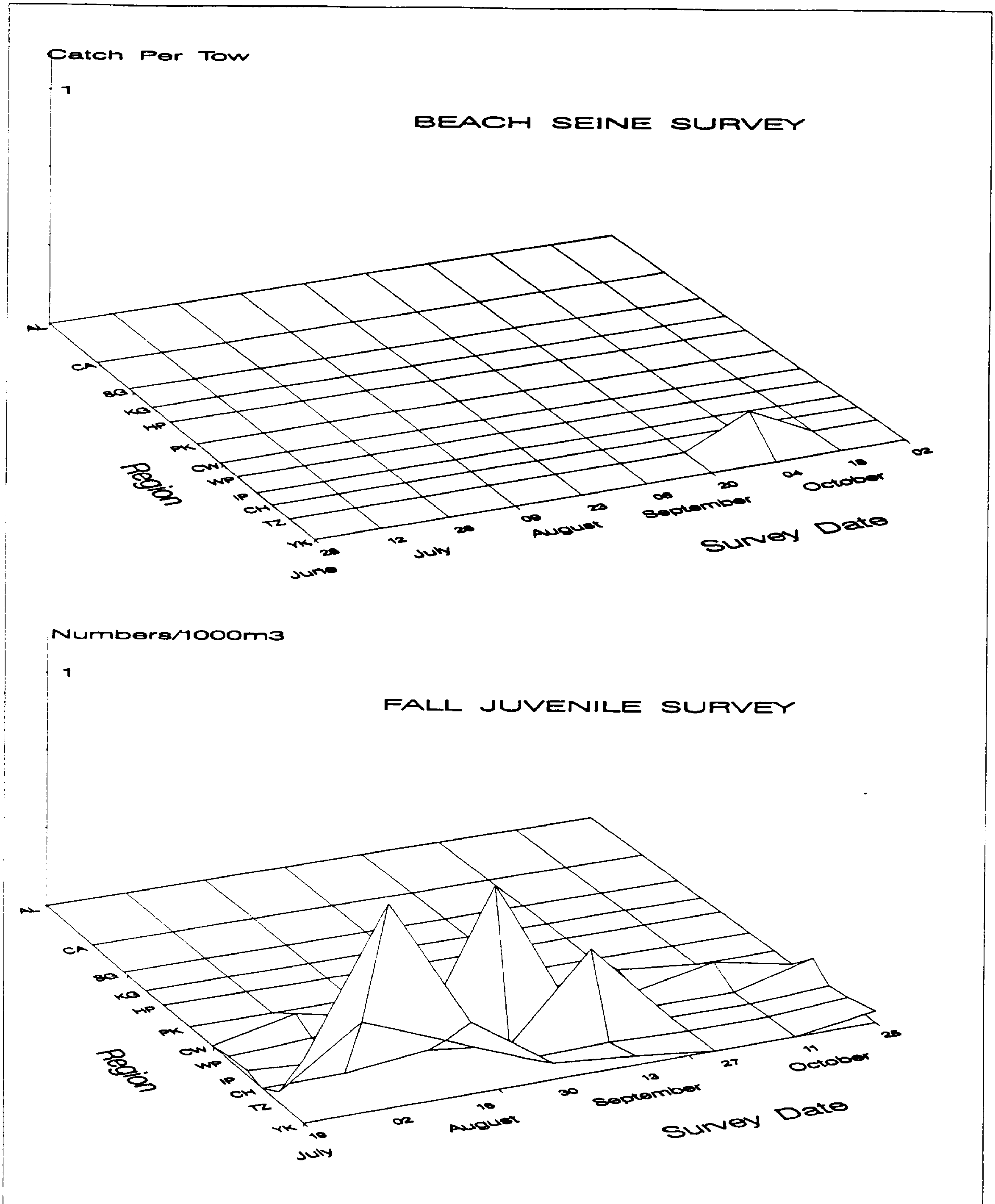


Figure 4-19. Spatiotemporal distribution of yearling and older Atlantic tomcod in the Hudson River estuary based on the 1993 Fall Shoals and Beach Surveys.

Comparing the temporal distribution of early life stages of Atlantic tomcod in 1993 with the long-term database (beginning in early May) available from previous years (1974-1992), the 1993 PYSL distribution was consistent with the long-term record with over 70 percent of the PYSL collected in early May (Figure 4-20). The 1993 YOY distribution was concentrated around mid-May which is later in the year than the historical average. The geographical distributions of post yolk-sac and juveniles collected in the 1993 LRS 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 BSS indicated that 1993 was very consistent with the long-term record, with a high proportion of all juveniles and yearling 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 1993, cessation of growth in the summer is evident from weekly length statistics obtained from BSS and FSS collections (Figure 4-23, Appendix Tables D-7 and D-8). 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. Following the period of rapid growth during the fall, mature YOY migrate upriver to spawn.

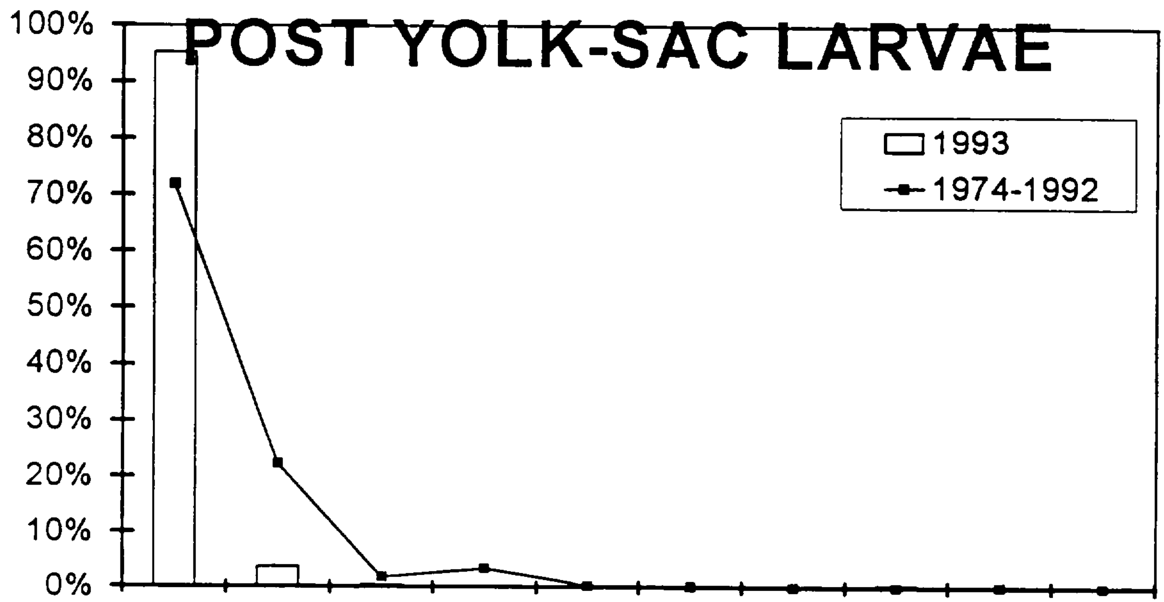
4.5 BAY ANCHOVY

Bay anchovy (*Anchoa mitchilli*) is a small, slender fish, from 1-1/2- to 4 in. long, that is 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 anchovy 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, National Marine Fisheries Service trawl data indicate a movement of bay anchovy 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 bay anchovy 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 anchovy rarely survive more than 2 years. They grow rapidly and mature at a size of 1-2 in. In warm waters, they may mature within 3 months of hatching, but in cooler, northern waters they usually mature in their second summer, 11-14 months after hatching. They are also very prolific; individual females may spawn 50 or more times per year, averaging about 1,100 eggs per spawn



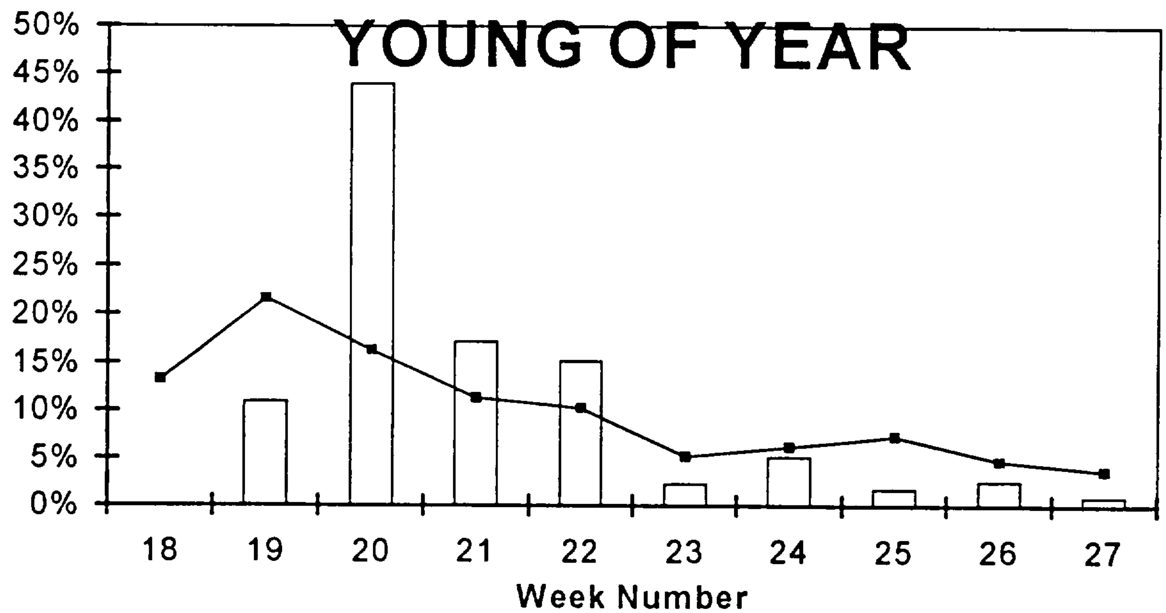


Figure 4-20. Temporal distribution indices for early life stages of Atlantic tomcod collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1974 - 1993.

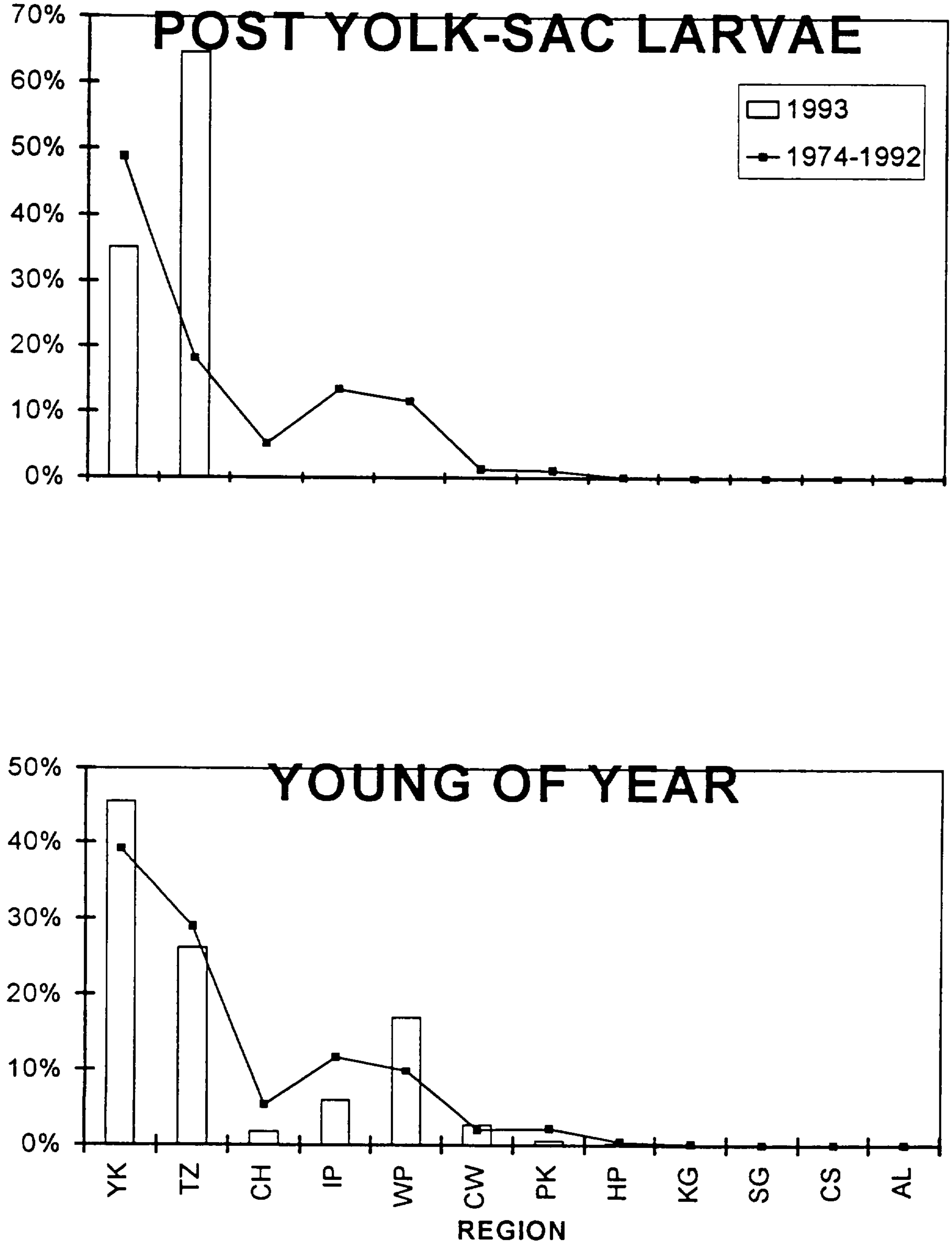
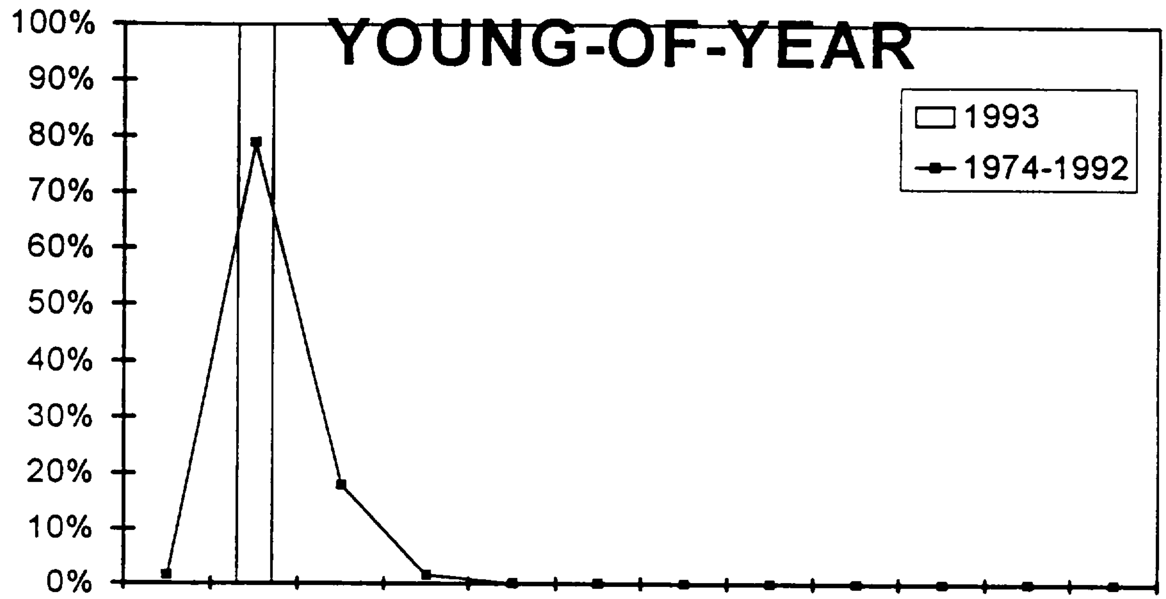


Figure 4-21. Geographical distribution indices for early life stages of Atlantic tomcod collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1974 - 1993.



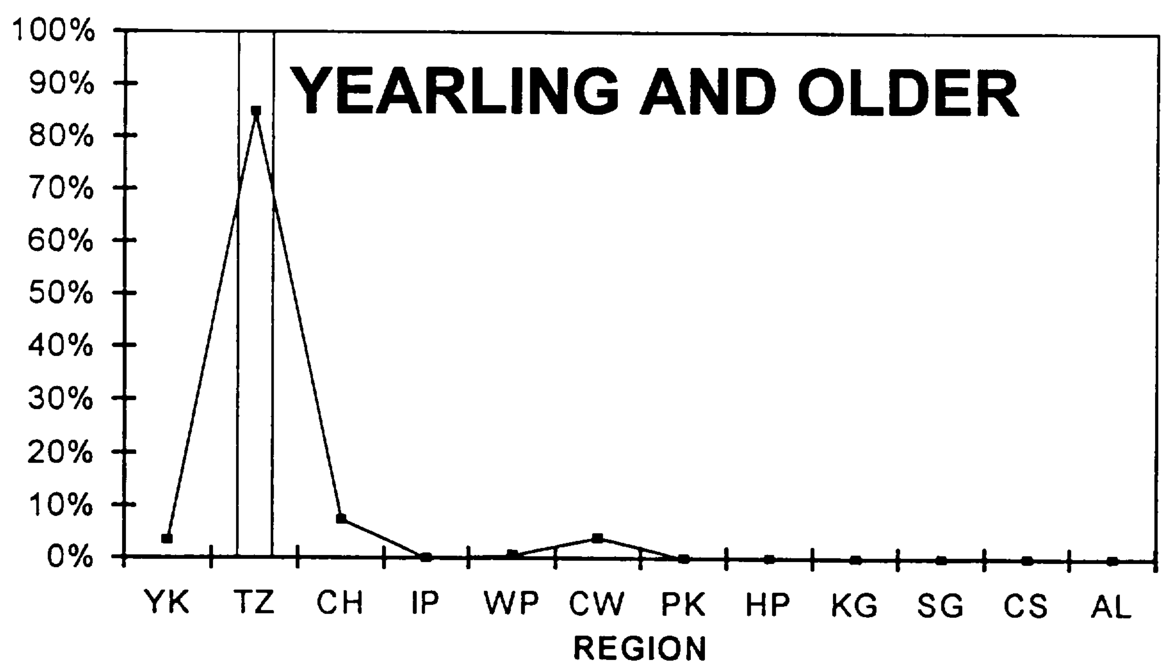


Figure 4-22. Geographical distribution indices for young-of-year and yearling and older Atlantic tomcod collected during Beach Seine surveys of the Hudson River estuary, 1974 - 1993.

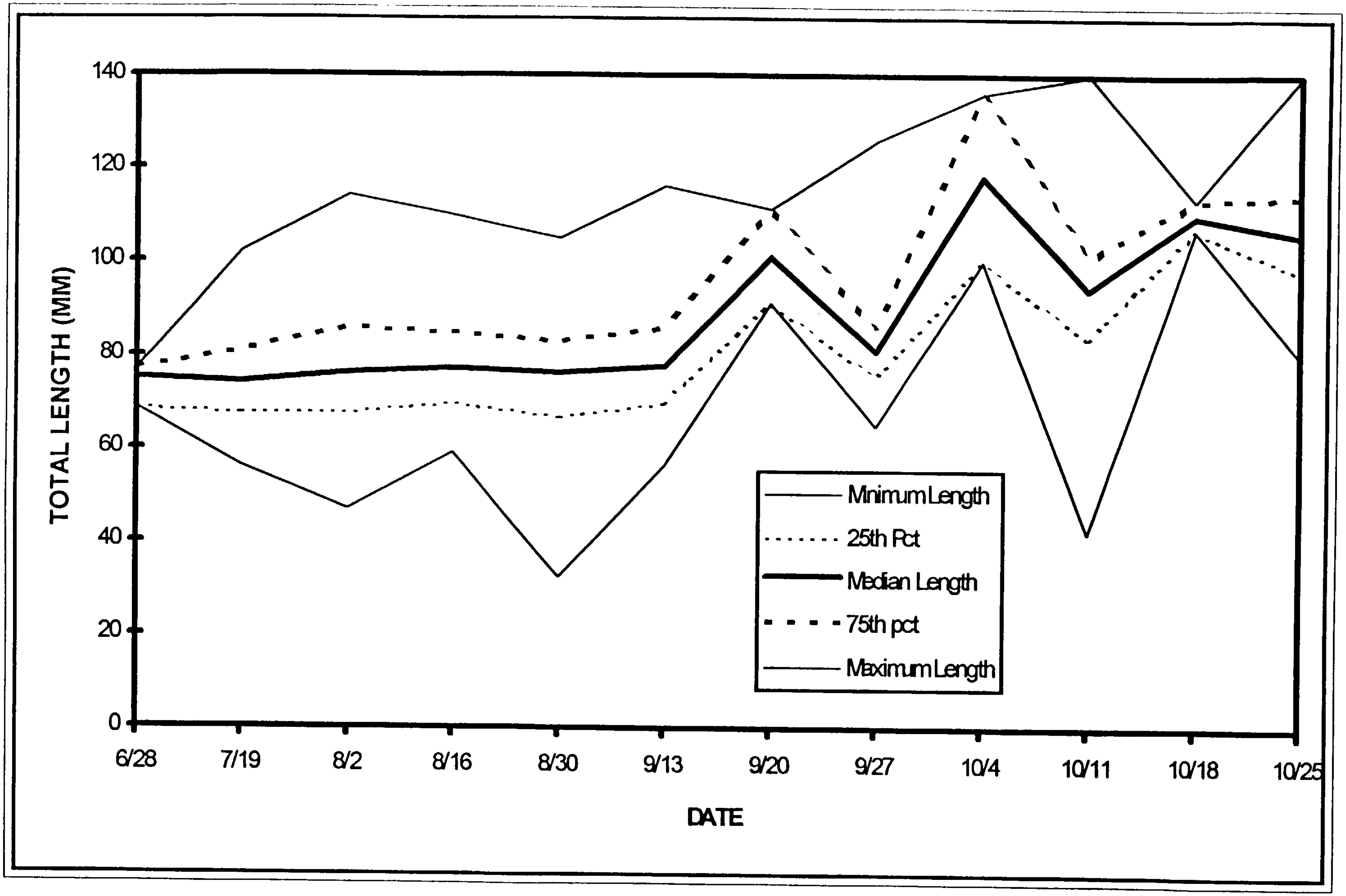


Figure 4-23. Weekly length statistics for Atlantic tomcod larvae and young-of-year in the Hudson River estuary, 1993.

(Houde and Zastrow 1991). Partially as a result of this early maturity and high fecundity, bay anchovy may be the most abundant fish species in the western north Atlantic (McHugh 1967).

Bay anchovy 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 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 New York 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 12-16 hours of floating. Hatching occurs approximately 24 hours after spawning. Newly hatched YSL are about 1/16-1/8 in. long, transparent, and drift along the bottom with the tidal currents. The YSL stage is very brief, and typically lasts less than 1 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 July and the center of their distribution shifts slightly upriver compared to that of eggs and YSL (Figure 4-25).

Bay anchovy are about 1/2 in. long at the beginning of the juvenile stage. Juvenile bay anchovy are found in the Hudson River estuary from mid-August through October and as far upriver as Albany (Schmidt 1992). During 1993, most of the juvenile population was located downstream of the Hyde Park region (Figures 4-25 and 4-26). Yearling and older bay anchovy were much less abundant in collections than juveniles (Figure 4-27). They were caught more frequently early in the summer compared to juveniles whose abundance was relatively constant throughout the summer and early fall.

Comparing the temporal distribution of early life stages of bay anchovy in 1993 with the prior 4-year period (1989-1992) when LRS sampling included the Battery region (RM 0 - RM 12), the 1993 bay anchovy egg distribution occurred earlier than the long-term trend with peak egg abundance in mid-June (Figure 4-28). Peak PYSL occurrence was slightly later than normal with the peak distribution in mid-July. Peak juvenile distribution in the 1993 LRS was within the distribution range seen over the 4 previous years, spanning the period from late July to early September (Figure 4-28).

The geographical distribution of bay anchovy eggs in 1993 was consistent with the distribution pattern seen over the 1989-1992 period, except that the 1993 distribution was more equally spread between the Battery and Yonkers regions rather than concentrated in the Yonkers region (Figure 4-29). The 1993 PYSL and YOY geographical distribution was similar to the previous 4 years with peak abundance in the Tappan Zee region.

The 1993 geographical distribution of YOY bay anchovy in the BSS was not consistent with the 1974-1992 long-term trend, since the main distribution was not centered in the Tappan Zee but located a little further south in the Yonkers region, as was also true in 1992. The 1993 distribution in yearling and older fish, however, was consistent with the long-term trend with over 80 percent of the catch located in Yonkers region (Figure 4-30).

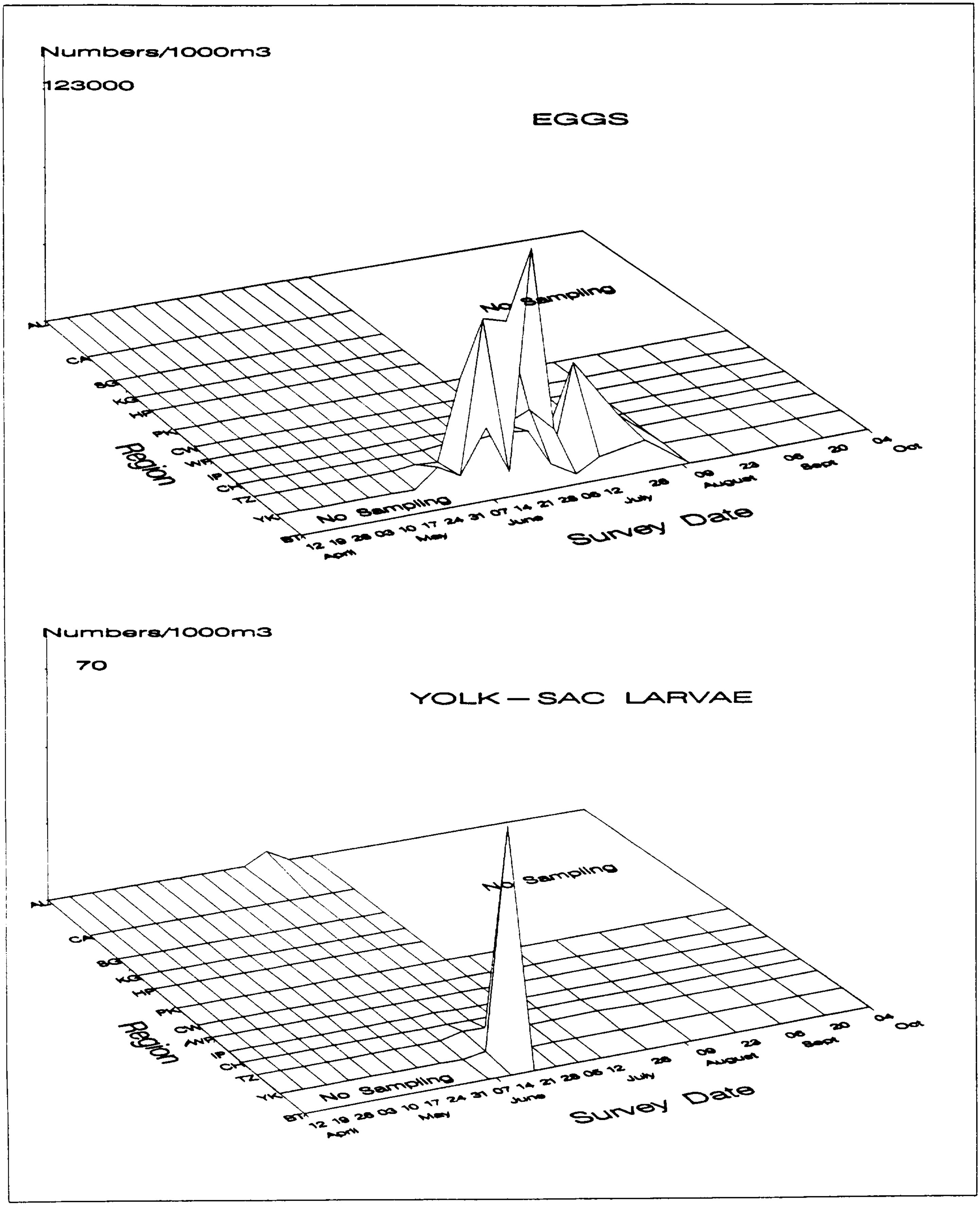


Figure 4 – 24. Spatiotemporal distribution of egg and yolk – sac stages of bay anchovy in the the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

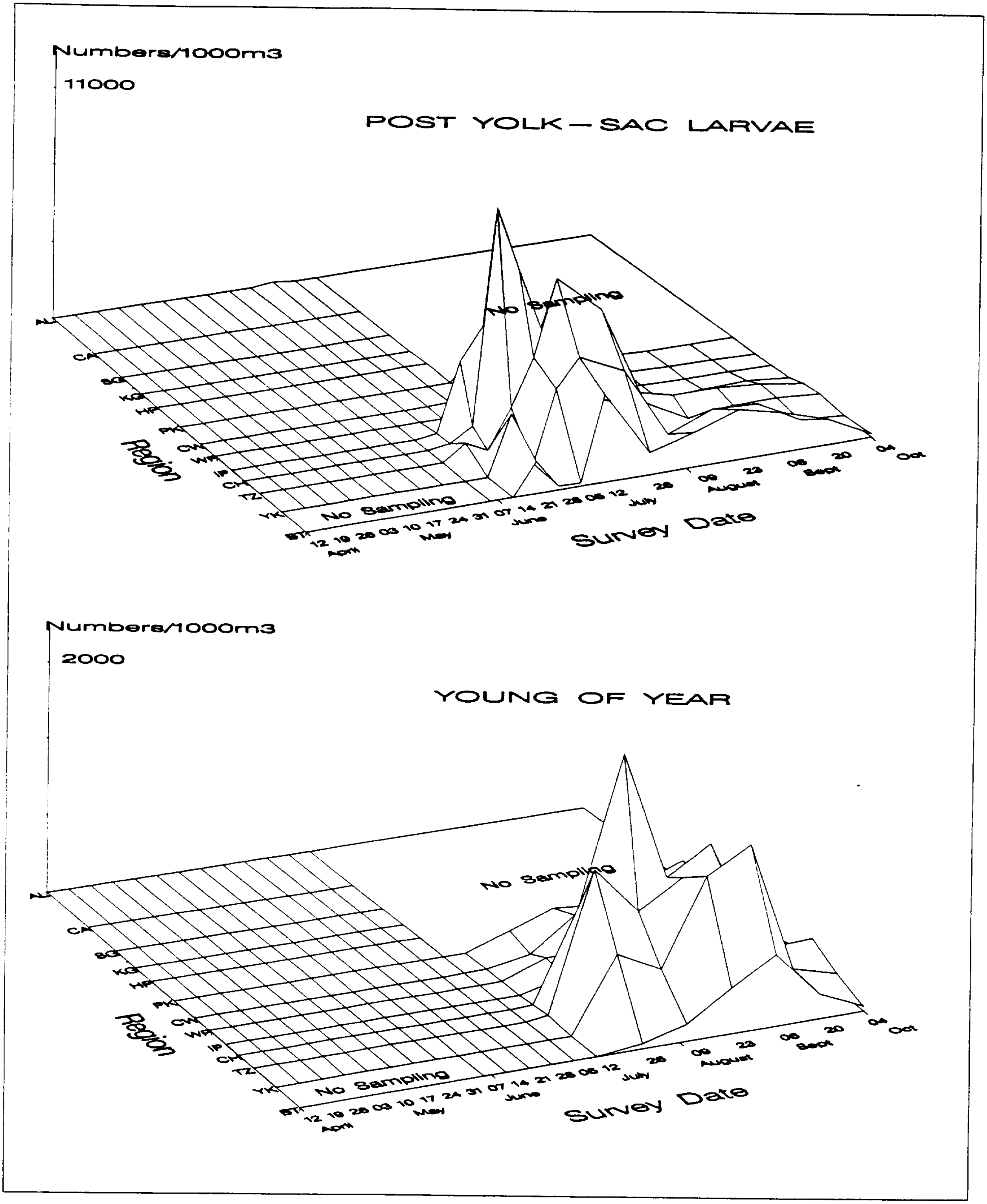


Figure 4–25. Spatiotemporal distribution of post yolk–sac and young–of–year stages of bay anchovy in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

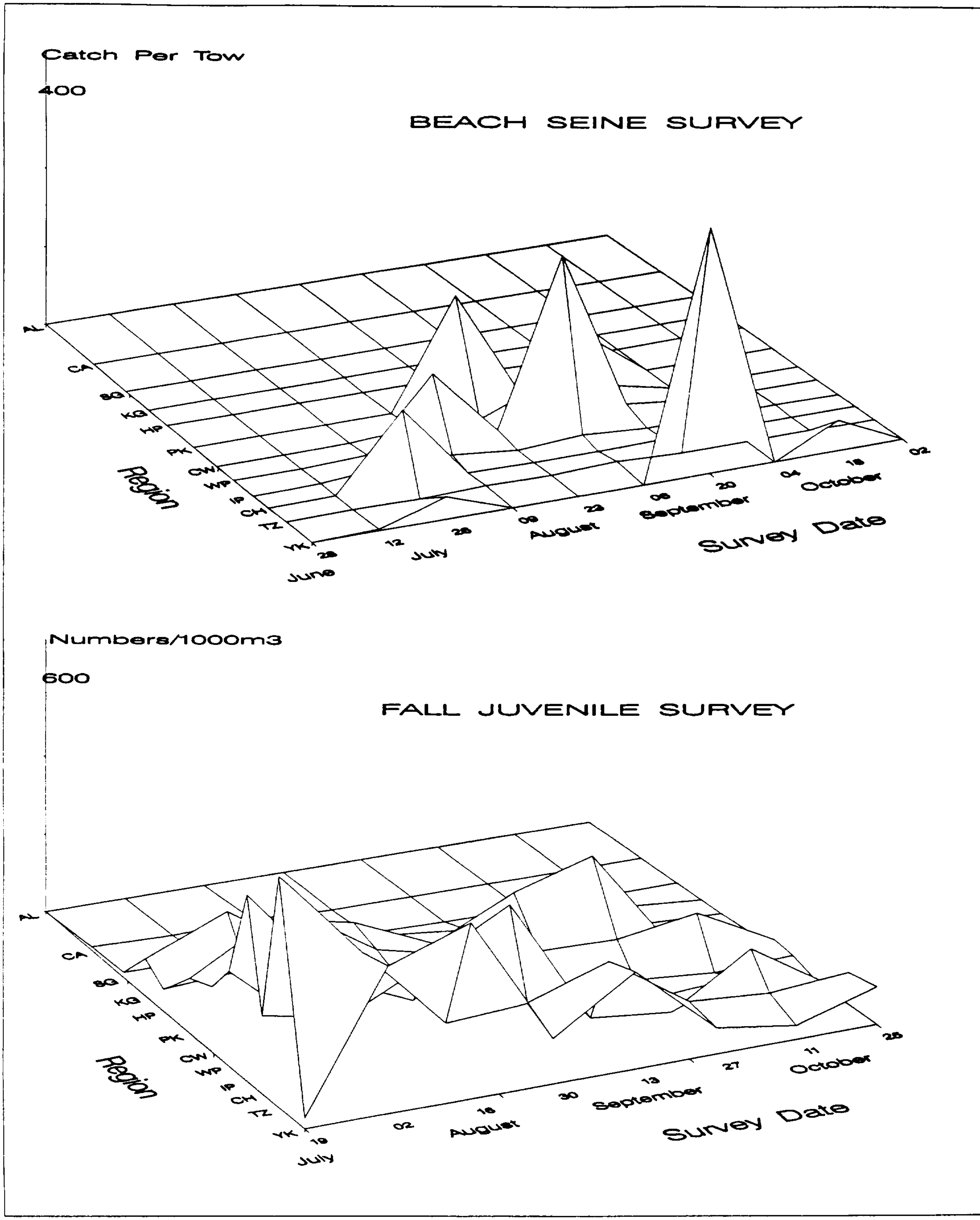


Figure 4–26. Spatiotemporal distribution of young–of–year bay anchovy in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

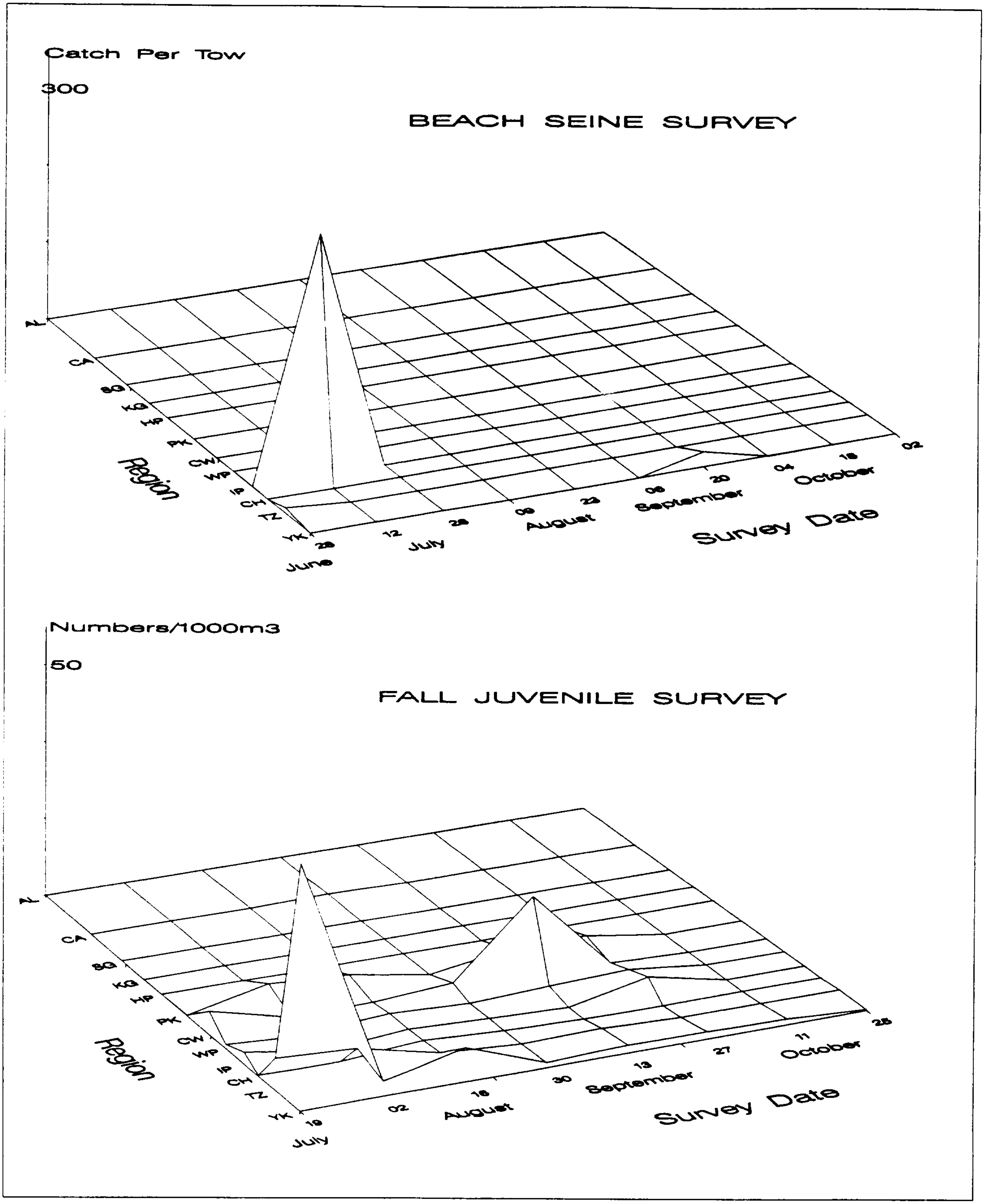


Figure 4-27. Spatiotemporal distribution of yearling and older bay anchovy in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

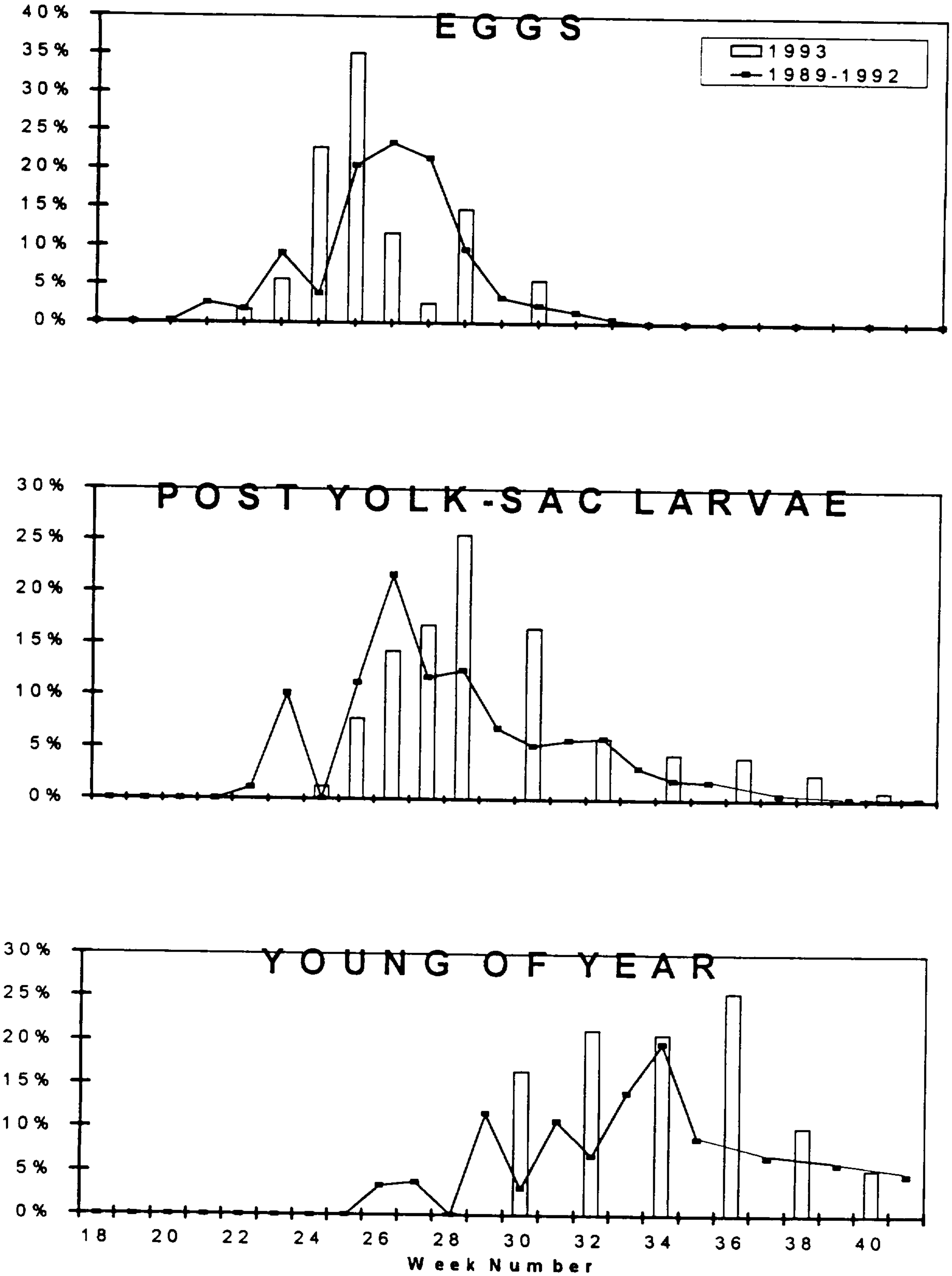


Figure 4-28. Temporal distribution indices for early life stages of bay anchovy collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1989 - 1993.

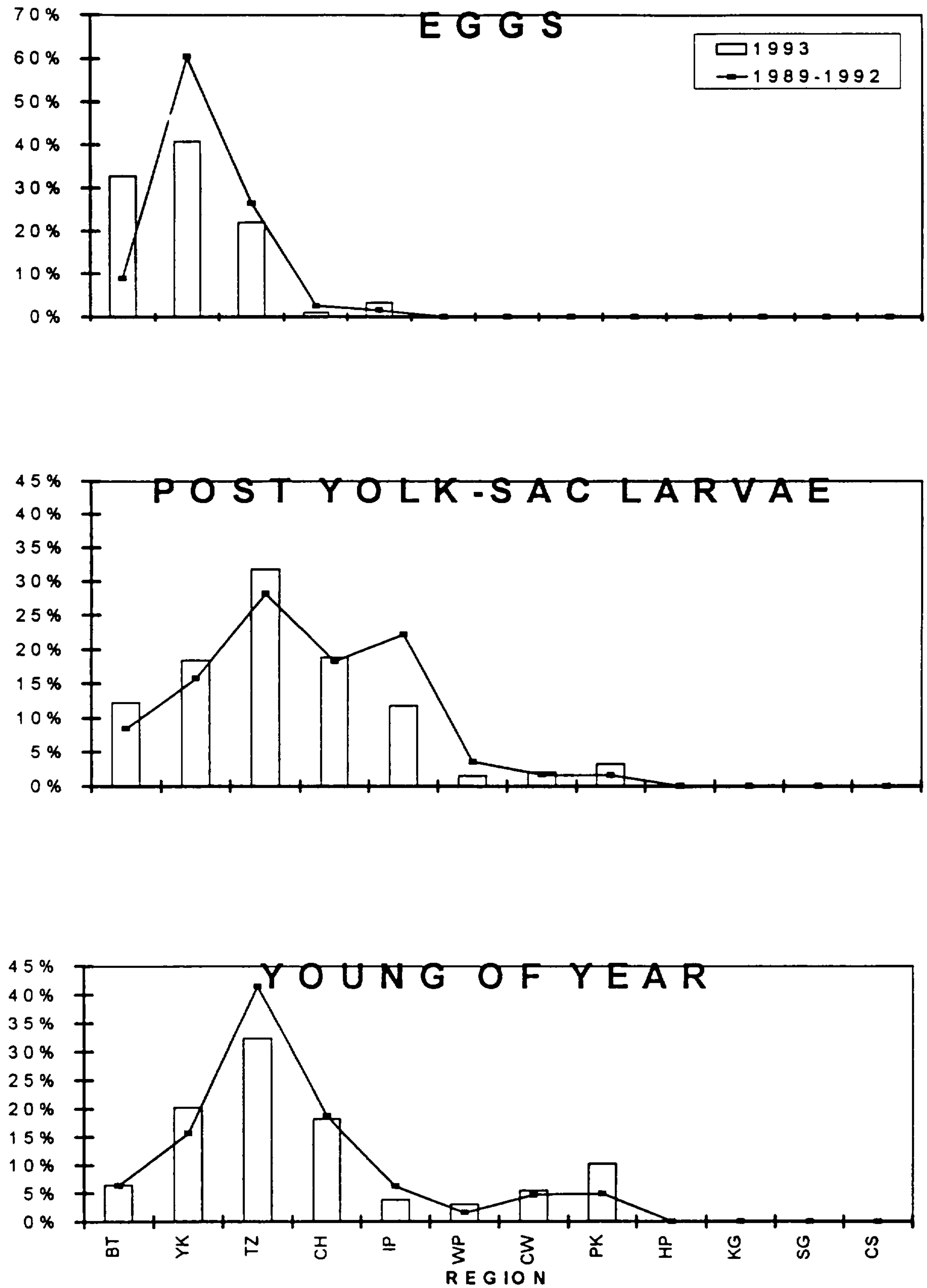


Figure 4-29. Geographical distribution indices for early life stages of bay anchovy collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1989 - 1993.

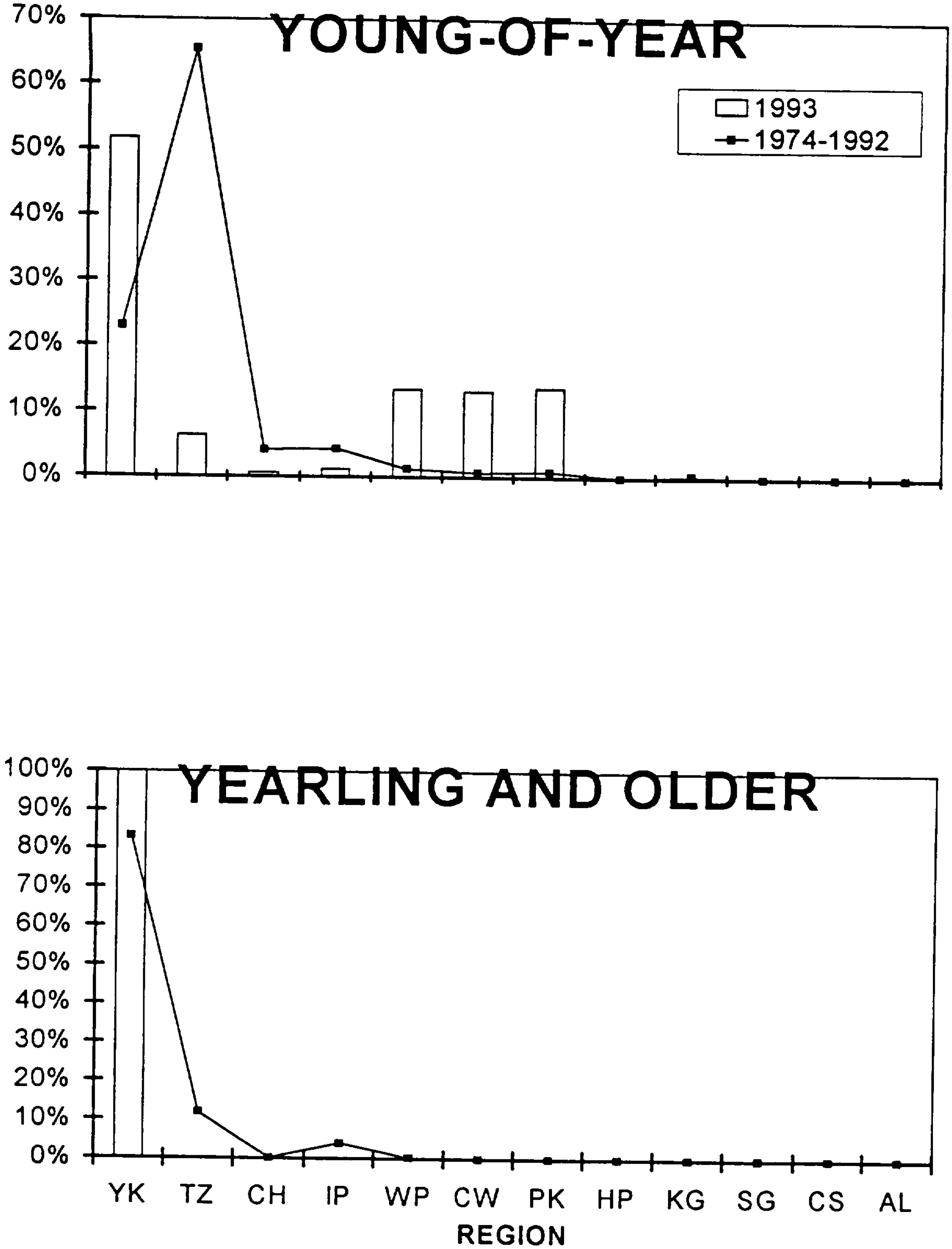


Figure 4-30. Geographical distribution indices for young-of-year and yearling and older bay anchovy collected during Beach Seine surveys of the Hudson River estuary, 1974 - 1993.

Weekly length statistics for bay anchovy juvenile life stages collected in 1993 show a steady growth throughout the early summer, no net increase in growth during September and October as the fish near adult size, and a final spurt in November reflecting collections of large adults. The wide range in size (up to 1.6 in.) during a collection period reflects the protracted spawning period of bay anchovy (Figure 4-31, Appendix Tables D-9 and D-10).

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 3-6 years at sea, although some males may mature within 2 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 50-60 °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 1993, the bulk of American shad eggs were collected in the Catskill and Albany regions, primarily during May (Figure 4-32).

American shad produce 116,000-468,000 eggs per female. The eggs are 1/16-1/8 in. in diameter, semibuoyant, and nonadhesive. They hatch in 3-12 days, depending upon water temperature. Newly hatched YSL are approximately 1/4 in. long and grow very rapidly. They absorb the yolk-sac within 1 week and are approximately 1/2 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.

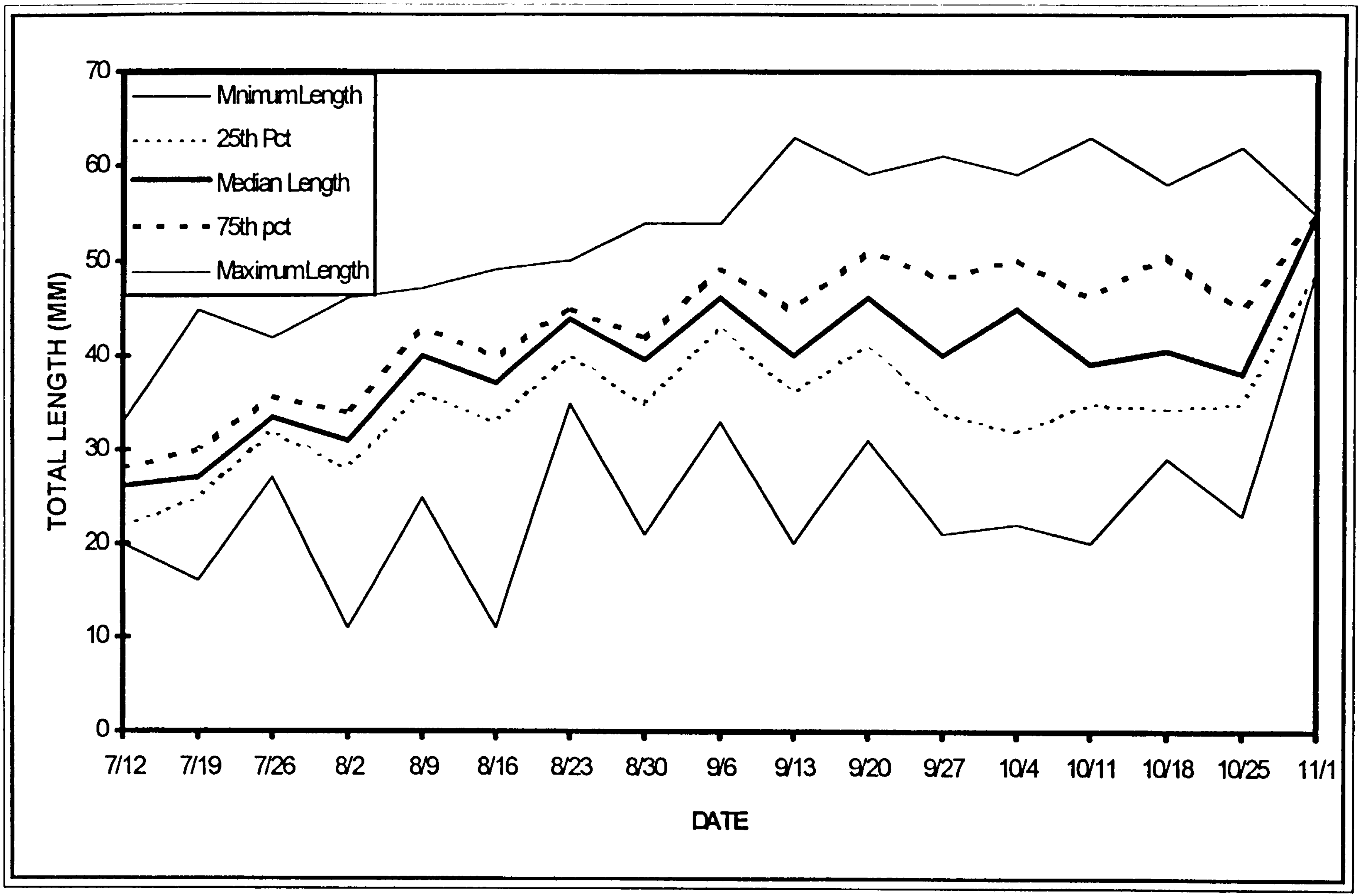


Figure 4-31. Weekly length statistics for bay anchovy young-of-year in the Hudson River estuary, 1993.

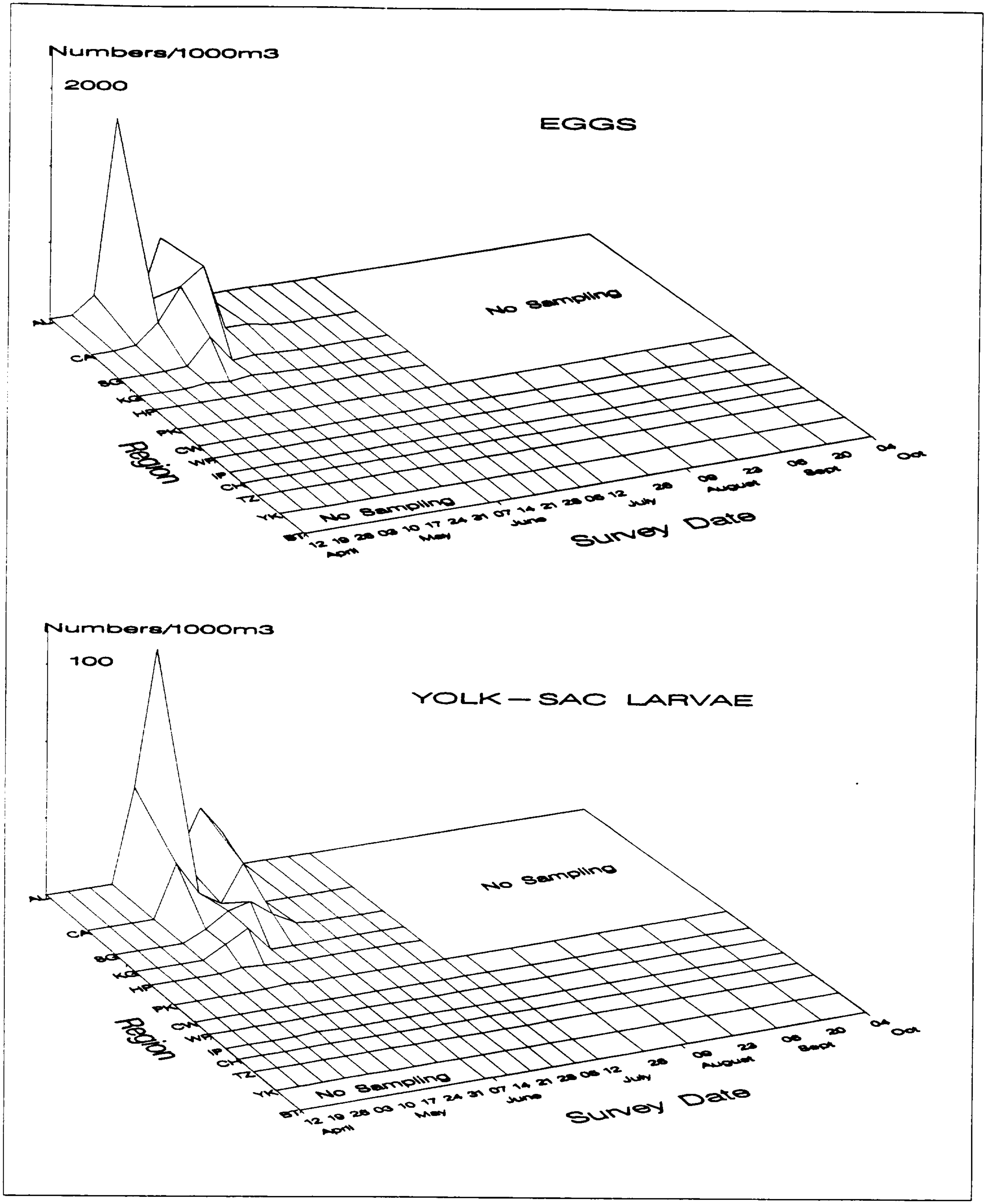


Figure 4–32. Spatiotemporal distribution of egg and yolk–sac stages of American shad in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

Although some downriver dispersal is apparent during 1993, 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 1993 juvenile shad appeared to have been fully recruited to the beach seine gear by early July with the highest catch effort still evident in the upper estuary (Figure 4-34). Few yearling and older American shad were collected in 1993 (Figure 4-35), since adult spawning fish (3- to 6-year-old fish) effectively avoid the BSS and FSS juvenile gear.

Comparing the temporal distribution of early life stages of American shad in 1993 with previous years (1974-1992), it is apparent that in 1993 the distributions of early life stages were generally consistent with the long-term record (Figure 4-36). However, in 1993, approximately 45 percent of the egg distribution occurred in early May, whereas over the long-term peak egg distribution occurred in late May. Peak larval distribution in 1993 coincided with historical peaks which are mid-May for YSL, late May for PYSL, and late June for YOY. The geographical distribution of American shad early life stages in 1993 is also consistent with the long-term record with greatest distribution in the upper estuary (Figure 4-37).

The long-term geographical distribution of YOY American shad in the BSS shows 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). The 1993 geographical distribution data support the upper and middle estuary peaks, but show no evidence of a lower estuary peak.

Weekly length statistics for American shad from YSL through juvenile life stages collected in 1993 show a rapid growth period from early June through mid-July and steady growth thereafter through the end of BSS/FSS collections in November (Figure 4-39, Appendix Tables D-11 through D-13). 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, alewife 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.

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 and alewife are very much alike in external appearance, especially as larvae, but older alewife have proportionately larger eyes and deeper bodies than blueback herring. In Hudson River sampling, eggs and larvae of alewife and blueback herring are not differentiated because of the similarity in appearance. Any references in this document to eggs and larvae pertain to the combined numbers from both species, referred to as *Alosa* spp. Juveniles of these two species are differentiated by the size of the eyes and the mouth morphology and are discussed separately.

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 alewife. Alewife spawning activity is most intense when water temperatures are 51-71°F, which results in

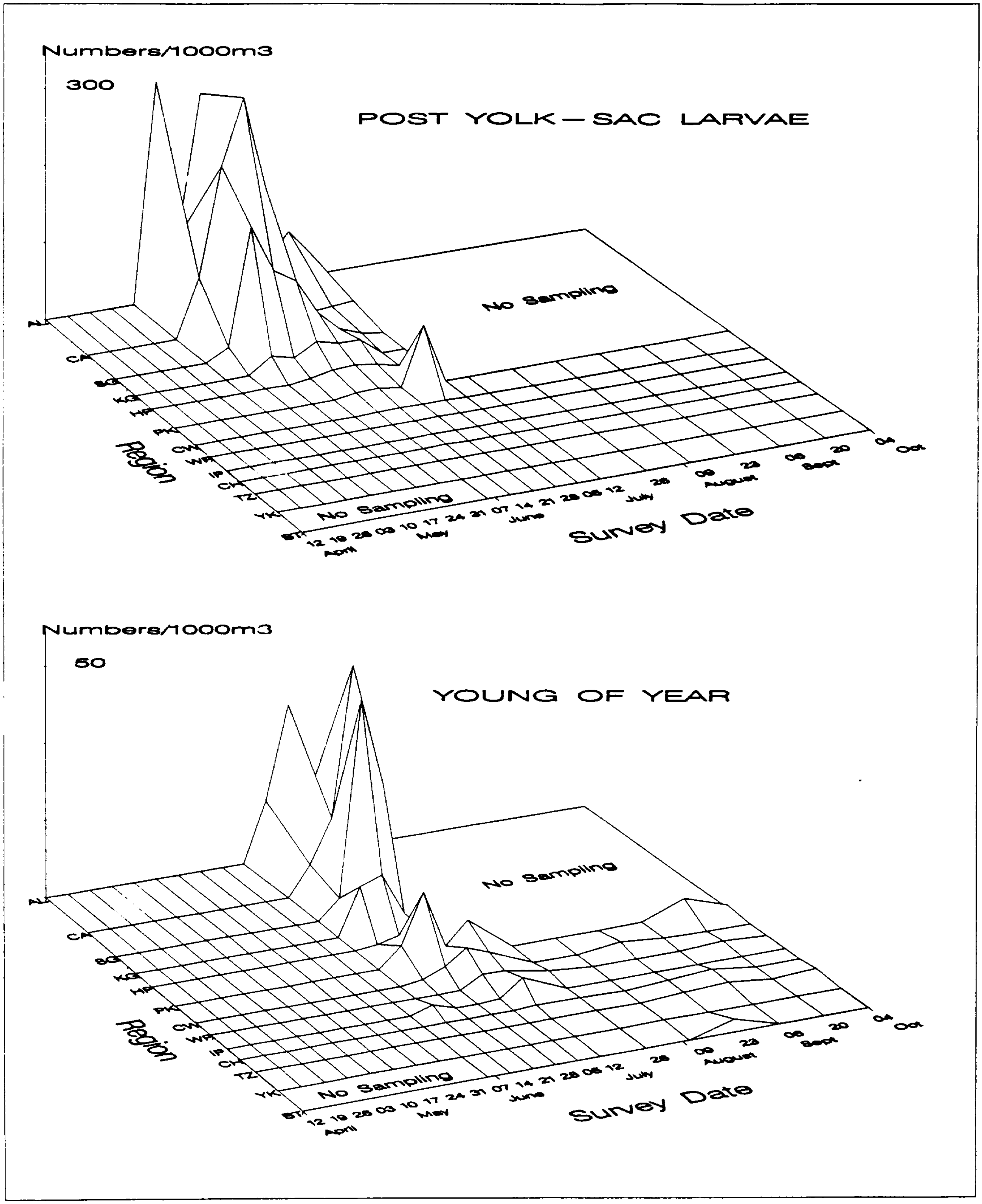
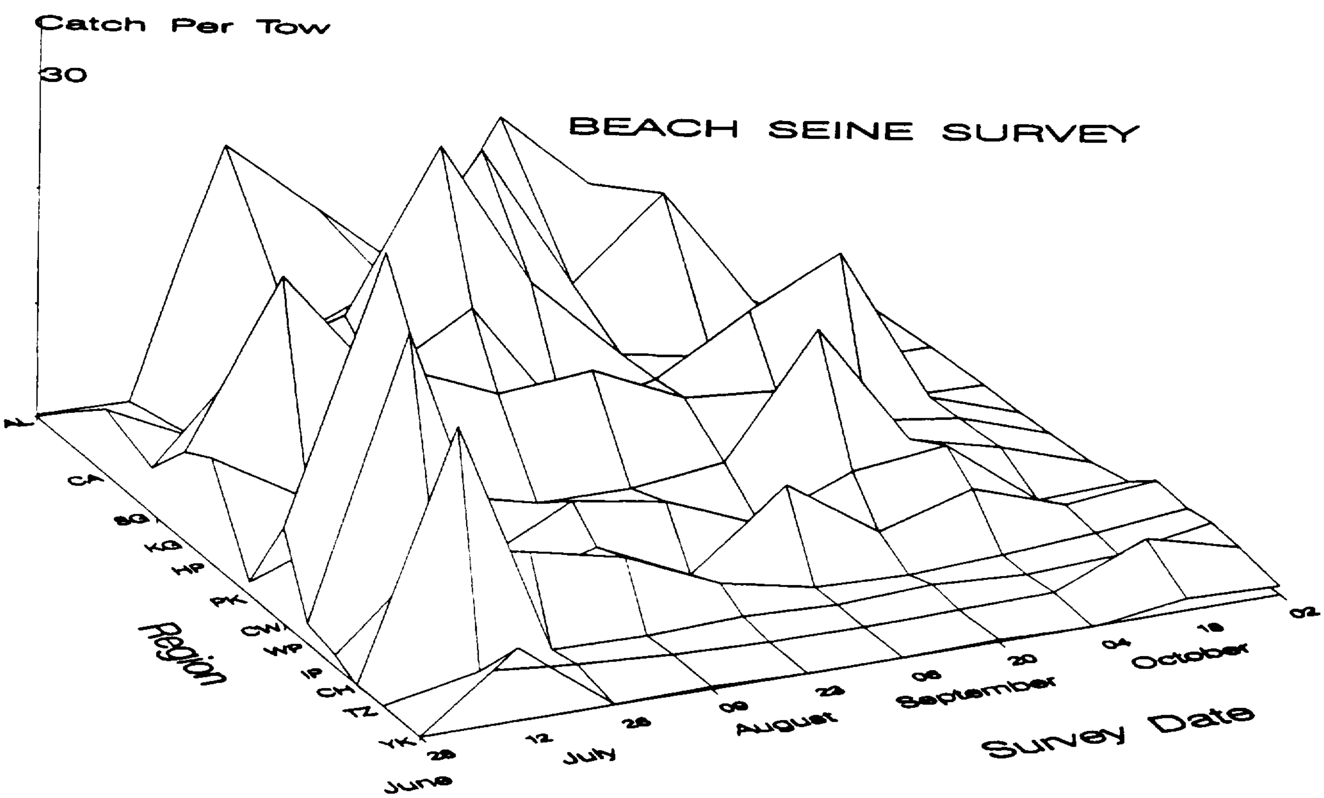


Figure 4-33. Spatiotemporal distribution of post yolk-sac and young-of-year stages of American shad in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.



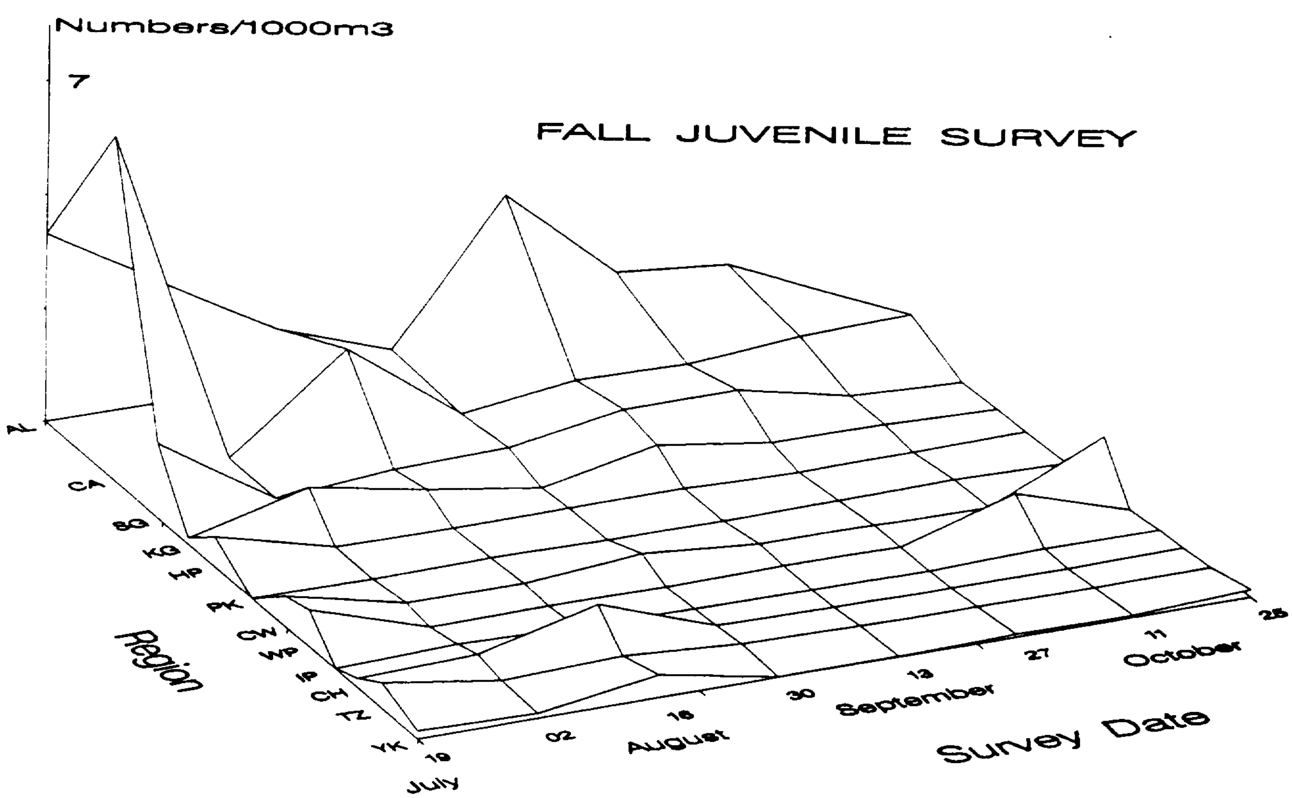


Figure 4-34. Spatiotemporal distribution of young-of-year American shad in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

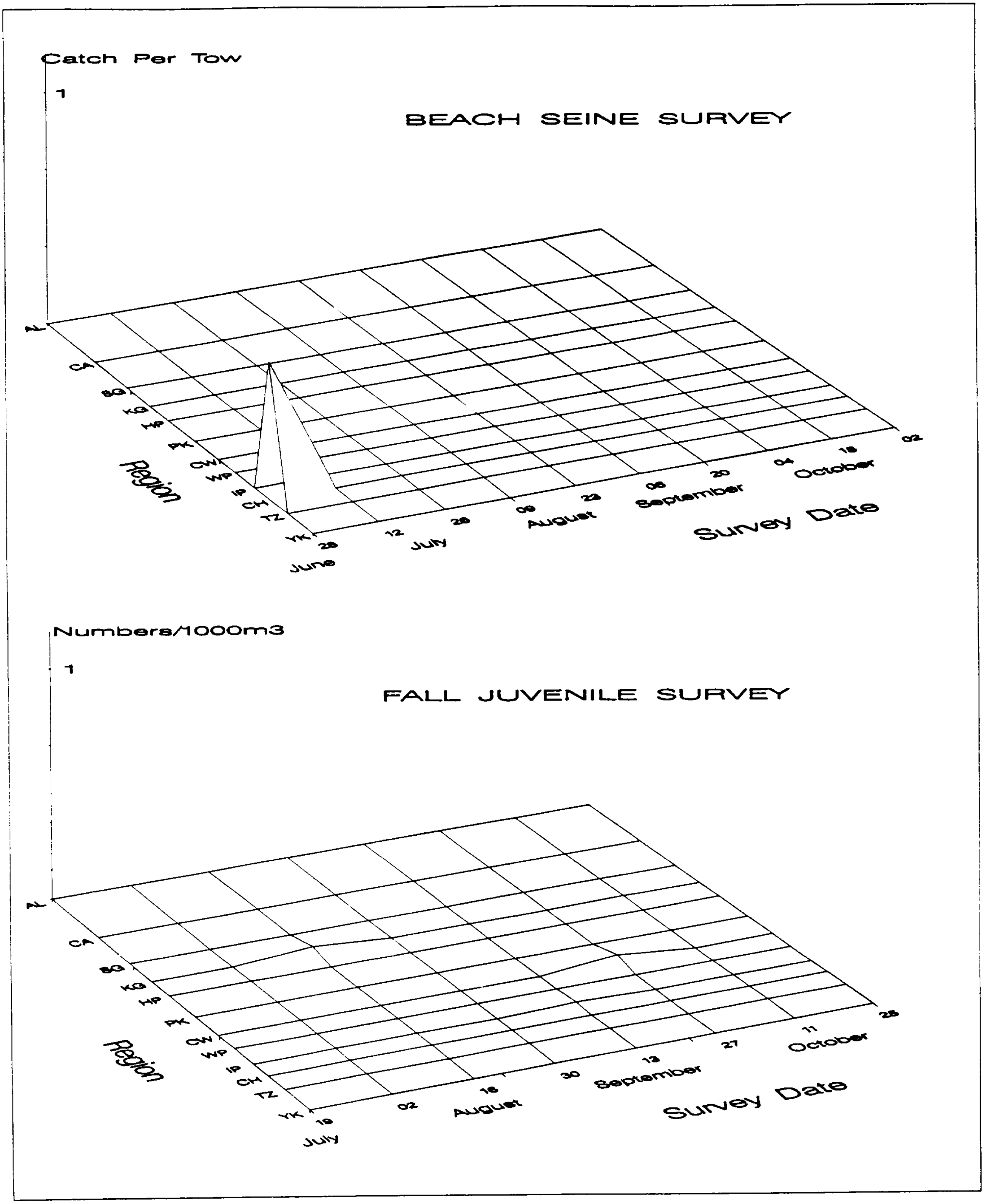


Figure 4−35. Spatiotemporal distribution of yearling and older American shad in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

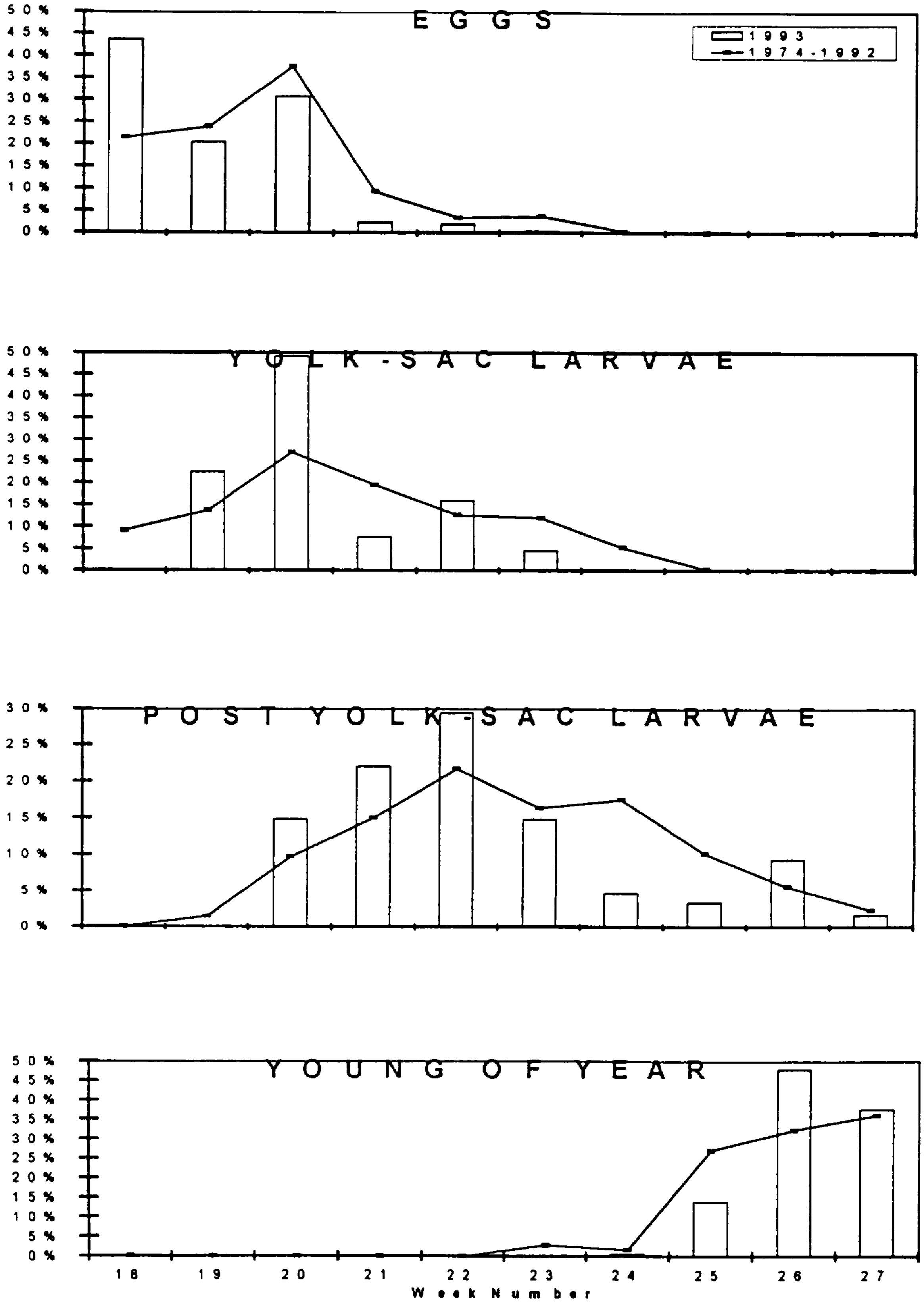


Figure 4-36. Temporal distribution indices for American shad collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1974 - 1993.

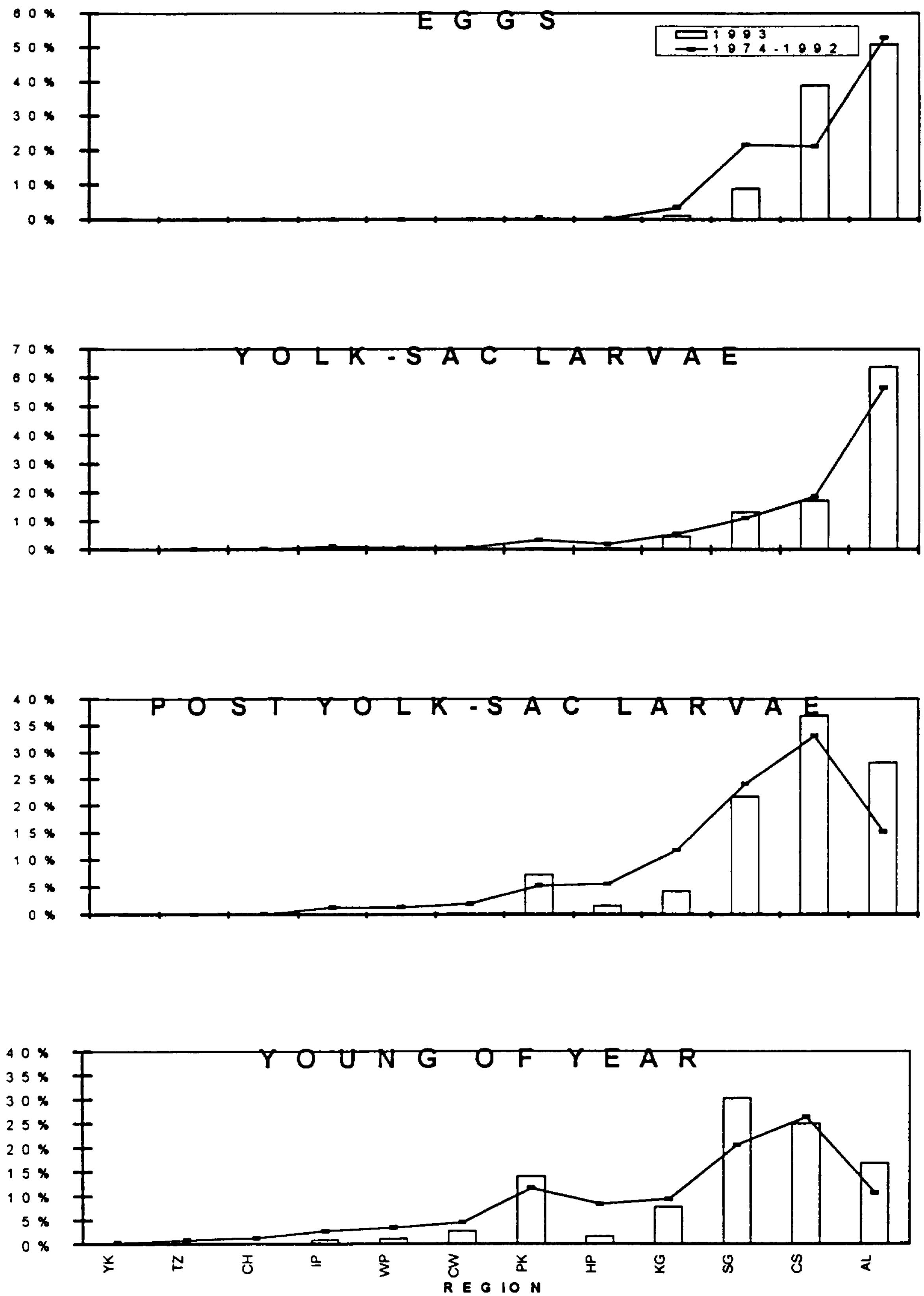


Figure 4-37 Geographical distribution indices for early life stages of American shad collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1993.

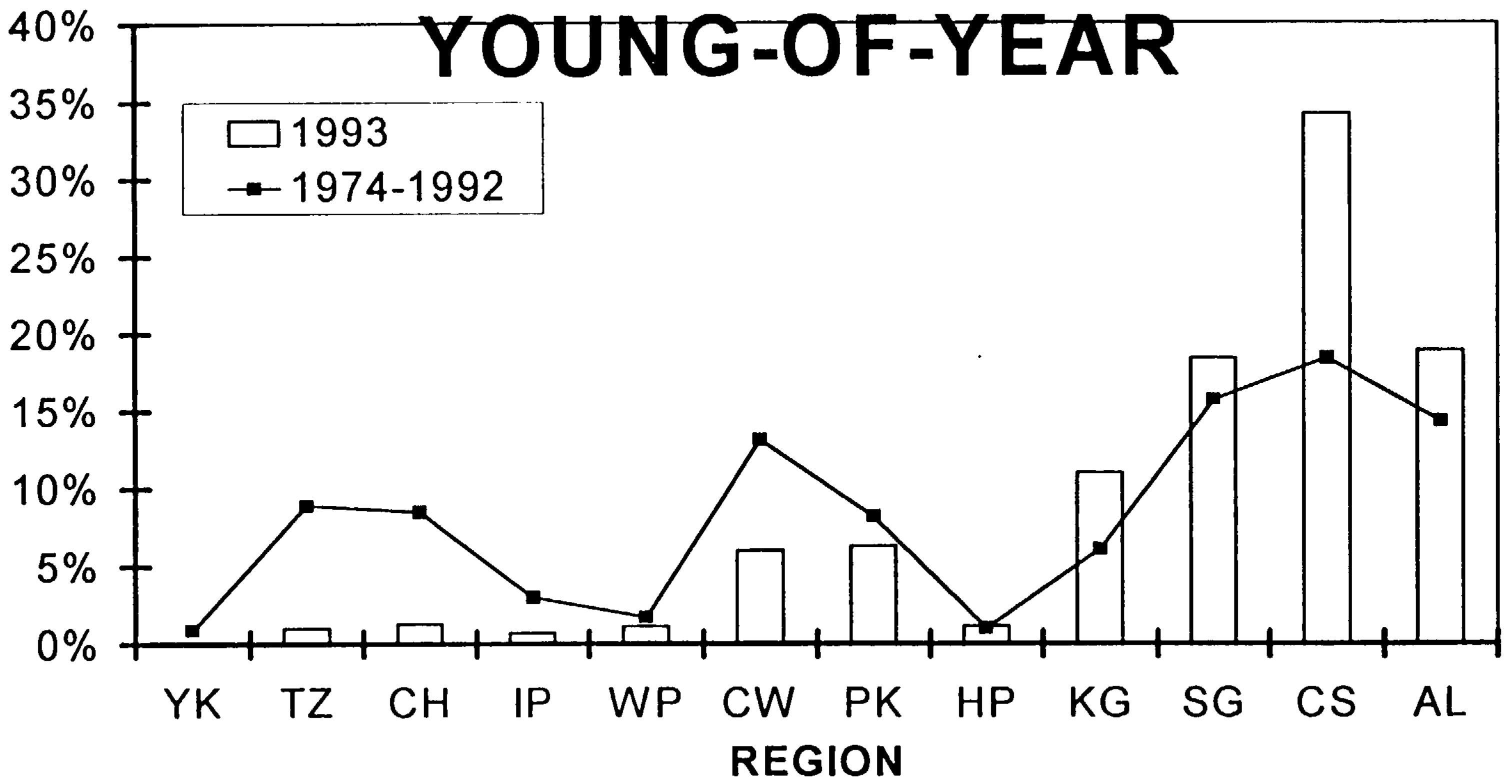


Figure 4-38. Geographical distribution indices for young-of-year American shad collected during Beach Seine surveys of the Hudson River estuary, 1974-1993.

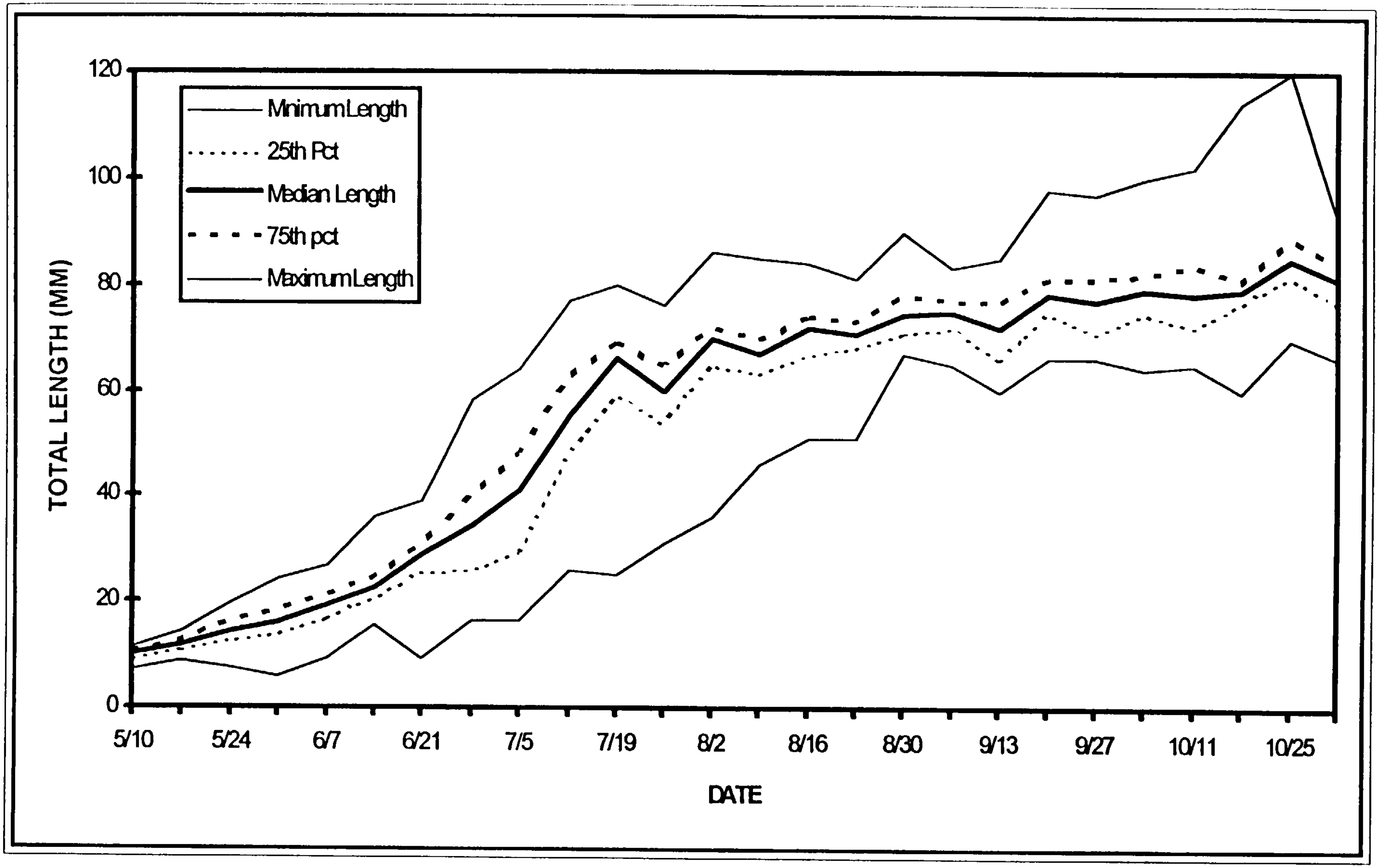


Figure 4-39. Weekly length statistics for American shad larvae and young-of-year in the Hudson River estuary, 1993.

slightly earlier spawning than that of blueback herring. Blueback herring peak spawning activity occurs near the end of May. Spawning activity occurs within the river, but preferred spawning habitat for blueback herring 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. Alewife prefer ponds and slow-moving streams for their spawning habitat.

Alewife eggs are semidemersal, slightly adhesive, but easily torn free and carried by currents. The egg diameter is about 1/16 in. Hatching takes 2-15 days depending upon temperature (Smith 1985). Blueback herring produce 45,000-350,000 eggs per female. The eggs are 1/16 in. in diameter and adhesive upon release, but they may later become dislodged and be pelagic. Development proceeds rapidly and hatching occurs in 2-3 days. Newly hatched blueback herring are 0.125 in. long and the yolk-sac is absorbed in about 4 days. At the beginning of the PYSL stage, the larvae are about 0.1875 in. long.

In the Hudson River during 1993, peak abundance of *Alosa* spp. eggs occurred in the upper estuary from Kingston to Albany during mid-May (Figure 4-40). YSL and PYSL were also most abundant in the upper estuary but PYSL were found downriver in the Cornwall region by late June (Figure 4-41).

Comparing the temporal distribution of early life stages of *Alosa* spp. in 1993 with previous years (1974-1992), the 1993 distributions of eggs, YSL and PYSL were generally consistent with the long-term record, showing peak abundance of each life stage in May (Figure 4-42). The geographical distribution of *Alosa* spp. early life stages in 1993 is also consistent with the long-term record, except that the major proportion of YSL occurred in the Catskill instead of Albany region in 1993 (Figure 4-43) and YOY were concentrated in Catskill instead of exhibiting an even distribution in the upper estuary.

4.8 ALEWIFE

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 alewife 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 9 years.

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. Upon returning to the lower estuary after spawning, alewife feed heavily on shrimp (Bigelow and Schroeder 1953).

Alewife assume adult characteristics at about one month of age and about 1/2 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

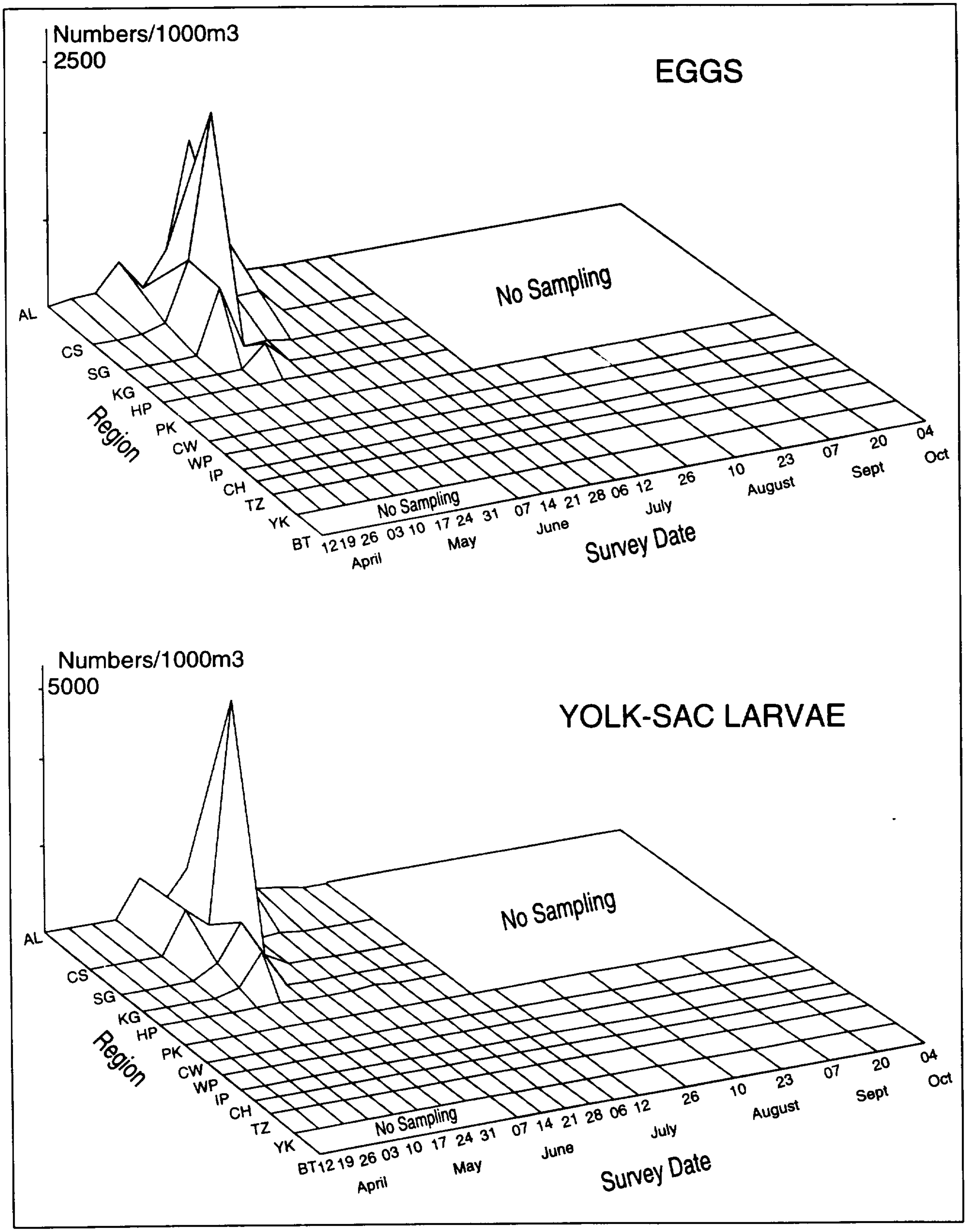


Figure 4-40. Spatiotemporal distribution of egg and yolk-sac stages of Alosa spp. in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

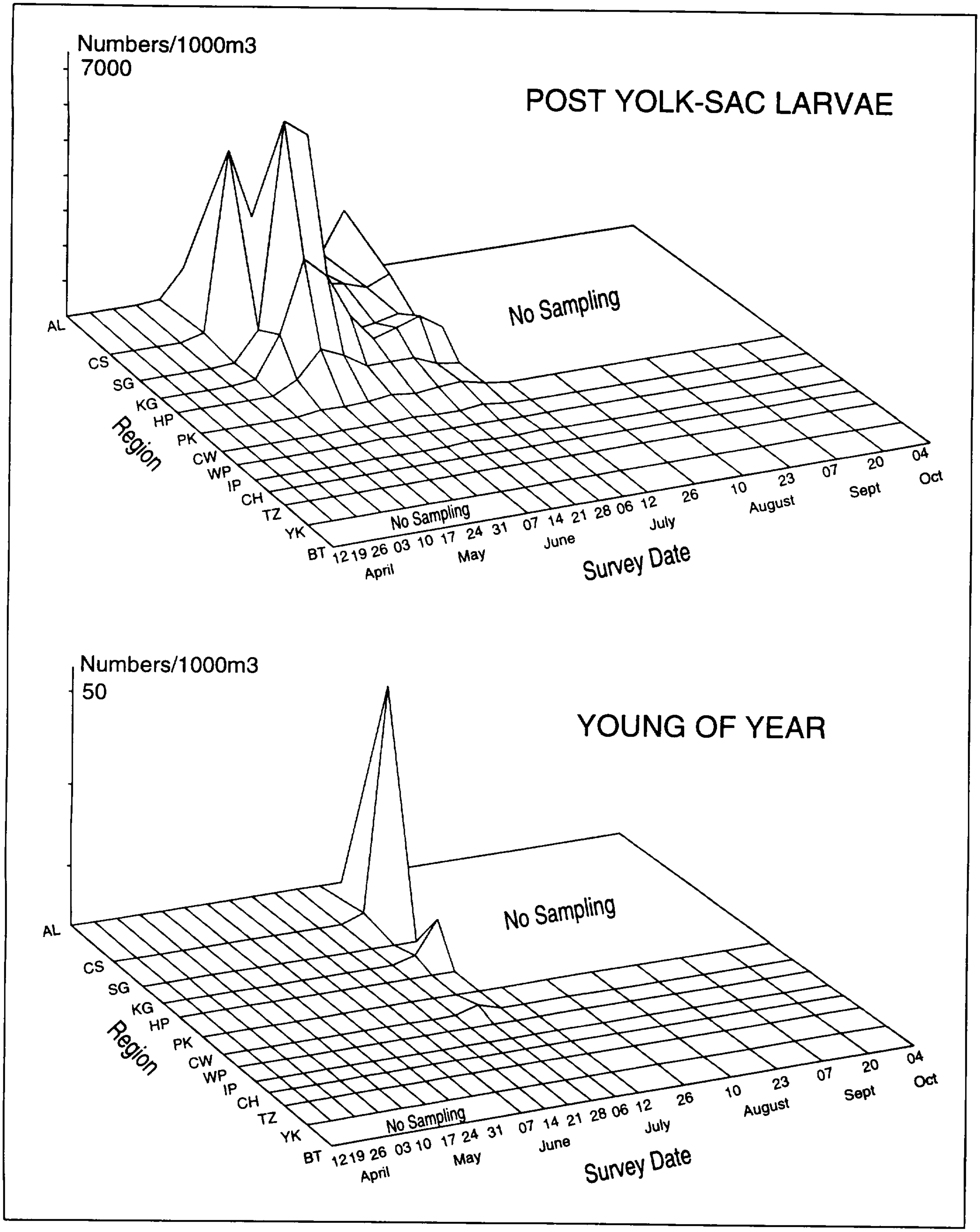


Figure 4-41. Spatiotemporal distribution of post yolk-sac and young-of-year stages of Alosa spp. in the Hudson River estuary based on the 1993 Long River Icthyoplankton Survey.

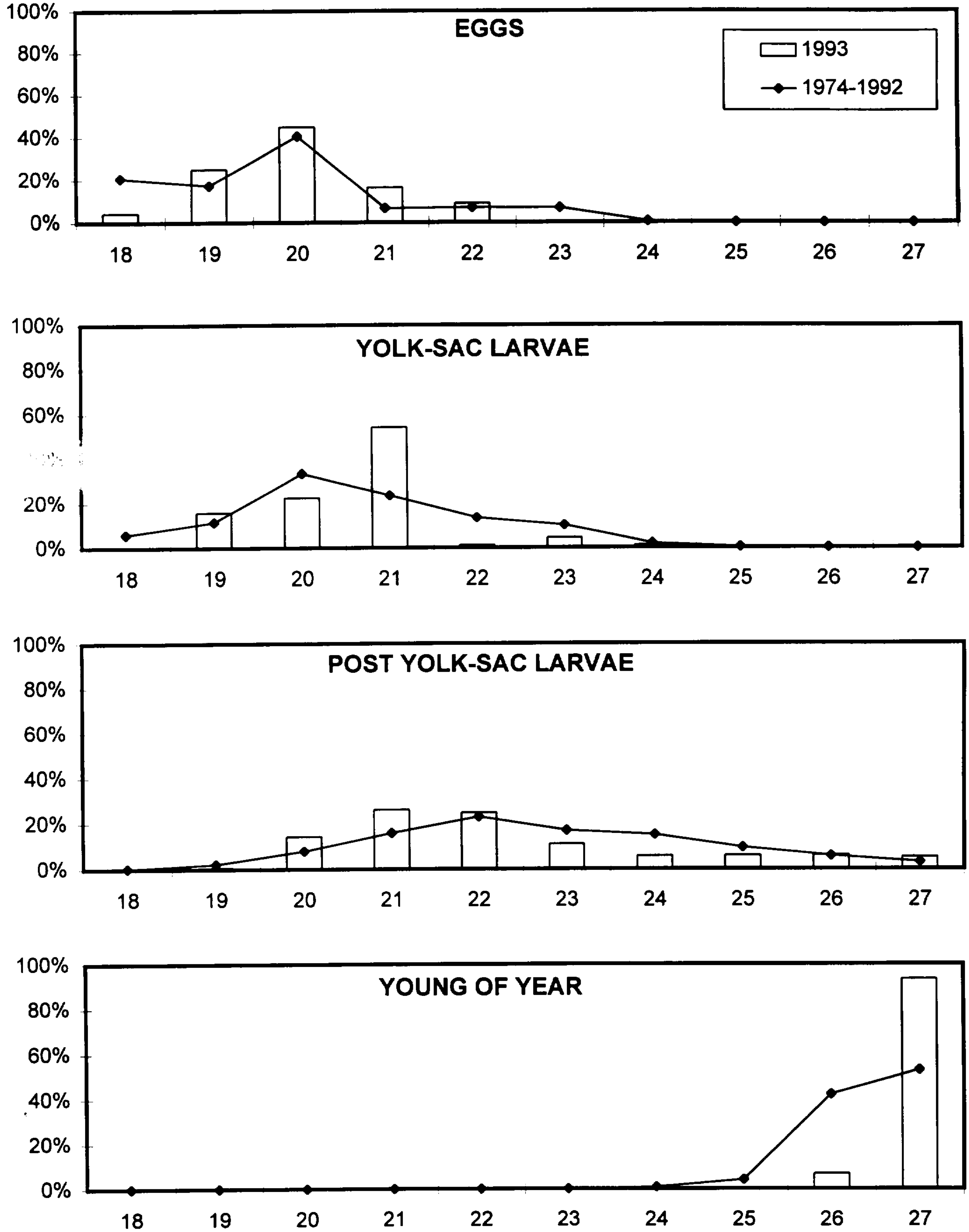


Figure 4-42. Temporal distribution indices for early life stages of *Alosa* spp. collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1974-1993.

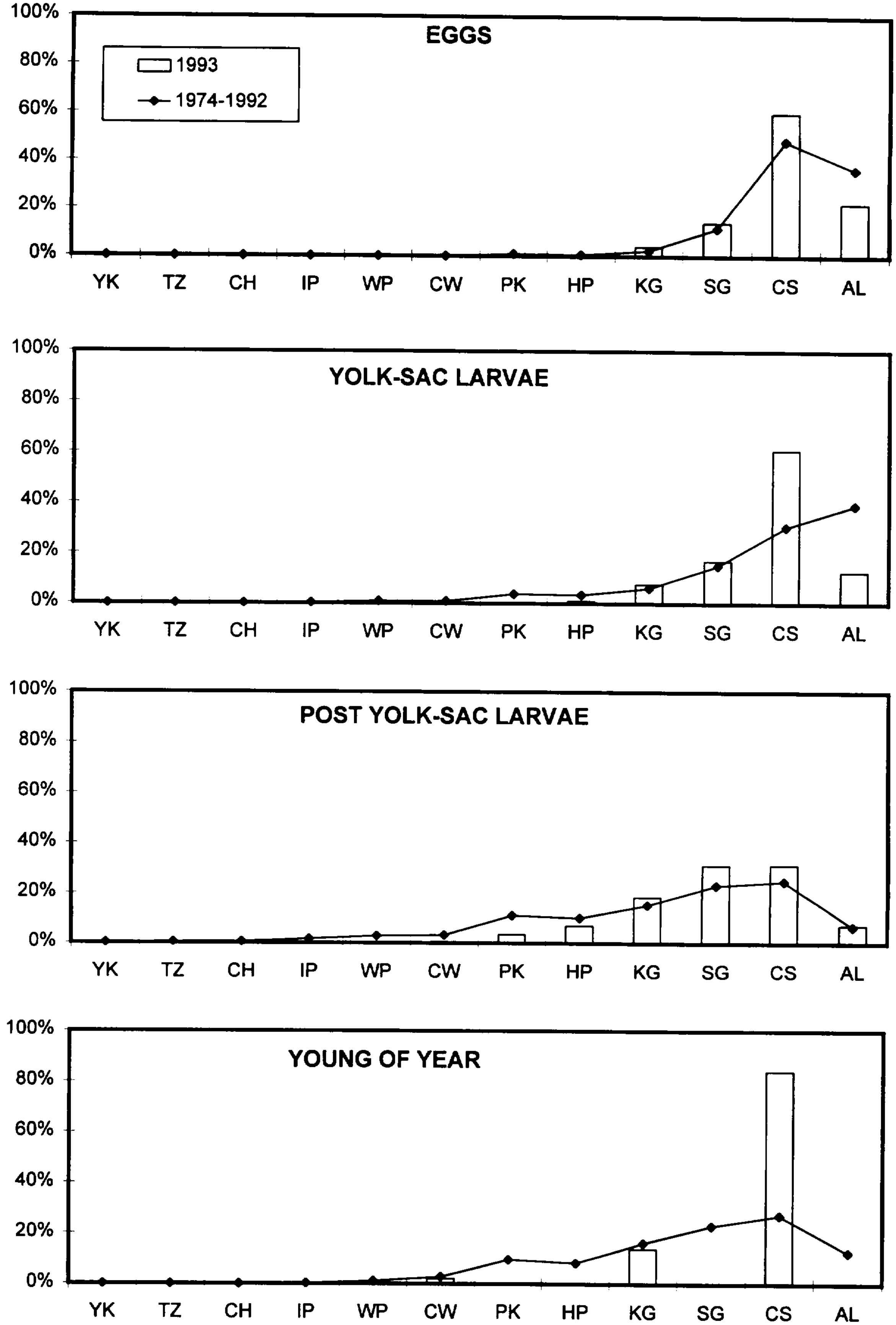


Figure 4-43. Geographical distribution indices for early life stages of *Alosa* spp. collected during Longitudinal River Ichthyoplankton surveys of the Hudson River estuary, 1974-1993.

related to size, and larger juveniles migrate earlier (Schmidt et al. 1988). Little is known about the migration patterns at sea. The presence of alewife 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 alewife began appearing in the 1993 LRS in late June in the upper estuary with the highest density found in the Poughkeepsie region (Figure 4-44). Spatiotemporal distribution of juvenile alewife based on the 1993 BSS shows peak CPUE in the Cornwall region in early July; however, peak densities of juveniles in the FSS occurred further upriver in the Catskill and Saugerties regions and progressed downriver to the Cornwall region by October (Figure 4-45). Few yearling and older alewife were collected in the BSS and FSS gear (Figure 4-46).

Comparing the geographical distribution of juvenile alewife based on the 1993 BSS with previous years (1974-1992), the 1993 distribution of juveniles was generally consistent with the long-term record (Figure 4-47). However, in 1993 a bi-modal, instead of tri-modal, pattern in the distribution was apparent, with peaks in Poughkeepsie and Saugerties. Only a small portion of the population was found in the Tappan Zee region, which historically has contributed to about 20 percent of the population.

Weekly length statistics for alewife juveniles collected in 1993 show steady growth from early July through the end of BSS/FSS collections in November (Figure 4-48, Appendix Tables D-14 and D-15).

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 70-80 miles offshore, little is known about the oceanic migration patterns. The presence of blueback herring and alewife 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. Blueback herring grow to a maximum length of 15 in. and a weight of about 1 lb and live for up to 8 or 9 years (Scott and Crossman 1973).

Within a month of hatching the young blueback herring assume adult characteristics and are about 0.5 in. long. Juvenile blueback herring remain in upper estuaries throughout the summer. During this period they are about 10 times more abundant than juvenile alewife. Juvenile blueback herring grow more slowly than juvenile alewife 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).

In the Hudson River during 1993, 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 began appearing in the 1993 BSS and FSS in early July, with collections gradually increasing in downriver regions by October, reflecting the downriver migration (Figure 4-50). Few yearling and older blueback herring were collected in the BSS and FSS gear (Figure 4-51).

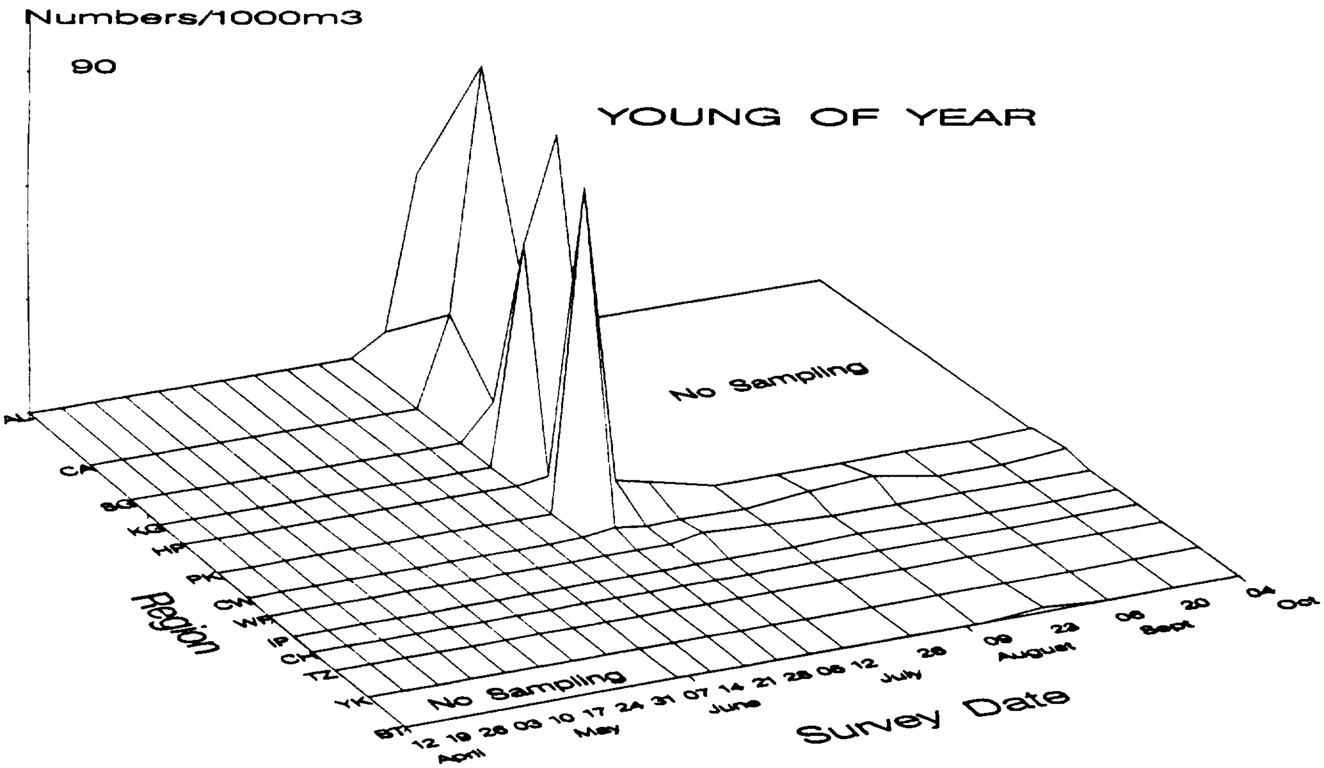


Figure 4-44. Spatiotemporal distribution of young-of-year alewife in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

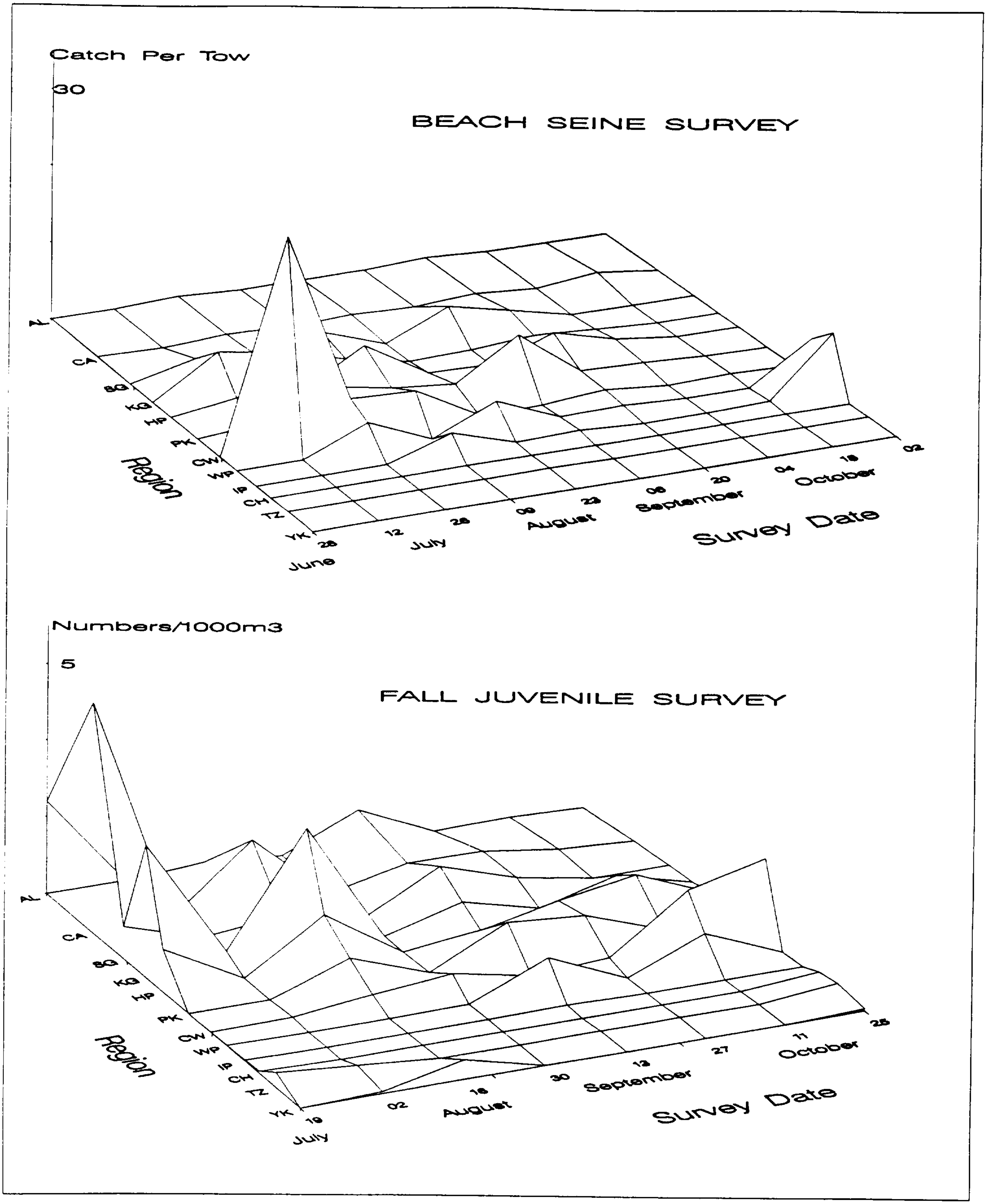


Figure 4-45. Spatiotemporal distribution of young-of-year alewife in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine surveys.

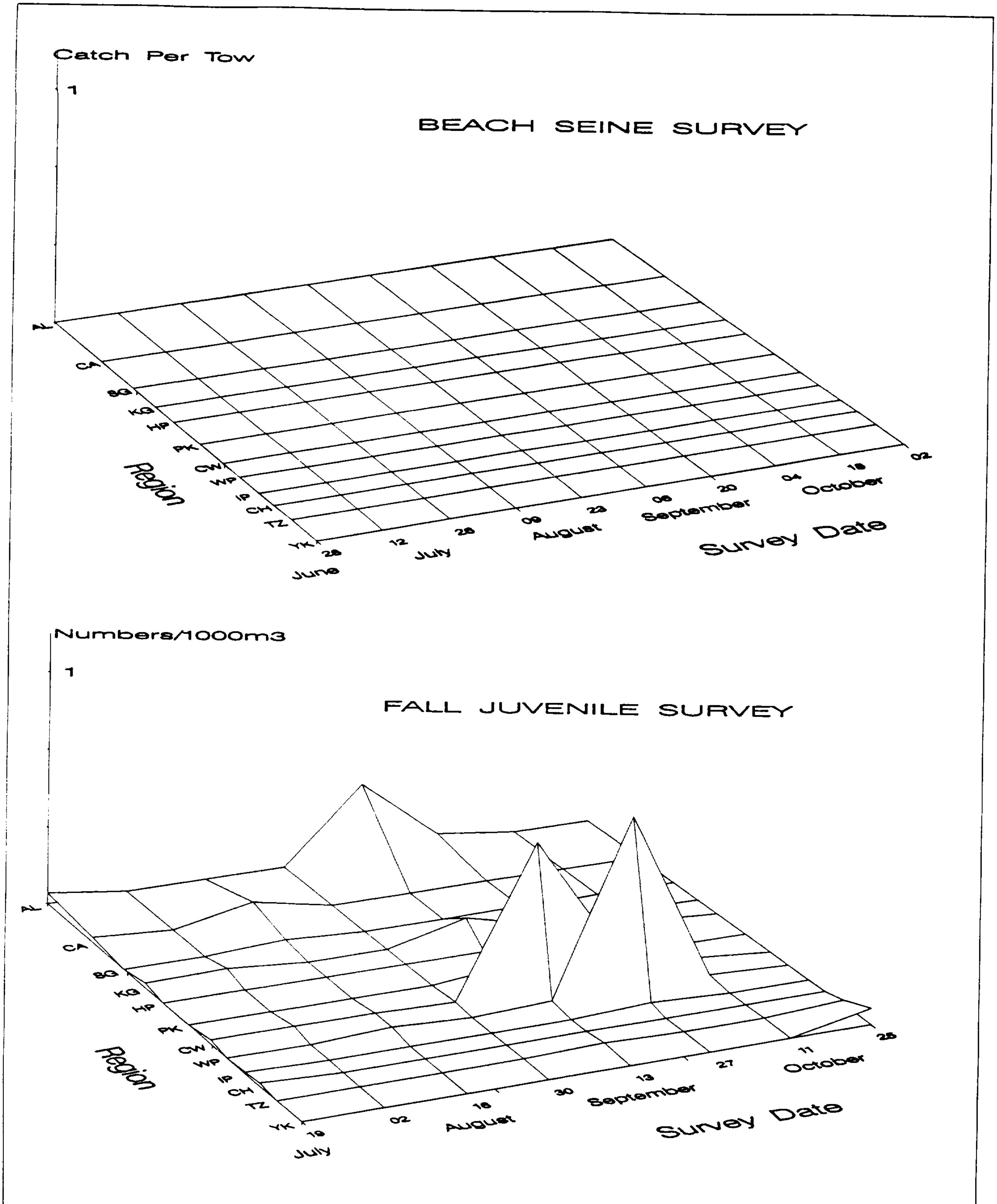


Figure 4-46. Spatiotemporal distribution of yearling and older alewife in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

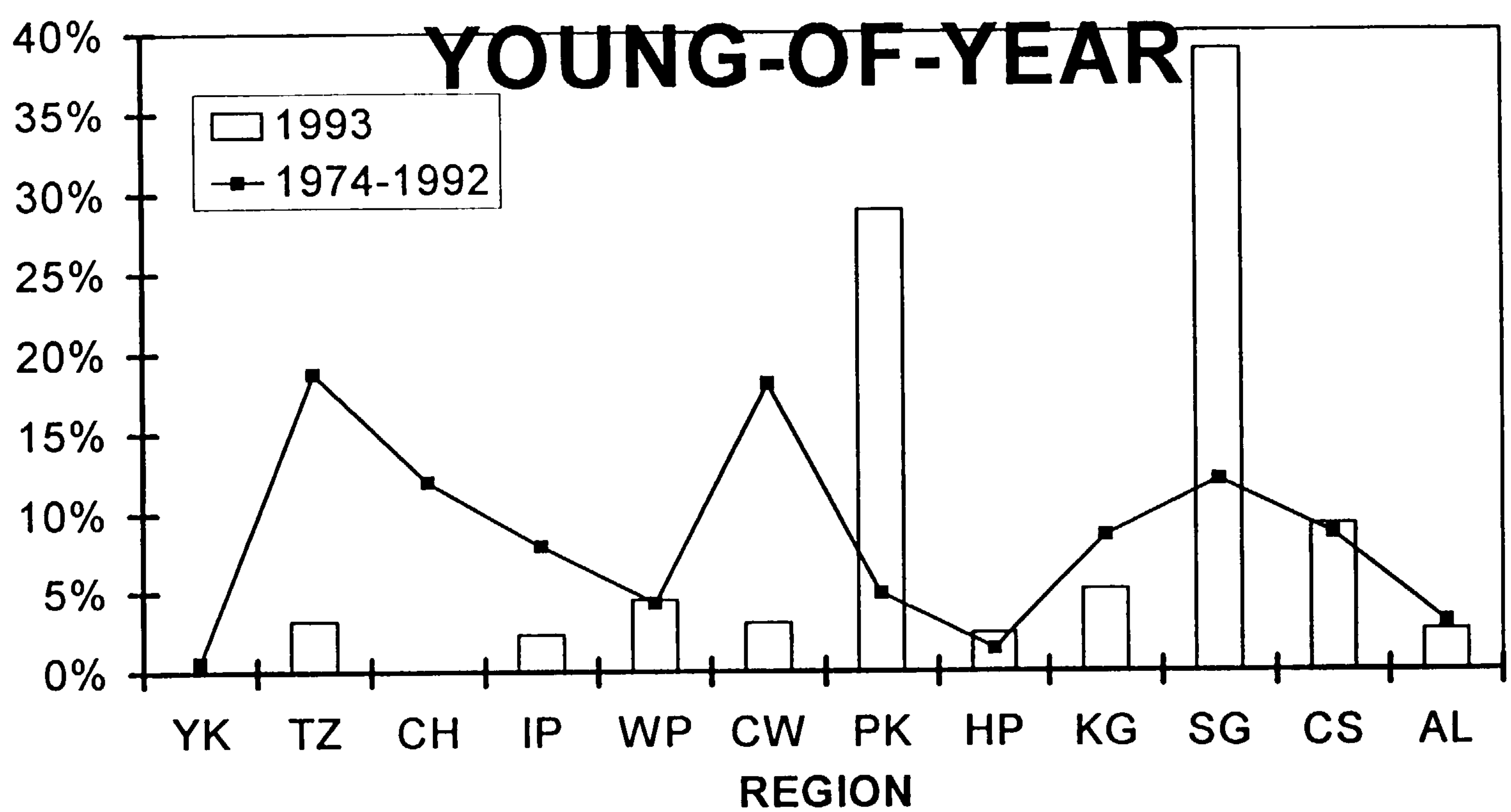


Figure 4-47. Geographical distribution indices for young-of-year alewife collected during Beach Seine surveys of the Hudson River estuary, 1974-1993.

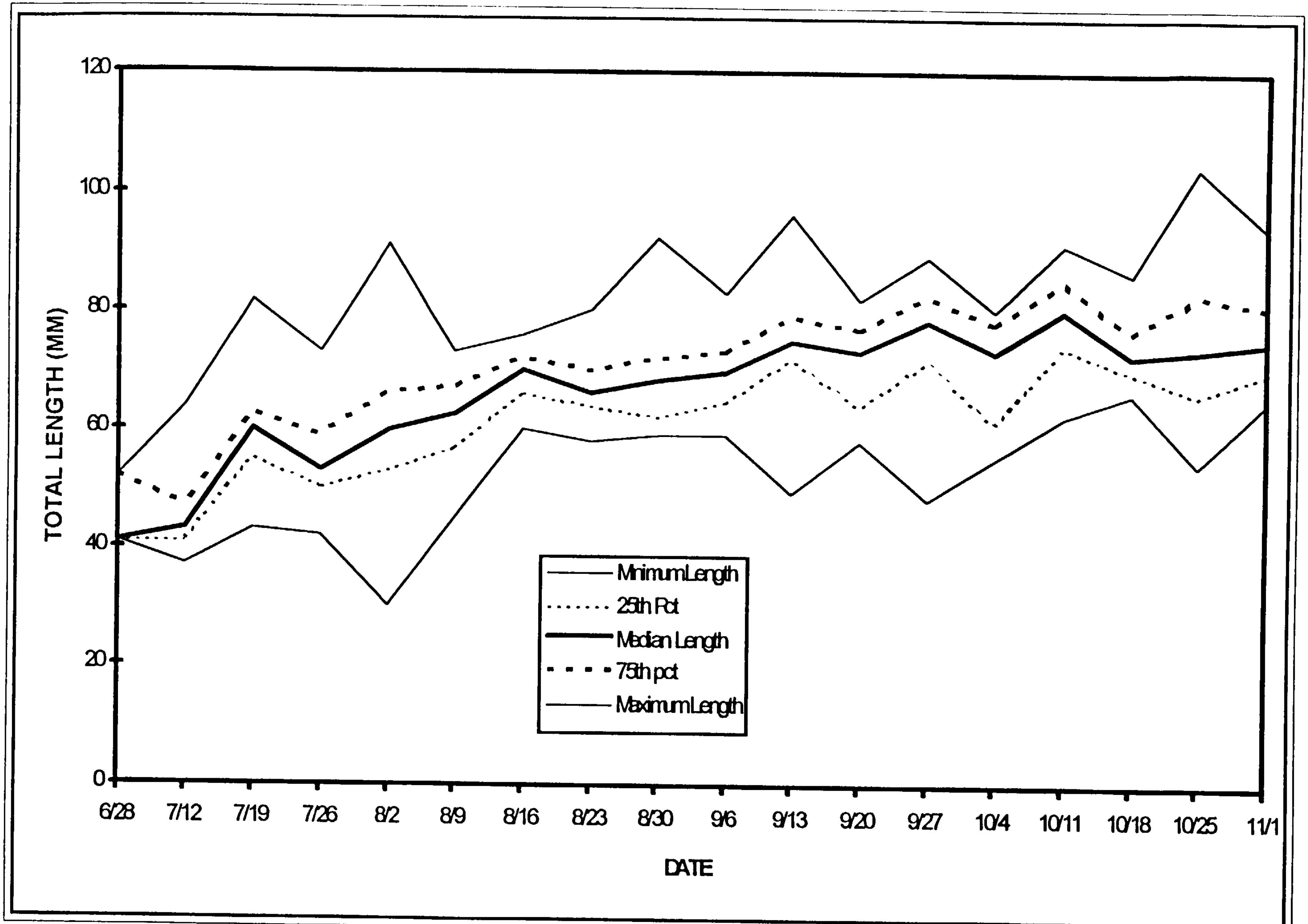


Figure 4-48. Weekly length statistics for alewife young-of-year in the Hudson River estuary, 1993.

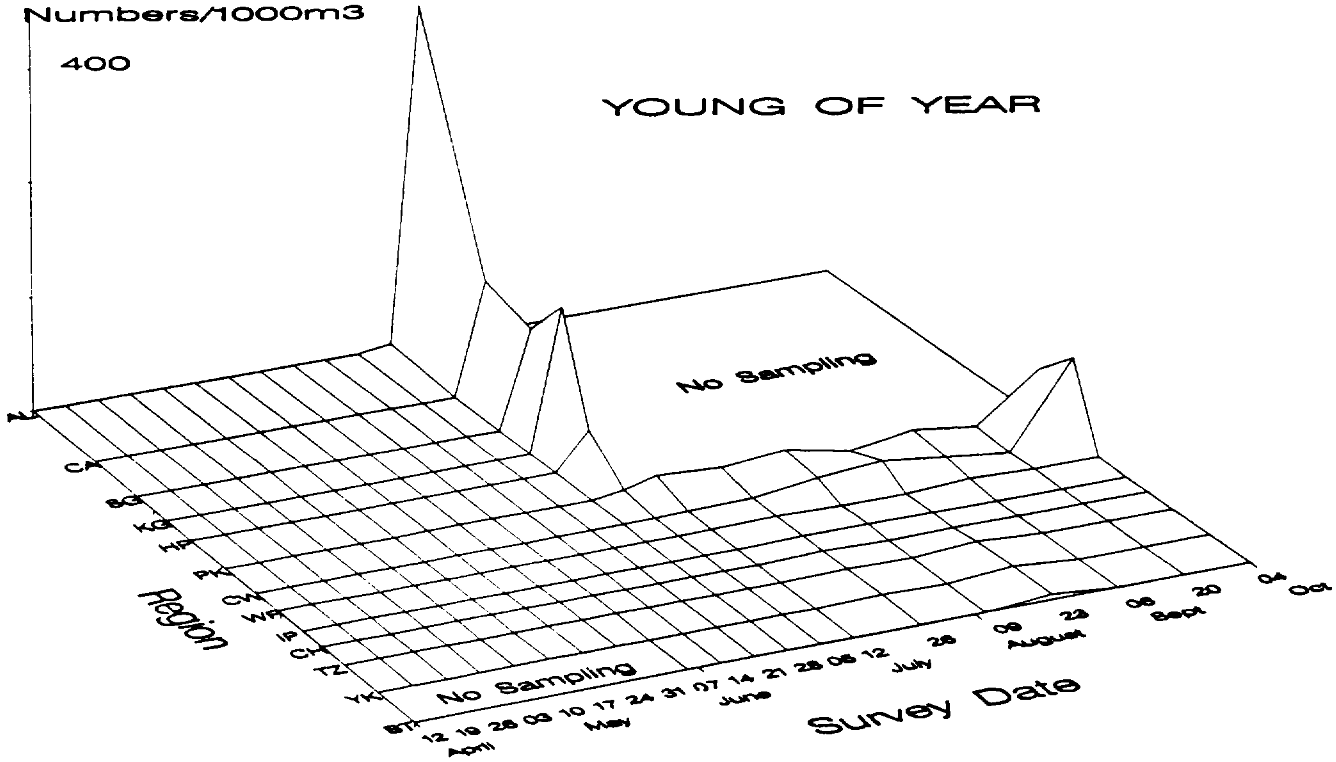


Figure 4-49. Spatiotemporal distribution of young-of-year blueback herring in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

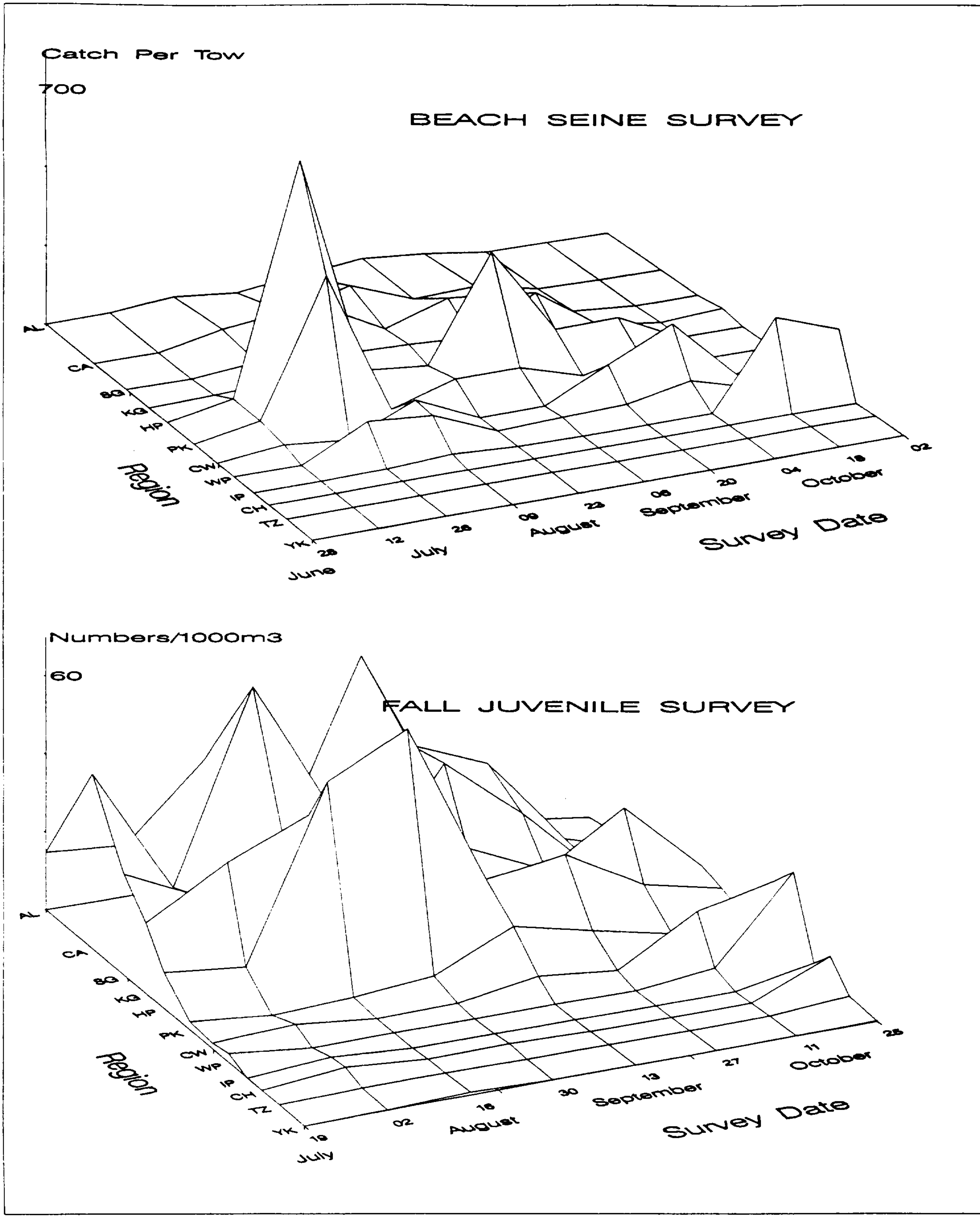


Figure 4-50. Spatiotemporal distribution of young-of-year blueback herring in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

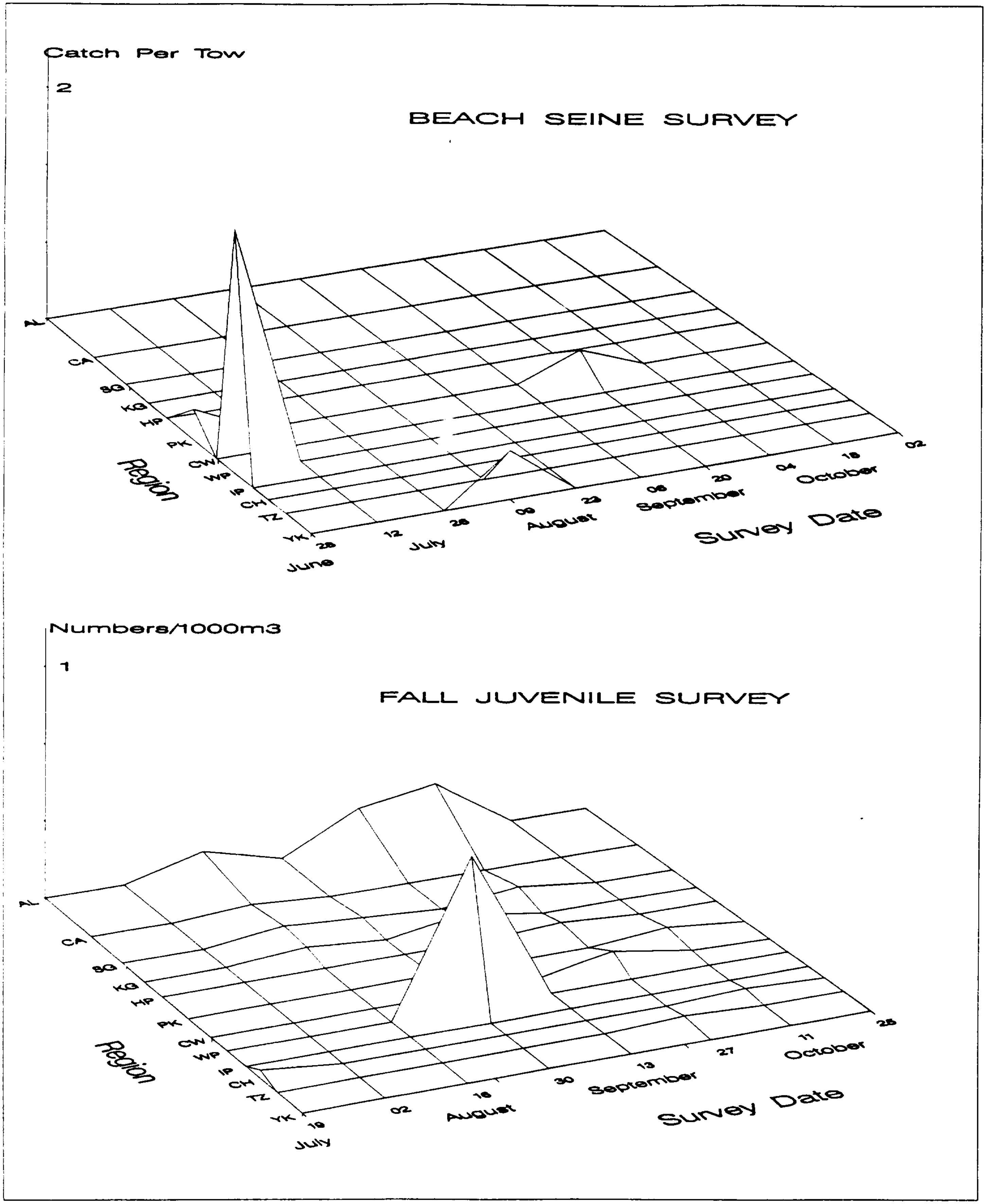


Figure 4-51. Spatiotemporal distribution of yearling and older blueback herring in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

Comparing the geographical distribution of juvenile blueback herring based on the 1993 BSS with previous years (1974-1992), the 1993 distribution of juveniles was consistent with the long-term record, with a slightly higher proportion of the population caught in the Cornwall and Saugerties regions than in previous years (Figure 4-52).

Weekly length statistics for juvenile blueback herring collected in 1993 show slow but steady growth from early July through mid-September and little change in size by the end of BSS/FSS collections in November (Figure 4-53, Appendix Tables D-16 and D-17).

4.10 GIZZARD SHAD

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. 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 10-14 in. and 1-3 lb in weight (Miller 1960).

Gizzard shad spawn when the water temperature reaches 50-70°F (April-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 from 1-1/2 to 7 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 5 or 6 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 7 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). Young gizzard shad are eaten by most predatory fish, but adults are generally too large to be eaten easily.

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 1993 BSS and FSS, except during mid-August beach seine collections in the

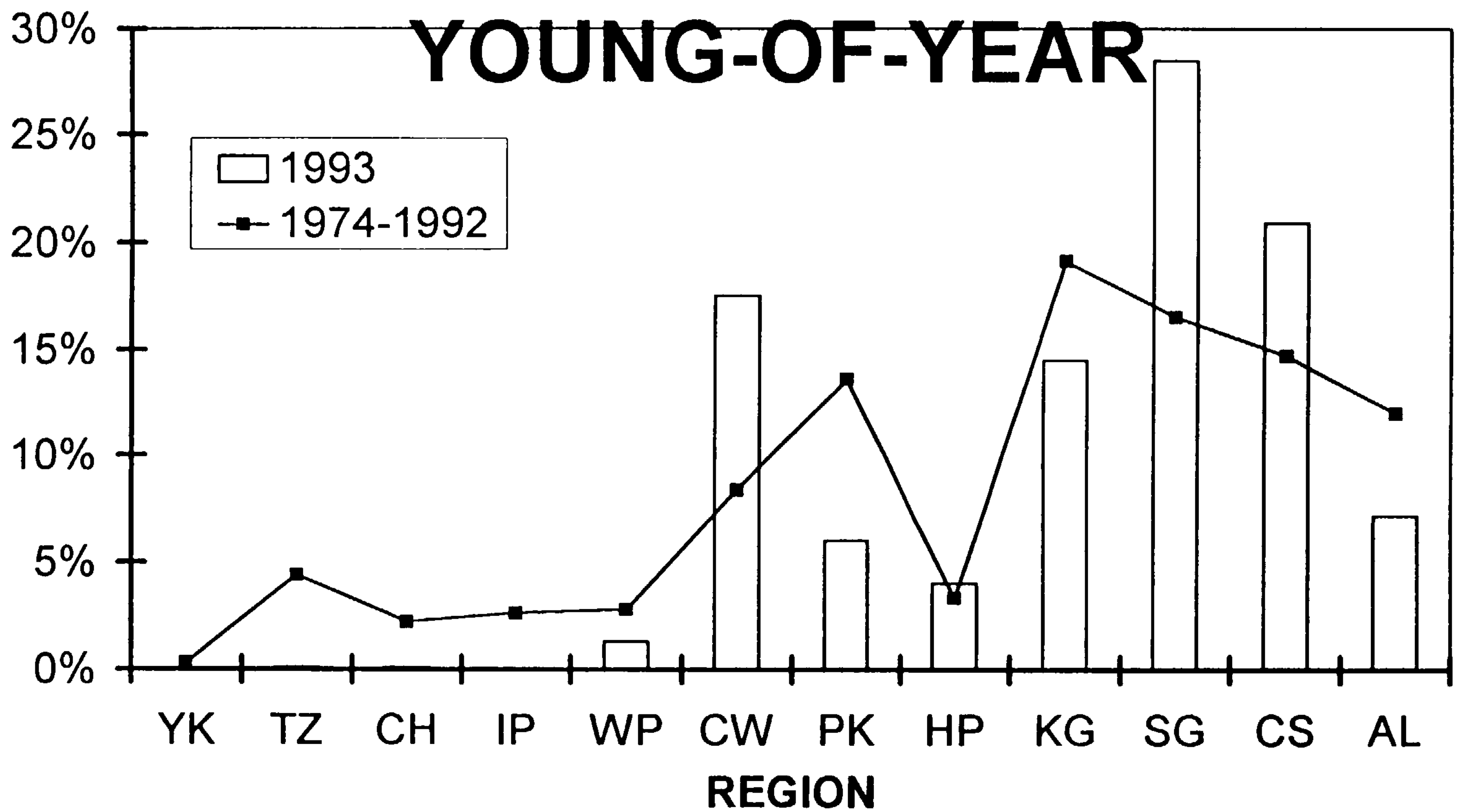


Figure 4-52. Geographical distribution indices for young-of-year blueback herring collected during Beach Seine surveys of the Hudson River estuary, 1974-1993.

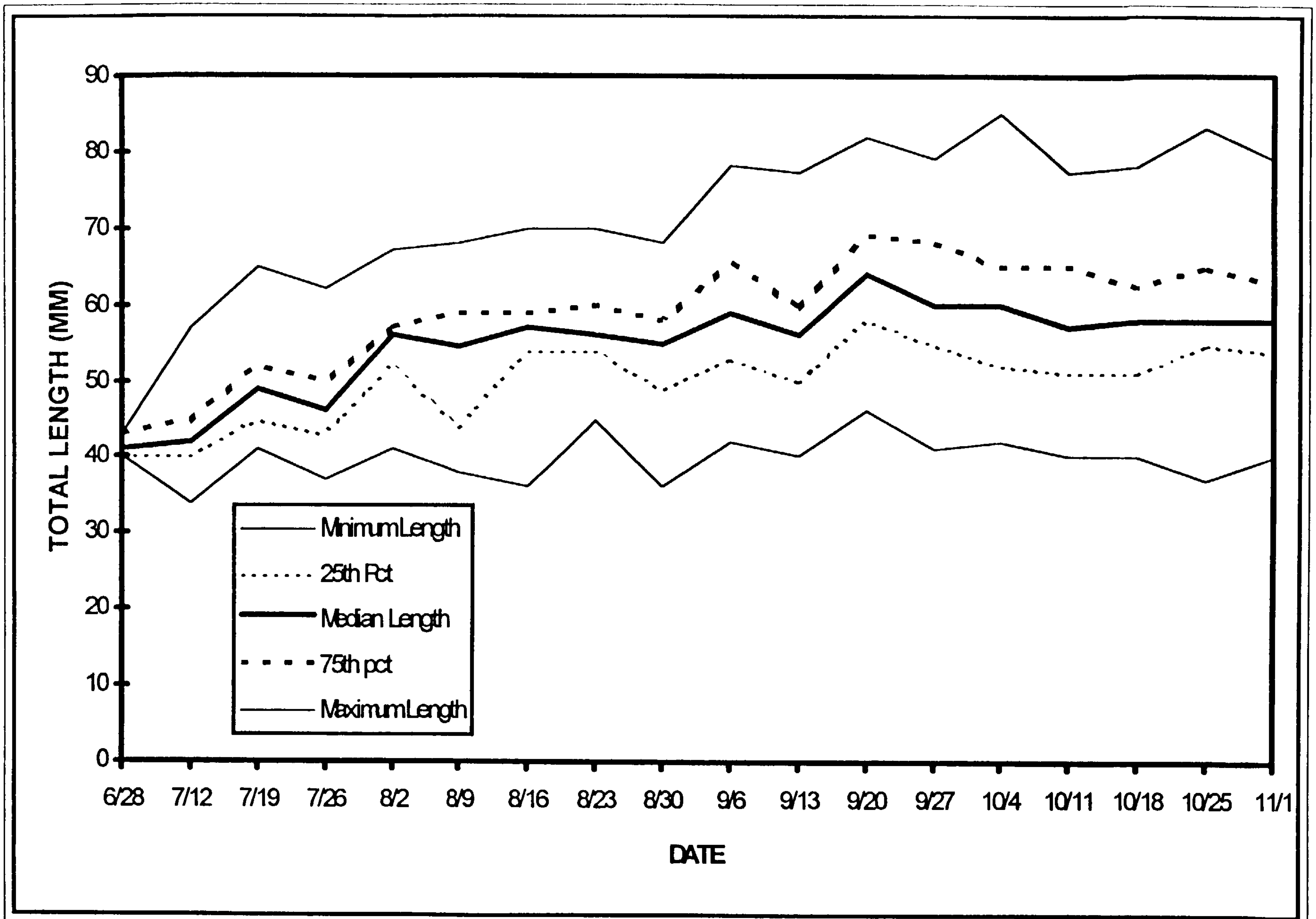


Figure 4-53. Weekly length statistics for blueback herring young-of-year in the Hudson River estuary, 1993.

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 1993 were collected in beach seines in the Hyde Park region (Figure 4-55).

Comparing both juvenile and yearling and older distributions of gizzard shad during 1993 with the long-term record (1974-1992) is difficult as few gizzard shad were collected in 1993 (Figure 4-56). Gizzard shad were primarily distributed in the middle Hudson River (Poughkeepsie and Hyde Park) whereas in the long-term record there also was an upriver distribution in the Kingston through Albany regions.

4.11 RAINBOW SMELT

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 Adirondack 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 rainbow 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 7-8 in. in total length, but occasionally reach lengths of 13-14 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 7,000 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 1993 rainbow smelt eggs were found on only two occasions in the ichthyoplankton catches, one from the Albany and one from the Croton-Haverstraw regions (Figure 4-57). Rainbow smelt eggs hatch in about a week to almost a month, depending on temperature, and historically, eggs have been present in the Hudson River ichthyoplankton catches for about 2 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 1993, YSL were abundant in early May and were found from the Albany through Indian Point regions (Figure 4-57). The yolk-sac is absorbed when the fish are about

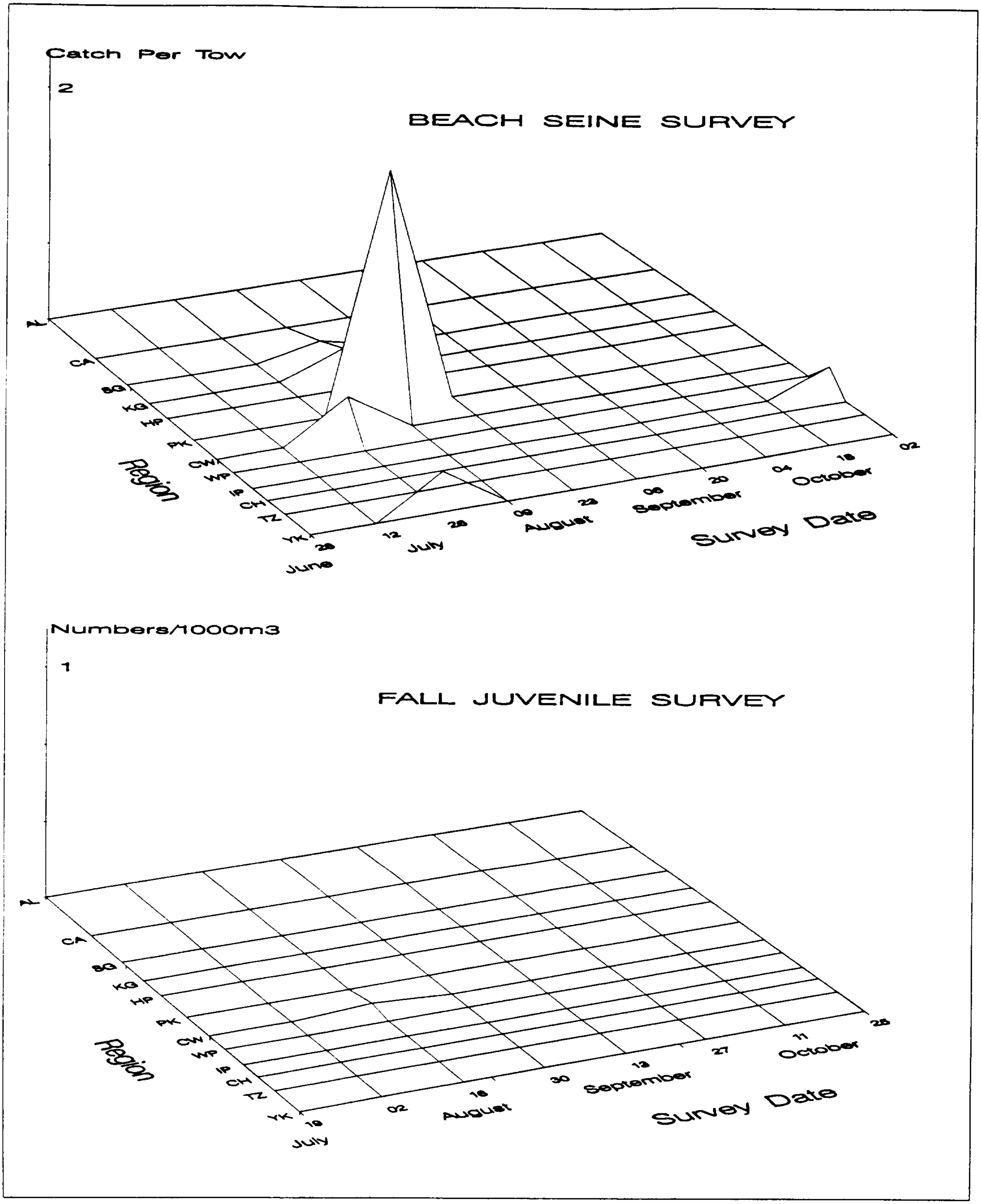


Figure 4-54. Spatiotemporal distribution of young-of-year gizzard shad in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

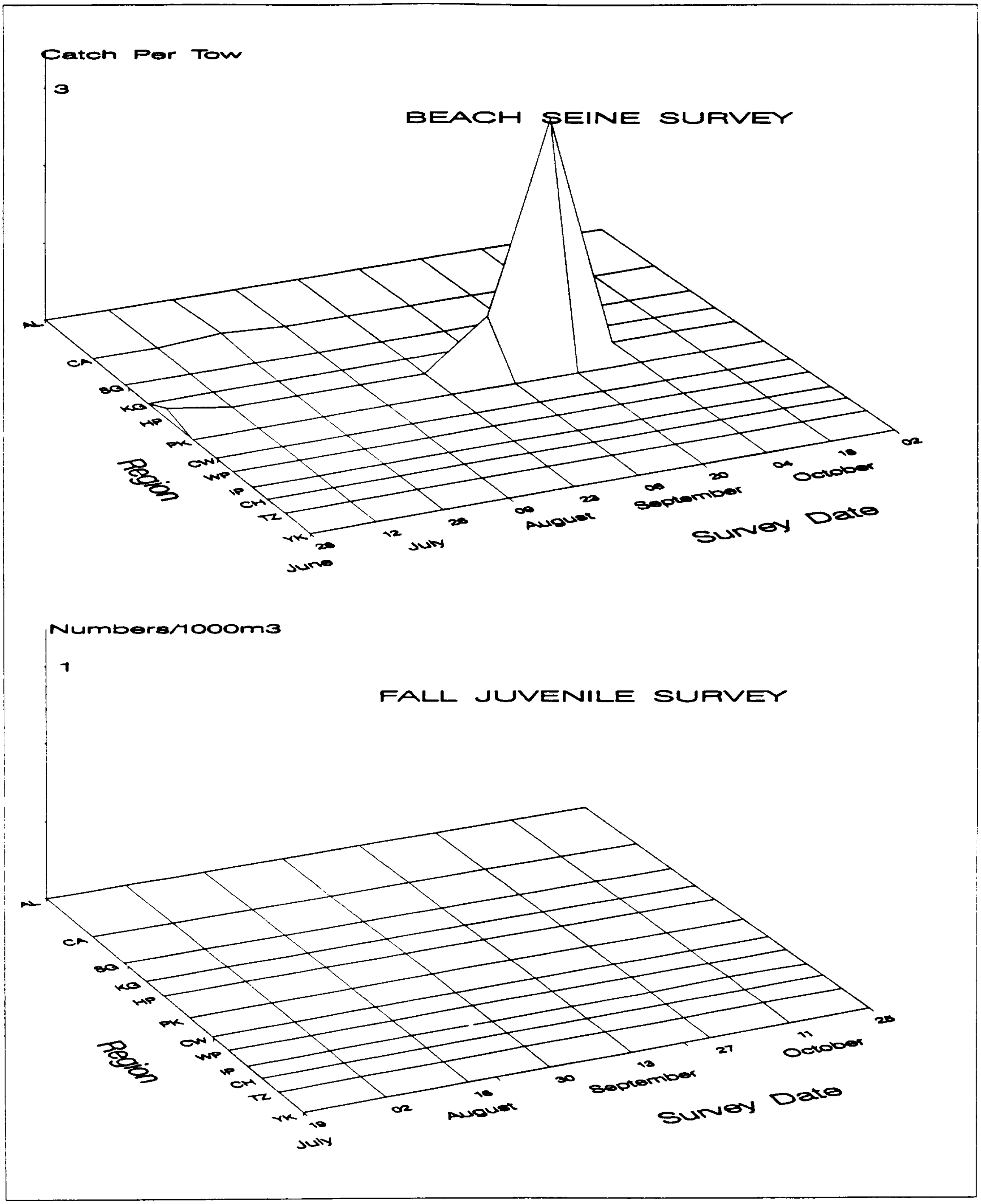
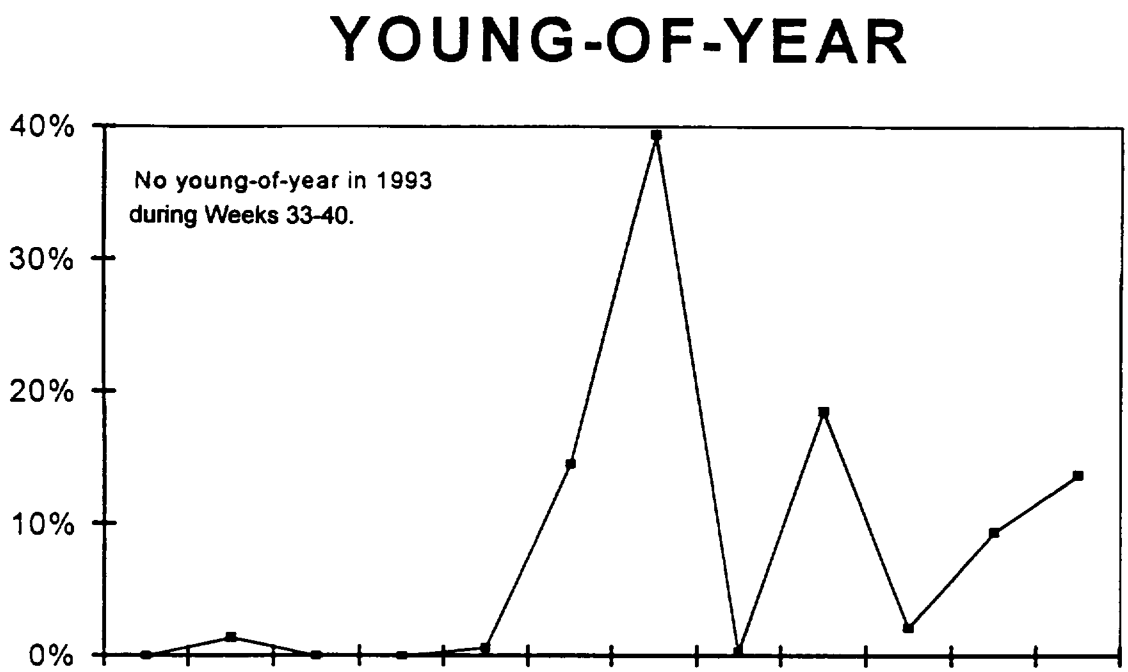


Figure 4 – 55. Spatiotemporal distribution of yearling and older gizzard shad in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.



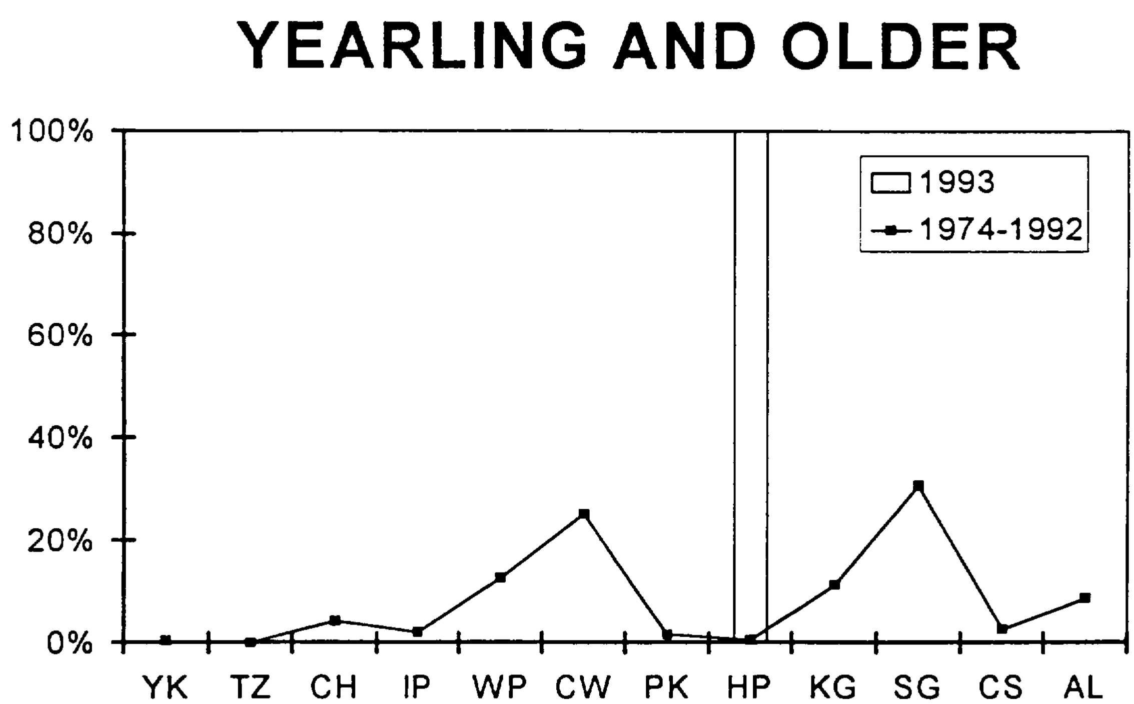
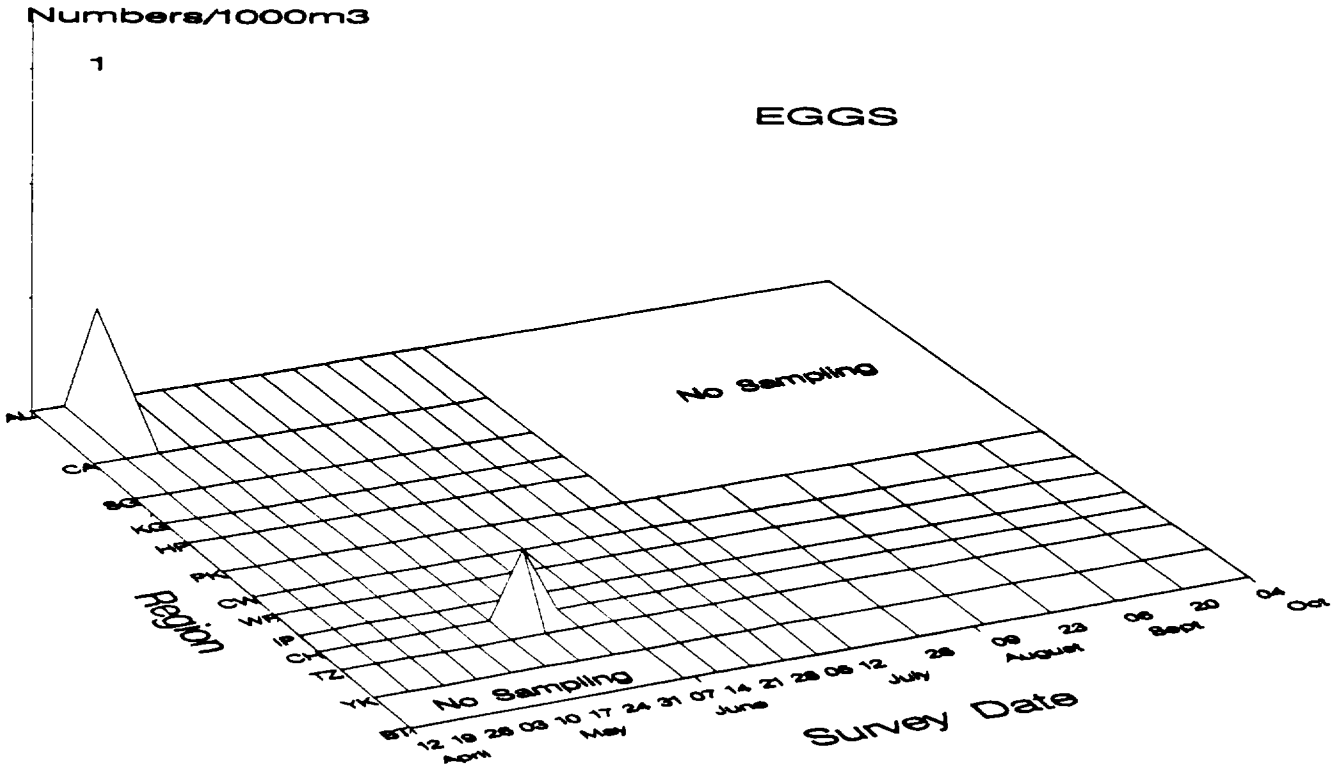


Figure 4-56 Geographical distribution indices for gizzard shad collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1993.



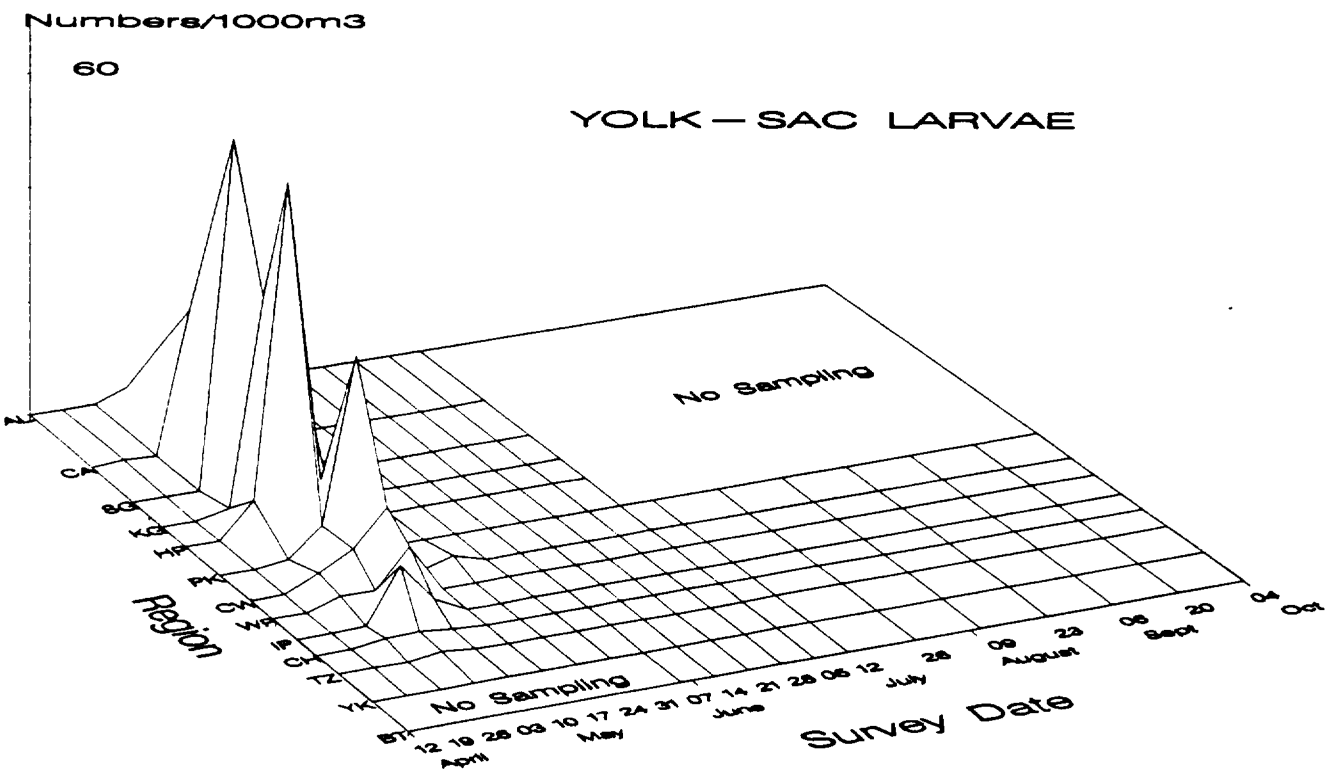


Figure 4–57. Spatiotemporal distribution of egg and yolk–sac stages of rainbow smelt in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

1/4 in. in length. In 1993 PYSL were commonly found from the Kingston through Tappan Zee regions (Figure 4-58), and were abundant from mid-May into July. 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 1993 LRS catches from mid-June through September (Figure 4-58). Juvenile smelt are exceedingly slender and nearly transparent. At about 3/4 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 1993 BSS and FSS collections where beach seines conducted during the day collected very few rainbow smelt and fall shoals sampling conducted at night collected juveniles primarily in the West Point through Poughkeepsie regions (Figure 4-59). By late summer the young smelt leave the estuary. The few yearling and older rainbow smelt collected in the 1993 FSS were found in the middle estuary between Indian Point and Hyde Park (Figure 4-60).

Comparing the temporal distribution of early life stages of rainbow smelt in 1993 with previous years (1974-1992), the 1993 distributions of the larval stages closely paralleled the long-term record (Figure 4-61). Most YSL were collected in early May, PYSL were found throughout May and June, and YOY were prevalent in late June.

The geographical distribution of rainbow smelt early stages during 1993 was generally consistent with the long-term record (Figure 4-62). The single egg collection in 1993, however, was from the Croton-Haverstraw region, rather than in the Saugerties through Albany regions. The peak distributions for PYSL and YOY were slightly downriver of the historical peak distribution, but still evenly distributed in the middle and lower estuary. The 1993 geographical distribution of YOY and yearling and older rainbow smelt in the FSS was very consistent with the long-term trend of greatest distribution in the mid-Hudson River regions except that more fish were found upriver in the Poughkeepsie rather than Cornwall region in 1993 (Figure 4-63).

4.12 HOGCHOKER

Hogchoker (*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. Hogchoker reach a length of 2-3 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 hogchoker 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 hogchoker to Atlantic coastal populations is unknown.

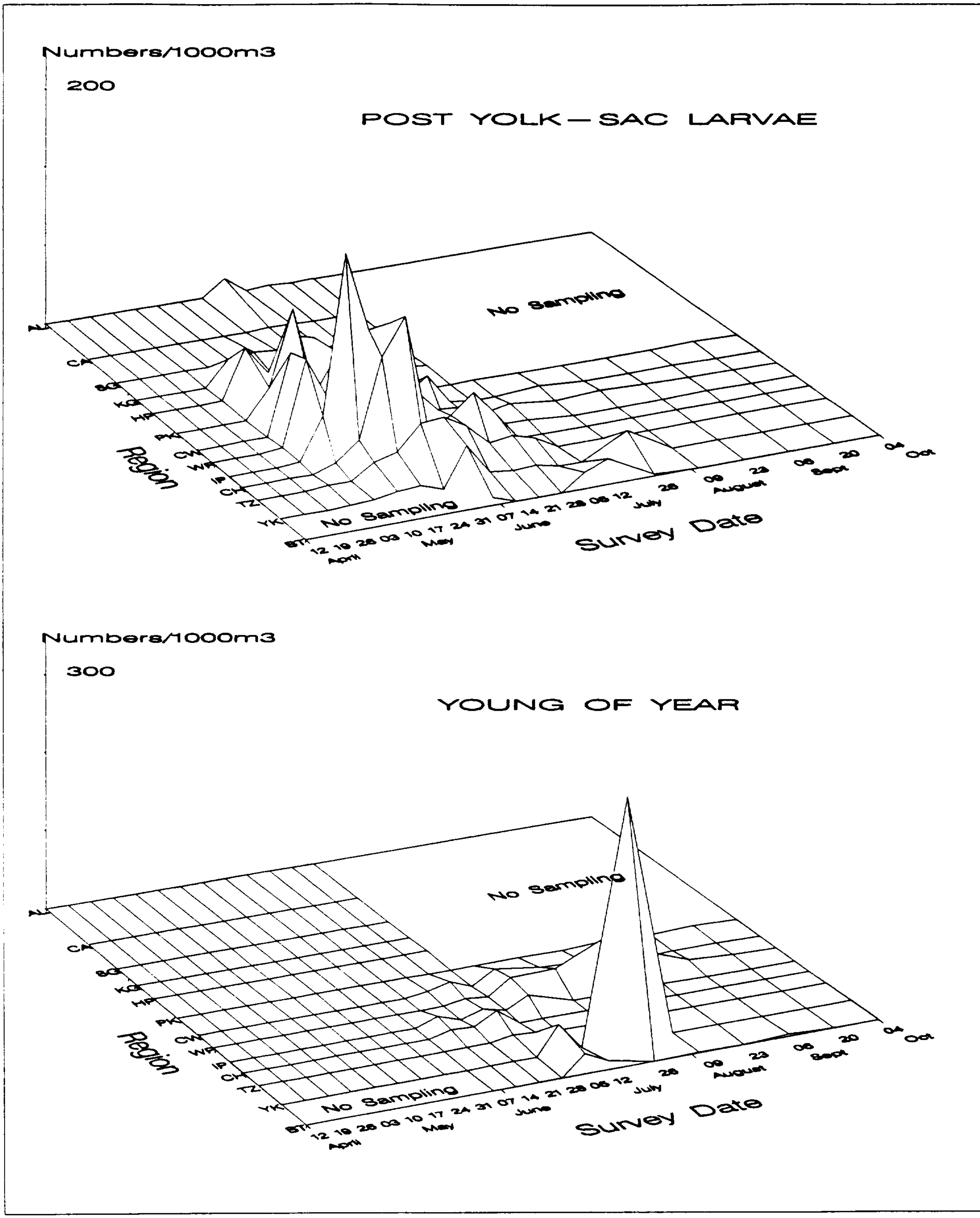
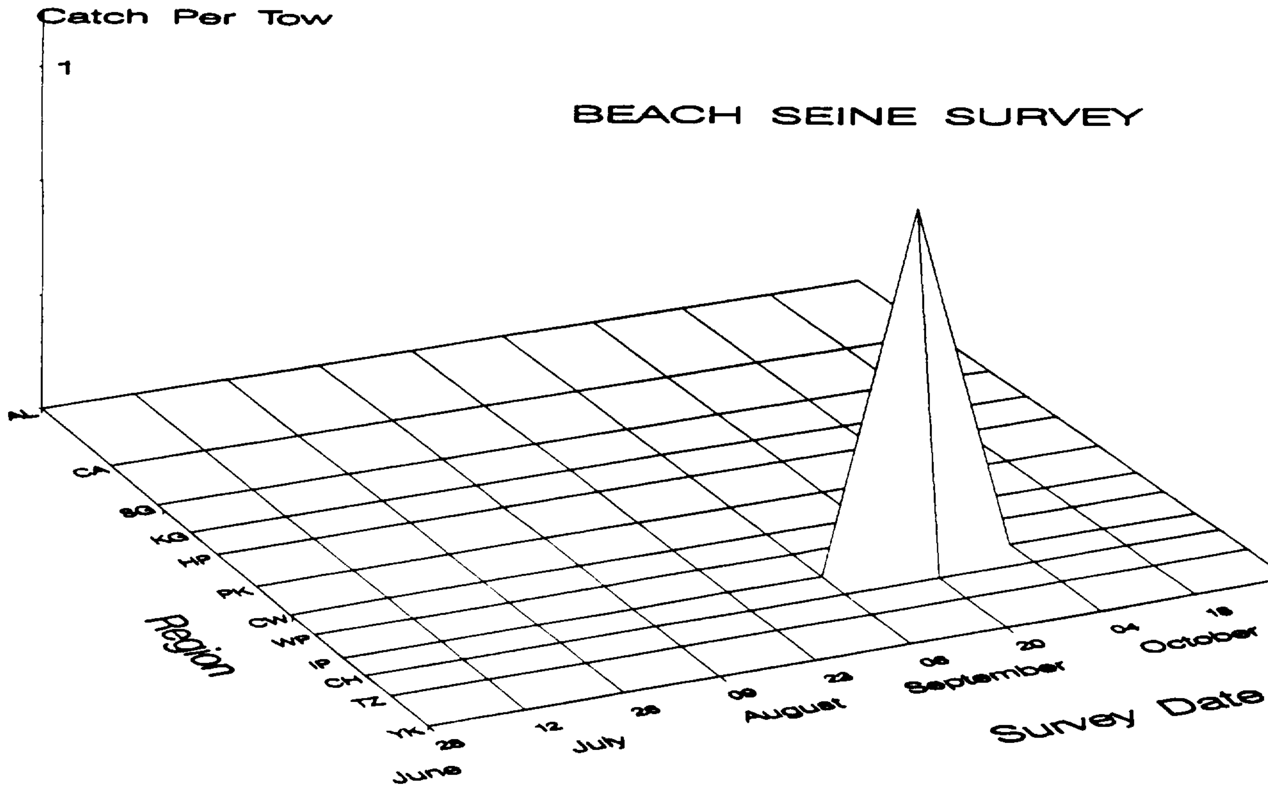


Figure 4-58. Spatiotemporal distribution of post yolk-sac and young-of-year stages of rainbow smelt in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.



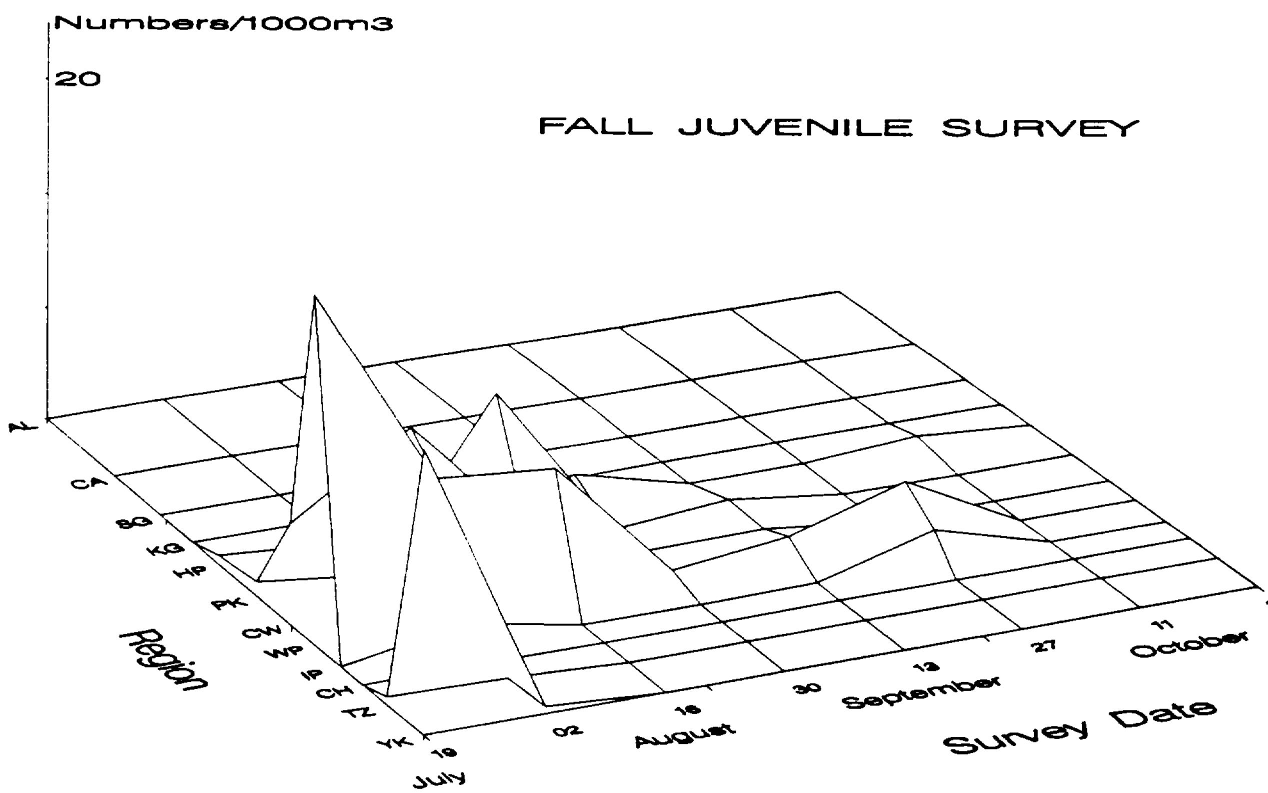


Figure 4-59. Spatiotemporal distribution of young-of-year rainbow smelt in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

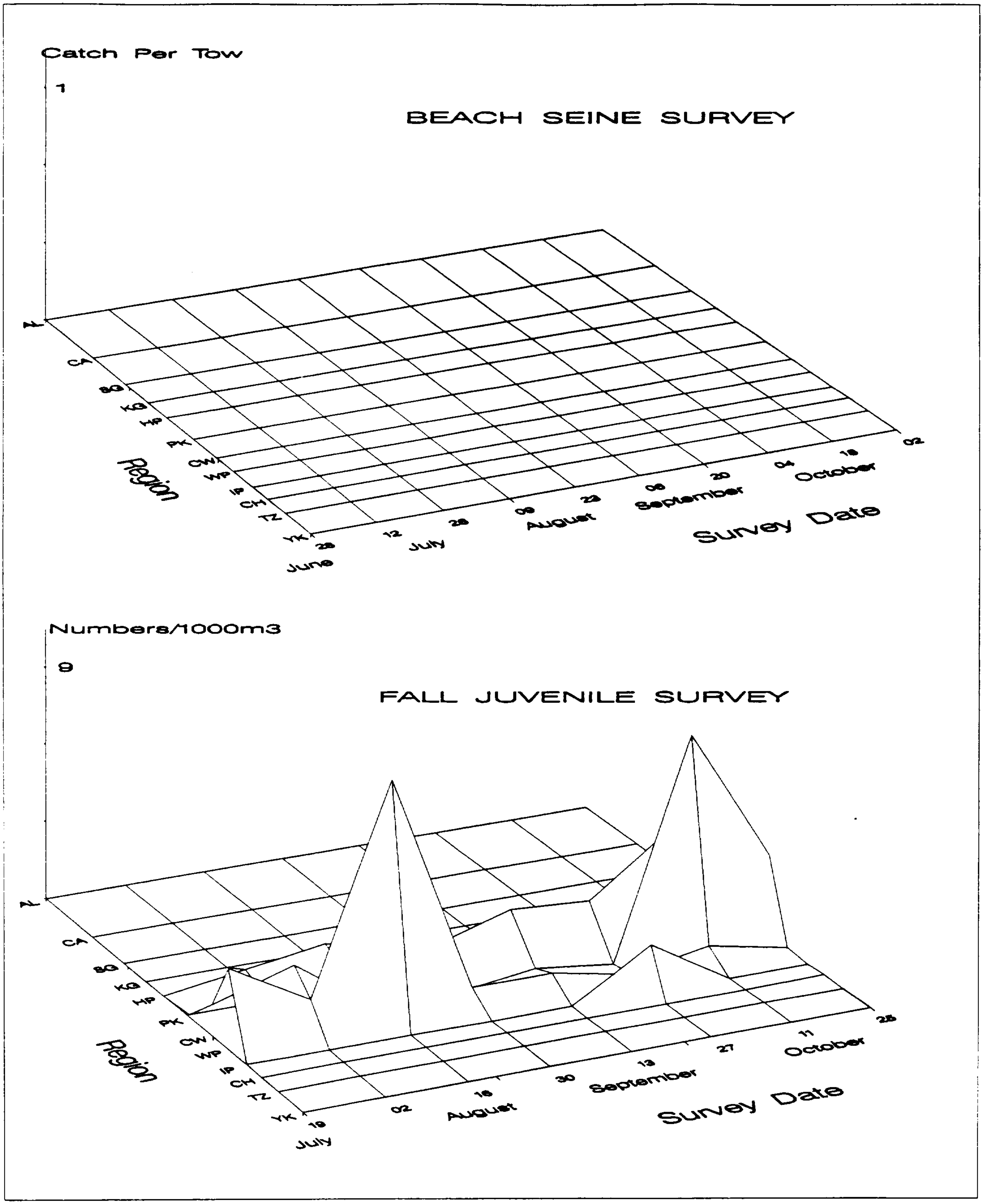


Figure 4–60. Spatiotemporal distribution of yearling and older rainbow smelt in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

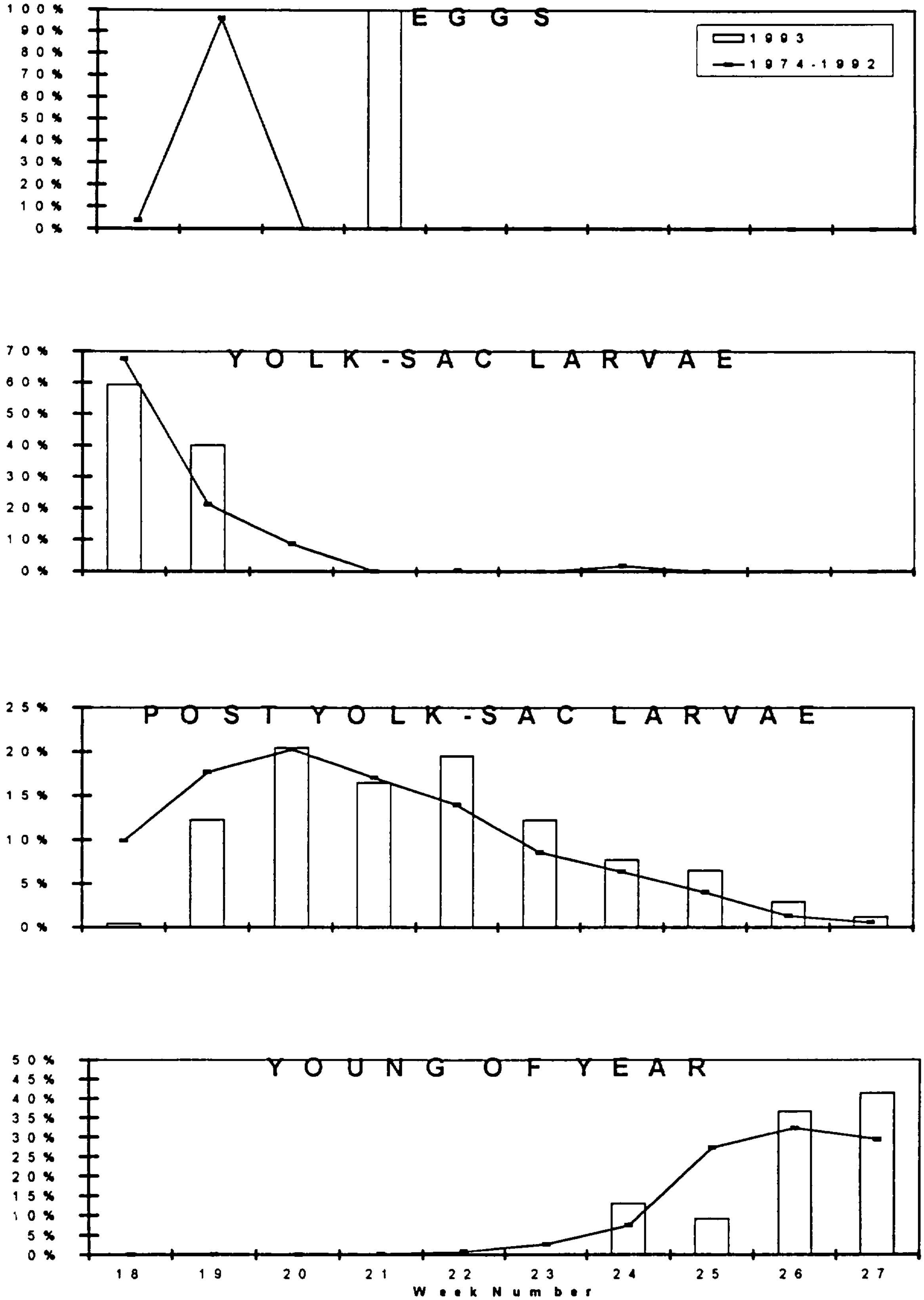


Figure 4-61 Temporal distribution indices for early life stages of rainbow smelt collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1993.

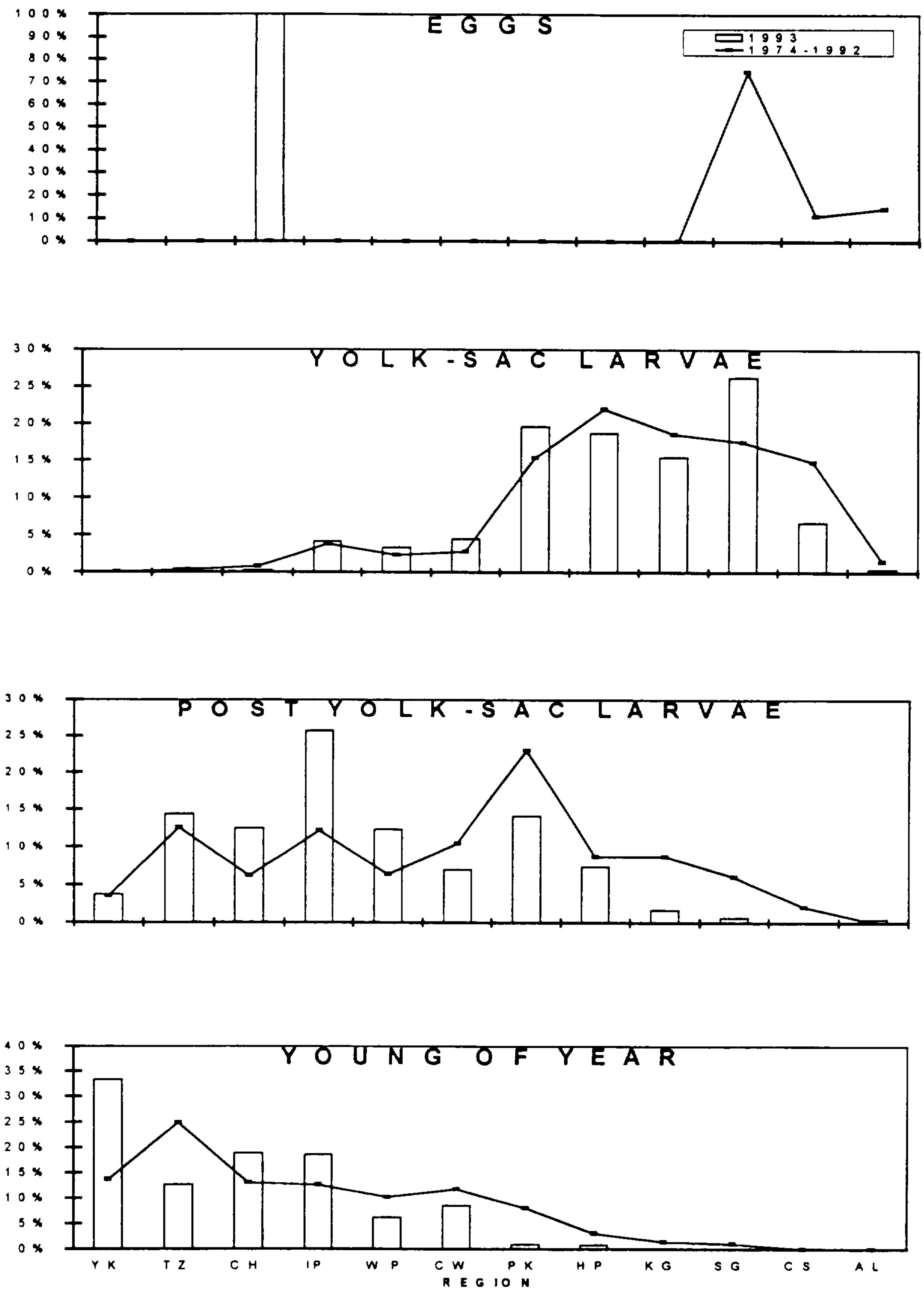


Figure 4-62 Geographical distribution indices for early life stages of rainbow smelt collected during Longitudinal River Ichthyoplankton Surveys of the Hudson River Estuary, 1974 - 1993.

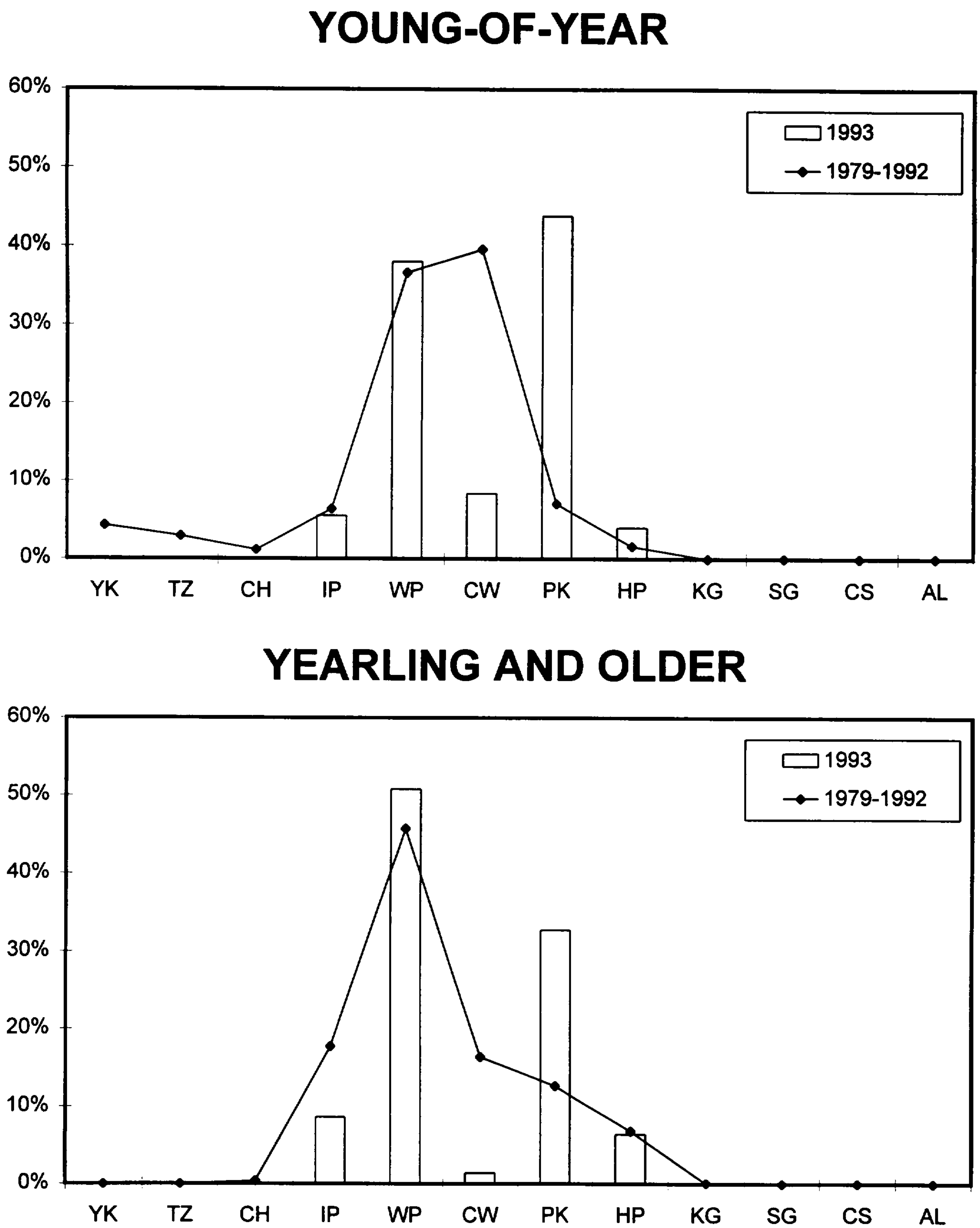


Figure 4-63. Geographical distribution indices for young-of-year and yearling and older rainbow smelt collected during Fall Shoals surveys of the Hudson River estuary, 1979 - 1993.

Individual hogchoker 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 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 1993 hogchoker eggs were collected primarily in the Yonkers and Battery regions from mid-June through August (Figure 4-64).

After hatching, the YSL 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 hogchoker were recorded in the LRS during 1993 (Figure 4-65). Generally low numbers of juvenile hogchoker were collected in the catches of the monitoring program from mid-July through late October (Figure 4-66). However, during 1993 yearling and older hogchoker were abundant, particularly in FSS collections from Yonkers through Poughkeepsie (Figure 4-67).

The 1993 geographical distribution of YOY and yearling and older hogchoker in the FSS is generally consistent with the long-term trend (1979-1992), except that the peak of juveniles occurred in the Croton-Haverstraw region compared to the long-term record where the juvenile distribution is more evenly distributed in the middle estuary (Figure 4-68). About 30 percent of the yearling and older hogchoker are found in the Tappan Zee region.

In the Hudson River, hogchoker 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. Hogchoker feed near the bottom on a variety of benthic invertebrates, including annelid worms and smaller crustaceans.

4.13 SPOTTAIL SHINER

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).

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 shiner 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 shiner appear in the ichthyoplankton samples from the upper, freshwater regions of the estuary during May. Spottail shiner produce from 100 to 2,600 eggs, depending upon the age and size of the female. Very few eggs and larvae have been collected during the LRS, 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 1993, no eggs or YSL and very few PYSL and juveniles were collected in the LRS (Figures 4 69 and 4-70). Juvenile spottail shiner first appeared in the BSS during late June and were most

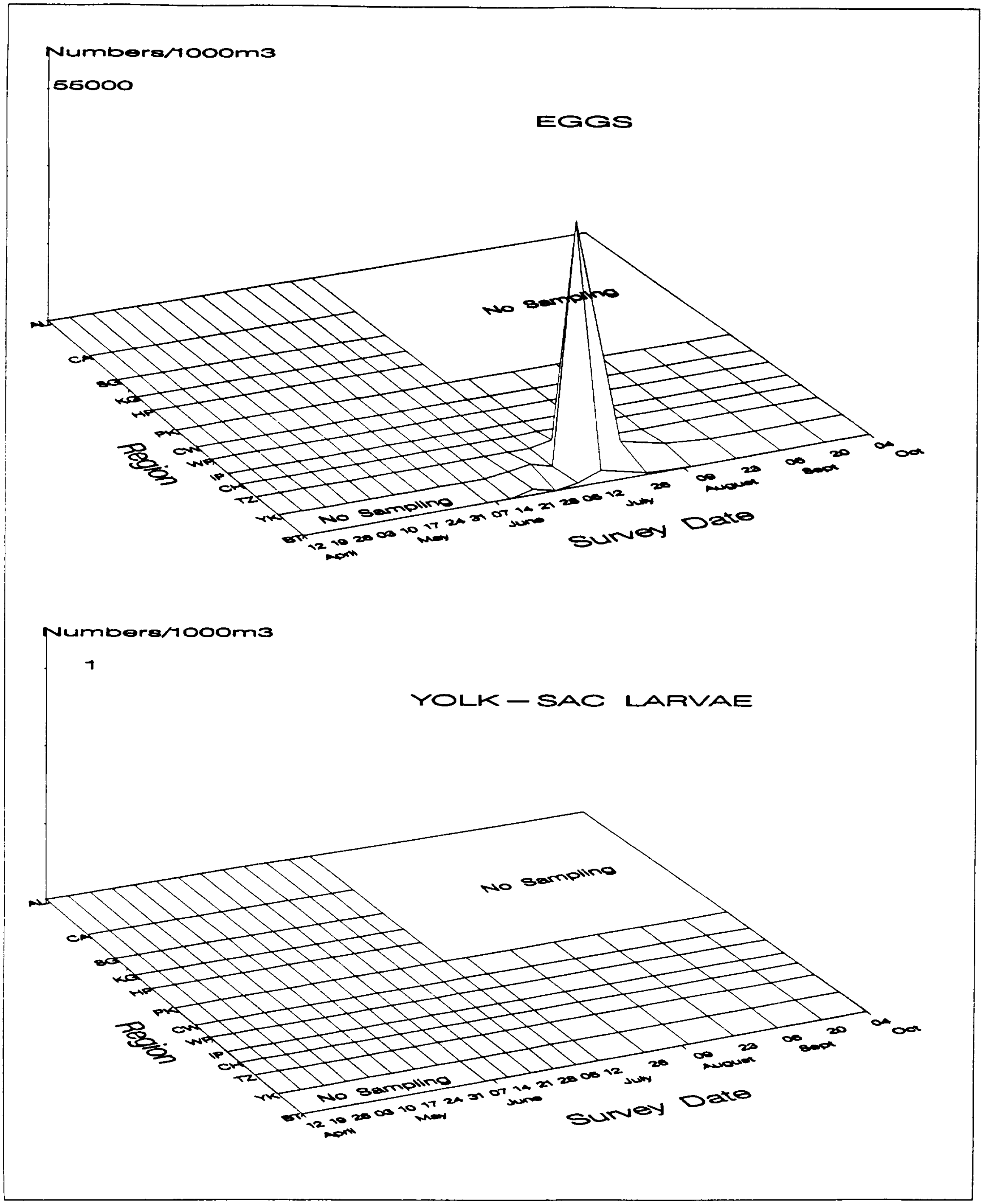
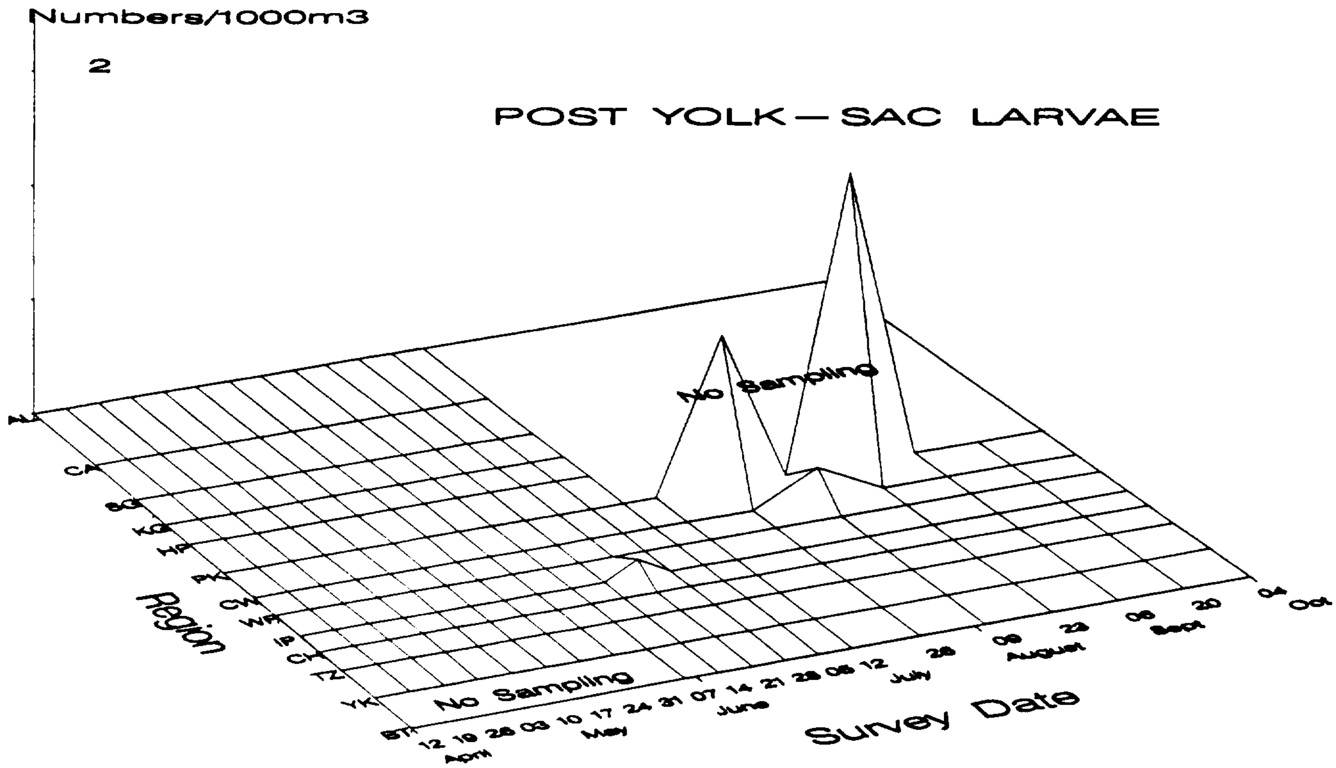


Figure 4 – 64. Spatiotemporal distribution of egg and yolk – sac stages of hogchoker in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.



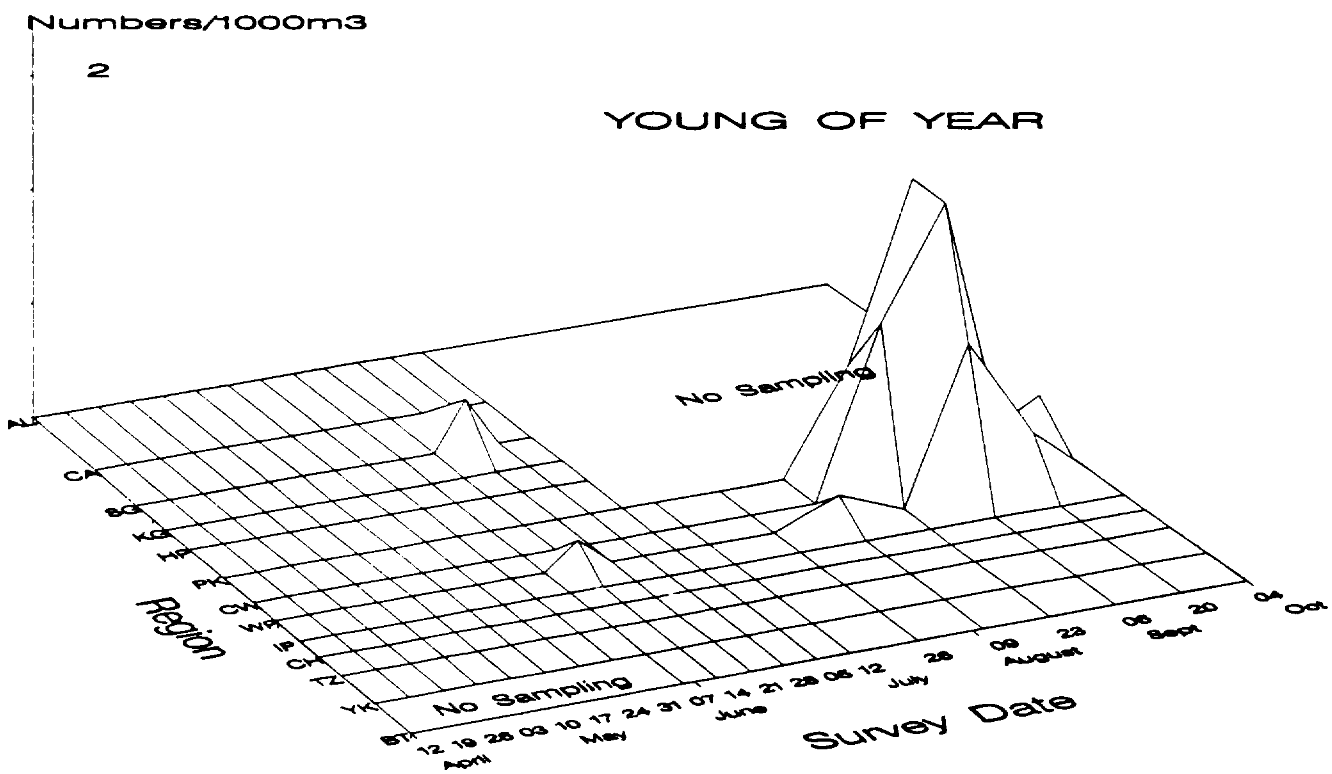


Figure 4-65. Spatiotemporal distribution of post yolk-sac and young-of-year stages of hogchoker in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

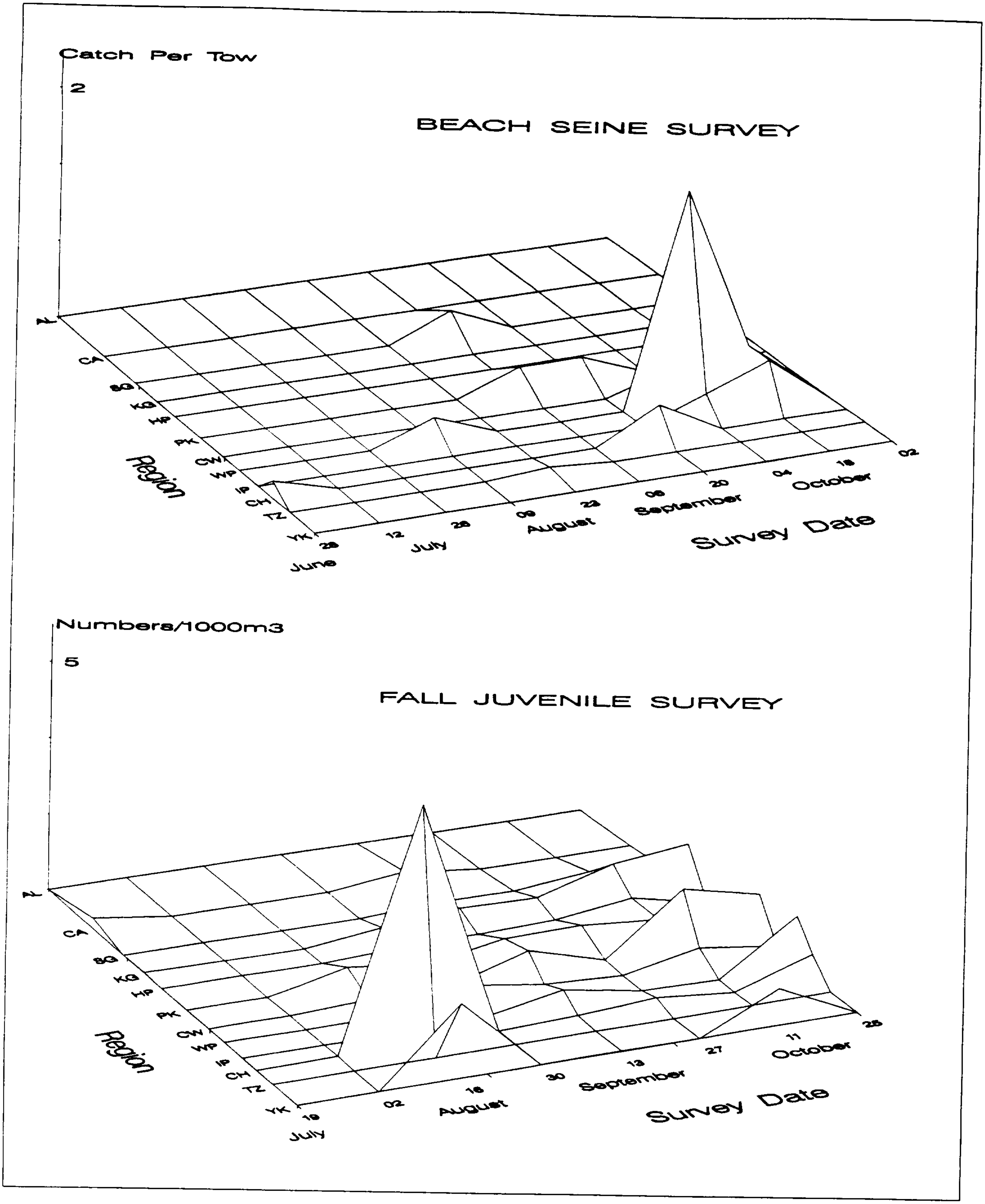


Figure 4–66. Spatiotemporal distribution of young–of–year hogchoker in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

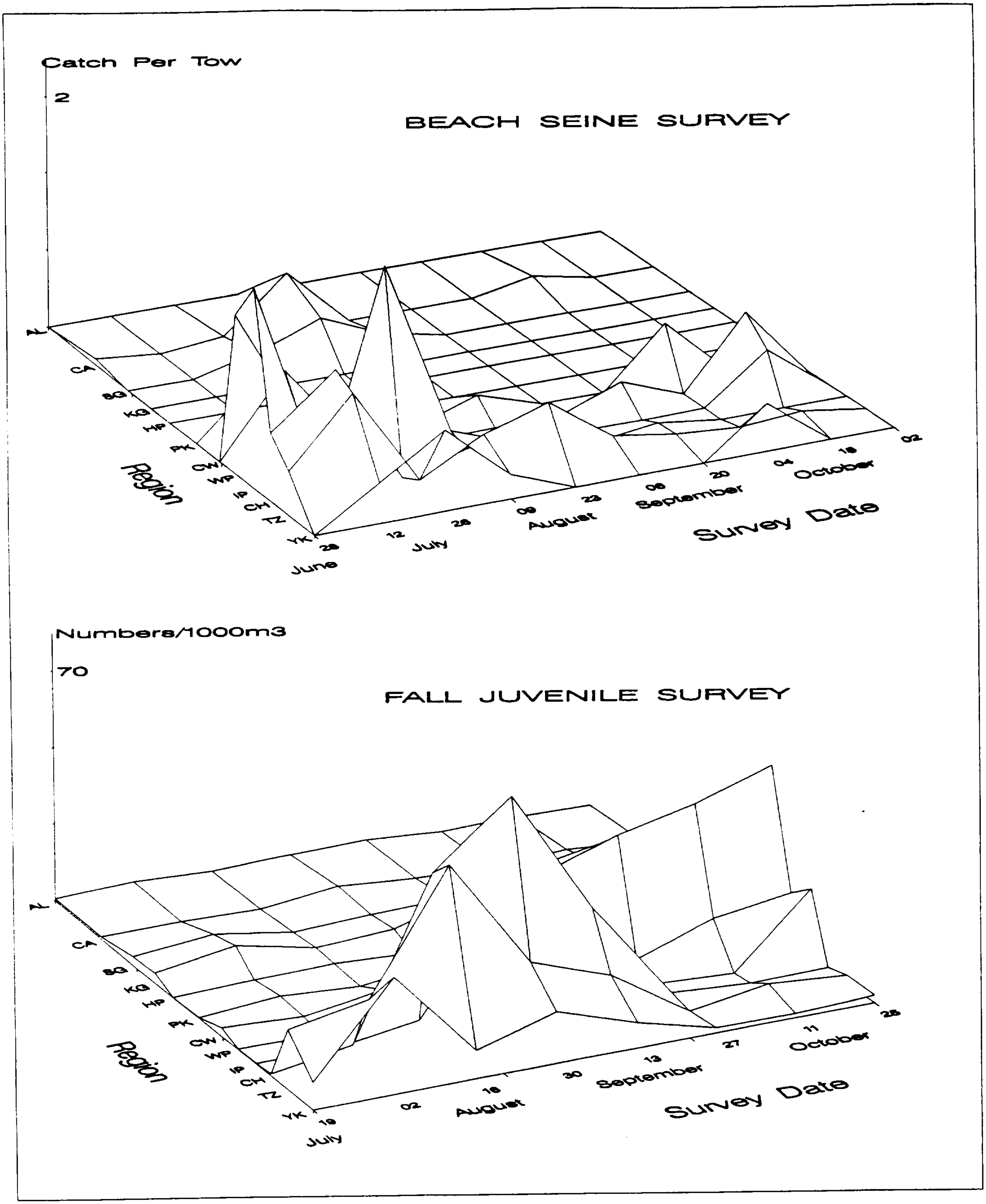


Figure 4-67. Spatiotemporal distribution of yearling and older hogchoker in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

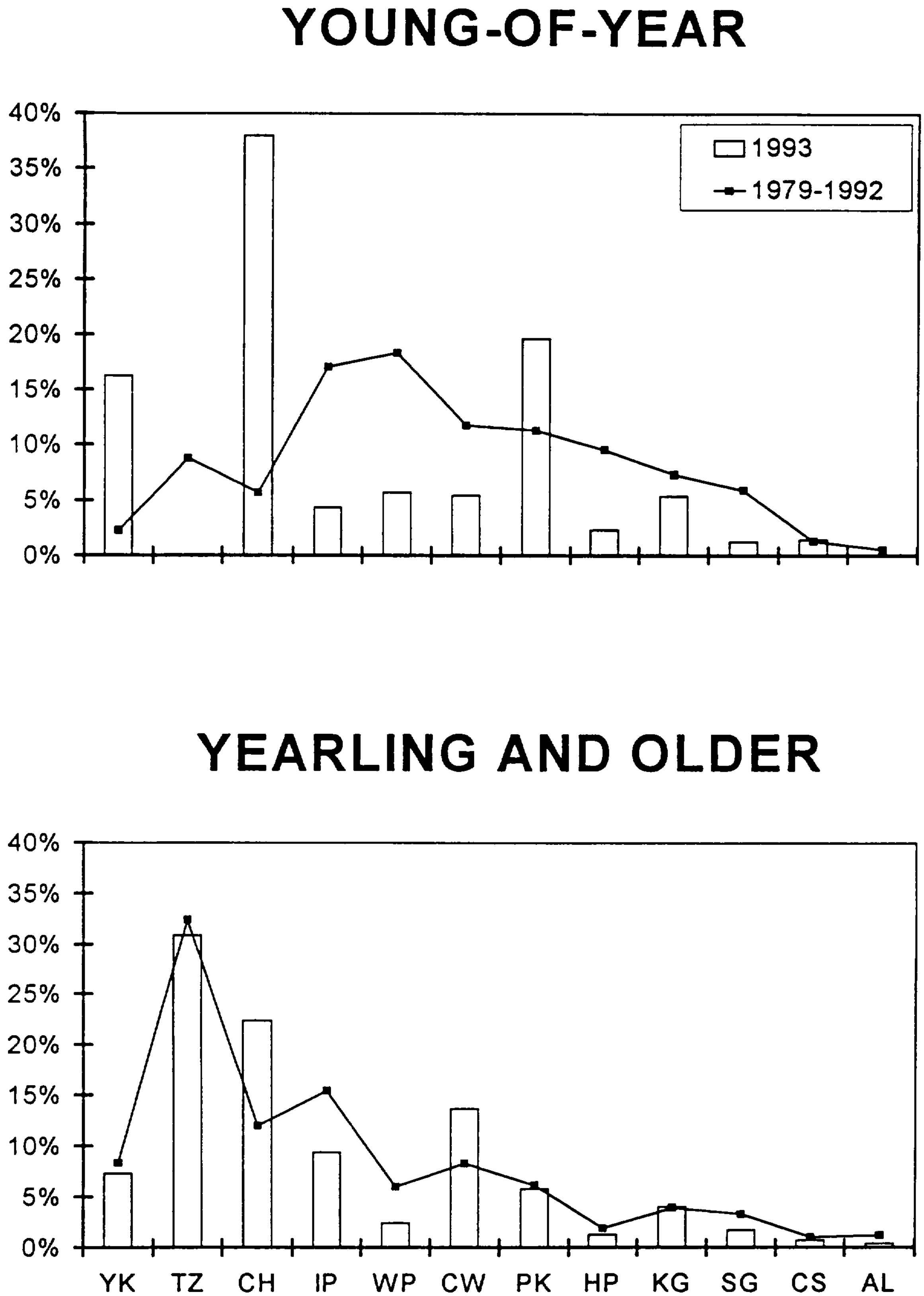


Figure 4-68 Geographical distribution indices for hogchoker collected during Fall Shoals surveys of the Hudson River Estuary, 1979 - 1993.

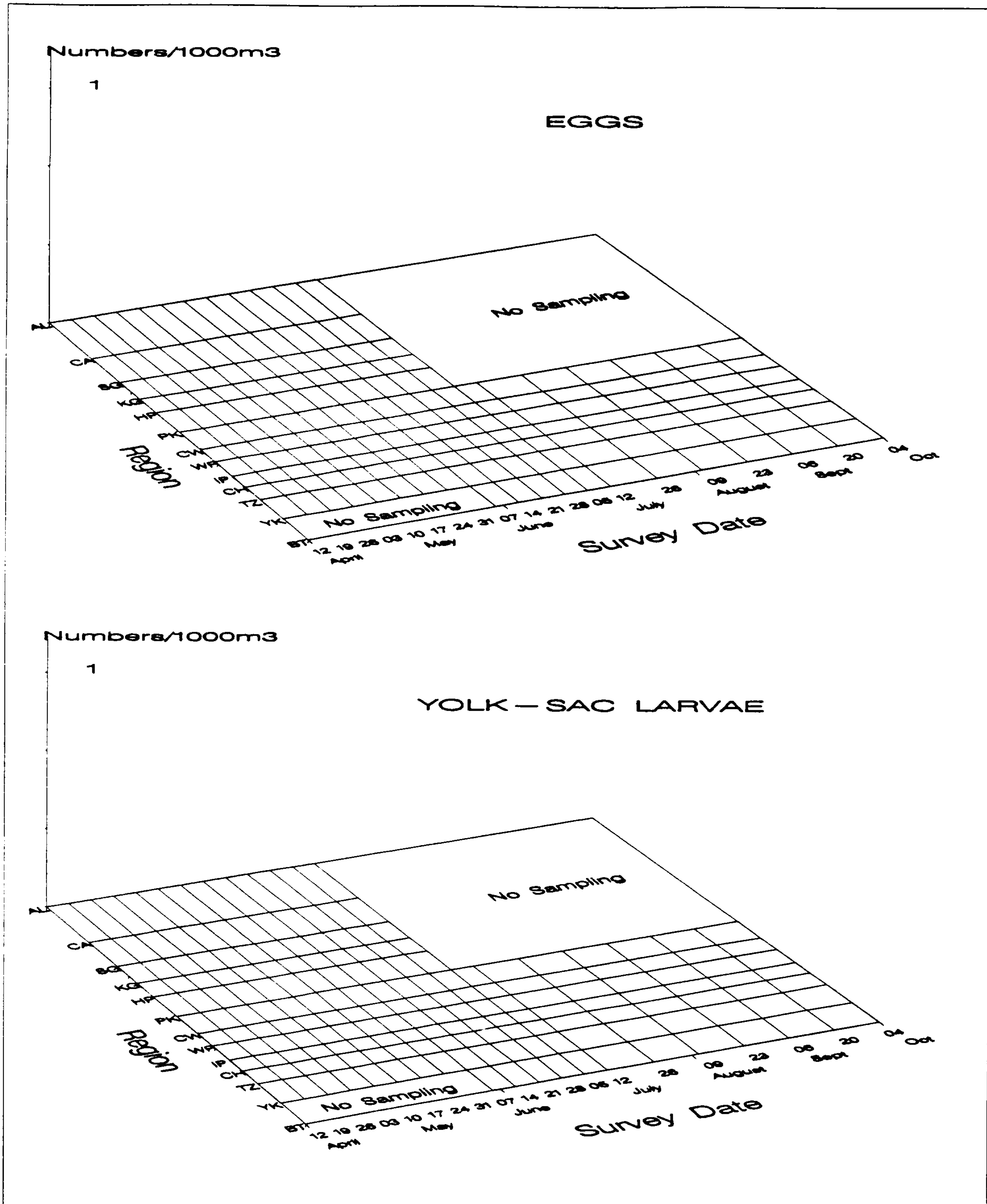


Figure 4 – 69 Spatiotemporal distribution of egg and yolk – sac stages of spottail shiner in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

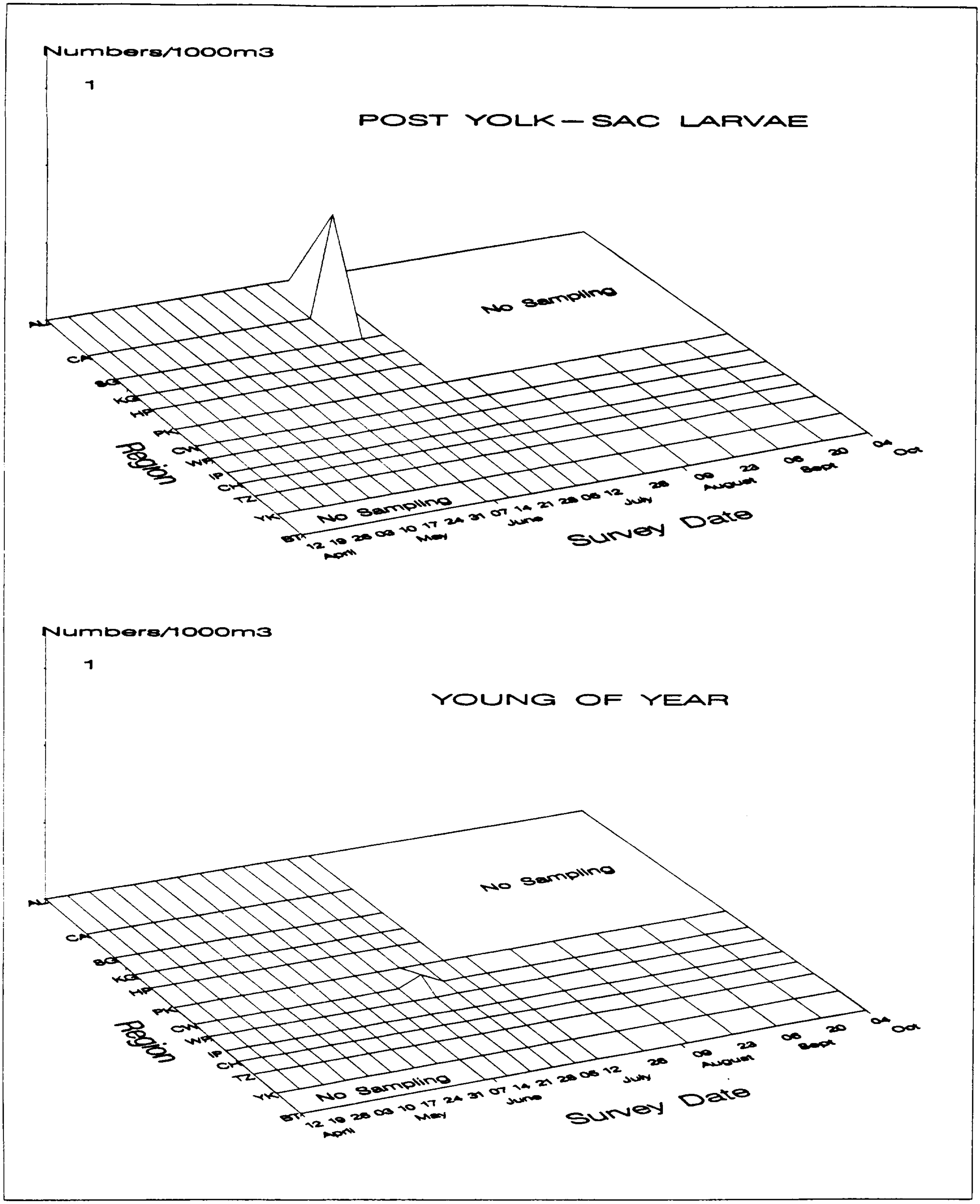


Figure 4-70. Spatiotemporal distribution of post yolk-sac and young-of-year stages of spottail shiner in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

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 shiner were also found throughout the middle and upper Hudson above Indian Point (Figure 4-72).

Comparing the geographical distribution of juvenile and yearling and older spottail shiner based on BSS in 1993 with previous years (1974-1992), the 1993 distribution of these life stages was generally consistent with the long-term record (Figure 4-73). However, in 1993 the peak distributions for each life stage occurred further downriver in Catskill or Saugerties rather than in the Albany region as seen in the long-term record.

Weekly length statistics for juvenile spottail shiner collected in 1993 show steady growth from late June through mid-September and then only a slight increase in growth by the end of BSS/FSS collections in November (Figure 4-74, Appendix Tables D-18 and D-19).

In general, spottail shiner 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).

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). Atlantic sturgeon are anadromous with spawning occurring in freshwater, but most of their life is spent in marine waters, often undertaking long distance migrations along the Atlantic Coast (Bain 1996a). 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, North Carolina. 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.

Atlantic sturgeon are long-lived, slow-maturing, large fishes. Dovel and Berggren (1983) reported that by age 29, Atlantic sturgeon averaged 7.8 ft. The largest known Atlantic sturgeon was a 14-ft specimen weighing 811 lb from Saint John River, New Brunswick (Van Den Avyle 1984). While in the Hudson River the maximum reported age is 36 (Van Eenennaam et al. 1996), the oldest known Atlantic sturgeon is a 60-year-old individual from the St. Lawrence River (Gilbert 1989). 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.

Male Atlantic sturgeon reach maturity at about 12 years and females at 18-19 years (Dovel and Berggren 1983), although some females may reach maturity at 15 years (Van Eenennaam et al. 1996). They are believed to spawn at intervals ranging from 1 to 5 years (Bain 1996a), however, males may possibly have an annual spermatogenic cycle (Van Eenennaam et al. 1996).

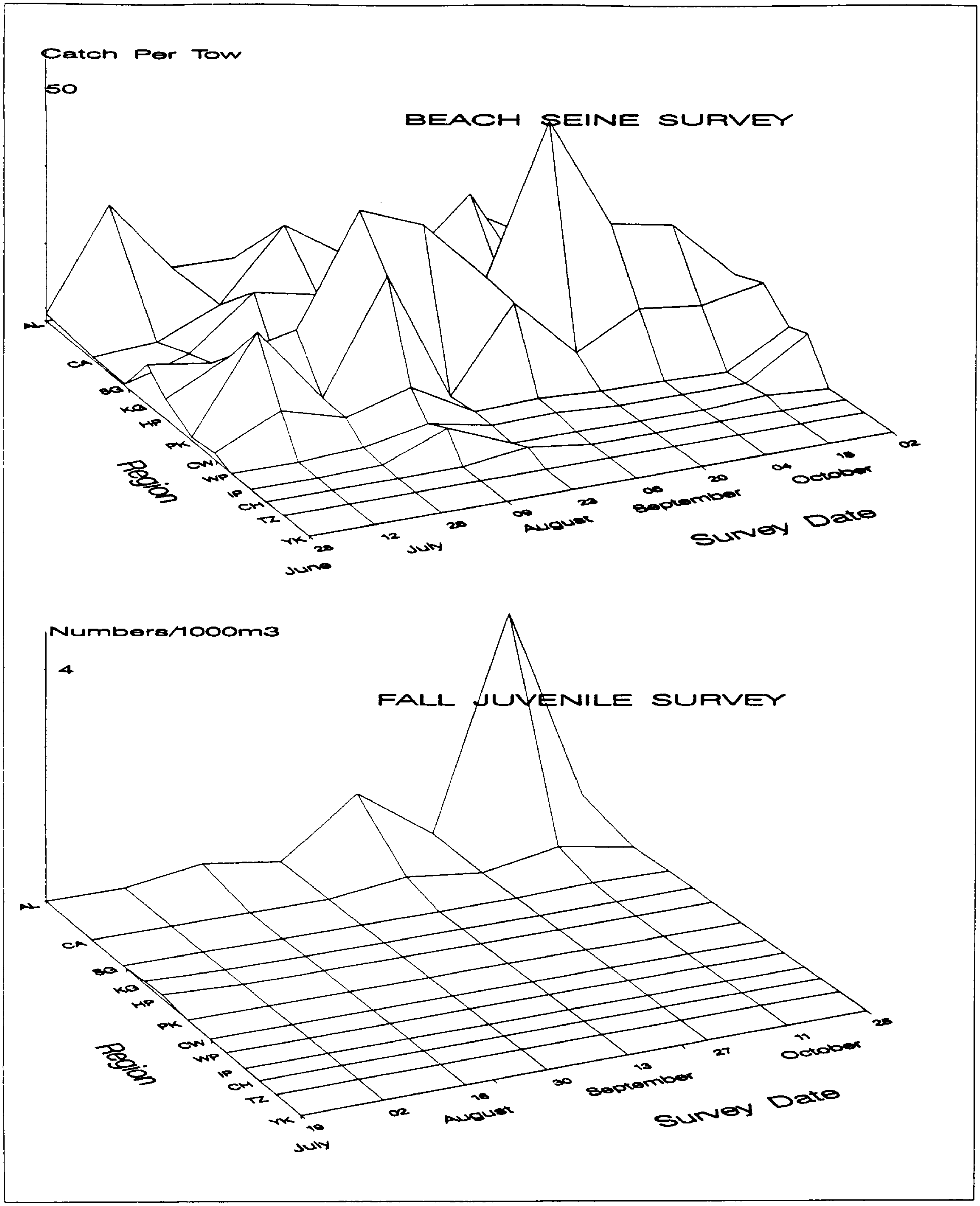


Figure 4–71. Spatiotemporal distribution of young–of–year spottail shiner in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

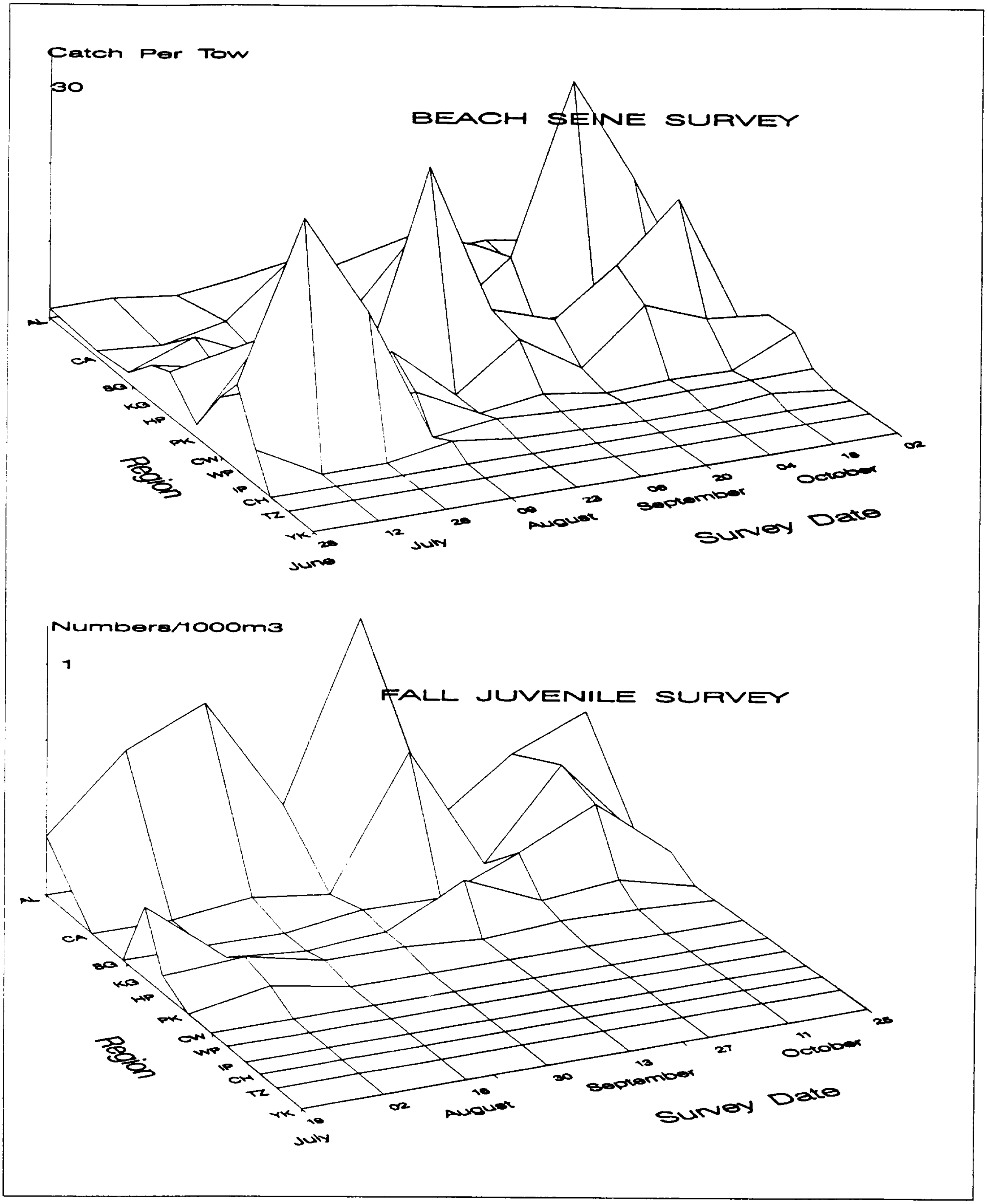
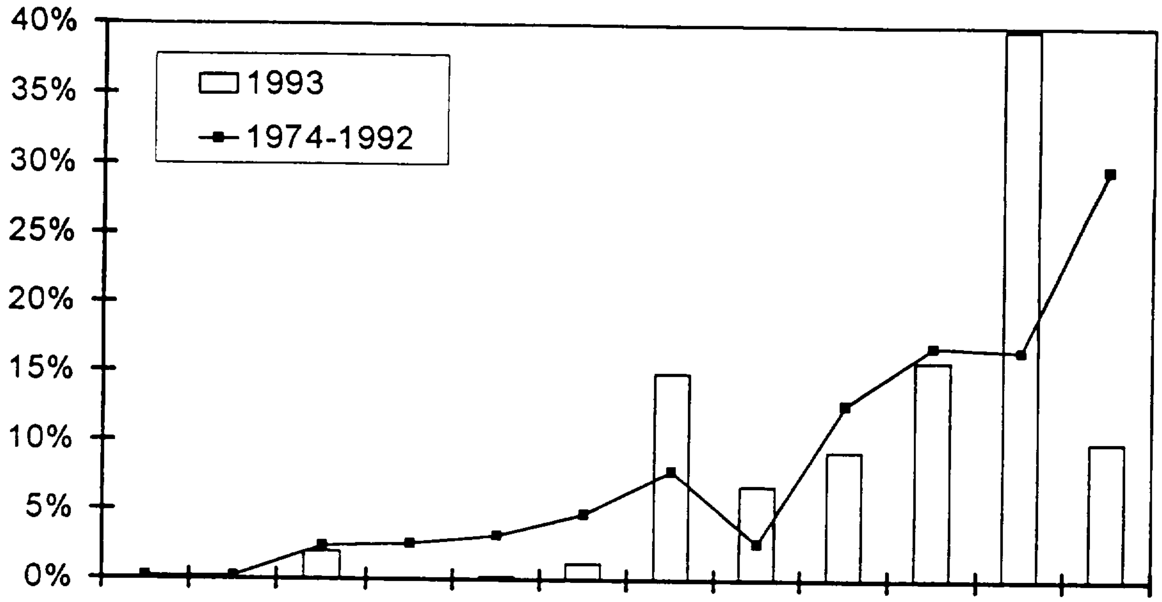


Figure 4 – 72. Spatiotemporal distribution of yearling and older spottail shiner in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

YOUNG-OF-YEAR



YEARLING AND OLDER

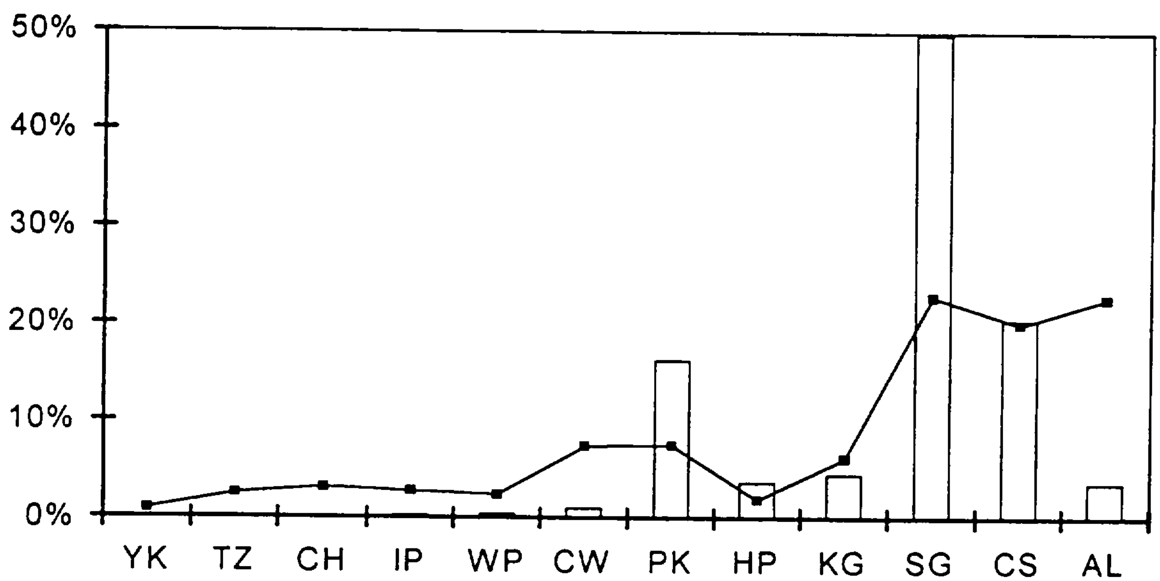


Figure 4-73 Geographical distribution indices for spottail shiner collected during Beach Seine surveys of the Hudson River Estuary, 1974 - 1993.

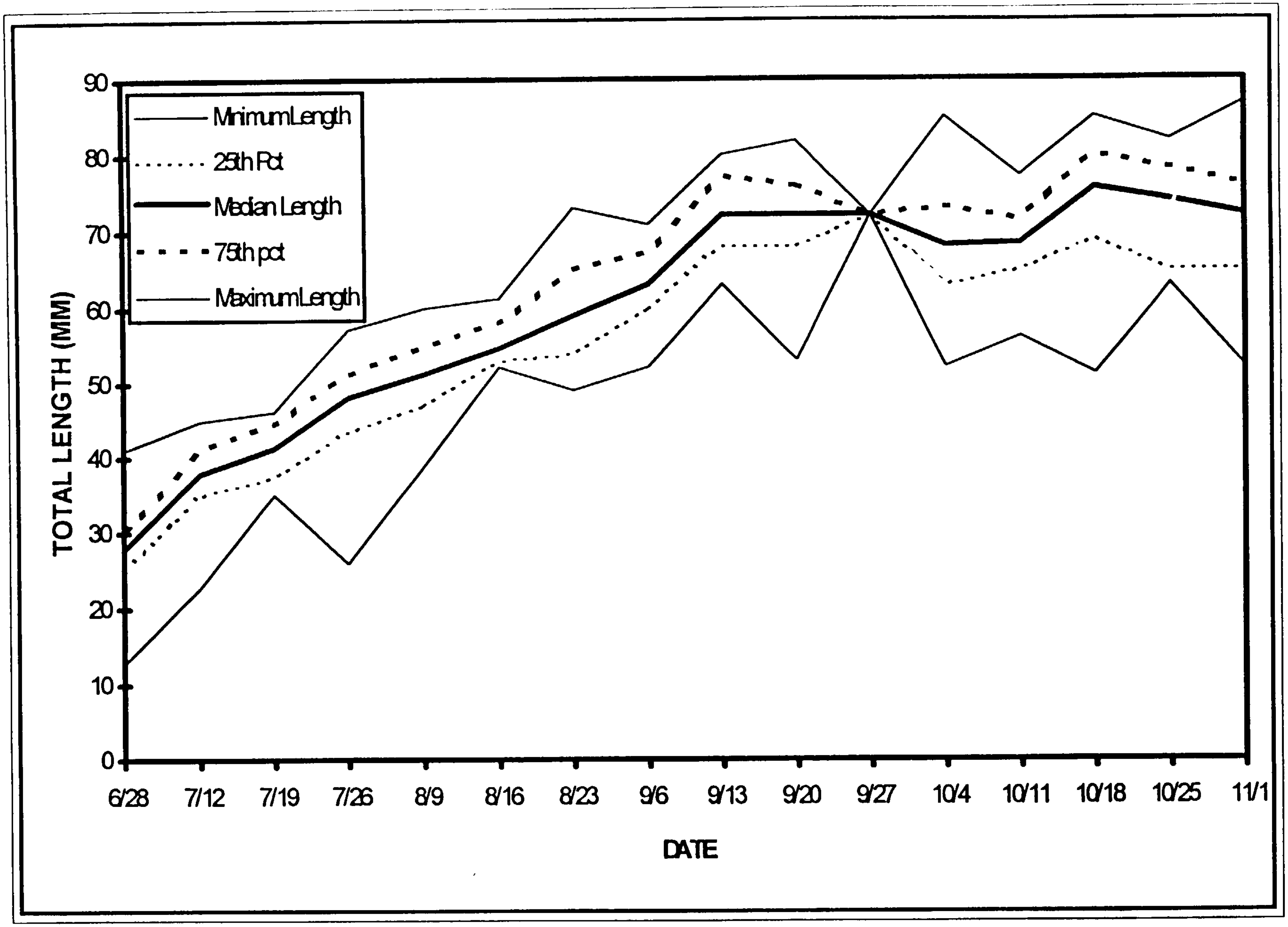


Figure 4-74. Weekly length statistics for spottail shiner young-of-year in the Hudson River estuary, 1993.

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 occurs from May through July. Telemetry studies in 1994 and 1995 suggest that spawning occurs in concentration areas near Hyde Park (RM 80) and Clinton Point (RM 70) (Nack and Bain 1996). Other studies have identified an additional concentration area near Catskill (RM 113) (Van Eenennaam et al. 1996). After spawning, males and females were tracked to a congregation site at Con Hook (RM 48) where the estuary is deep (up to 120 ft). Post-spawning adults were joined at this site by marine-migrant juveniles and this large population of Atlantic sturgeon remained at Con Hook throughout most of the summer. A gradual emigration to marine waters began in August and was completed by October (Nack and Bain 1996).

During spawning, 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 minutes and attach to rocks, weeds, and other submerged objects (Gilbert 1989).

Larvae of Atlantic sturgeon, as all life stages, are oriented on the bottom of deep channel habitats (Bain 1996a). Based on capture locations of larval and juvenile sturgeon from early Hudson River studies, the nursery region for sturgeon is believed to be located between RM 43 and RM 118 from May through mid-July (Hoff et al. 1977 in Hoff et al. 1988). More recent data collected during the LRS from 1974 through 1994 show two concentration areas of sturgeon larvae and early juveniles in the Hudson estuary (Appendix Figure F-1). Based on the recent telemetry studies discussed above, it is possible that the downriver concentration area (RM 43 - RM 100) of larvae and early juveniles between mid-May and mid-July corresponds to the distribution of Atlantic sturgeon early life stages.

Juvenile Atlantic sturgeon remain in the Hudson estuary for 2-6 years before migrating to marine waters. During the first 3 years of life, they quickly grow to over 2 ft (Bain 1996a). From July through September, juvenile Atlantic sturgeon are distributed over much of the Hudson estuary (Bain 1996a), but one section of the estuary (RM 43 - RM 48) contained high numbers of juveniles (Haley et al. 1996). As water temperatures drop in the fall, juveniles form an overwintering congregation in deep waters (>25 ft) between the Bear Mountain Bridge and the George Washington Bridge (Dovel and Berggren 1983).

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.

The Atlantic sturgeon is an important commercial species in the Hudson estuary, prized for its flesh and caviar. Commercial landings peaked at 7 million pounds at the turn of the 19th century, but the fishery crashed within a 10-year period due to over-exploitation of a slow-growing, slow-maturing fish (Field 1996). Since then, coast-wide landings hovered around 200,000 lb. In 1990, the Atlantic States Marine Fisheries Commission adopted a management plan for Atlantic sturgeon establishing a minimum size limit for the commercial fishery. Recent annual landings in New York State have ranged from 17,000 to 36,000 lb (McKown 1996). However, in 1996, the Atlantic States Marine Fisheries Commission recommended a 2-year fishery moratorium based on recent scientific analyses of the Hudson River Atlantic sturgeon which indicated a collapsing population (Field 1996).

Fisheries surveys conducted during 1993 resulted in a total of 7 yearling and older Atlantic sturgeon collected in the FSS between the Indian Point and Albany regions from August through October (Figure 4-75 and Table 4-3).

4.15 SHORTNOSE STURGEON

The shortnose sturgeon, *Acipenser brevirostrum*, is less widespread than the Atlantic sturgeon, ranging from the St. John River, New Brunswick, to the St. Johns River, Florida (Gruchy and Parker 1980b). Shortnose sturgeon are amphidromous, using mainly fresh and brackish waters, and only occasionally marine waters, during its life cycle (Bain 1996a). Shortnose sturgeon presumably from the Hudson River have been caught in Sandy Hook Bay, New Jersey just off the mouth of the Hudson (Dovel et al. 1992), but most seem to remain within the Hudson estuary. Forty-four shortnose sturgeon tagged in the Hudson River between 1979 and 1980 were recaptured by researchers from 1993 to 1995, from 14 to 17 years after tagging (Bain et al. 1996).

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, however, the oldest known shortnose sturgeon is a 67-year-old female from St. John River, Canada (Gilbert 1989). The largest shortnose sturgeon reported for the Hudson River was almost 4 ft long (Geoghegan et al. 1992), considerably smaller than that reported for Atlantic sturgeon. However, 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.

Male shortnose sturgeon in the Hudson River do not reach sexual maturity until age 3-5 and females at age 6-7 (Dadswell et al. 1984). The first spawning, however, may follow maturation in males by 1-2 years, while in females spawning may be delayed for up to 5 years (Dadswell 1979). Spawning appears to be a nonannual event. Based on the percentage of fish examined from August to March that were developing sexually, Dadswell (1979) suggested that females spawn once every third year and males every other year. Other evidence (annuli of the pectoral ray) suggests a 5- to 11-year interval between spawnings (Dadswell 1979). However, tagging studies on the Hudson River tracked shortnose sturgeon to the spawning grounds in successive years (Dovel et al. 1992).

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. Spawning occurs from late April to early May (Bain 1996a). After spawning, adults move downriver to feed and disperse over the tidal portion of the Hudson estuary, but are primarily south of Kingston (Bain 1996a). From October through March, pre-spawning adults concentrate near Esopus Meadows (RM 87) (Dovel et al. 1992). Non-spawning adults may inhabit another winter concentration area located near Croton Point (RM 34) (Geoghegan et al. 1992; Bain 1996a).

Like Atlantic sturgeon, shortnose sturgeon eggs are demersal and adhesive and the newly hatched larvae remain on the bottom. Relatively little is known about the early life histories of shortnose and Atlantic sturgeon because of the infrequency of their capture. From 1973 through 1979, only 49 larvae and 26 juveniles of the combined sturgeon species were collected in the Hudson River (Hoff et al. 1988). Data from 21 years of the LRS (1974-1994) document the collection of 186 larvae and

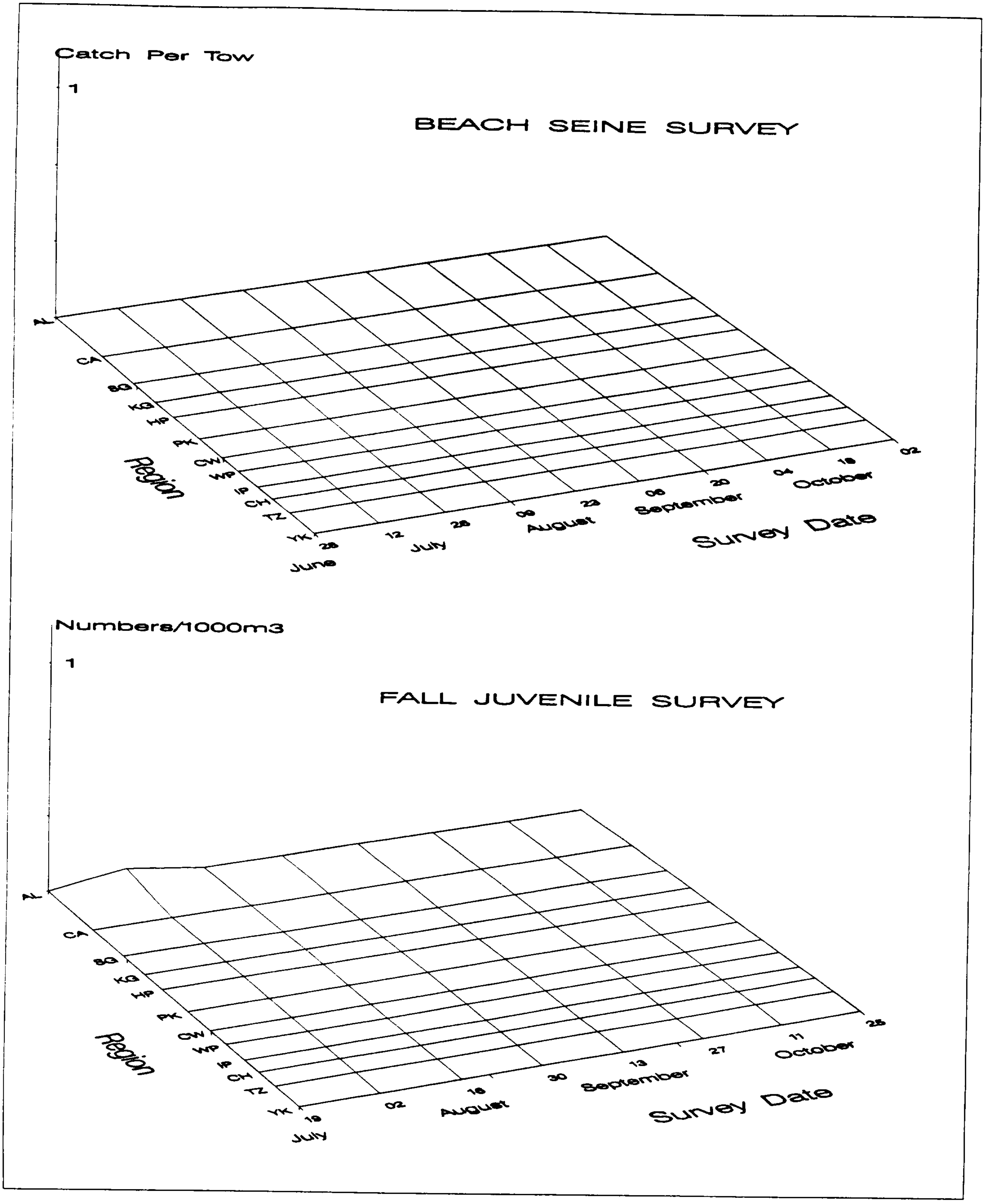


Figure 4-75. Spatiotemporal distribution of yearling and older Atlantic sturgeon in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

TABLE 4-3 COLLECTIONS OF ATLANTIC STURGEON DURING THE 1993 HUDSON RIVER SURVEYS

Date		Survey	Region	River Mile	Number Collected	Total Length (mm)
2	AUG	FSS	Indian Point	42	1	985
3	AUG	FSS	Albany	128	1	147
18	AUG	FSS	Kingston	91	1	558
16	SEP	FSS	Cornwall	61	1	480
28	SEP	FSS	Kingston	92	1	693
28	SEP	FSS	Hyde Park	85	1	692
27	OCT	FSS	Cornwall	61	1	567

early juveniles (Appendix Figure F-2 and Table F-1). The data also show two concentration areas of sturgeon larvae and early juveniles in the Hudson estuary (Appendix Figure F-1). Based on spawning ground identification by Dovel et al. (1992), the concentration area from RM 120 to RM 150 during May may correspond to the distribution of shortnose sturgeon larvae and early juveniles in the Hudson River.

Early growth is rapid. For shortnose sturgeon, larvae are approximately 0.7 in. in total length at the end of May and from 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). 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.

Juvenile shortnose sturgeon use a large portion of the Hudson estuary as nursery ground (Bain 1996a). During the summer, more juvenile shortnose sturgeon were found in the relatively shallow, freshwater zone of the estuary around Poughkeepsie (RM 67 - RM 86) than in the deeper, more saline zone near West Point (RM 42-56) (Haley et al. 1996). By late fall and early winter, most juveniles occupy the broad region of the Hudson River near Haverstraw (RM 34 - RM 39) (Bain 1996a). Juvenile shortnose sturgeon typically prey on benthic crustaceans and insect larvae, whereas adults will feed on larger items with molluscs being a major component of their diet (Bain 1996a).

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. Current research efforts have focused on the ecology of juveniles and on the population status of shortnose sturgeon in the Hudson River. Trends in the relative abundance of shortnose and Atlantic sturgeon have shown an increase in shortnose sturgeon and a decline in Atlantic sturgeon (Bain 1996b). Dovel et al. (1992) observed that in 1984 equal numbers of juvenile Atlantic and shortnose sturgeon were collected; while during earlier years (1975-1980), the ratio of Atlantic to shortnose sturgeon was 10:1 in the Hudson River. Other evidence of an increasing population of shortnose sturgeon over its range is that the National Marine Fisheries Service is considering a petition to delist shortnose sturgeon as an endangered species in the Kennebec River system in Maine (Haley 1996).

Fisheries surveys conducted during 1993 resulted in a total of 87 shortnose sturgeon collected primarily in the FSS. Although shortnose sturgeon were caught from Yonkers to Saugerties, the majority of fish were collected between the Poughkeepsie and Kingston regions from mid-July though October (Figure 4-76 and Table 4-4).

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. They are found in estuaries all along the Atlantic Coast from the Hudson River to Florida and west along the Gulf of Mexico to Mobile Bay. White catfish prefer fresh and slightly brackish waters and moderate water currents, however, they do not tolerate high salinity, so estuarine populations generally remain in their natal systems.

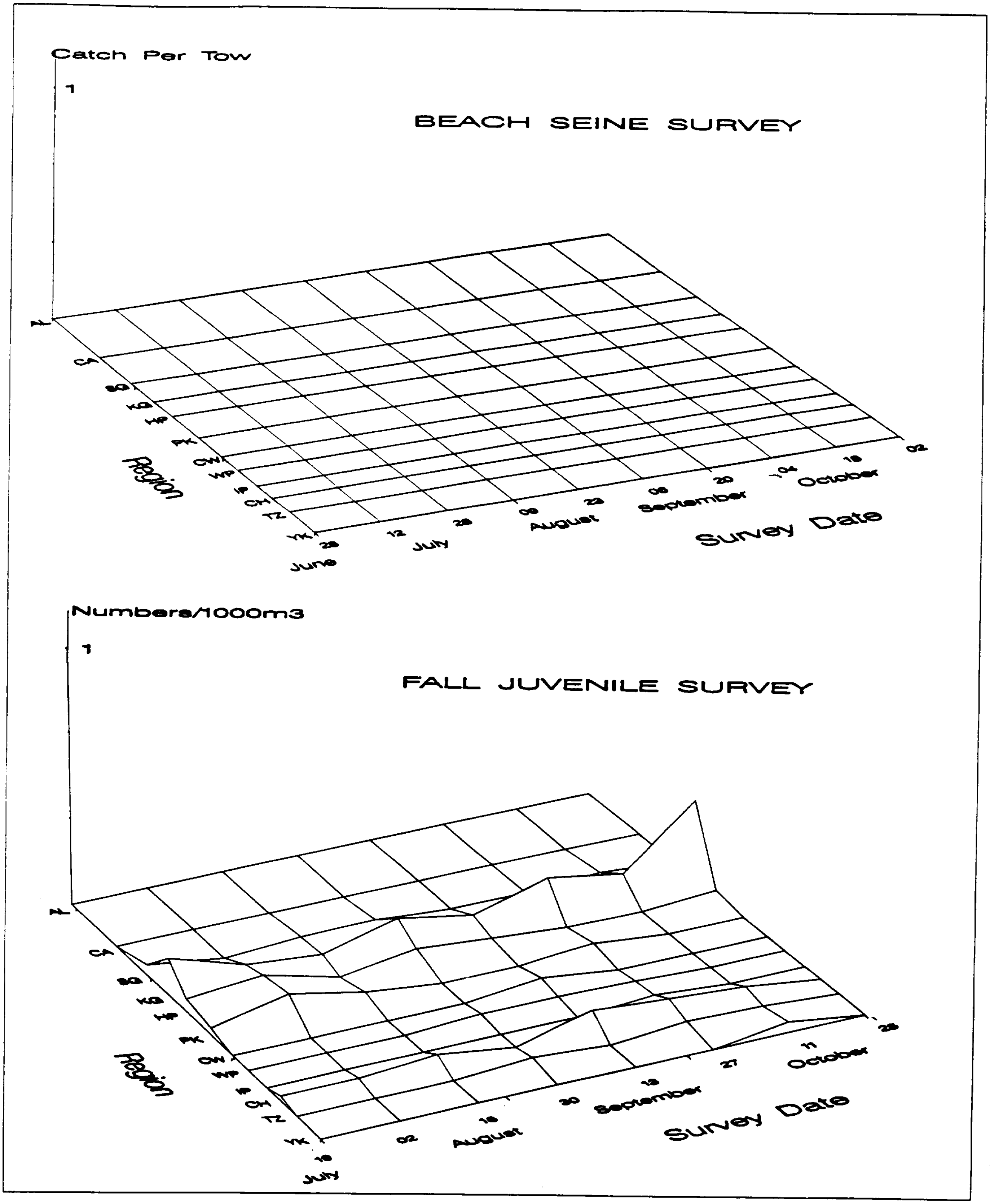


Figure 4-76. Spatiotemporal distribution of yearling and older shortnose sturgeon in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

TABLE 4-4 COLLECTIONS OF SHORTNOSE STURGEON DURING THE 1993 HUDSON RIVER SURVEYS

Date		Survey	Region	River Mile	Number Collected	Total Length (mm)
20	MAY	LRS	West Point	55	1	NA
26	MAY	LRS	Catskill	115	1	NA
27	MAY	LRS	Saugerties	105	1	NA
7	JUL	LRS	West Point	55	1	NA
14	JUL	LRS	Cornwall	56	1	NA
21	JUL	FSS	Saugerties	94	2	660,670
22	JUL	FSS	Kingston	91	6	683,588,795,662,637,860
22	JUL	FSS	Hyde Park	85	2	709,740
22	JUL	FSS	Poughkeepsie	65	1	741
23	JUL	FSS	Croton-Haverstraw	38	1	650
3	AUG	FSS	Croton-Haverstraw	35	1	956
4	AUG	FSS	Kingston	92,92	2	722,594
5	AUG	FSS	Hyde Park	84,82,82	3	697,687,773
5	AUG	FSS	Poughkeepsie	72,70,70	3	725,763,701
18	AUG	FSS	Saugerties	103	1	655
18	AUG	FSS	Kingston	93	1	653
19	AUG	FSS	Poughkeepsie	71	1	696
20	AUG	FSS	Croton-Haverstraw	36	2	780,773
31	AUG	FSS	Saugerties	94	1	641
31	AUG	FSS	Kingston	93,91,91	3	630,762,622
1	SEP	FSS	Kingston	88	1	673
1	SEP	FSS	Hyde Park	85,82	2	723,674
2	SEP	FSS	West Point	55	1	687
2	SEP	FSS	Tappan Zee	31	1	677
16	SEP	FSS	Kingston	88,87	2	718,760
16	SEP	FSS	Hyde Park	82	1	738
17	SEP	FSS	Cornwall	58	1	650
17	SEP	FSS	West Point	55	1	755
18	SEP	FSS	Croton-Haverstraw	37,37,37,36	4	686,823,608,742
28	SEP	FSS	Kingston	93,93,92,92,87	5	809,665,719,707,708
29	SEP	FSS	Poughkeepsie	68	1	826
29	SEP	FSS	Tappan Zee	24	1	688
30	SEP	FSS	West Point	48	1	525
30	SEP	FSS	Indian Point	39	1	715
30	SEP	FSS	Croton-Haverstraw	37,36	2	700,671
30	SEP	FSS	Tappan Zee	32	1	684
1	OCT	FSS	Croton-Haverstraw	36	1	638
11	OCT	FSS	Tappan Zee	24	2	788,669
11	OCT	FSS	Yonkers	14	1	852
12	OCT	FSS	Croton-Haverstraw	38,37	2	726,746
14	OCT	FSS	Saugerties	102	1	802
14	OCT	FSS	Kingston	93	4	850,695,793,635
26	OCT	FSS	Kingston	88	2	868,660
26	OCT	FSS	Kingston	87	12	673,720,776,660,709,730, 651,722,650,663,677,650
27	OCT	FSS	Hyde Park	81	1	680

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 3-4 years old and 7-8 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 3,200-3,500 eggs, but the eggs are large, approximately 1/4 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 1993 BSS and FSS consistently captured low numbers of YOY and yearling and older white catfish (Figures 4-77 and 4-78).

The 1993 geographical distribution of YOY and yearling and older white catfish in the FSS is generally consistent with the 1979-1992 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, but in 1993 more YOY than usual were found in the Poughkeepsie region. 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 1985a).

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 1993 show an overall increase in growth from mid-July to mid-September and little increase in size through the end of FSS collections in October (Figure 4-80, Appendix Table D-20).

4.17 WEAKFISH

Weakfish (*Cynoscion regalis*) is a member of the drum family commonly inhabiting nearshore 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

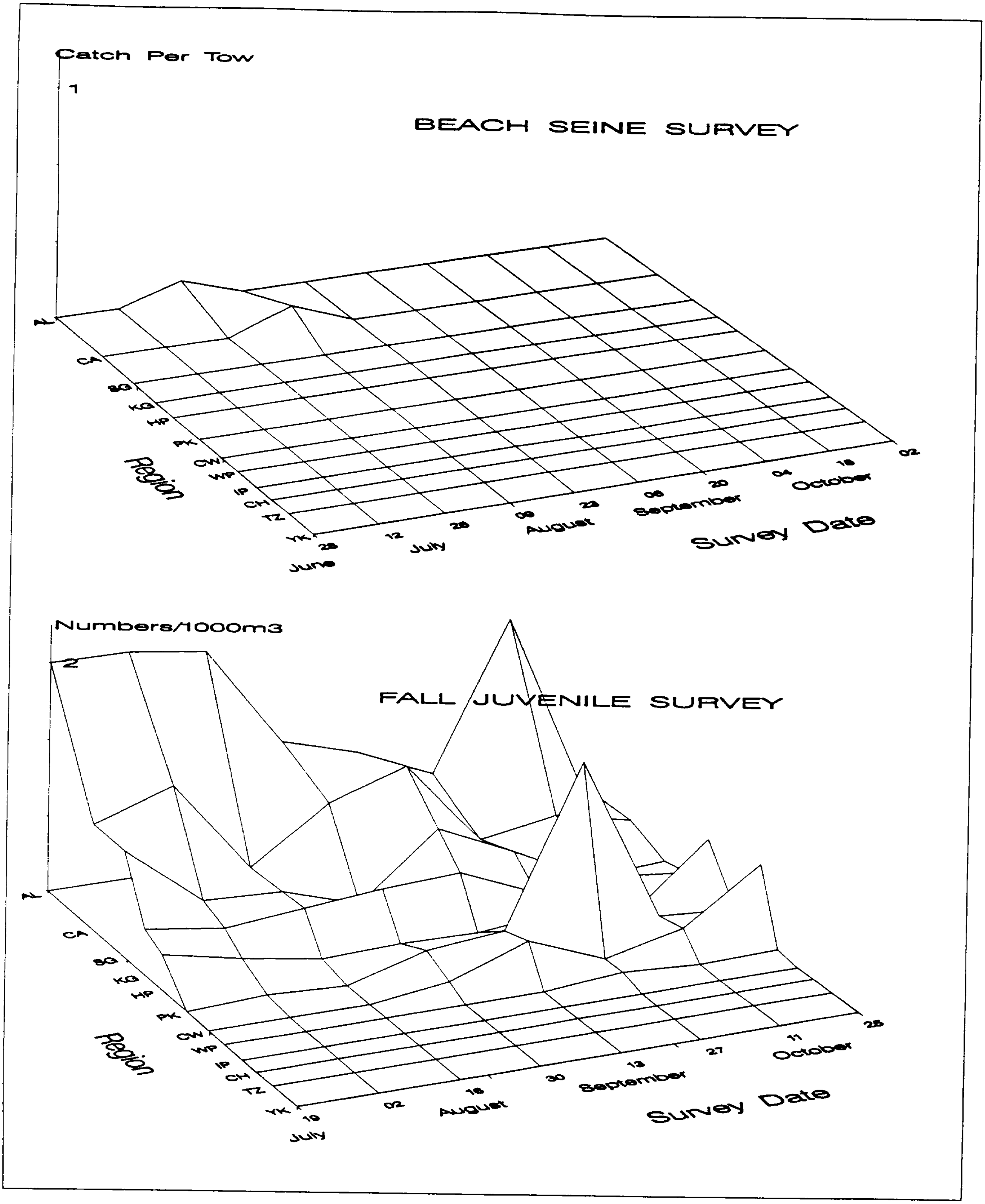
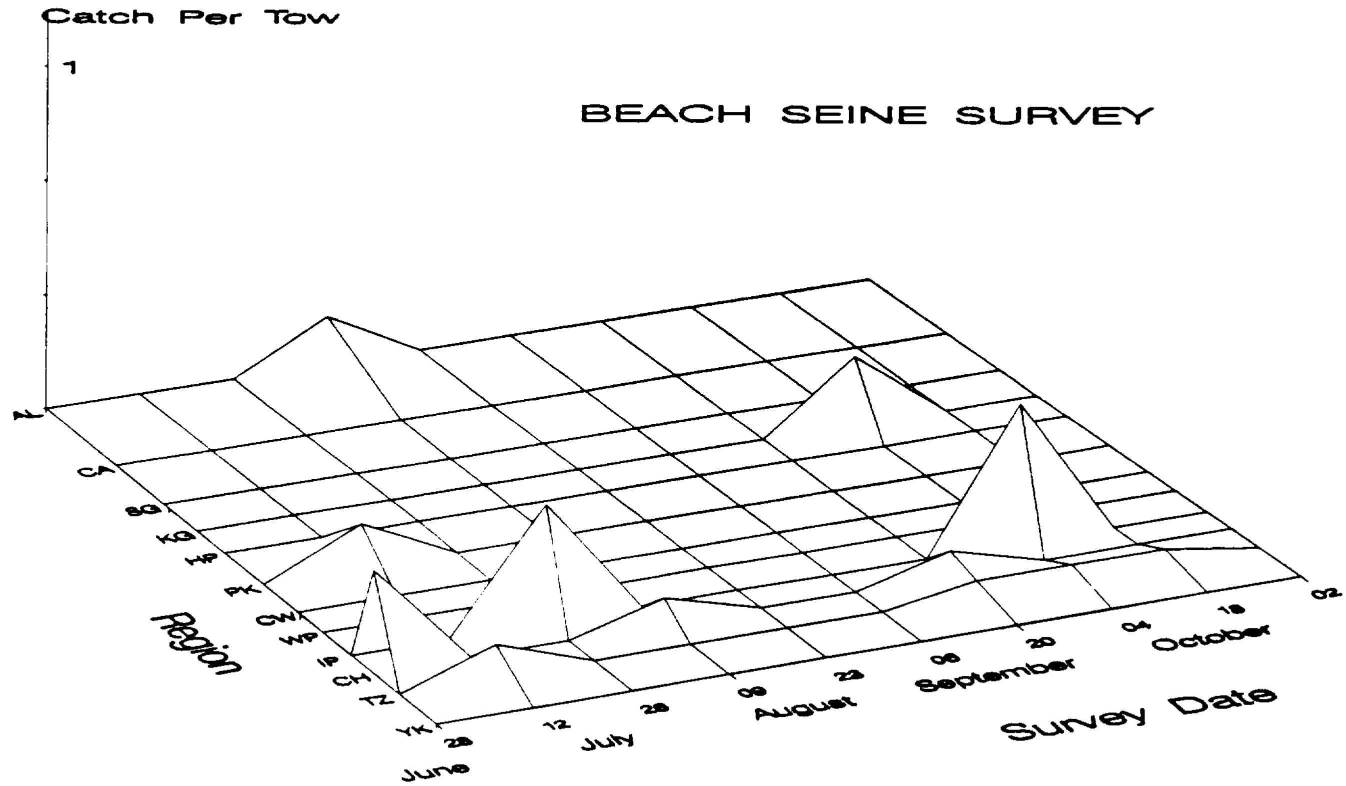


Figure 4-77. Spatiotemporal distribution of young-of-year white catfish in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.



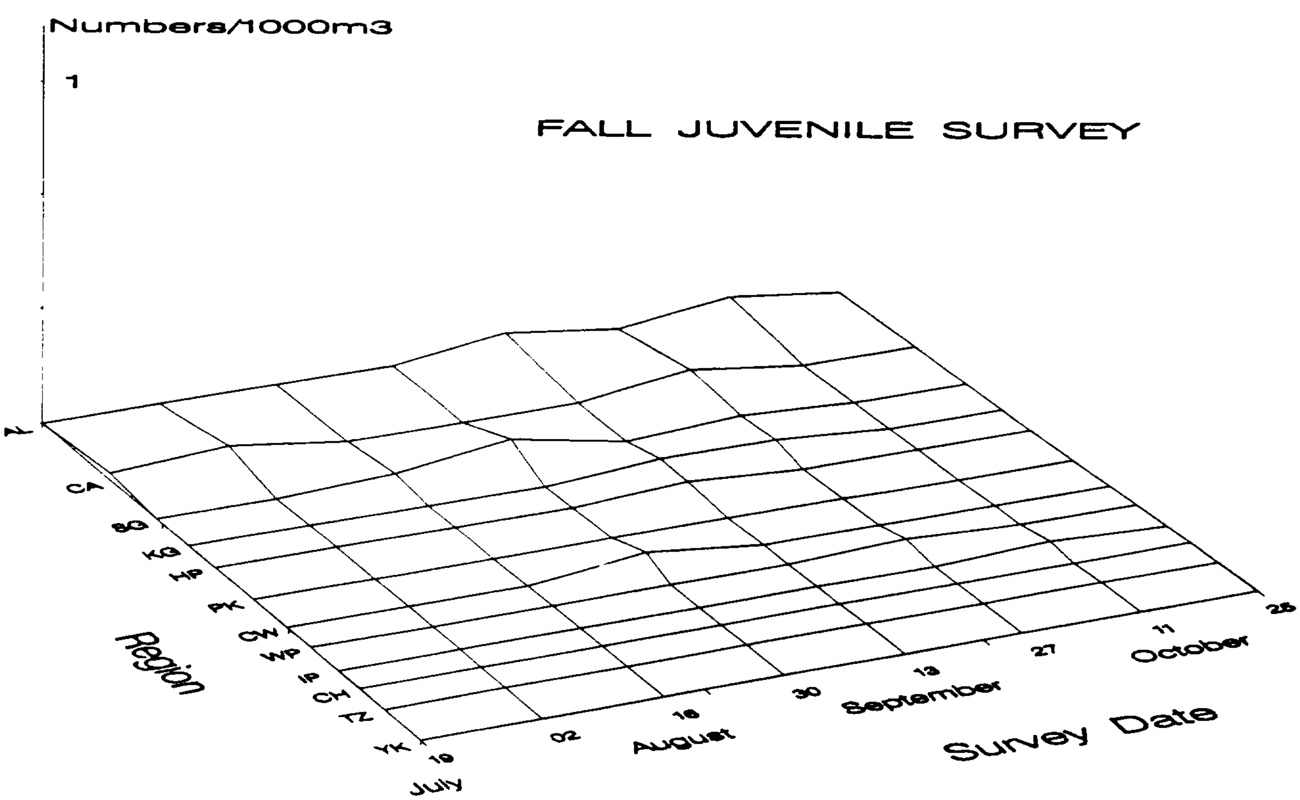


Figure 4-78. Spatiotemporal distribution of yearling and older white catfish in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

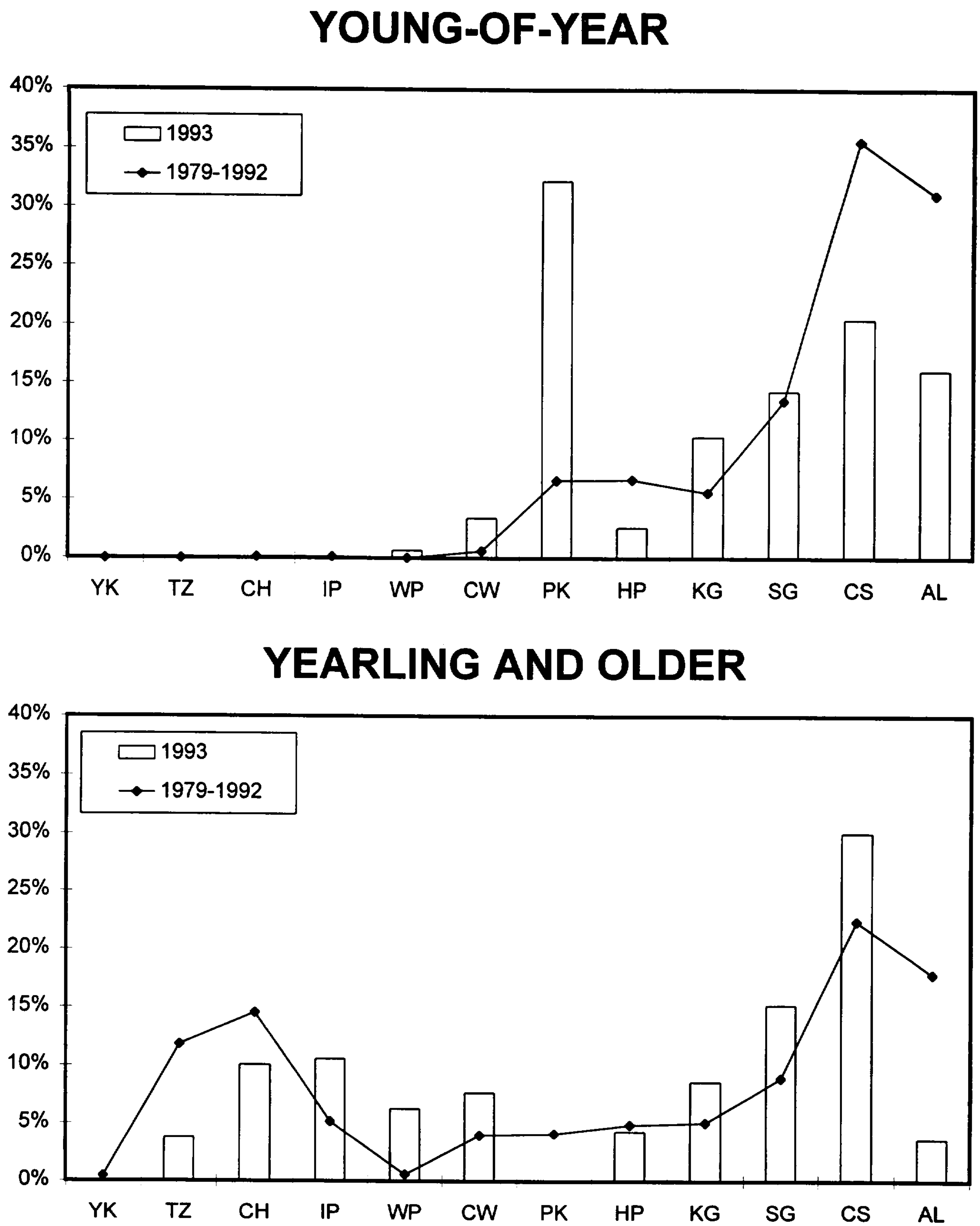


Figure 4-79. Geographical distribution indices for young-of-year and yearling and older white catfish collected during Fall Shoals surveys of the Hudson River estuary, 1979 - 1993.

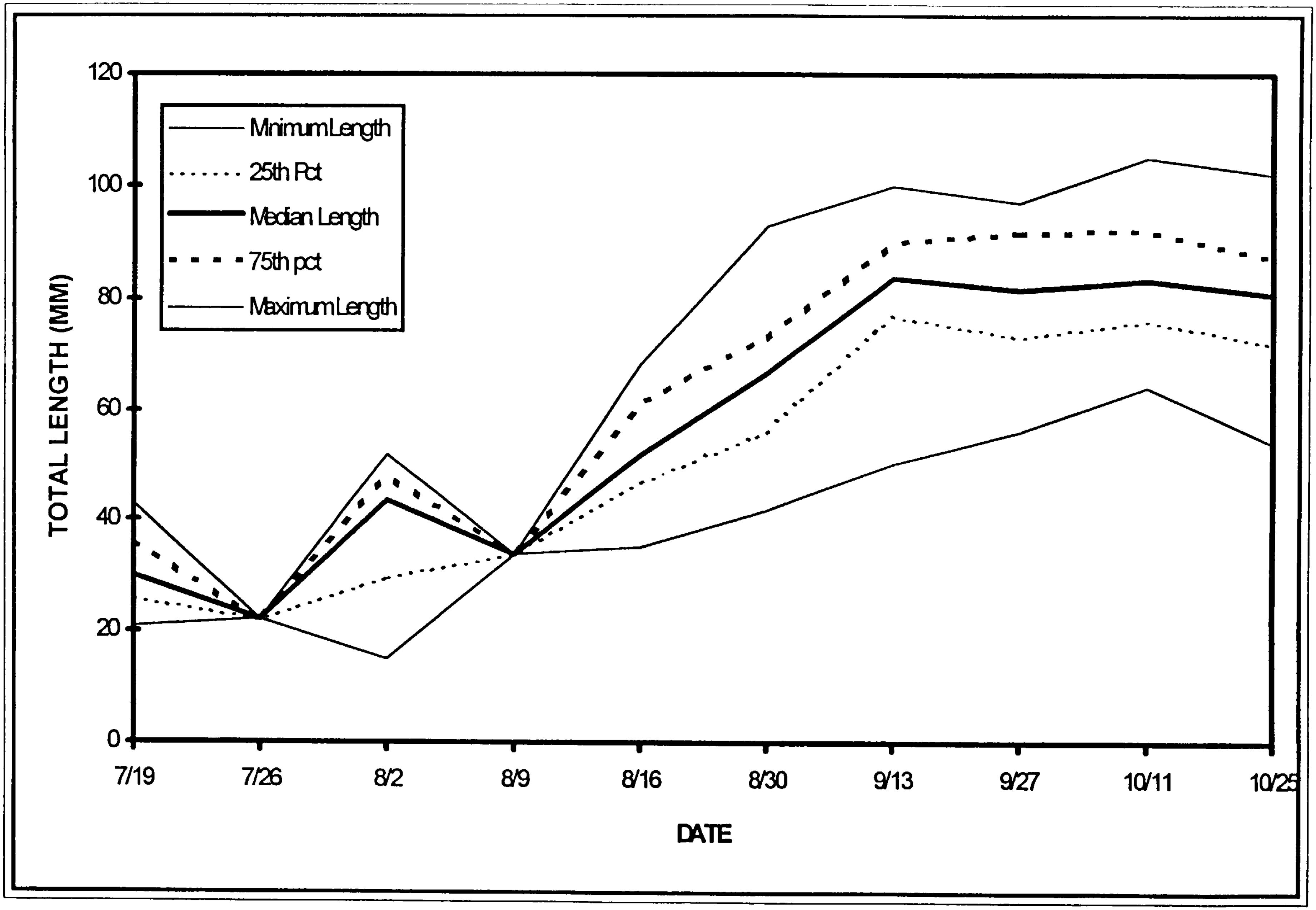


Figure 4-80. Weekly length statistics for white catfish young-of-year in the Hudson River estuary, 1993.

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 nearshore 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 2 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 3-6 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 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 1993 LRS weakfish juveniles peaked in late August and were abundant from the Battery to the Cornwall regions (Figure 4-81). In the 1993 FSS juvenile weakfish were found from the Yonkers through Poughkeepsie regions, beginning in mid-July (Figure 4-82). They peaked in the Yonkers region in mid-August and gradually emigrated from the Hudson estuary (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 1993 geographical distribution of YOY weakfish in the FSS is very consistent with the 1979-1992 long-term trend of the majority of juveniles distributed in the lower estuary, while ranging as far upriver as Poughkeepsie (Figure 4-84). The few yearling and older weakfish in FSS collections were found in the Tappan Zee region, whereas in the long-term record, they were more likely found in the Yonkers and West Point regions.

Weekly length statistics for juvenile weakfish collected in 1993 show an overall increase in growth with slow initial growth during the BSS/FSS collection period (Figure 4-85 and Appendix Table D-21).

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).

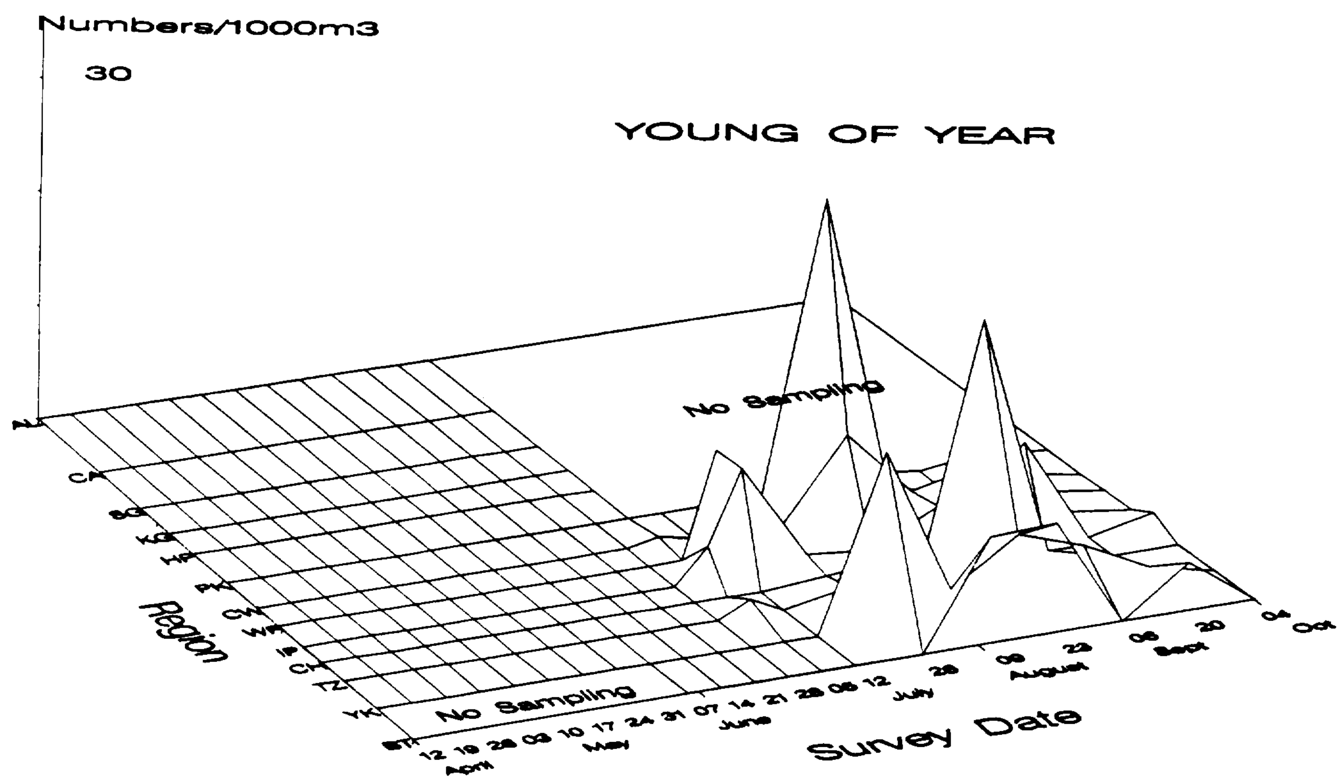


Figure 4-81. Spatiotemporal distribution of young-of-year stage of weakfish in the Hudson River estuary based on the 1993 Long River Ichthyoplankton Survey.

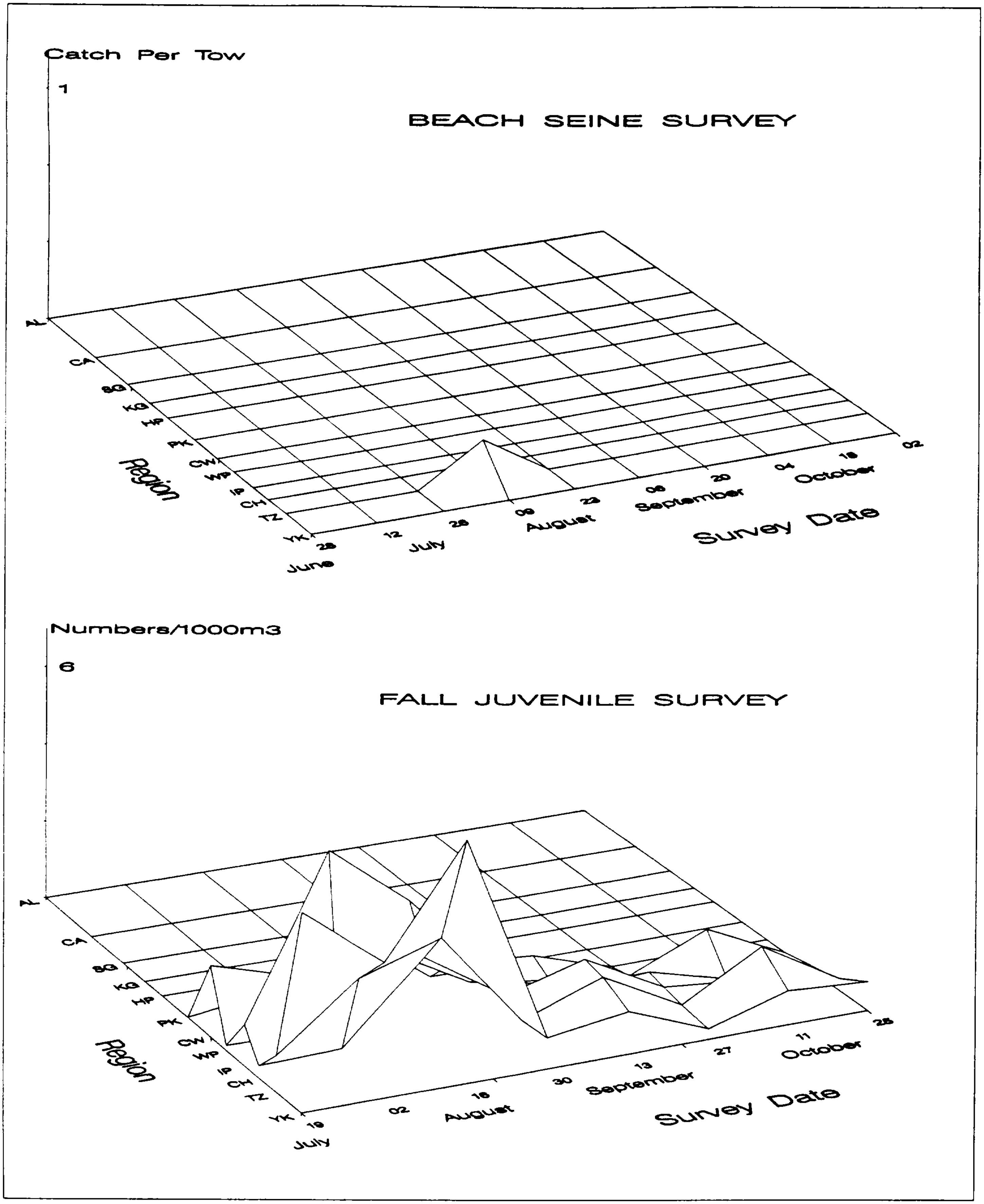


Figure 4-82. Spatiotemporal distribution of young-of-year weakfish in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

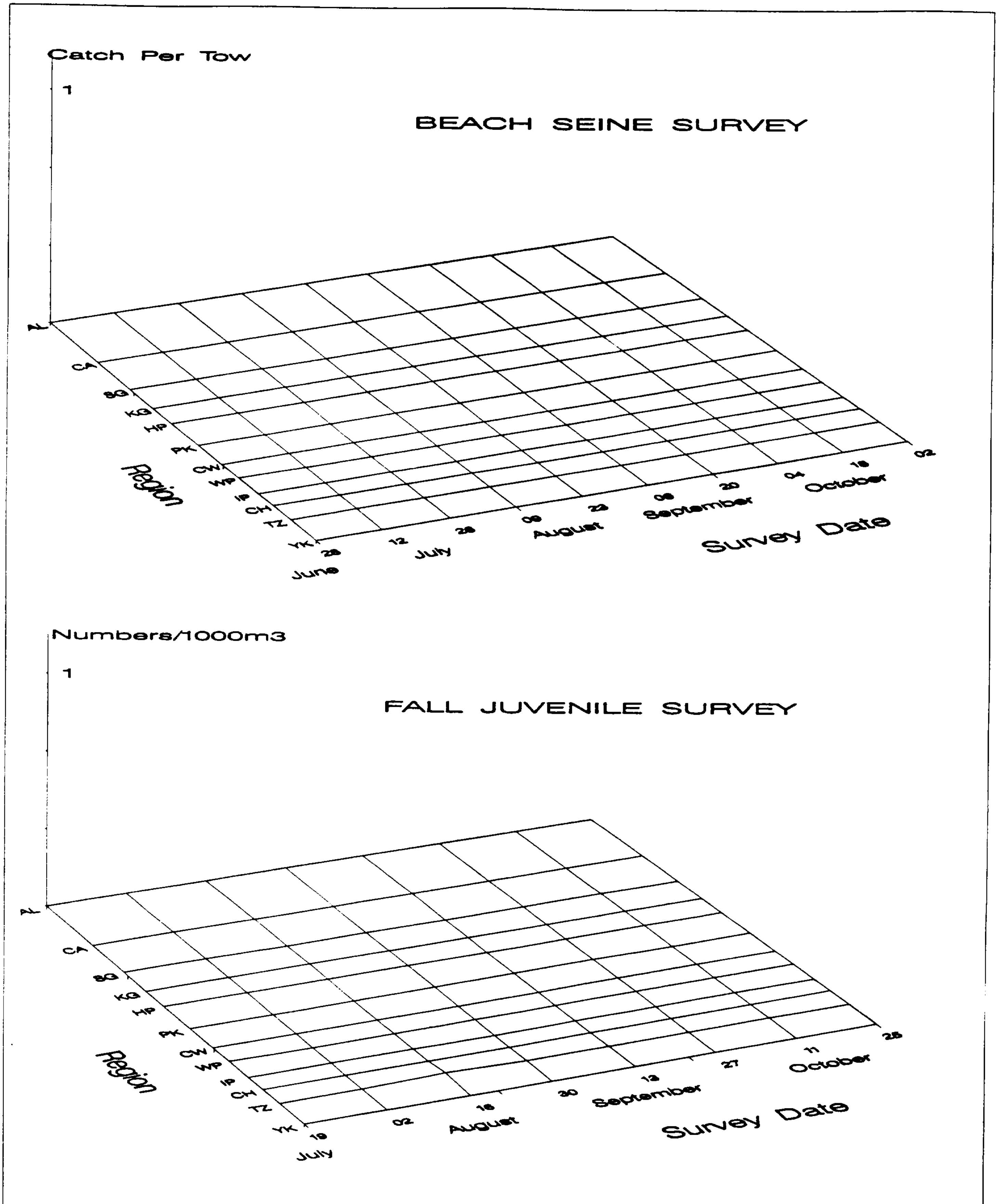
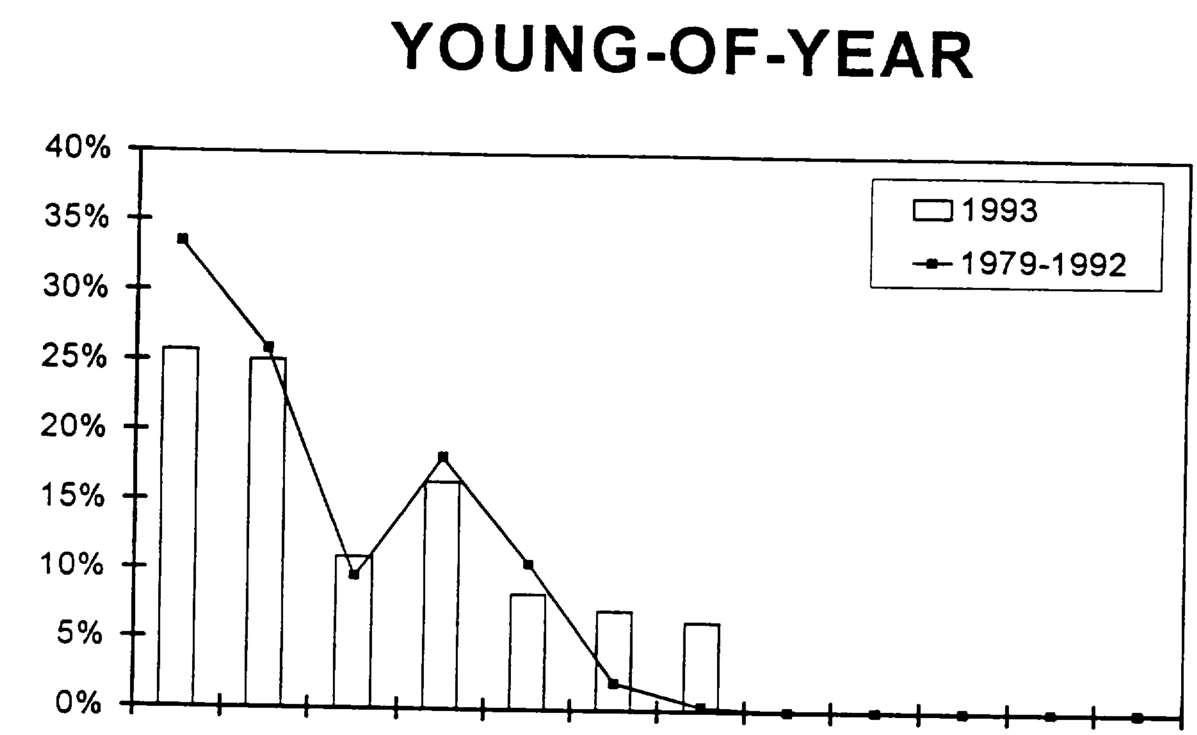


Figure 4–83. Spatiotemporal distribution of yearling and older weakfish in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.



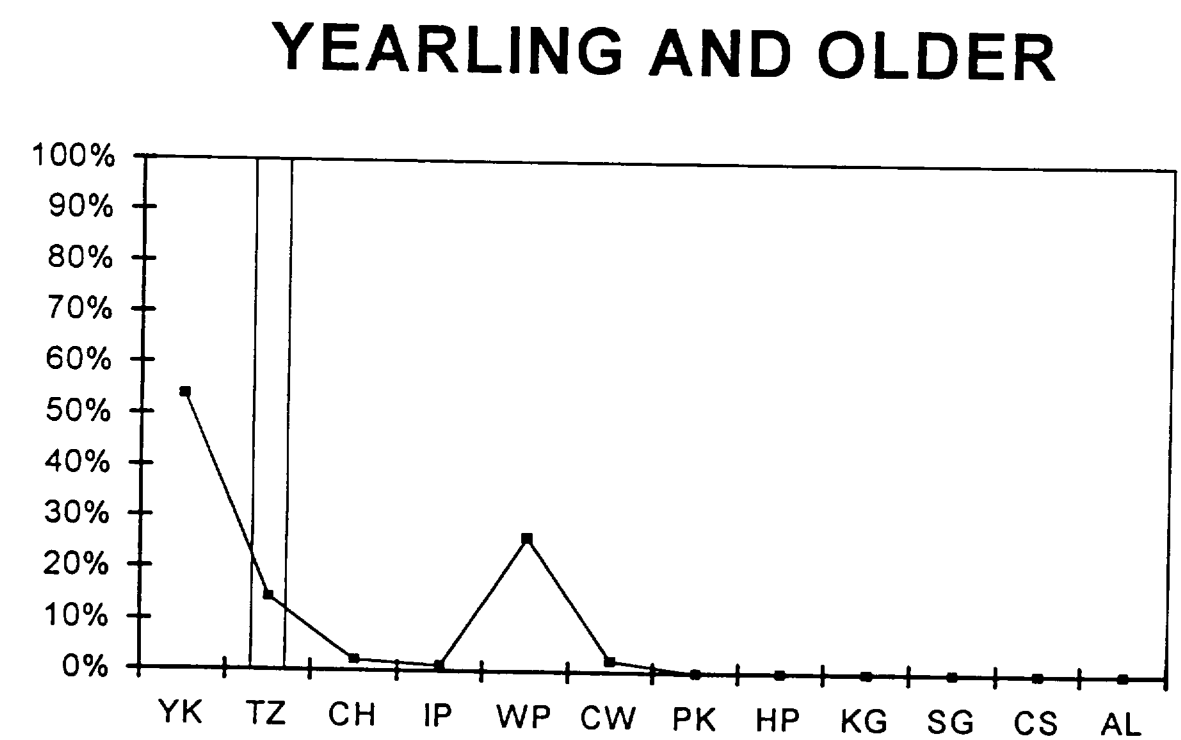


Figure 4-84 Geographical distribution indices for weakfish collected during Fall Shoals surveys of the Hudson River Estuary, 1979 - 1993

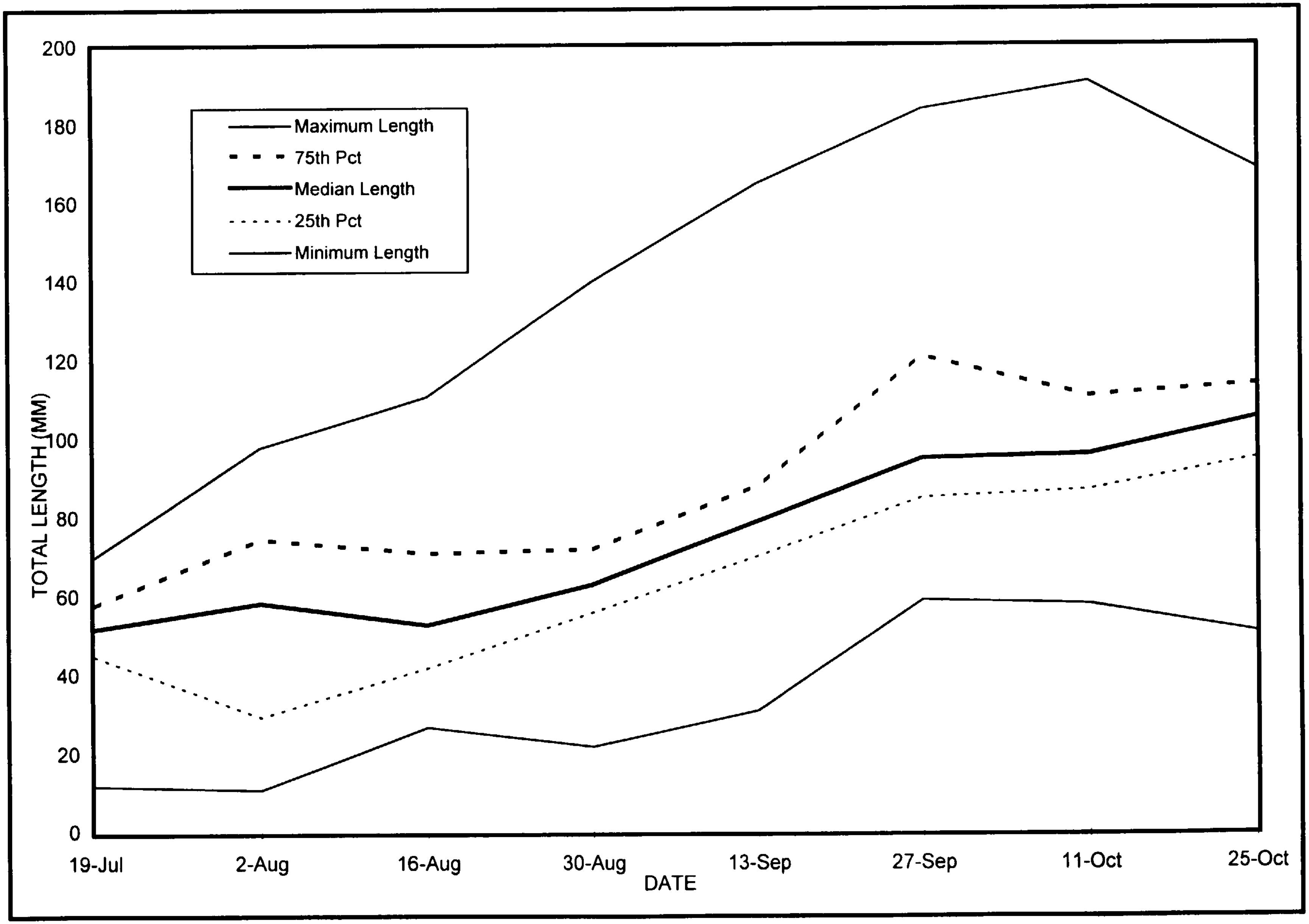


Figure 4-85. Weekly length statistics for weakfish young-of-year in the Hudson River estuary, 1993.

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 2 days. The newly hatched larvae are also pelagic and remain in offshore waters for 1-2 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 1-2 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.

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 1993 juvenile bluefish were collected as far north as the Poughkeepsie 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.

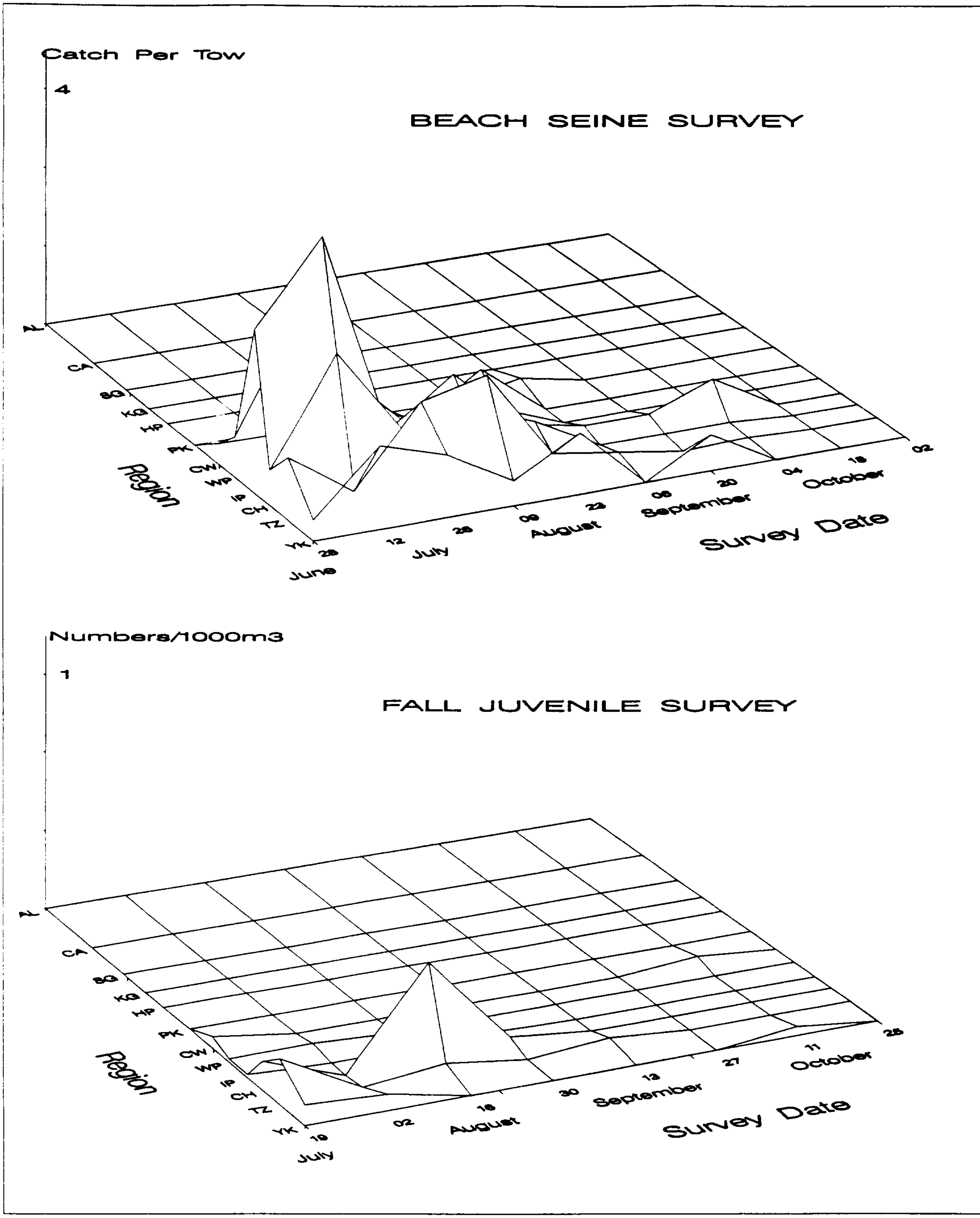


Figure 4-86. Spatiotemporal distribution of young-of-year bluefish in the Hudson River estuary based on the 1993 Fall Shoals and Beach Seine Surveys.

The 1993 geographical distribution of YOY bluefish in the BSS is generally consistent with the 1974-1992 long-term trend with the majority of fish in the Tappan Zee and Croton-Haverstraw regions (Figure 4-87). However, in 1993, there were more juveniles upriver in the middle Hudson River regions from Indian Point to Poughkeepsie than seen in the long-term trend.

In the Hudson River YOY bluefish aggressively feed on a variety of macroinvertebrates and fish and grow rapidly to a size of 3-6 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 silverside, 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.

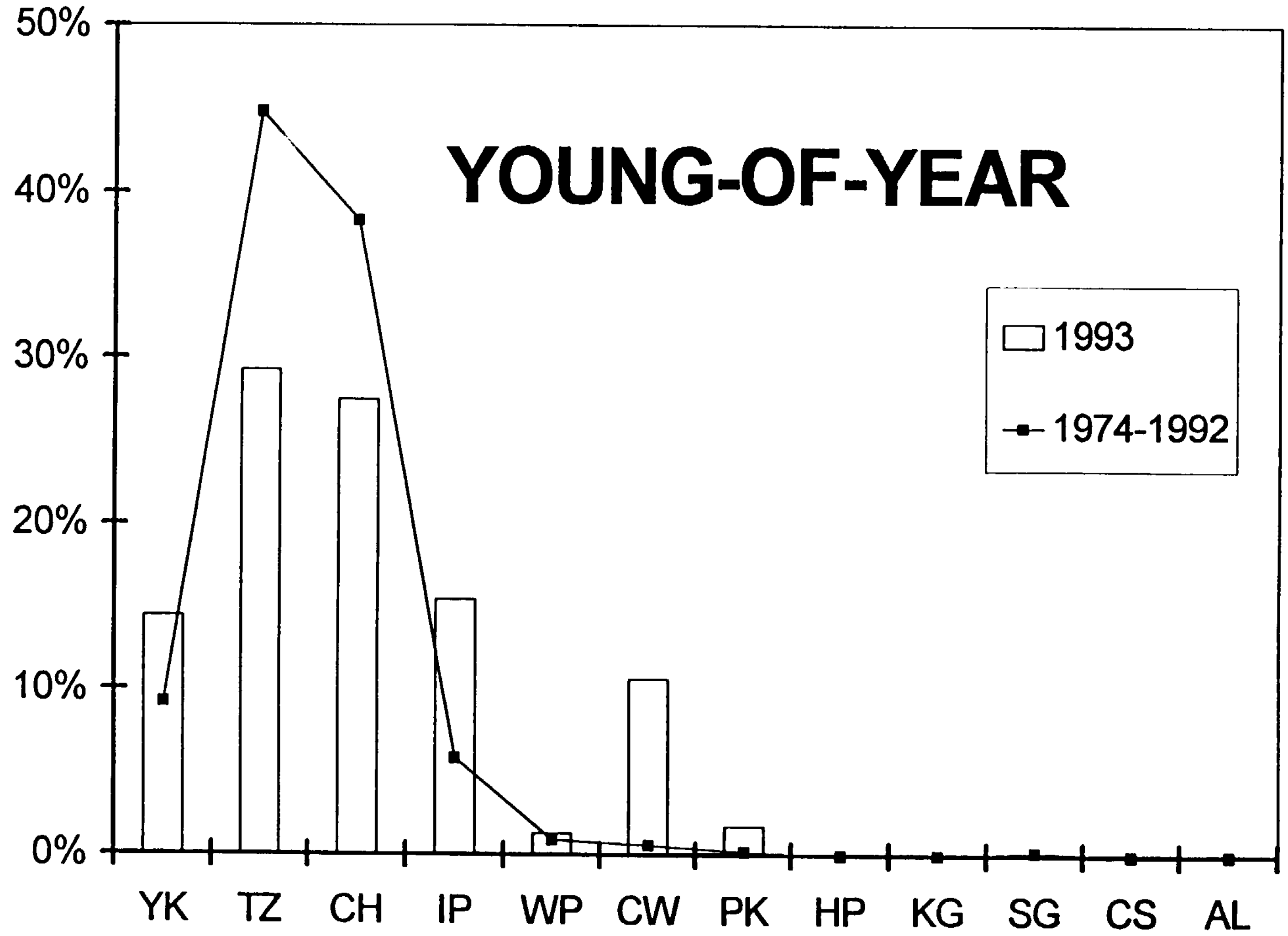


Figure 4-87. Geographical distribution indices for young-of-year bluefish collected during Beach Seine surveys of the Hudson River estuary, 1974-1993.

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Appendix A

Quality Assurance Program

1993 Ichthyoplankton and Fall Shoals Laboratory Program

QUALITY ASSURANCE REPORT FOR THE 1993 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM AND 1993 FALL JUVENILE SURVEY

Prepared for

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QUALITY ASSURANCE REPORT FOR THE 1993
HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM
AND 1993 FALL JUVENILE SURVEY

1.0 INTRODUCTION

This quality assurance report for the laboratory tasks of the 1993 Hudson River Ichthyoplankton Survey and the 1993 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 1993 Hudson River Ichthyoplankton Laboratory Program and 1993 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 1993 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 1993 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

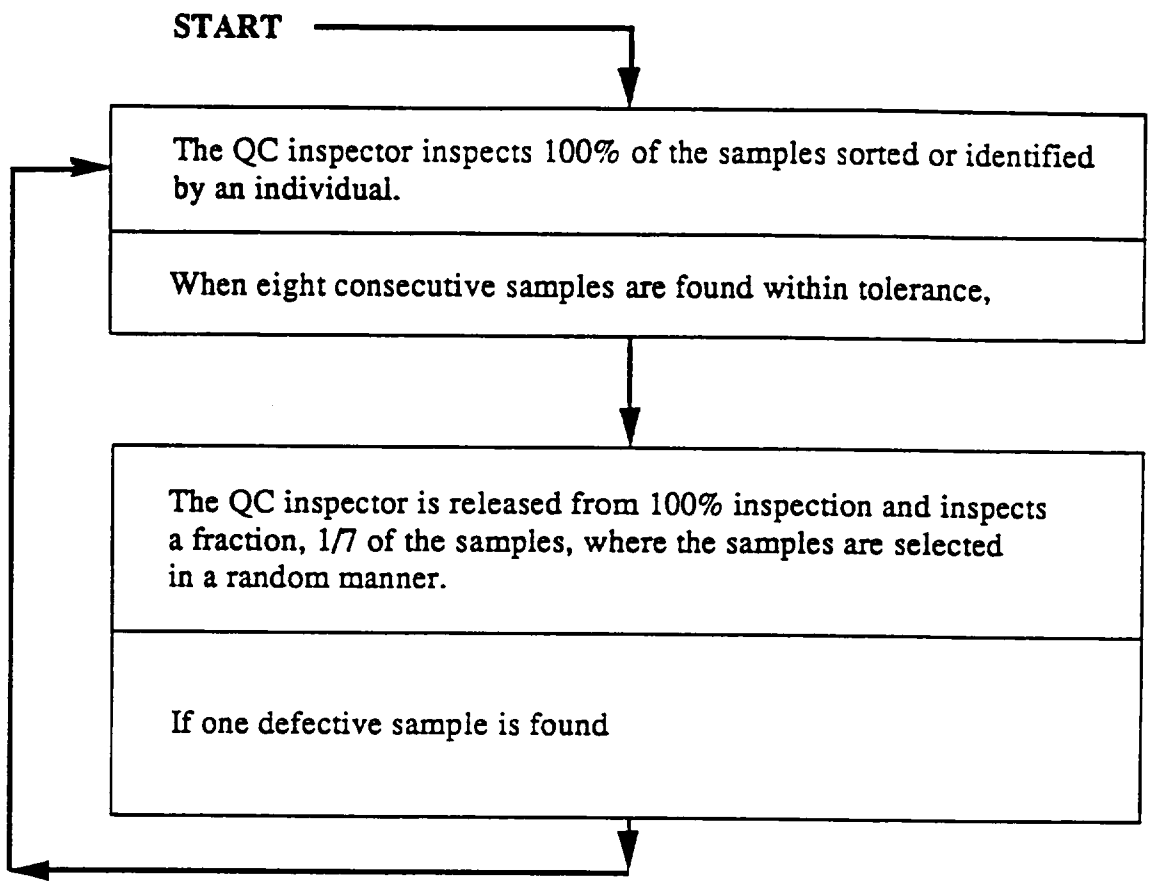

Figure 1. Quality control inspection plan for ichthyoplankton sorting and identification tasks.

measurements. If a sample was found to have exceeded acceptable tolerances, all subsequent samples processed by the same technician 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 1993 and 1994 Hudson River Ichthyoplankton Laboratory Programs (Rev. 1, Change 0, 31 Dec 93) documents specific QA/QC methods utilized for this program.

TABLE 1. TASK SPECIFIC APPLICATIONS OF CONTINUOUS SAMPLING PLANS FOR THE 1993 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	± 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)	one sample

In some cases an experienced QC inspector was able to determine the taxon or life stage of damaged specimens when the original identifier recorded them as unknown life stage, unidentified taxon, or a higher level taxon (genus or family). If a more general taxon or life stage used by the original identifier <u>included</u> the more specific category used by the QC inspector, and that was the only reason for a count discrepancy, then that sample was not considered as failing the QC inspection. For example, damaged specimens recorded as *Morone* sp. by the original identifier and as striped bass by the QC inspector were considered to be in agreement because the category *Morone* sp. includes striped bass. In contrast, an original determination of unidentified gobiid would not be acceptable if the QC determination was striped bass, because striped bass is not included in the family Gobiidae.

For laboratory identification and length measurements of young-of-the-year fishes in the 1993 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 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 1993 Hudson River Fall Juvenile and Beach Seine Surveys Standard Operating Procedures (Rev. 10, Change 1, 2/15/94). 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 1993 FALL JUVENILE SURVEY.

TASK	QC PLAN	AOQL	i	f	x	TOLERANCE	QC 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

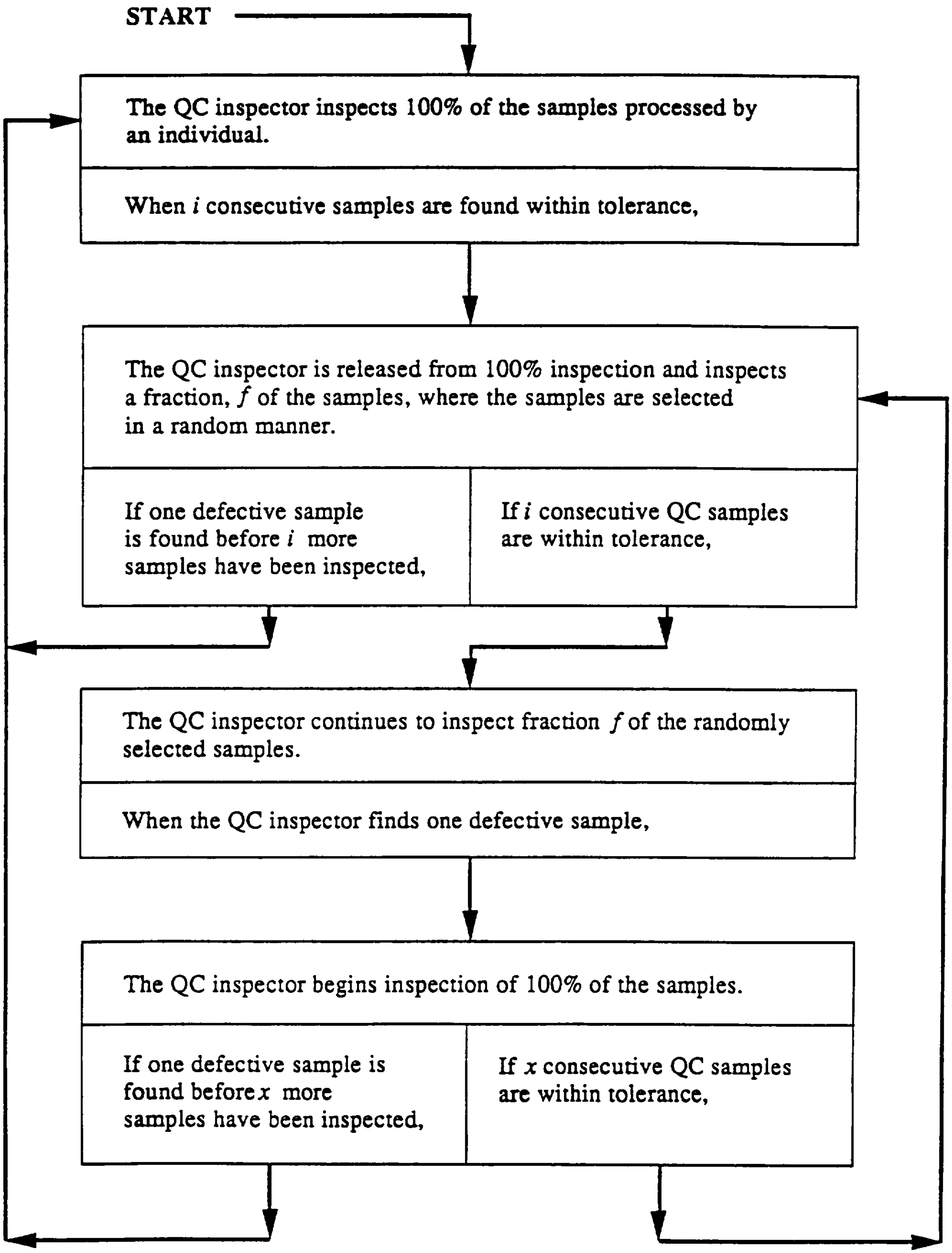

Figure 2. Quality control inspection plan for identification and length measurement of young-of-the-year fishes.

2.2 QUALITY CONTROL REPORTING METHODS

The 1993 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 1993 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

$$= \frac{\text{Number of Samples Inspected}}{\text{Total Number of Samples}} \times 100 \qquad \text{(Equation 1)}$$

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 ichthyoplankton tasks, the number of samples inspected excludes "training QC samples", which do not represent the independent performance of the technician. For the ichthyoplankton identification task, the total number of samples identified excludes empty ("no catch") samples, which 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 Process Average (Percent Nonconforming)

Process Average (Percent Nonconforming)

$$= \frac{\text{Number Nonconforming Samples Inspected}}{\text{Number of Samples Inspected}} \times 100 \quad \text{(Equation 2)}$$

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 =

$$\frac{\text{Quality Control Value}}{\text{(Original Value + Quality Control Value)}} \times 100 \quad \text{(Equation 3)}$$

Sample: 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 that 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 =

$$\frac{(\text{Original Value} - \text{Quality Control Value})}{\text{Quality Control Value}} \times 100 \qquad \text{(Equation 4)}$$

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. If the original count for a life stage was acceptably close to a resolution value but not to the quality control value, the percent measurement error was calculated as described above except that the resolution value was substituted for the quality control value.

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.

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.

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

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

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:

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

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 Cumulative Error Rates

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 =

$$\sum_{i=1}^{n} |I_i - Q_i| \;/\; \sum_{i=1}^{n} Q_i \qquad \text{Equation 6}$$

Net Error Rate =

$$\sum_{i=1}^{n} (I_i - Q_i) \;/\; \sum_{i=1}^{n} Q_i \qquad \text{Equation 7}$$

where

I_i = initial count for taxon-life stage in sample i
Q_i = QC count for taxon-life stage in sample i (or the resolution count, if I_i was acceptably close to it but not to the QC count)
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 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM

The Average Outgoing Quality (AOQ) of the 1993 Hudson River Ichthyoplankton Laboratory Program was 4.39% for the sorting task and 1.39% for the identification task. 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 19.07% for sorting and 16.52% 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 1993 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

TASK	FRACTION INSPECTED(%)	PROCESS AVERAGE(%)	MEAN PERCENT MEASUREMENT ERROR(%)	AOQ(%)
Sorting	19.07	5.54	3.43	4.39
Identification	16.52	1.66	6.21	1.39

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 7.48% to 25.21% for individual river runs (Table 4). River run nonconformities for the sorting task among the inspected samples ranged from 0% to 11.11% and was 5.54% overall (Table 5). Sorting measurement error was between 0% and 8.46% and averaged 3.43% for the study (Table 6). For the task of sample identification, 11.93% to 32.48% of samples were inspected from individual river runs (Table 7). Percent nonconforming for the identification task ranged among river runs from 0% to 11.11% (Table 8) and measurement error from 0% to 22.56% (Table 9). Overall percent nonconformance was 1.66% (Table 8) and overall measurement error was 6.21% (Table 9) for the identification task of this study.

TABLE 4. SAMPLE SORTING FRACTION INSPECTED RESULTS, 1993 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

	FRACTION INSPECTED SORTING QC		
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	TOTAL # OF SAMPLES SORTED	FRACTION INSPECTED
04/12/93	12	108	11.11
04/19/93	8	107	7.48
04/26/93	18	108	16.67
05/03/93	28	117	23.93
05/10/93	27	117	23.08
05/17/93	27	109	24.77
05/24/93	18	110	16.36
05/31/93	26	109	23.85
06/07/93	20	118	16.95
06/14/93	27	118	22.88
06/21/93	24	119	20.17
06/28/93	30	119	25.21
07/05/93	28	119	23.53
07/12/93	12	72	16.67
07/26/93	12	73	16.44
08/09/93	13	73	17.81
08/23/93	16	73	21.92
09/06/93	12	72	16.67
09/20/93	10	73	13.70
10/04/93	11	73	15.07
STUDY	379	1987	19.07

TABLE 5. SAMPLE SORTING PERCENT NONCONFORMANCE RESULTS, 1993 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)
04/12/93	0	12	0.00	0.00
04/19/93	0	8	0.00	0.00
04/26/93	2	18	11.11	5.26
05/03/93	3	28	10.71	7.58
05/10/93	2	27	7.41	7.53
05/17/93	2	27	7.41	7.50
05/24/93	1	18	5.56	7.25
05/31/93	0	26	0.00	6.10
06/07/93	2	20	10.00	6.52
06/14/93	2	27	7.41	6.64
06/21/93	2	24	8.33	6.81
06/28/93	2	30	6.67	6.79
07/05/93	2	28	7.14	6.83
07/12/93	0	12	0.00	6.56
07/26/93	0	12	0.00	6.31
08/09/93	0	13	0.00	6.06
08/23/93	1	16	6.25	6.07
09/06/93	0	12	0.00	5.87
09/20/93	0	10	0.00	5.71
10/04/93	0	11	0.00	5.54
STUDY	21	379		

TABLE 6. SAMPLE SORTING MEAN PERCENT MEASUREMENT ERROR RESULTS, 1993 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

	MEAN PERCENT MEASUREMENT ERROR SORTING QC	
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	MEAN PERCENT MEASUREMENT ERROR
04/12/93	12	0.00
04/19/93	8	0.00
04/26/93	18	7.14
05/03/93	28	8.46
05/10/93	27	4.21
05/17/93	27	3.85
05/24/93	18	4.00
05/31/93	26	3.62
06/07/93	20	3.57
06/14/93	27	3.53
06/21/93	24	4.33
06/28/93	30	2.63
07/05/93	28	3.46
07/12/93	12	1.68
07/26/93	12	1.11
08/09/93	13	1.31
08/23/93	16	2.02
09/06/93	12	1.13
09/20/93	10	0.76
10/04/93	11	0.18
STUDY	379	3.43

TABLE 7. SAMPLE IDENTIFICATION FRACTION INSPECTED RESULTS, 1993 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

	FRACTION INSPECTED IDENTIFICATION QC		
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	TOTAL # OF SAMPLES IDENTIFIED	FRACTION INSPECTED
04/12/93	8	54	14.81
04/19/93	6	47	12.77
04/26/93	12	70	17.14
05/03/93	15	109	13.76
05/10/93	38	117	32.48
05/17/93	27	109	24.77
05/24/93	18	110	16.36
05/31/93	13	109	11.93
06/07/93	15	118	12.71
06/14/93	23	118	19.49
06/21/93	19	119	15.97
06/28/93	23	119	19.33
07/05/93	16	119	13.45
07/12/93	9	72	12.50
07/26/93	10	73	13.70
08/09/93	10	73	13.70
08/23/93	10	72	13.89
09/06/93	11	71	15.49
09/20/93	9	73	12.33
10/04/93	9	70	12.86
STUDY	301	1822	16.52

TABLE 8. SAMPLE IDENTIFICATION PERCENT NONCONFORMANCE RESULTS, 1993 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)
04/12/93	0	8	0.00	0.00
04/19/93	0	6	0.00	0.00
04/26/93	0	12	0.00	0.00
05/03/93	0	15	0.00	0.00
05/10/93	1	38	2.63	1.27
05/17/93	0	27	0.00	0.94
05/24/93	2	18	11.11	2.42
05/31/93	0	13	0.00	2.19
06/07/93	0	15	0.00	1.97
06/14/93	1	23	4.35	2.29
06/21/93	0	19	0.00	2.06
06/28/93	1	23	4.35	2.30
07/05/93	0	16	0.00	2.15
07/12/93	0	9	0.00	2.07
07/26/93	0	10	0.00	1.98
08/09/93	0	10	0.00	1.91
08/23/93	0	10	0.00	1.84
09/06/93	0	11	0.00	1.77
09/20/93	0	9	0.00	1.71
10/04/93	0	9	0.00	1.66
STUDY	5	301		

TABLE 9. SAMPLE IDENTIFICATION MEAN PERCENT MEASUREMENT ERROR RESULTS, 1993 HUDSON RIVER ICHTHYOPLANKTON LABORATORY PROGRAM.

		MEAN PERCENT MEASUREMENT ERROR IDENTIFICATION QC	
SAMPLING WEEK (BEGINNING MONDAY)	TOTAL # OF SAMPLES INSPECTED	MEAN PERCENT MEASUREMENT ERROR	NUMBER OF TAXA INSPECTED
04/12/93	8	0.00	11
04/19/93	6	0.00	8
04/26/93	12	0.00	21
05/03/93	15	0.47	52
05/10/93	38	12.88	184
05/17/93	27	1.24	159
05/24/93	18	20.40	101
05/31/93	13	1.10	88
06/07/93	15	1.31	89
06/14/93	23	22.56	137
06/21/93	19	1.11	118
06/28/93	23	1.90	118
07/05/93	16	0.93	87
07/12/93	9	0.77	47
07/26/93	10	1.59	44
08/09/93	10	2.62	24
08/23/93	10	0.78	28
09/06/93	11	1.05	43
09/20/93	9	1.27	18
10/04/93	9	0.99	20
STUDY	301	6.21	1397

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 89% 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 life stage most commonly missed by sorters for white perch, *Morone* sp., and clupeids was post yolk-sac larvae (Table 11). For bay anchovy, eggs and post yolk-sac larvae were equally likely to be missed. The most commonly missed life stage was yolk-sac larvae for striped bass and eggs for hogchoker. Generally the life stage most frequently missed by sorters was the most abundant one, except that the larger young-of-the-year fish were very rarely overlooked by the sorters.

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 low total counts had absolute error rates above 0.05 (Table 12).

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

TAXON	NUMBER OF ORGANISMS FOUND IN SORT QC	PERCENT
WHITE PERCH	1380	30.96
STRIPED BASS	1363	30.58
BAY ANCHOVY	636	14.27
CLUPEID UNID.	596	13.37
MORONE SP.	165	3.70
HOGCHOKER	97	2.18
UNIDENTIFIED	95	2.13
RAINBOW SMELT	36	0.81
AMERICAN SHAD	19	0.43
WINDOWPANE	18	0.40
GOBIID UNID.	15	0.34
CYPRINID UNID.	11	0.25
TESSELLATED DARTER	8	0.18
WEAKFISH	4	0.09
CUNNER	3	0.07
YELLOW PERCH	3	0.07
ATLANTIC TOMCOD	2	0.04
AMERICAN EEL	1	0.02
ATLANTIC MENHADEN	1	0.02
CENTRARCHID UNID.	1	0.02
FUNDULUS SP.	1	0.02
GIZZARD SHAD	1	0.02
NORTHERN PIPEFISH	1	0.02
TOTAL	4457	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	323	50.79	0.43	75173
	YOLK-SAC LARVAE	2	0.31	5.13	39
	POST YOLK-SAC LARVAE	307	48.27	0.51	60503
	YOUNG-OF-THE-YEAR	0	0.00	0.00	24440
	UNIDENTIFIED	4	0.63	1.29	310
CLUPEID UNID.	EGGS	110	18.46	1.74	6308
	YOLK-SAC LARVAE	67	11.24	1.01	6631
	POST YOLK-SAC LARVAE	392	65.77	1.23	31799
	YOUNG-OF-THE-YEAR	0	0.00	0.00	60
	UNIDENTIFIED	27	4.53	2.59	1042
HOGCHOKER	EGGS	97	100.00	1.30	7468
	POST YOLK-SAC LARVAE	0	0.00	0.00	9
	YOUNG-OF-THE-YEAR	0	0.00	0.00	25
MORONE SP.	YOLK-SAC LARVAE	9	5.45	10.71	84
	POST YOLK-SAC LARVAE	120	72.73	2.09	5753
	YOUNG-OF-THE-YEAR	1	0.61	100.00	1
	UNIDENTIFIED	35	21.21	0.93	3771
STRIPED BASS	EGGS	240	17.61	1.83	13080
	YOLK-SAC LARVAE	671	49.23	1.81	37152
	POST YOLK-SAC LARVAE	451	33.09	0.43	104346
	YOUNG-OF-THE-YEAR	1	0.07	0.07	1395
	UNIDENTIFIED	0	0.00	0.00	92
WHITE PERCH	EGGS	146	10.58	1.45	10091
	YOLK-SAC LARVAE	227	16.45	1.40	16251
	POST YOLK-SAC LARVAE	1006	72.90	1.01	99893
	YOUNG-OF-THE-YEAR	0	0.00	0.00	25
	UNIDENTIFIED	1	0.07	0.77	130

[a]Includes 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
AMERICAN EEL	YOUNG OF THE YEAR	225	0.00000	0.00000	55
AMERICAN SHAD	EGGS	889	-0.01125	0.01125	24
	YOLK-SAC LARVAE	106	-0.00943	0.00943	15
	POST YOLK SAC LARVAE	131	-0.00763	0.05344	25
	YOUNG OF THE YEAR	69	0.02899	0.05797	13
ATLANTIC TOMCOD	UNIDENTIFIED	0	1.00000	1.00000	1
	POST YOLK SAC LARVAE	447	0.00447	0.01342	13
	YOUNG OF THE YEAR	1907	-0.00944	0.00944	75
BAY ANCHOVY	UNIDENTIFIED	5	1.60000	2.00000	7
	EGGS	12926	0.00325	0.01888	56
	YOLK-SAC LARVAE	1	0.00000	0.00000	1
	POST YOLK SAC LARVAE	7959	-0.00138	0.02902	119
	YOUNG OF THE YEAR	3296	-0.00030	0.02215	56
GOBY FAMILY	POST YOLK SAC LARVAE	541	-0.01664	0.04251	28
	YOUNG OF THE YEAR	0	1.00000	1.00000	1
HERRING FAMILY	UNIDENTIFIED	76	0.65789	0.65789	14
	EGGS	1251	0.00639	0.02718	33
	YOLK-SAC LARVAE	2352	-0.00383	0.02849	50
	POST YOLK SAC LARVAE	4242	-0.00259	0.03984	107
	YOUNG OF THE YEAR	3	0.00000	0.00000	1
HOGCHOKER	EGGS	1199	-0.01334	0.05004	23
	POST YOLK SAC LARVAE	0	2.00000	2.00000	2
	YOUNG OF THE YEAR	4	0.25000	0.25000	3
MORONE SPECIES	UNIDENTIFIED	617	0.08428	0.08752	34
	YOLK-SAC LARVAE	11	0.18182	0.18182	2
	POST YOLK SAC LARVAE	272	0.16176	0.19853	34
RAINBOW SMELT	UNIDENTIFIED	29	0.10345	0.17241	7
	YOLK-SAC LARVAE	203	0.10837	0.12808	27
	POST YOLK SAC LARVAE	1532	-0.01044	0.04047	111
	YOUNG OF THE YEAR	112	-0.01786	0.14286	26
STRIPED BASS	UNIDENTIFIED	26	0.11538	0.11538	2
	EGGS	1666	0.00300	0.01381	48
	YOLK-SAC LARVAE	4188	-0.00788	0.03701	68
	POST YOLK SAC LARVAE	11771	-0.00688	0.03016	118
	YOUNG OF THE YEAR	28	0.00000	0.21429	14
WHITE PERCH	UNIDENTIFIED	12	0.66667	0.66667	6
	EGGS	905	-0.00221	0.02431	37
	YOLK-SAC LARVAE	3259	0.00706	0.04449	73
	POST YOLK SAC LARVAE	13140	-0.00563	0.02846	124
	YOUNG OF THE YEAR	1	1.00000	1.00000	1
WINDOWPANE	EGGS	1752	0.00057	0.04395	22
	YOLK-SAC LARVAE	1	0.00000	0.00000	1
	POST YOLK SAC LARVAE	22	0.27273	0.27273	11
	YOUNG OF THE YEAR	7	-0.71429	0.71429	3

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 JUVENILE SURVEY

Results of the laboratory quality control program for the 1993 Fall Juvenile Survey (consisting of the Beach Seine Survey and the Fall Shoals Survey) were summarized by the same methods as the QC results for the 1993 Hudson River Ichthyoplankton Laboratory Program (Section 2.2) and are presented in Table 13.

TABLE 13. FRACTION INSPECTED, PROCESS AVERAGE, AND AVERAGE OUTGOING QUALITY OF LABORATORY TASKS PERFORMED BY NAI FOR THE 1993 FALL JUVENILE SURVEY.

TASK	AVERAGE FRACTION INSPECTED(%)	PROCESS AVERAGE(%)	AVERAGE OUTGOING QUALITY(%)
Identification	10.30	0.00	0.00
Measurement	3.57	0.00	0.00

A total of 1071 and 1695 young-of-the-year fish identification records were made in the laboratory for the Fall Shoals and Beach Seine surveys respectively and 6214 and 6045 young-of-the-year fish length measurement records were made for the Fall Shoals and Beach Seine surveys respectively.

4.0 BIBLIOGRAPHY

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Appendix B

Physical/Chemical Parameters

APPENDIX B

LIST OF TABLES

TABLE B-1 DAILY FRESHWATER FLOW (m^3/s) ESTIMATED FOR GREEN ISLAND, NEW YORK, 1993

Day of Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1,166	300	258	2,592	931	209	153	150	147	156	243	623
2	821	280	266	2,205	908	232	139	142	192	164	280	492
3	611	297	272	1,814	812	224	139	133	167	158	252	478
4	563	311	275	1,443	688	207	133	122	175	181	252	478
5	804	303	275	1,157	580	190	133	144	192	181	280	665
6	1,194	300	269	1,143	603	187	133	139	178	209	467	821
7	1,033	275	269	1,174	577	241	144	133	127	181	436	651
8	846	263	221	1,206	555	215	136	133	147	170	351	521
9	696	280	198	1,242	512	198	161	136	142	158	277	458
10	563	283	201	1,474	478	207	144	130	139	158	275	391
11	484	283	201	2,318	368	209	127	125	139	142	243	436
12	733	280	198	2,471	365	226	144	127	153	158	235	526
13	422	277	181	1,973	357	212	133	122	164	147	224	447
14	413	266	175	1,483	303	184	133	127	153	190	229	388
15	408	275	167	1,237	255	161	125	144	144	170	255	354
16	405	283	170	1,211	283	184	119	156	156	150	272	348
17	413	280	192	1,984	277	198	130	153	147	161	260	342
18	410	272	224	2,539	252	190	192	156	144	238	710	300
19	376	272	224	1,936	238	178	127	147	136	238	552	275
20	337	263	218	1,423	204	184	130	127	144	215	399	286
21	354	260	224	1,172	207	249	144	136	142	207	300	470
22	368	252	204	1,477	207	294	127	153	142	337	317	328
23	399	258	192	2,788	198	294	125	147	125	331	258	422
24	433	269	218	2,564	212	198	122	133	122	235	280	325
25	490	263	232	2,080	167	192	119	173	133	221	246	272
26	478	263	317	1,797	204	158	116	178	139	195	201	243
27	427	260	433	2,103	181	167	161	144	170	164	207	218
28	396	255	611	1,856	175	164	144	142	275	187	436	215
29	368	.	1,189	1,508	181	175	116	127	212	181	843	241
30	334	.	3,056	1,112	173	147	127	133	187	175	832	235
31	300	.	2,915	.	170	.	144	119	.	195	.	238

NOTE: Dots (.) indicate no sampling.

TABLE B-2 LONG-TERM (1947-1992) AND 1993 MONTHLY MEAN FRESHWATER FLOW (m^3/sec) RECORDED AT GREEN ISLAND, NEW YORK

	Flow (m^3/sec)			
Month	1993 Average	Long-Term Average	Long-Term Minimum[a]	Long-Term Maximum[a]
JAN	550	368	118	961
FEB	276	397	128	885
MAR	453	616	258	1,077
APR	1,749	851	384	1,462
MAY	375	529	156	1,147
JUN	202	282	101	839
JUL	136	183	87	520
AUG	140	160	48	414
SEP	158	182	58	482
OCT	192	251	71	853
NOV	347	359	93	740
DEC	403	415	173	764
Annual Average[b]	414	382		

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

TABLE B-3 MONTHLY MEAN FRESHWATER FLOW (m^3/s) ESTIMATED FOR GREEN ISLAND, NEW YORK FROM 1974 TO 1993

	YEAR																			
MONTH	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
JAN	623	540	417	225	744	571	256	148	321	259	133	439	310	262	268	196	383	512	304	550
FEB	527	548	885	227	400	335	128	851	356	352	552	319	362	201	349	256	703	496	236	276
MAR	587	670	897	987	619	1,077	633	349	613	580	281	581	1,018	605	461	332	994	696	408	453
APR	854	724	1,040	1,092	950	1,009	748	384	897	1062	761	456	689	981	476	548	894	655	648	1,749
MAY	650	566	900	421	530	508	274	328	354	1036	651	232	363	156	357	620	990	346	501	375
JUN	249	367	431	207	282	216	192	169	431	358	275	157	428	175	123	389	250	144	342	203
JUL	333	211	432	162	131	131	144	140	182	127	127	133	250	162	131	92	157	112	254	136
AUG	180	254	414	154	169	149	130	133	124	155	48	104	350	118	139	61	248	123	203	140
SEP	294	482	271	408	175	221	118	233	122	133	58	171	218	341	164	120	159	136	217	158
OCT	256	662	658	853	244	313	158	456	124	71	178	206	336	504	211	254	477	216	286	192
NOV	486	637	507	663	227	465	242	393	196	224	277	423	544	453	565	407	653	301	531	347
DEC	548	532	398	749	303	430	273	319	233	624	447	338	524	437	330	180	687	364	438	403
ANNUAL AVERAGE	466	516	604	512	398	452	275	325	329	415	316	296	449	366	298	288	549	342	364	415

TABLE B-4 POUGHKEEPSIE WATERWORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1993

Month	Day	Long Term Mean	Temperature Minimum	(1951-1992) Maximum	1993 Actual Temperatures
1	1	1.6	0.6	4.4	1.3
1	2	1.5	0.0	4.4	1.1
1	3	1.6	0.6	4.4	1.0
1	4	1.5	0.6	3.3	0.9
1	5	1.5	0.0	3.3	1.1
1	6	1.3	0.0	3.3	1.2
1	7	1.3	0.0	3.3	1.8
1	8	1.2	0.0	3.3	1.5
1	9	1.2	0.0	3.3	1.5
1	10	1.1	0.0	2.8	1.4
1	11	1.1	0.0	2.8	1.5
1	12	1.1	0.6	2.8	1.5
1	13	1.1	0.0	2.8	1.5
1	14	1.1	0.0	2.8	1.3
1	15	1.1	0.0	2.8	1.4
1	16	1.1	0.5	2.8	1.1
1	17	1.1	0.6	2.8	1.0
1	18	1.1	0.6	3.3	1.0
1	19	1.0	0.6	2.8	0.6
1	20	1.0	0.5	2.2	0.9
1	21	1.0	0.0	2.4	1.1
1	22	1.0	0.6	2.2	1.1
1	23	1.0	0.6	2.2	1.0
1	24	1.0	0.0	2.2	0.9
1	25	1.0	0.0	3.1	0.8
1	26	0.9	0.0	2.2	1.2
1	27	1.0	0.0	2.2	1.0
1	28	1.0	0.6	2.2	0.9
1	29	1.0	0.6	2.2	1.2
1	30	1.0	0.6	2.2	0.9
1	31	1.0	0.6	2.2	0.9
2	1	1.0	0.6	2.2	0.6
2	2	1.0	0.6	2.2	0.6
2	3	1.0	0.6	2.2	0.6
2	4	0.9	0.6	1.8	0.9
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	0.8
2	8	1.0	0.6	2.2	0.9
2	9	1.0	0.6	2.2	0.7
2	10	1.1	0.6	3.3	0.8
2	11	1.0	0.0	2.2	1.2
2	12	1.0	0.6	2.3	1.1
2	13	1.1	0.6	2.2	1.1
2	14	1.2	0.6	2.8	1.1
2	15	1.1	0.6	2.8	1.0
2	16	1.1	0.0	2.8	0.8
2	17	1.1	0.6	2.8	0.9
2	18	1.1	0.0	2.8	0.7
2	19	1.2	0.6	2.8	0.8
2	20	1.2	0.6	2.8	0.8
2	21	1.2	0.6	2.8	0.9
2	22	1.2	0.0	3.9	1.0
2	23	1.3	0.0	2.8	1.0
2	24	1.3	0.0	3.9	0.8
2	25	1.3	0.6	3.9	1.1
2	26	1.5	0.0	3.9	0.9
2	27	1.5	0.0	4.4	0.9
2	28	1.5	0.0	5.0	0.7
2	29	1.8	0.6	4.4	
3	1	1.5	0.6	4.4	1.2
3	2	1.5	0.6	4.4	0.8
3	3	1.5	0.6	4.4	1.9
3	4	1.6	0.6	4.4	1.1
3	5	1.5	0.6	3.3	0.9
3	6	1.6	0.6	3.7	0.8
3	7	1.7	0.6	4.7	0.9
3	8	1.7	0.0	4.9	1.2
3	9	1.8	0.6	4.5	1.0
[illegible]	[illegible]	1.9	0.6	4.8	1.1
3	11	2.0	0.6	4.4	1.1
3	12	2.1	0.6	4.4	1.2

TABLE B-4 POUGHKEEPSIE WATERWORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1993

Month	Day	Long Term Mean	Temperature Minimum	(1951-1992) Maximum	1993 Actual Temperatures
3	13	2.2	0.6	4.4	1.2
3	14	2.3	0.6	4.4	0.9
3	15	2.4	0.6	5.0	0.6
3	16	2.5	0.6	5.6	0.7
3	17	2.6	0.6	5.7	0.6
3	18	2.6	0.6	5.9	0.5
3	19	2.7	0.6	7.7	0.7
3	20	2.9	0.6	7.5	0.8
3	21	3.0	0.6	7.3	0.6
3	22	3.1	0.6	7.2	1.1
3	23	3.3	0.6	7.1	1.3
3	24	3.5	0.6	7.1	0.9
3	25	3.6	0.6	5.9	1.2
3	26	3.8	0.6	6.1	1.3
3	27	4.1	1.1	6.7	1.3
3	28	4.3	1.1	6.7	1.8
3	29	4.5	1.1	6.7	2.9
3	30	4.6	1.1	7.8	3.8
3	31	4.9	1.1	8.3	3.1
4	1	5.2	1.7	9.4	2.4
4	2	5.3	2.2	8.3	3.0
4	3	5.5	2.8	8.9	3.1
4	4	5.7	2.8	8.9	3.5
4	5	5.9	2.8	8.9	3.4
4	6	6.1	3.3	8.9	3.5
4	7	6.2	2.8	9.4	4.0
4	8	6.3	2.8	9.4	4.2
4	9	6.4	2.8	9.2	4.9
4	10	6.5	2.8	10.2	5.7
4	11	6.8	2.8	11.2	6.5
4	12	7.0	2.8	11.4	7.5
4	13	7.2	2.8	11.4	7.4
4	14	7.3	2.8	11.4	7.4
4	15	7.5	2.8	11.5	7.4
4	16	7.7	3.3	11.8	7.2
4	17	7.9	3.9	11.7	7.5
4	18	8.2	5.6	11.8	7.9
4	19	8.4	5.6	12.2	8.8
4	20	8.6	6.1	12.2	10.0
4	21	9.0	6.1	12.2	10.2
4	22	9.2	6.7	12.8	9.8
4	23	9.4	6.7	12.8	9.3
4	24	9.6	6.7	13.3	8.4
4	25	9.7	6.7	13.3	9.0
4	26	10.0	6.7	13.3	8.5
4	27	10.1	7.2	13.3	8.6
4	28	10.4	7.8	13.3	8.5
4	29	10.6	8.3	13.9	8.6
4	30	10.9	8.9	13.9	9.7
5	1	11.1	8.9	14.4	10.3
5	2	11.4	8.9	14.4	10.9
5	3	11.6	8.9	14.4	11.5
5	4	11.9	8.9	15.0	12.0
5	5	12.0	8.9	15.0	12.6
5	6	12.2	8.9	15.0	13.1
5	7	12.5	8.9	15.0	13.5
5	8	12.6	8.9	15.1	14.0
5	9	12.7	8.9	15.6	14.5
5	10	12.9	8.9	16.1	15.4
5	11	13.1	9.4	16.1	15.7
5	12	13.1	9.4	16.1	16.2
5	13	13.3	10.0	16.2	16.7
5	14	13.5	10.6	16.7	16.4
5	15	13.8	11.1	16.7	16.8
5	16	14.1	11.1	17.2	16.9
5	17	14.3	11.7	17.2	17.6
5	18	14.5	12.2	17.3	17.7
5	19	14.8	12.2	17.5	17.7
5	20	15.0	12.2	17.8	17.8
5	21	15.3	12.8	[illegible]	[illegible]
5	22	15.5	12.8	18.5	17.8
5	23	15.7	12.8	18.9	17.9

TABLE B-4 POUGHKEEPSIE WATERWORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1993

Month	Day	Long Term Mean	Temperature Minimum	(1951-1992) Maximum	1993 Actual Temperatures
5	24	15.9	12.8	19.0	18.2
5	25	16.1	12.8	19.3	18.2
5	26	16.3	12.2	19.4	18.2
5	27	16.5	12.2	20.6	18.2
5	28	16.8	12.2	20.6	18.3
5	29	17.0	12.8	20.7	18.3
5	30	17.2	12.8	21.5	18.3
5	31	17.3	13.3	21.3	18.4
6	1	17.7	13.3	22.0	18.7
6	2	17.9	13.3	22.2	18.6
6	3	18.0	14.4	22.1	18.7
6	4	18.3	13.9	22.5	18.8
6	5	18.5	15.0	22.2	18.9
6	6	18.6	15.6	22.4	18.9
6	7	18.8	15.0	22.4	18.7
6	8	19.1	16.1	22.5	18.8
6	9	19.2	16.1	23.0	18.9
6	10	19.5	16.1	23.2	19.1
6	11	19.7	17.2	23.4	19.4
6	12	19.8	17.2	23.3	19.5
6	13	20.0	17.8	23.4	19.6
6	14	20.1	17.8	23.3	20.2
6	15	20.2	17.8	23.5	20.4
6	16	20.4	17.8	23.8	20.5
6	17	20.4	17.8	23.8	20.7
6	18	20.7	17.8	24.2	21.0
6	19	20.8	17.8	24.1	21.3
6	20	20.9	17.8	24.0	21.5
6	21	21.2	17.8	24.3	21.8
6	22	21.4	17.2	24.3	22.1
6	23	21.4	17.2	24.1	22.0
6	24	21.6	17.8	24.1	22.4
6	25	21.7	17.8	24.2	22.3
6	26	21.9	17.8	24.5	22.5
6	27	22.0	17.8	24.4	22.6
6	28	22.1	17.8	24.4	22.7
6	29	22.2	17.8	25.0	23.5
6	30	22.4	17.8	25.0	23.4
7	1	22.5	18.9	25.4	23.7
7	2	22.6	18.9	25.0	23.7
7	3	22.8	19.4	25.0	23.7
7	4	22.8	19.4	25.0	23.8
7	5	23.0	20.0	25.6	23.9
7	6	23.1	20.0	25.6	24.5
7	7	23.2	20.0	25.6	24.7
7	8	23.3	20.0	25.6	24.9
7	9	23.4	20.0	25.6	25.3
7	10	23.4	20.6	25.6	25.4
7	11	23.5	20.6	25.6	25.9
7	12	23.7	21.1	26.1	26.1
7	13	23.9	21.7	26.7	26.2
7	14	23.9	21.7	26.7	26.0
7	15	24.1	21.7	26.7	26.3
7	16	24.2	22.2	26.7	26.3
7	17	24.3	22.2	26.1	26.2
7	18	24.3	22.2	26.1	26.1
7	19	24.5	22.2	26.1	26.3
7	20	24.6	22.2	26.7	26.1
7	21	24.6	22.8	26.1	25.9
7	22	24.7	22.2	26.7	25.8
7	23	24.8	22.2	26.7	25.8
7	24	24.8	22.8	26.7	25.6
7	25	24.8	22.8	26.7	25.8
7	26	24.9	22.8	26.7	25.9
7	27	25.1	22.8	27.2	25.6
7	28	25.1	22.8	27.2	25.8
7	29	25.1	22.8	26.7	25.5
7	30	25.1	23.3	26.7	25.6
7	31	25.2	23.3	26.7	25.4
8	1	25.2	23.3	26.7	25.4
8	2	25.2	22.8	26.7	25.4
8	3	25.3	23.3	26.8	25.6

TABLE B-4 POUGHKEEPSIE WATERWORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1993

Month	Day	Long Term Mean	Temperature Minimum	(1951-1992) Maximum	1993 Actual Temperatures
8	4	25.3	23.3	26.9	25.6
8	5	25.3	23.3	27.2	25.6
8	6	25.3	23.3	27.2	25.6
8	7	25.3	23.3	27.4	25.5
8	8	25.3	23.3	27.4	25.5
8	9	25.3	23.3	27.8	25.3
8	10	25.3	23.3	27.8	25.2
8	11	25.3	22.8	27.8	25.3
8	12	25.2	22.8	28.1	25.0
8	13	25.1	22.2	28.0	24.9
8	14	25.1	22.2	28.4	25.0
8	15	25.0	22.2	28.4	25.5
8	16	25.0	22.2	28.4	25.6
8	17	24.9	22.2	28.1	24.8
8	18	24.9	22.8	28.0	24.8
8	19	24.9	22.2	27.7	25.0
8	20	24.9	22.8	27.6	25.0
8	21	24.8	22.2	27.5	25.0
8	22	24.7	22.2	27.1	25.0
8	23	24.7	22.8	26.9	25.0
8	24	24.6	22.2	26.7	25.1
8	25	24.5	21.7	26.2	25.1
8	26	24.5	21.7	26.1	25.0
8	27	24.5	22.2	26.2	25.4
8	28	24.4	22.2	25.8	25.4
8	29	24.2	22.2	26.7	25.4
8	30	24.3	22.2	26.1	25.5
8	31	24.2	22.2	26.1	25.6
9	1	24.2	22.2	26.1	25.5
9	2	24.1	22.2	26.7	25.5
9	3	24.0	22.2	26.1	25.5
9	4	23.9	22.2	25.6	25.6
9	5	23.8	21.7	25.6	25.6
9	6	23.7	22.2	25.6	25.4
9	7	23.6	21.7	25.6	25.3
9	8	23.5	21.7	25.6	24.7
9	9	23.4	21.7	25.6	24.7
9	10	23.3	21.1	25.6	24.5
9	11	23.2	21.1	25.6	24.4
9	12	23.1	21.1	25.6	24.2
9	13	22.9	20.0	25.6	23.9
9	14	22.7	18.9	25.0	24.1
9	15	22.5	17.8	25.0	24.1
9	16	22.3	17.2	25.0	23.4
9	17	22.2	17.2	25.0	23.2
9	18	22.0	16.7	25.0	22.6
9	19	21.9	16.7	23.9	21.7
9	20	21.8	17.2	23.9	21.1
9	21	21.5	16.7	23.3	21.0
9	22	21.3	16.1	23.3	21.3
9	23	21.0	16.1	22.8	21.4
9	24	20.8	15.6	22.8	20.9
9	25	20.7	15.6	22.8	20.3
9	26	20.5	15.6	22.2	20.9
9	27	20.3	16.1	22.2	21.0
9	28	20.2	15.6	22.2	21.1
9	29	19.9	15.6	22.2	20.2
9	30	19.7	15.6	22.2	19.7
10	1	19.6	16.1	22.2	18.9
10	2	19.4	15.6	22.2	18.9
10	3	19.3	15.6	22.2	18.8
10	4	19.0	15.6	21.7	18.3
10	5	18.7	15.0	21.1	18.3
10	6	18.6	15.0	21.1	18.0
10	7	18.5	15.0	21.1	17.8
10	8	18.2	14.4	21.1	
10	9	18.0	14.4	21.1	17.8
10	10	17.9	14.4	21.1	17.2
10	11	17.7	13.9	21.1	17.1
[illegible]	[illegible]	[illegible]	13.3	21.1	16.6
10	13	17.2	13.3	20.0	16.1
10	14	17.0	12.8	21.1	15.5

TABLE B-4 POUGHKEEPSIE WATERWORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1993

Month	Day	Long Term Mean	Temperature Minimum	(1951-1992) Maximum	1993 Actual Temperatures
10	15	16.8	12.2	20.0	15.2
10	16	16.6	12.2	20.0	15.2
10	17	16.3	12.2	20.0	15.1
10	18	16.1	12.2	20.0	
10	19	15.9	11.7	20.0	15.3
10	20	15.6	10.6	19.4	15.1
10	21	15.3	10.6	18.9	15.3
10	22	15.1	10.0	18.9	14.4
10	23	14.9	10.0	18.9	14.3
10	24	14.7	10.0	18.3	14.0
10	25	14.5	10.0	18.3	14.0
10	26	14.3	10.0	17.8	14.2
10	27	14.1	9.4	17.8	13.5
10	28	13.9	8.9	17.8	13.5
10	29	13.6	8.3	17.8	13.5
10	30	13.5	7.8	16.7	13.4
10	31	13.2	7.2	16.7	12.9
11	1	13.0	7.2	16.7	12.7
11	2	12.8	7.2	16.1	11.9
11	3	12.7	7.2	16.1	11.5
11	4	12.4	7.2	16.1	11.1
11	5	12.2	7.2	15.6	11.2
11	6	12.0	6.7	15.6	11.1
11	7	11.7	6.1	15.0	11.0
11	8	11.4	6.1	15.0	9.9
11	9	11.2	5.6	15.0	9.8
11	10	11.0	5.0	15.0	9.5
11	11	10.7	5.0	15.0	9.3
11	12	10.4	5.0	15.0	9.2
11	13	10.2	5.0	13.3	9.2
11	14	10.0	5.0	13.3	8.8
11	15	9.7	5.0	12.8	9.2
11	16	9.5	5.0	12.8	9.0
11	17	9.4	5.0	12.8	8.6
11	18	9.2	5.0	12.8	8.6
11	19	8.9	5.0	12.2	8.4
11	20	8.7	5.0	11.1	8.3
11	21	8.5	3.9	11.1	8.3
11	22	8.2	3.9	11.1	8.2
11	23	8.1	3.9	11.1	7.9
11	24	7.8	3.9	10.6	7.9
11	25	7.6	3.9	10.6	7.3
11	26	7.4	3.3	10.0	6.9
11	27	7.1	3.3	10.0	6.5
11	28	7.0	3.3	10.0	6.6
11	29	6.8	3.3	10.0	5.8
11	30	6.5	2.8	10.0	5.9
12	1	6.3	2.2	9.4	5.6
12	2	6.1	3.0	8.9	5.8
12	3	5.8	2.2	8.9	5.8
12	4	5.6	1.3	8.3	5.8
12	5	5.4	2.8	7.8	5.8
12	6	5.3	2.6	7.8	5.5
12	7	5.1	2.0	7.8	4.7
12	8	4.8	2.0	7.8	5.0
12	9	4.6	1.7	7.2	4.7
12	10	4.3	1.1	7.2	4.5
12	11	4.1	1.1	7.2	4.5
12	12	3.9	0.6	7.2	4.4
12	13	3.8	0.6	6.7	4.1
12	14	3.6	0.6	6.7	3.7
12	15	3.4	0.6	6.7	3.6
12	16	3.2	0.6	6.7	3.6
12	17	3.1	0.6	5.6	3.4
12	18	2.9	0.6	5.6	3.3
12	19	2.7	0.6	5.0	3.4
12	20	2.7	0.6	5.0	3.3
12	21	2.4	0.6	4.4	2.7
12	22	2.2	0.6	4.4	2.4
12	23	2.1	0.6	[illegible]	2.2
12	24	2.1	0.6	5.6	2.2
12	25	2.0	0.6	5.6	2.2

TABLE B-4 POUGHKEEPSIE WATERWORKS DATA, MEAN, MINIMUM, AND MAXIMUM TEMPERATURE (C) FOR EACH DAY OF THE YEAR, 1951-1993

Month	Day	Long Term Mean	Temperature Minimum	(1951-1992) Maximum	1993 Actual Temperatures
12	26	1.9	0.0	6.1	2.0
12	27	1.9	0.0	6.1	1.3
12	28	1.8	0.0	6.1	1.3
12	29	1.8	0.0	6.1	1.3
12	30	1.7	0.6	6.1	1.0
12	31	1.7	0.0	5.0	0.6

TABLE B-5 WEIGHTED MEAN TEMPERATURE (°C) BY REGION AND WEEK FROM 1993 LONG RIVER/FALL SHOALS SURVEYS

Week Beginning Monday	Regions YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
12APR93	4.4	4.0	4.0	5.7	6.4	6.3	5.8	5.1	4.5	4.1	3.3	3.1
19APR93	8.1	8.1	7.2	6.7	7.7	8.1	8.3	8.6	8.3	7.5	7.0	6.5
26APR93	9.6	8.9	8.4	8.1	7.4	7.4	7.2	7.6	8.0	8.8	8.5	8.4
03MAY93	10.3	10.8	9.9	9.9	10.9	10.8	10.9	12.0	11.9	11.9	12.3	12.1
10MAY93	13.3	13.4	12.6	13.6	13.8	14.4	14.7	15.5	16.1	16.4	16.3	16.3
17MAY93	14.2	14.1	14.6	14.8	15.1	15.5	15.9	17.0	17.4	17.4	17.5	16.9
24MAY93	15.1	15.6	15.9	16.1	16.1	17.1	17.4	17.6	17.4	17.2	16.7	16.4
31MAY93	15.0	16.3	17.2	17.8	17.1	17.5	17.7	17.8	17.2	16.9	16.7	16.5
07JUN93	17.5	18.1	18.9	19.1	18.3	18.1	18.0	17.9	17.2	16.8	16.7	16.3
14JUN93	18.8	19.6	20.0	20.3	20.2	20.4	20.0	19.5	19.9	20.1	20.2	20.1
21JUN93	19.8	21.1	22.0	21.8	21.5	21.6	21.4	21.6	21.6	21.5	21.9	21.4
28JUN93	21.4	23.1	23.9	23.7	22.8	23.1	22.8	22.8	22.9	23.1	23.2	22.9
05JUL93	24.5	25.1	25.8	26.1	24.6	24.4	24.0	24.1	24.1	24.5	24.9	25.0
12JUL93	25.2	25.4	25.3	25.1	25.1	25.3	25.3	.	.	.	.	.
19JUL93	22.9	23.4	24.6	24.7	24.3	24.5	24.8	24.9	24.5	24.3	24.7	24.9
26JUL93	25.9	27.5	25.7	24.8	24.0	23.9	24.7	.	.	.	.	.
02AUG93	24.5	24.6	25.3	25.4	24.8	23.9	24.1	23.9	24.6	24.7	25.0	24.8
09AUG93	23.4	24.1	25.0	25.0	24.5	24.4	24.8	.	.	.	.	.
16AUG93	24.8	25.3	26.5	27.0	24.6	25.0	26.2	25.5	25.3	25.3	25.1	25.1
23AUG93	24.0	24.9	25.6	26.6	25.4	25.4	25.5	.	.	.	.	.
30AUG93	25.2	25.6	25.3	25.8	25.0	25.1	25.3	24.6	24.7	24.9	25.1	25.5
06SEP93	25.0	25.6	26.1	25.6	25.0	24.7	24.8	.	.	.	.	.
13SEP93	21.2	21.0	21.6	22.5	21.8	21.8	22.4	21.9	21.1	20.8	22.4	21.8
20SEP93	20.1	20.0	20.6	21.3	20.8	20.6	21.1	.	.	.	.	.
27SEP93	18.9	19.5	20.4	20.8	20.6	20.6	20.6	19.4	18.2	18.4	18.6	18.0
04OCT93	17.9	18.0	19.4	20.2	19.6	19.0	19.2	.	.	.	.	.
11OCT93	16.0	16.1	17.4	18.1	17.8	17.3	16.7	15.0	13.7	13.3	13.4	13.5
25OCT93	14.4	14.6	15.3	15.3	15.0	14.8	14.2	13.2	12.5	12.3	12.2	11.4

NOTE: Dots (.) indicate no sampling.

TABLE B-6 MEAN TEMPERATURE (°C) BY REGION AND WEEK FROM 1993 BEACH SEINE SURVEY

Week Beginning Monday	Regions											
	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
28JUN93	25.3	26.4	26.0	26.7	23.5	23.4	23.3	22.9	22.5	23.7	22.7	23.9
12JUL93	28.9	29.3	28.7	29.5	26.7	27.5	23.9	26.8	26.6	28.3	28.5	28.1
26JUL93	24.5	24.7	25.2	25.0	25.8	28.1	27.3	26.5	24.8	24.7	24.5	24.0
09AUG93	24.9	25.3	25.7	25.1	25.0	24.6	25.3	25.0	25.6	26.6	25.4	24.6
23AUG93	26.5	26.2	26.4	26.9	25.1	25.7	26.6	26.7	26.3	25.5	25.2	24.2
06SEP93	25.2	23.9	22.9	24.8	23.7	23.0	24.1	24.0	23.3	23.9	23.4	22.1
20SEP93	21.0	20.2	21.4	22.8	22.3	20.3	21.5	20.3	19.6	19.7	18.8	18.8
04OCT93	17.6	17.4	19.1	19.9	19.1	17.6	17.6	16.0	16.5	16.3	15.8	14.1
18OCT93	14.7	15.2	16.6	16.5	15.8	14.2	15.0	13.7	13.4	13.2	12.9	12.9
01NOV93	11.0	9.8	11.2	12.4	11.6	9.7	10.8	10.3	8.3	7.4	6.9	7.1

TABLE B-7 WEIGHTED MEAN SALINITY (PPT) BY REGION AND WEEK FROM 1993 LONG RIVER/FALL SHOALS SURVEYS

Week Beginning Monday	Regions YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
12APR93	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
19APR93	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
26APR93	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
03MAY93	5.5	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10MAY93	3.9	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
17MAY93	10.6	9.0	5.4	3.2	1.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
24MAY93	9.3	6.7	4.9	2.4	0.5	0.2	0.1	0.1	0.1	0.2	0.2	0.2
31MAY93	16.7	8.9	4.4	1.7	0.5	0.2	0.1	0.1	0.1	0.2	0.2	0.2
07JUN93	10.7	6.3	3.6	2.0	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2
14JUN93	13.0	8.7	5.1	4.7	1.8	0.6	0.2	0.2	0.2	0.2	0.2	0.2
21JUN93	15.0	9.8	5.5	3.7	1.4	0.6	0.2	0.2	0.2	0.2	0.2	0.2
28JUN93	14.6	8.5	4.4	3.0	1.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
05JUL93	11.9	8.1	5.5	3.1	1.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
12JUL93	13.0	8.5	8.5	4.3	2.1	1.1	0.2	.	.	.	.	.
19JUL93	15.7	11.2	7.8	7.4	3.1	2.0	0.9	0.2	0.2	0.2	0.2	0.2
26JUL93	15.4	8.8	7.3	6.0	3.7	2.6	0.9	.	.	.	.	.
02AUG93	13.2	10.7	8.2	5.9	3.0	2.2	0.6	0.2	0.2	0.2	0.2	0.2
09AUG93	16.1	10.0	6.9	5.4	3.2	2.0	0.8	.	.	.	.	.
16AUG93	13.8	10.1	7.9	6.7	3.4	2.0	0.8	0.2	0.2	0.2	0.2	0.1
23AUG93	12.1	8.8	6.4	4.8	2.8	2.0	0.7	.	.	.	.	.
30AUG93	12.5	10.8	6.9	5.5	2.3	1.4	0.4	0.2	0.2	0.2	0.2	0.2
06SEP93	10.9	8.6	6.6	4.7	2.3	1.2	0.4	.	.	.	.	.
13SEP93	11.6	10.6	7.2	5.0	2.1	1.4	0.3	0.2	0.2	0.2	0.2	0.2
20SEP93	14.6	8.2	5.5	4.1	2.0	1.4	0.4	.	.	.	.	.
27SEP93	10.4	8.3	5.3	3.8	1.5	0.6	0.2	0.2	0.2	0.2	0.2	0.2
04OCT93	12.4	6.8	4.7	3.5	1.7	0.4	0.2	.	.	.	.	.
11OCT93	12.3	8.8	5.2	3.8	2.0	0.6	0.2	0.1	0.1	0.1	0.1	0.1
25OCT93	12.1	8.8	4.5	4.1	1.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1

NOTE: Dots (.) indicate no sampling.

TABLE B-8 MEAN SALINITY (PPT) BY REGION AND WEEK FROM 1993 BEACH SEINE SURVEY

Week Beginning Monday	Regions											
	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
28JUN93	8.5	6.2	4.6	2.5	1.0	0.3	0.1	0.2	0.2	0.2	0.1	0.1
12JUL93	7.0	5.7	4.4	4.3	1.3	0.6	0.1	0.1	0.1	0.1	0.1	0.1
26JUL93	11.6	9.5	7.5	6.1	2.6	1.3	0.5	0.1	0.2	0.2	0.2	0.2
09AUG93	10.5	8.1	5.8	4.5	2.8	1.4	0.4	0.1	0.1	0.1	0.1	0.1
23AUG93	10.2	8.6	7.0	4.8	1.9	0.9	0.3	0.2	0.2	0.1	0.1	0.1
06SEP93	9.0	7.3	5.5	4.2	1.9	0.9	0.4	0.1	0.1	0.1	0.1	0.2
20SEP93	11.1	7.8	5.5	4.6	1.7	0.8	0.3	0.2	0.1	0.1	0.1	0.1
04OCT93	7.6	5.8	4.1	2.4	0.8	0.3	0.2	0.1	0.1	0.1	0.1	0.1
18OCT93	8.2	6.6	3.7	1.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1
01NOV93	6.6	5.2	4.0	2.2	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.1

TABLE B-9 WEIGHTED MEAN DISSOLVED OXYGEN (mg/L) BY REGION AND WEEK FROM 1993 LONG RIVER/FALL SHOALS SURVEYS

	Regions											
Week Beginning Monday	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
12APR93	.	.	.	.	.	.	.	.	.	.	.	.
19APR93	11.9	10.8	10.8	11.1	12.7	12.4	12.0	12.0	12.1	12.8	12.6	12.8
26APR93	10.7	10.7	10.4	10.8	11.3	11.5	11.4	11.3	11.1	11.5	11.6	11.9
03MAY93	9.3	9.5	9.9	9.9	9.8	10.6	10.9	10.7	10.5	10.4	10.4	11.0
10MAY93	9.0	9.6	9.6	9.7	9.9	10.0	9.7	9.5	9.3	9.2	9.5	9.9
17MAY93	8.9	8.6	8.5	8.5	8.9	9.0	8.5	8.5	8.7	8.7	8.0	8.2
24MAY93	8.1	8.3	8.4	8.7	8.7	9.4	8.1	8.2	8.2	8.1	8.0	8.2
31MAY93	7.0	7.9	8.2	8.5	8.7	9.0	8.5	8.2	8.3	8.2	7.9	8.2
07JUN93	7.7	8.0	8.2	8.6	8.9	8.6	7.6	7.9	7.6	7.4	7.4	8.2
14JUN93	10.2	9.2	7.8	7.4	7.5	9.3	9.7	9.5	9.9	10.0	9.9	10.0
21JUN93	8.1	9.0	8.5	7.5	7.4	7.5	7.5	8.1	8.2	8.1	7.3	7.7
28JUN93	6.2	7.8	8.1	7.5	6.6	7.8	7.8	7.3	7.7	8.0	7.1	7.5
05JUL93	6.7	6.8	6.7	6.6	7.0	7.9	7.3	7.2	7.3	7.6	6.8	6.8
12JUL93	8.0	6.8	6.1	5.5	5.9	6.5	6.7	.	.	.	.	.
19JUL93	5.9	6.6	6.2	6.0	5.9	6.2	6.2	6.1	6.6	7.4	6.5	6.5
26JUL93	5.2	5.9	6.2	5.8	5.9	6.2	6.1	.	.	.	.	.
02AUG93	8.2	8.3	6.6	6.3	6.9	6.5	6.4	6.8	7.6	7.1	6.5	6.7
09AUG93	5.8	6.4	6.3	6.0	6.1	6.6	6.6	.	.	.	.	.
16AUG93	6.9	7.5	6.0	5.7	5.8	6.8	7.5	6.4	6.8	6.6	6.3	6.7
23AUG93	6.0	6.7	5.8	5.4	5.8	6.4	6.8	.	.	.	.	.
30AUG93	6.9	6.2	5.9	6.2	6.7	7.3	5.9	5.7	6.5	6.5	5.9	6.9
06SEP93	5.7	5.0	4.4	4.7	4.9	5.0	6.5	.	.	.	.	.
13SEP93	6.8	4.6	5.4	5.5	6.7	7.8	4.9	5.0	5.6	6.4	7.3	8.3
20SEP93	5.7	6.2	6.6	6.3	5.4	5.9	6.8	.	.	.	.	.
27SEP93	6.5	5.9	8.0	9.1	6.9	6.0	6.2	6.1	7.2	8.5	8.6	9.2
04OCT93	8.2	4.3	4.6	5.4	5.1	4.5	4.7	.	.	.	.	.
11OCT93	8.3	8.5	8.3	8.1	8.2	8.7	9.2	9.5	10.0	9.9	9.7	9.9
25OCT93	8.7	8.8	9.0	9.0	9.5	9.6	9.6	9.8	10.0	10.2	10.3	11.2

NOTE: Dots (.) indicate no sampling. During week of 12 April, dissolved oxygen meters malfunctioned, and no measurements were taken.

TABLE B-10 MEAN DISSOLVED OXYGEN (mg/L) BY REGION AND WEEK FROM 1993 BEACH SEINE SURVEY

Week Beginning Monday	Regions											
	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
28JUN93	9.6	11.2	11.7	7.0	7.2	8.0	7.4	6.8	6.8	7.7	7.5	7.0
12JUL93	13.5	10.8	9.2	8.9	7.0	6.9	7.5	7.3	6.7	8.2	7.9	6.5
26JUL93	6.8	7.8	8.6	8.0	6.9	8.2	7.8	7.7	7.5	8.4	7.8	7.5
09AUG93	8.6	8.4	9.7	6.4	6.8	7.0	6.6	7.9	9.4	9.8	7.4	6.3
23AUG93	6.7	7.4	7.6	7.3	7.0	7.0	7.9	8.0	8.1	7.8	7.9	6.6
06SEP93	6.6	7.2	6.8	6.3	6.5	6.9	7.0	7.6	8.4	8.7	7.3	7.8
20SEP93	6.6	7.8	6.8	6.4	6.7	7.2	7.0	7.6	8.8	8.9	7.9	7.4
04OCT93	9.6	9.3	9.2	9.2	8.7	9.2	8.8	9.0	9.8	9.7	10.0	9.8
18OCT93	8.2	8.1	8.4	9.5	9.5	9.6	9.2	9.3	9.3	9.4	9.6	9.8
01NOV93	10.9	11.1	10.1	10.2	10.9	11.4	9.9	9.9	16.8	16.0	16.2	15.2

TABLE B-11 WEIGHTED MEAN PERCENT OXYGEN SATURATION BY REGION AND WEEK FROM 1993 LONG RIVER/FALL SHOALS SURVEYS

Week Beginning Monday	Regions											
	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
12APR93	.	.	.	.	.	.	.	.	.	.	.	.
19APR93	101.3	91.2	89.5	90.7	106.8	105.0	101.8	102.8	102.7	107.3	103.8	104.3
26APR93	94.4	92.4	88.8	91.4	94.0	95.7	94.7	94.9	93.9	98.6	99.6	101.4
03MAY93	86.5	86.1	87.7	87.3	88.9	96.0	98.3	98.9	96.8	96.7	97.0	102.2
10MAY93	88.0	92.4	90.7	93.5	95.7	98.3	96.1	94.8	94.6	94.0	96.8	101.2
17MAY93	93.4	89.1	86.9	86.0	88.9	90.5	85.9	87.6	90.7	91.2	83.7	84.7
24MAY93	86.0	87.1	88.1	90.0	88.9	97.2	84.8	85.4	85.7	84.4	82.8	84.4
31MAY93	78.1	85.1	87.2	90.8	90.5	94.0	88.8	86.4	86.0	84.8	81.2	84.6
07JUN93	86.7	88.7	90.5	93.6	94.8	91.3	80.3	83.5	78.5	76.0	76.5	83.3
14JUN93	119.8	106.6	88.3	84.2	83.7	103.5	106.8	103.7	108.4	109.7	109.1	110.9
21JUN93	97.6	107.4	101.4	87.9	84.5	85.2	85.0	92.5	93.6	91.6	83.2	86.8
28JUN93	77.3	96.4	98.2	90.9	77.5	91.3	90.4	84.9	90.1	93.6	83.3	87.4
05JUL93	86.3	87.1	85.1	82.8	84.2	94.3	87.0	86.0	87.0	91.2	82.5	81.9
12JUL93	106.0	87.0	77.7	68.5	73.0	79.4	81.3	.	.	.	.	.
19JUL93	75.7	83.0	77.8	75.7	71.3	75.5	75.4	73.7	78.6	88.4	78.5	78.4
26JUL93	70.6	79.5	79.3	72.3	71.3	74.5	74.1	.	.	.	.	.
02AUG93	107.4	106.5	84.1	79.5	84.2	77.7	76.9	81.1	90.9	85.8	78.9	80.8
09AUG93	75.0	81.1	79.6	74.5	75.0	79.7	79.4	.	.	.	.	.
16AUG93	90.5	96.8	78.8	74.0	71.3	83.0	93.6	77.6	83.3	80.4	77.0	81.2
23AUG93	77.4	85.5	73.2	69.0	71.5	79.4	83.1	.	.	.	.	.
30AUG93	90.8	80.7	75.3	78.9	82.3	89.6	71.3	68.5	78.4	78.6	71.9	84.7
06SEP93	73.4	64.4	56.7	58.9	59.6	60.2	78.1	.	.	.	.	.
13SEP93	82.0	55.9	63.7	66.1	77.6	90.0	56.2	57.6	62.9	71.4	84.3	94.2
20SEP93	68.8	72.3	76.5	73.3	61.5	65.6	76.6	.	.	.	.	.
27SEP93	75.3	68.3	91.7	103.7	77.1	67.3	69.1	66.3	76.0	91.0	92.5	97.2
04OCT93	94.4	47.2	52.1	61.5	56.5	48.7	50.7	.	.	.	.	.
11OCT93	91.3	91.1	89.4	88.3	87.3	90.8	94.5	94.4	96.2	94.8	93.0	95.1
25OCT93	92.3	91.8	92.3	92.6	94.8	94.9	93.6	93.1	94.2	95.6	96.0	102.6

NOTE: Dots (.) indicate no sampling. During week of 12 April, dissolved oxygen meters malfunctioned, and no measurements were taken.

TABLE B-12 MEAN PERCENT OXYGEN SATURATION BY REGION AND WEEK FROM 1993 BEACH SEINE SURVEY

Week Beginning Monday	Regions											
	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
28JUN93	122.9	145.0	149.0	88.7	85.2	94.5	86.9	78.6	78.9	91.1	86.5	83.5
12JUL93	182.4	146.7	122.0	119.7	88.0	87.5	88.9	90.7	83.8	105.4	101.2	82.9
26JUL93	87.4	99.6	109.1	100.1	86.0	105.1	99.2	96.2	90.9	100.7	93.8	89.2
09AUG93	111.0	107.5	123.1	80.3	83.7	85.0	80.5	96.1	115.6	121.8	90.4	75.4
23AUG93	88.2	96.7	98.8	94.6	85.5	85.9	98.1	99.4	100.1	94.6	95.8	79.2
06SEP93	85.5	90.0	82.2	78.4	77.4	80.5	83.3	90.1	98.3	103.1	85.8	89.4
20SEP93	80.0	90.1	79.7	77.0	77.8	79.9	79.8	84.0	95.9	97.1	85.0	79.9
04OCT93	105.7	101.4	102.0	102.9	94.4	96.1	91.7	90.8	99.9	98.7	101.3	95.0
18OCT93	85.1	84.2	88.2	98.4	96.5	94.0	91.6	89.4	88.7	90.1	90.9	93.2
01NOV93	104.0	101.5	94.1	96.7	100.7	100.6	89.2	88.9	143.2	133.2	133.4	125.4

TABLE B-13 WEIGHTED MEAN CONDUCTIVITY (MS/CM @ 25°C) BY REGION AND WEEK FROM 1993 LONG RIVER/FALL SHOALS SURVEYS

Week Beginning Monday	Regions YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
12APR93	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
19APR93	1.0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
26APR93	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
03MAY93	9.4	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
10MAY93	6.8	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
17MAY93	17.8	15.2	9.3	5.5	2.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3
24MAY93	15.8	11.5	8.5	4.3	0.9	0.3	0.2	0.3	0.3	0.3	0.3	0.3
31MAY93	27.3	15.2	7.7	3.0	0.9	0.3	0.2	0.3	0.3	0.3	0.3	0.3
07JUN93	18.1	10.8	6.3	3.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14JUN93	21.5	14.8	8.8	8.2	3.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3
21JUN93	24.7	16.6	9.5	6.5	2.5	1.1	0.3	0.3	0.3	0.3	0.3	0.3
28JUN93	24.1	14.6	7.7	5.3	2.1	0.5	0.3	0.3	0.3	0.3	0.3	0.3
05JUL93	19.9	13.9	9.5	5.5	2.0	0.6	0.3	0.3	0.3	0.3	0.3	0.3
12JUL93	21.6	14.5	14.5	7.5	3.8	1.9	0.4	.	.	.	.	.
19JUL93	25.9	18.9	13.5	12.7	5.4	3.5	1.5	0.3	0.3	0.3	0.3	0.3
26JUL93	25.5	15.0	12.5	10.4	6.5	4.6	1.6	.	.	.	.	.
02AUG93	22.1	18.0	14.0	10.2	5.3	3.8	1.1	0.3	0.3	0.3	0.3	0.3
09AUG93	26.5	16.9	11.9	9.4	5.6	3.6	1.5	.	.	.	.	.
16AUG93	23.0	17.1	13.5	11.6	6.0	3.5	1.4	0.3	0.3	0.3	0.3	0.3
23AUG93	20.4	15.0	11.2	8.4	4.9	3.5	1.2	.	.	.	.	.
30AUG93	21.0	18.2	11.9	9.6	4.1	2.5	0.7	0.3	0.3	0.3	0.3	0.3
06SEP93	18.3	14.7	11.5	8.1	4.1	2.1	0.6	.	.	.	.	.
13SEP93	19.6	18.0	12.4	8.7	3.8	2.4	0.4	0.3	0.3	0.3	0.3	0.3
20SEP93	24.3	14.1	9.5	7.2	3.6	2.4	0.7	.	.	.	.	.
27SEP93	17.7	14.2	9.2	6.6	2.6	1.1	0.4	0.3	0.3	0.3	0.3	0.3
04OCT93	20.7	11.7	8.2	6.2	3.0	0.7	0.4	.	.	.	.	.
11OCT93	20.4	15.0	9.1	6.7	3.6	1.0	0.3	0.2	0.3	0.3	0.2	0.2
25OCT93	20.2	14.9	7.8	7.1	1.9	0.3	0.3	0.3	0.3	0.3	0.3	0.2

NOTE: Dots (.) indicate no sampling.

TABLE B-14 MEAN CONDUCTIVITY (mS/cm AT 25°C) BY REGION AND WEEK FROM 1993 BEACH SEINE SURVEY

Week Beginning Monday	Regions											
	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL
28JUN93	14.6	10.8	8.0	4.4	1.7	0.4	0.3	0.3	0.3	0.3	0.3	0.2
12JUL93	12.1	9.9	7.7	7.5	2.4	1.0	0.3	0.2	0.3	0.2	0.2	0.2
26JUL93	19.5	16.2	13.0	10.6	4.5	2.3	0.9	0.3	0.3	0.3	0.3	0.3
09AUG93	17.7	13.9	10.1	7.9	4.9	2.4	0.7	0.3	0.3	0.2	0.2	0.2
23AUG93	17.3	14.8	12.0	8.3	3.4	1.5	0.6	0.3	0.3	0.3	0.2	0.2
06SEP93	15.3	12.6	9.6	7.4	3.3	1.6	0.7	0.3	0.3	0.3	0.2	0.3
20SEP93	18.7	13.4	9.5	8.1	3.0	1.4	0.6	0.3	0.3	0.3	0.2	0.2
04OCT93	13.1	10.0	7.2	4.2	1.4	0.6	0.3	0.3	0.3	0.2	0.2	0.2
18OCT93	14.0	11.3	6.5	2.9	0.9	0.6	0.3	0.3	0.3	0.3	0.2	0.2
01NOV93	11.3	9.0	6.9	3.8	0.8	0.3	0.3	0.3	0.3	0.3	0.3	0.2

Appendix C

Density and Standing Crop Estimates

APPENDIX C

LIST OF TABLES

APPENDIX C

LIST OF TABLES (Cont.)

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TABLE C-1 REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	2.64	0.55	14.45	1.49
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	1.84	0.55	7.44	7.69
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.81	0.00	2.74	1.76	0.00	0.00	0.00	0.44
	SE		0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.46	1.76	0.00	0.00	0.00	2.35
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	5.55	31.69	1569.23	84.85	133.94	628.12	768.97	0.97	0.00	268.61
	SE		0.00	0.00	0.00	3.20	14.83	1494.72	23.28	82.97	331.85	537.36	0.48	0.00	1625.03
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.21	0.49	64.14	58.10	105.79	44.39	84.98	0.59	2.00	0.00	30.06
	SE		0.00	0.00	0.21	0.27	20.00	20.93	41.60	15.98	63.98	0.59	1.42	0.00	83.18
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.90	95.81	287.29	56.38	641.14	1354.58	134.81	53.27	320.88	25.04	247.51
	SE		0.00	0.00	0.90	84.01	101.46	18.41	282.26	951.13	33.71	21.63	318.16	25.04	1051.41
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	1.06	14.39	122.07	8.49	14.30	8.30	5.77	0.46	0.00	14.57
	SE		0.00	0.00	0.00	1.06	7.35	60.77	8.49	10.84	3.59	4.67	0.46	0.00	63.03
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	6.22	0.00	0.00	21.56	99.06	40.78	209.56	1.94	2.99	11.68	0.40	30.32
	SE	0.00	0.00	6.22	0.00	0.00	12.82	68.65	15.14	54.95	1.70	1.95	5.33	0.40	90.55
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	16.01	0.00	0.62	0.34	27.77	11.01	7.85	53.00	6.41	70.28	17.99	12.05	17.18
	SE	0.00	16.01	0.00	0.45	0.13	22.12	5.32	3.43	21.61	2.32	68.89	12.78	8.33	78.98
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-1 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	9.03	13.47	0.70	6.79	0.00	0.00	0.00	0.00	2.31
	SE	0.00	0.00	0.00	0.00	0.00	5.32	8.82	0.70	3.40	0.00	0.00	0.00	0.00	10.87
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.45	1.49	0.50	0.00	0.00	0.00	0.00	0.00	0.19
	SE	0.00	0.00	0.00	0.00	0.00	0.45	1.37	0.32	0.00	0.00	0.00	0.00	0.00	1.48
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-2 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	40	465	89	1028	1623
	SE		0	0	0	0	0	0	0	0	40	325	89	530	629
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	114	0	454	249	0	0	0	817
	SE		0	0	0	0	0	78	0	242	249	0	0	0	355
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	1157	6574	219365	25296	22165	88859	135566	155	0	499138
	SE		0	0	0	666	3076	208949	6941	13729	46947	94734	78	0	234701
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	31	102	13306	8121	31541	7346	12023	104	322	0	72896
	SE		0	0	31	56	4149	2925	12401	2644	9052	104	228	0	16388
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	133	19961	59600	7881	191147	224162	19072	9391	51575	1782	584705
	SE		0	0	133	17502	21048	2574	84152	157397	4769	3814	51139	1782	187795
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	221	2985	17065	2530	2366	1174	1017	74	0	27432
	SE		0	0	0	221	1525	8496	2530	1794	507	823	74	0	9225
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	2002	0	0	4474	13848	12157	34679	275	526	1877	29	69866
	SE	0	0	2002	0	0	2659	9596	4515	9094	240	344	857	29	14393
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	3674	0	92	71	5762	1539	2339	8770	908	12390	2891	858	39293
	SE	0	3674	0	67	27	4590	743	1023	3577	329	12145	2055	592	14183
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-2 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	1873	1882	208	1123	0	0	0	0	5087
	SE	0	0	0	0	0	1103	1233	208	563	0	0	0	0	1760
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	93	209	150	0	0	0	0	0	452
	SE	0	0	0	0	0	93	191	97	0	0	0	0	0	234
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-3 REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.14	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE		0.00	0.14	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	21.53	23.64	60.34	126.05	124.67	10.47	4.11	0.00	0.00	30.90
	SE		0.00	0.00	0.00	10.00	4.37	18.55	14.88	27.40	3.97	2.02	0.00	0.00	38.15
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.71	8.47	544.93	7602.22	923.67	336.59	7.70	12.95	0.00	0.00	786.44
	SE		0.00	0.00	0.51	3.27	99.54	3679.67	343.03	81.45	3.21	7.71	0.00	0.00	3697.88
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.40	1023.16	842.49	16941.41	7430.99	4189.90	291.94	33.50	11.97	3.39	2564.10
	SE		0.00	0.00	0.29	450.48	225.58	13573.23	3330.00	960.43	137.09	6.79	8.44	2.47	14018.44
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.38	0.40	7.76	2603.63	3412.03	3241.43	251.22	201.25	56.14	1.02	0.00	814.61
	SE		0.00	0.38	0.28	4.84	656.19	1508.78	1378.61	55.15	54.92	22.38	1.02	0.00	2148.05
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	7.00	0.00	12.54	645.20	1008.75	1711.22	393.15	34.27	23.02	2.63	0.00	295.21
	SE	0.00	0.00	7.00	0.00	9.73	197.54	198.95	474.05	71.75	20.28	3.78	1.91	0.00	555.92
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	15.36	62.41	97.05	44.71	6.72	6.44	4.67	13.86	19.32
	SE	0.00	0.00	0.00	0.00	0.00	13.54	17.70	61.13	10.95	2.61	3.26	3.19	13.19	67.49
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-3 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	DENSITY	0.00	0.00	0.00	0.00	0.81	8.98	13.31	19.73	21.43	0.00	0.26	0.00	6.80	5.49
26JUN	SE	0.00	0.00	0.00	0.00	0.43	2.93	10.78	15.13	9.61	0.00	0.26	0.00	6.80	22.19
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	DENSITY	0.00	0.00	0.00	0.00	0.00	5.68	2.17	2.03	0.00	0.00	0.00	0.00	0.00	0.76
03JUL	SE	0.00	0.00	0.00	0.00	0.00	2.63	1.19	0.83	0.00	0.00	0.00	0.00	0.00	3.00
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	DENSITY	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.02
09JUL	SE	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.19
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
14JUL	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
28JUL	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
12AUG	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
25AUG	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
09SEP	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
21SEP	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
05OCT	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-4 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	44	0	9	0	0	0	0	0	0	0	0	53
	SE		0	44	0	9	0	0	0	0	0	0	0	0	45
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	4485	4905	8435	37579	20631	1482	725	0	0	78241
	SE		0	0	0	2084	907	2594	4438	4534	562	356	0	0	7251
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	104	1764	113049	1062723	275377	55701	1089	2283	0	0	1512089
	SE		0	0	75	681	20649	514385	102269	13478	454	1358	0	0	525035
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	59	213162	174779	2368257	2215425	693364	41301	5907	1923	241	5714418
	SE		0	0	42	93852	46797	1897416	992785	158936	19395	1196	1357	176	2149987
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	123	59	1617	540139	476971	966380	41573	28471	9898	165	0	2065395
	SE		0	123	42	1009	136130	210914	411009	9126	7770	3945	165	0	481772
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	2252	0	2612	133851	141015	510172	65060	4848	4058	422	0	864290
	SE	0	0	2252	0	2027	40982	27812	141330	11873	2869	666	308	0	150287
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	3186	8725	28933	7399	951	1136	751	986	52066
	SE	0	0	0	0	0	2809	2475	18224	1812	369	574	513	938	18736
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-4 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	168	1864	1860	5883	3547	0	46	0	484	13852
	SE	0	0	0	0	89	608	1506	4512	1591	0	46	0	484	5077
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	1179	303	605	0	0	0	0	0	2088
	SE	0	0	0	0	0	545	166	247	0	0	0	0	0	621
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	16	0	0	52	0	0	0	0	0	68
	SE	0	0	0	0	16	0	0	52	0	0	0	0	0	54
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-5 REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO.TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.01
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.12
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.21	17.17	446.40	1770.99	254.21	36.12	5.18	0.20	0.00	0.00	210.87
	SE		0.00	0.00	0.21	8.03	93.78	872.54	54.31	12.37	2.89	0.20	0.00	0.00	879.38
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.57	29.45	76.01	4618.45	3359.66	3578.85	1868.93	983.33	58.04	19.97	370.61	1.04	1247.08
	SE		0.40	17.78	7.51	1939.24	693.61	1730.69	411.81	341.95	13.32	18.13	365.21	1.04	2767.28
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	4.29	126.33	1137.40	2686.00	18509.76	9142.43	9498.02	991.76	790.88	219.83	31.85	4.21	3595.23
	SE		2.44	65.30	273.86	612.19	4993.67	2424.24	2963.67	221.06	192.47	88.87	11.91	2.96	6336.01
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	11.29	444.77	287.06	526.89	4377.45	4075.76	2874.19	2492.93	418.81	215.43	92.18	29.33	1.05	1219.01
	SE	4.31	71.23	72.41	120.78	2102.87	1119.11	734.94	840.44	87.50	58.53	49.71	11.30	1.05	2638.10
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.55	37.03	45.58	190.52	241.25	3299.65	2749.92	520.89	219.76	118.43	29.18	55.32	26.55	579.59
	SE	0.55	18.38	8.87	86.71	50.55	1168.72	384.98	141.66	48.37	32.70	11.30	19.77	14.88	1244.52
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-5 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	4.02	4.66	473.34	785.05	412.93	810.58	248.79	128.46	264.52	95.96	47.73	7.76	252.60
	SE	0.00	4.02	1.70	117.52	175.19	57.43	230.91	137.49	30.87	85.24	52.85	28.33	6.35	363.18
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	2.79	82.31	219.33	103.63	366.98	706.91	215.56	43.04	79.61	77.16	47.28	8.16	150.21
	SE	0.00	2.34	40.57	52.62	24.25	132.80	134.57	62.82	10.86	14.91	41.85	19.44	2.92	217.20
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	1.91	2.60	1.58	23.81	76.36	154.77	17.67	1.32	12.31	58.57	3.89	11.09	28.15
	SE	0.00	1.31	1.36	0.59	7.72	23.94	29.26	4.84	0.56	3.36	47.90	0.52	9.20	62.51
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	6.93	26.36	32.14	9.13	45.33	100.41	141.28	NS	NS	NS	NS	NS	45.20
	SE	0.00	6.73	23.05	28.59	4.08	21.44	18.91	64.04						79.55
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.05	0.15	0.00	0.00	NS	NS	NS	NS	NS	0.02
	SE	0.00	0.00	0.00	0.00	0.05	0.15	0.00	0.00						0.15
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-6 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	21	0	0	0	0	21
	SE		0	0	0	0	0	0	0	21	0	0	0	0	21
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	31	3578	92607	247569	75788	5977	734	36	0	0	426319
	SE		0	0	31	1673	19455	121974	16192	2047	409	36	0	0	124601
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	131	9477	11230	962191	696980	500292	557189	162726	8212	3520	59568	74	2971590
	SE		93	5722	1110	404015	143894	241935	122775	56587	1884	3196	58701	74	514038
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	985	40655	168036	559591	3839957	1278029	2831679	164122	111886	38755	5119	300	9039112
	SE		560	21015	40460	127541	1035965	338888	883570	36582	27228	15667	1914	210	1410475
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	2361	102039	92379	77841	911982	845540	401786	743227	69307	30477	16250	4714	75	3297975
	SE	901	16341	23304	17843	438104	232166	102739	250562	14479	8281	8763	1817	75	566269
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	114	8495	14669	28146	50261	684532	384415	155296	36368	16755	5145	8892	1889	1394978
	SE	114	4216	2854	12810	10532	242458	53817	42234	8005	4626	1991	3177	1059	252720
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-6 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	923	1498	69930	163553	85665	113311	74171	21259	37422	16917	7672	552	592874
	SE	0	923	546	17362	36498	11914	32279	40990	5108	12060	9316	4553	452	69123
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	640	26490	32404	21590	76133	98819	64265	7123	11263	13603	7600	580	360508
	SE	0	536	13055	7774	5051	27549	18811	18728	1796	2110	7377	3125	207	42334
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	439	836	234	4961	15842	21635	5267	219	1741	10326	626	789	62915
	SE	0	300	439	87	1607	4966	4091	1444	92	476	8445	84	655	10879
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	1589	8483	4748	1902	9404	14036	42121	NS	NS	NS	NS	NS	82283
	SE	0	1544	7418	4223	851	4447	2644	19093						21616
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	10	31	0	0	NS	NS	NS	NS	NS	40
	SE	0	0	0	0	10	31	0	0						32
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-7 REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	137.92	0.00	0.00	0.00	0.00	0.00	0.00	11.49
	SE		0.00	0.00	0.00	0.00	0.00	137.92	0.00	0.00	0.00	0.00	0.00	0.00	137.92
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-7 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.25	0.00	10.26	0.52	0.96	0.72	0.00	0.00	0.00	0.00	0.50	0.00	1.02
	SE	0.00	0.25	0.00	6.16	0.37	0.59	0.68	0.00	0.00	0.00	0.00	0.50	0.00	6.26
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.22	1.73	1.25	2.68	3.22	2.76	1.04	0.00	0.52	3.19	1.47	0.96	1.47
	SE	0.00	0.22	1.30	0.52	1.43	2.71	1.42	0.83	0.00	0.30	1.58	0.84	0.68	4.22
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	7.20	223.98	34.22	2.32	11.34	16.83	6.58	NS	NS	NS	NS	NS	37.81
	SE	0.00	6.81	191.74	20.84	1.46	6.78	7.55	3.15						193.29
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.23	5.45	1.20	0.00	3.36	1.00	0.00	NS	NS	NS	NS	NS	1.40
	SE	0.00	0.23	2.72	0.54	0.00	2.36	0.78	0.00						3.73
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.58	0.09	0.00	0.57	3.59	NS	NS	NS	NS	NS	0.60
	SE	0.00	0.00	0.00	0.58	0.09	0.00	0.57	2.82						2.94
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	10.43	2.71	6.78	8.78	2.00	0.35	3.67	0.63	NS	NS	NS	NS	NS	4.42
	SE	8.43	1.63	5.13	3.30	1.11	0.35	1.25	0.63						10.69
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.23	0.00	3.57	0.21	0.00	0.93	1.34	NS	NS	NS	NS	NS	0.78
	SE	0.00	0.23	0.00	3.57	0.21	0.00	0.53	1.34						3.86
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.82	0.00	0.00	0.00	0.16	1.65	0.25	0.22	NS	NS	NS	NS	NS	0.39
	SE	0.82	0.00	0.00	0.00	0.16	0.83	0.25	0.22						1.23
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.09
	SE	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00						0.76
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-8 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
16APR	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
23APR	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
01MAY	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
07MAY	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
14MAY	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-	ST. CROP	NS	0	0	0	0	0	19281	0	0	0	0	0	0	19281
21MAY	SE		0	0	0	0	0	19281	0	0	0	0	0	0	19281
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
29MAY	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
05JUN	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11JUN	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18JUN	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-8 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26JUN	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	57	0	1516	108	198	101	0	0	0	0	81	0	2061
03JUL	SE	0	57	0	910	76	122	96	0	0	0	0	81	0	932
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	52	558	184	559	668	385	311	0	74	562	236	68	3658
09JUL	SE	0	52	418	77	298	562	198	247	0	43	278	136	49	888
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	1652	72078	5055	483	2352	2352	1962	NS	NS	NS	NS	NS	85934
14JUL	SE	0	1562	61704	3078	303	1407	1056	939						61834
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	52	1753	177	0	698	140	0	NS	NS	NS	NS	NS	2820
28JUL	SE	0	52	877	79	0	490	110	0						1015
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	86	19	0	80	1070	NS	NS	NS	NS	NS	1255
12AUG	SE	0	0	0	86	19	0	80	842						850
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	2180	623	2181	1297	417	73	514	188	NS	NS	NS	NS	NS	7473
25AUG	SE	1762	375	1652	487	231	73	174	188						2517
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	53	0	527	43	0	130	400	NS	NS	NS	NS	NS	1153
09SEP	SE	0	53	0	527	43	0	75	400						670
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	172	0	0	0	33	343	35	67	NS	NS	NS	NS	NS	651
21SEP	SE	172	0	0	0	33	172	35	67						257
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	112	0	0	0	0	NS	NS	NS	NS	NS	112
05OCT	SE	0	0	0	112	0	0	0	0						112
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-9 REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	1.05	14.99	16.57	3.86	3.50	4.20	2.18	1.82	4.57	9.59	3.27	3.71	5.77
	SE	0.41	2.64	2.82	0.90	2.09	1.27	1.41	1.09	1.09	7.77	0.69	1.17	9.40
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.74	5.58	1.81	2.00	0.03	1.63	2.65	0.28	2.03	0.82	0.46	0.50	1.55
	SE	0.22	1.57	0.71	0.86	0.02	0.41	0.76	0.16	1.25	0.32	0.21	0.30	2.51
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.85	8.42	13.53	3.97	0.03	1.02	2.72	0.21	1.07	1.81	1.37	0.34	2.95
	SE	0.26	1.40	1.66	1.75	0.02	0.41	1.42	0.08	0.53	0.75	0.56	0.11	3.34
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	1.44	2.65	2.29	1.30	0.08	1.48	0.25	0.20	0.24	0.09	0.33	0.09	0.87
	SE	0.31	0.42	0.62	0.50	0.03	1.10	0.16	0.08	0.07	0.05	0.18	0.09	1.48
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.25	1.28	1.40	0.43	0.10	0.55	0.79	0.04	0.54	0.85	0.28	0.18	0.56
	SE	0.06	0.24	0.14	0.15	0.04	0.28	0.29	0.04	0.14	0.30	0.17	0.10	0.65
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.18	0.42	0.77	0.03	1.10	0.27	0.10	0.25	0.17	0.23	0.29	0.32
	SE	0.00	0.10	0.10	0.61	0.02	0.54	0.15	0.04	0.11	0.06	0.09	0.25	0.89
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.88	0.42	0.16	0.12	0.91	0.06	0.02	0.25	0.08	0.48	0.12	0.29
	SE	0.00	0.34	0.18	0.06	0.05	0.58	0.04	0.02	0.16	0.05	0.19	0.08	0.75
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.05	0.42	0.51	0.25	1.33	0.00	0.02	0.02	0.14	0.13	0.09	0.08	0.25
	SE	0.04	0.17	0.20	0.05	0.65	0.00	0.02	0.02	0.03	0.08	0.04	0.05	0.71
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-10 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	242	4824	2447	804	725	587	649	301	646	1691	525	264	13704
	SE	95	850	417	187	433	177	422	180	154	1370	111	83	1813
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	170	1794	268	416	7	228	790	47	288	145	74	36	4262
	SE	50	504	105	180	4	57	228	26	176	57	34	21	626
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	196	2711	1999	828	6	143	811	35	151	319	219	24	7444
	SE	59	450	246	364	4	57	422	13	75	132	90	8	782
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	329	853	339	270	16	207	74	32	33	15	54	7	2230
	SE	72	136	91	104	7	154	46	14	10	9	29	7	264
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	56	411	206	89	21	77	236	7	77	150	45	13	1388
	SE	14	78	20	32	8	40	86	7	20	53	28	7	144
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	59	63	160	6	154	81	17	36	30	37	21	664
	SE	0	32	15	126	4	75	46	6	16	10	14	18	161
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	283	63	34	25	128	18	3	35	14	78	8	689
	SE	0	109	27	13	10	82	11	3	23	8	30	6	145
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	11	134	76	51	277	0	7	3	19	23	15	6	622
	SE	9	53	29	11	136	0	7	3	5	14	7	4	150
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-11 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	12.67	56.27	52.29	60.00	36.67	2.67	2.50	20.13	5.63	4.67	2.21	2.08	21.48
	SE	7.51	29.96	32.87	42.06	13.17	1.67	1.38	11.13	2.66	2.09	0.87	1.82	64.20
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	44.67	27.36	34.00	19.00	35.00	7.67	21.75	13.25	6.50	6.20	4.79	2.42	18.55
	SE	26.17	3.93	12.93	13.65	14.05	3.18	11.79	5.92	2.90	1.49	1.77	1.45	38.10
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	35.33	32.55	23.71	15.33	8.67	13.33	11.00	6.63	2.63	12.47	6.37	2.25	14.19
	SE	12.55	9.22	6.84	4.67	1.76	2.33	3.78	3.14	1.10	4.27	2.04	0.66	19.18
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	42.20	33.83	22.53	6.00	16.80	14.33	15.40	2.20	3.40	14.78	8.20	2.00	15.14
	SE	13.88	4.68	5.22	1.00	8.70	4.90	3.94	0.97	1.78	6.20	4.67	0.90	20.57
	NO. TOWS	5	24	19	6	5	6	5	5	5	9	10	7	106
23AUG-29AUG	CPUE	15.80	29.88	20.26	8.13	9.00	57.00	5.20	4.00	2.80	5.78	17.80	1.14	14.73
	SE	8.78	5.60	4.11	4.71	1.38	20.32	1.53	1.38	1.46	2.73	5.04	0.46	24.53
	NO. TOWS	5	24	19	8	5	6	5	5	5	9	10	7	108
07SEP-10SEP	CPUE	16.20	9.58	10.48	1.80	4.60	2.00	4.60	1.60	3.80	2.67	7.70	2.86	5.66
	SE	12.11	1.53	2.48	0.73	1.69	0.68	3.63	0.93	1.07	1.01	2.60	0.99	13.52
	NO. TOWS	5	24	21	5	5	6	5	5	5	9	10	7	107
20SEP-23SEP	CPUE	1.80	5.33	9.05	6.00	7.60	10.43	17.50	1.20	0.80	1.89	3.00	1.86	5.54
	SE	0.97	1.20	1.93	3.07	5.64	2.13	6.56	0.37	0.58	0.82	0.91	0.77	9.88
	NO. TOWS	5	24	19	7	5	7	6	5	5	9	10	7	109
06OCT-08OCT	CPUE	7.20	6.88	10.12	1.00	20.86	6.75	0.80	0.20	0.60	1.33	0.80	1.14	4.81
	SE	1.71	1.72	4.39	0.55	9.72	1.64	0.58	0.20	0.60	0.47	0.59	0.83	11.17
	NO. TOWS	5	24	17	5	7	8	5	5	5	9	10	7	107
20OCT-22OCT	CPUE	2.80	2.64	1.20	3.33	8.33	4.00	1.80	1.80	0.40	0.56	0.50	0.14	2.29
	SE	1.46	0.53	0.37	1.23	2.64	1.71	0.97	1.11	0.24	0.34	0.40	0.14	4.06
	NO. TOWS	5	25	15	6	6	6	5	5	5	9	10	7	104
02NOV-04NOV	CPUE	0.60	0.75	1.87	4.20	5.00	0.67	0.20	0.60	1.60	0.11	0.60	0.00	1.35
	SE	0.40	0.21	0.54	1.74	3.38	0.49	0.20	0.40	1.36	0.11	0.40	0.00	4.17
	NO. TOWS	5	24	15	5	5	6	5	5	5	9	10	7	101

TABLE C-12 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	95	2557	1406	553	97	28	18	25	48	82	43	28	4981
	SE	57	1361	884	388	35	18	10	14	23	37	17	25	1671
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	336	1243	914	175	92	82	154	16	56	109	94	33	3306
	SE	197	179	348	126	37	34	84	7	25	26	35	20	469
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	266	1479	638	141	23	142	78	8	23	219	125	31	3172
	SE	94	419	184	43	5	25	27	4	9	75	40	9	478
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	318	1537	606	55	44	153	109	3	29	259	161	27	3302
	SE	105	213	140	9	23	52	28	1	15	109	92	12	317
	NO. TOWS	5	24	19	6	5	6	5	5	5	9	10	7	106
23AUG-29AUG	ST. CROP	119	1357	545	75	24	607	37	5	24	101	350	16	3260
	SE	66	255	110	43	4	216	11	2	13	48	99	6	378
	NO. TOWS	5	24	19	8	5	6	5	5	5	9	10	7	108
07SEP-10SEP	ST. CROP	122	435	282	17	12	21	33	2	33	47	152	39	1194
	SE	91	69	67	7	4	7	26	1	9	18	51	13	147
	NO. TOWS	5	24	21	5	5	6	5	5	5	9	10	7	107
20SEP-23SEP	ST. CROP	14	242	243	55	20	111	124	1	7	33	59	25	936
	SE	7	54	52	28	15	23	47	<0.5	5	14	18	10	100
	NO. TOWS	5	24	19	7	5	7	6	5	5	9	10	7	109
06OCT-08OCT	ST. CROP	54	312	272	9	55	72	6	0	5	23	16	16	841
	SE	13	78	118	5	26	18	4	<0.5	5	8	12	11	147
	NO. TOWS	5	24	17	5	7	8	5	5	5	9	10	7	107
20OCT-22OCT	ST. CROP	21	120	32	31	22	43	13	2	3	10	10	2	309
	SE	11	24	10	11	7	18	7	1	2	6	8	2	38
	NO. TOWS	5	25	15	6	6	6	5	5	5	9	10	7	104
02NOV-04NOV	ST. CROP	5	34	50	39	13	7	1	1	14	2	12	0	177
	SE	3	10	15	16	9	5	1	<0.5	12	2	8	0	30
	NO. TOWS	5	24	15	5	5	6	5	5	5	9	10	7	101

TABLE C-13 REGIONAL DENSITY (NO./1,000m3) OF STRIPED BASS YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.05	0.03
	SE	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.05	0.23
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.01	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.29	0.00	0.00	0.03
	SE	0.00	0.01	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.29	0.00	0.00	0.29
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.06	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01
	SE	0.00	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.07	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.05	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
	SE	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.01
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.01	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-14 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	0	3	3	1	0	0	0	0	0	0	40	3	51
24JUL	SE	0	3	3	1	0	0	0	0	0	0	37	3	37
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	0	3	2	2	0	1	0	0	0	50	0	0	59
06AUG	SE	0	3	2	2	0	1	0	0	0	50	0	0	51
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	0	19	6	2	0	0	0	0	0	0	3	0	29
20AUG	SE	0	10	4	2	0	0	0	0	0	0	3	0	11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	0	0	11	0	0	1	0	0	4	0	0	0	16
03SEP	SE	0	0	7	0	0	1	0	0	4	0	0	0	8
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	0	10	3	0	0	0	0	0	0	0	0	3	15
18SEP	SE	0	5	3	0	0	0	0	0	0	0	0	3	7
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	0	3	0	0	0	0	0	0	0	7	0	10
01OCT	SE	0	0	3	0	0	0	0	0	0	0	5	0	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	0	36	0	1	0	0	0	0	0	0	0	0	38
15OCT	SE	0	18	0	1	0	0	0	0	0	0	0	0	18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	3	32	5	0	0	0	0	0	0	0	0	0	40
29OCT	SE	3	17	3	0	0	0	0	0	0	0	0	0	17
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	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, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.42	0.92	0.17
	SE	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.22	0.48	0.60
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.18	0.43	0.33	1.00	0.00	0.00	0.00	0.13	0.07	0.05	0.75	0.24
	SE	0.00	0.18	0.30	0.33	0.58	0.00	0.00	0.00	0.13	0.07	0.05	0.59	0.97
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.09	0.43	0.00	0.00	0.00	0.00	0.25	0.13	0.20	0.11	0.17	0.11
	SE	0.00	0.09	0.30	0.00	0.00	0.00	0.00	0.16	0.13	0.14	0.07	0.17	0.44
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.21	0.11	0.17	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	SE	0.00	0.10	0.07	0.17	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
	NO. TOWS	5	24	19	6	5	6	5	5	5	9	10	7	106
23AUG-29AUG	CPUE	0.00	0.21	0.21	0.63	0.00	1.33	0.20	0.00	0.00	0.00	0.00	0.00	0.21
	SE	0.00	0.08	0.12	0.63	0.00	1.33	0.20	0.00	0.00	0.00	0.00	0.00	1.49
	NO. TOWS	5	24	19	8	5	6	5	5	5	9	10	7	108
07SEP-10SEP	CPUE	0.20	0.13	0.14	0.00	0.00	0.00	0.20	0.00	0.20	0.00	0.00	1.57	0.20
	SE	0.20	0.07	0.10	0.00	0.00	0.00	0.20	0.00	0.20	0.00	0.00	1.41	1.46
	NO. TOWS	5	24	21	5	5	6	5	5	5	9	10	7	107
20SEP-23SEP	CPUE	0.20	0.04	0.11	0.00	0.00	0.14	6.83	0.20	0.00	0.11	0.00	0.00	0.64
	SE	0.20	0.04	0.07	0.00	0.00	0.14	6.64	0.20	0.00	0.11	0.00	0.00	6.64
	NO. TOWS	5	24	19	7	5	7	6	5	5	9	10	7	109
06OCT-08OCT	CPUE	0.20	0.21	0.00	0.20	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	SE	0.20	0.10	0.00	0.20	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.33
	NO. TOWS	5	24	17	5	7	8	5	5	5	9	10	7	107
20OCT-22OCT	CPUE	0.00	0.08	0.13	0.00	0.00	0.33	0.20	0.00	0.40	0.00	0.00	0.00	0.10
	SE	0.00	0.06	0.09	0.00	0.00	0.33	0.20	0.00	0.40	0.00	0.00	0.00	0.57
	NO. TOWS	5	25	15	6	6	6	5	5	5	9	10	7	104
02NOV-04NOV	CPUE	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	NO. TOWS	5	24	15	5	5	6	5	5	5	9	10	7	101

TABLE C-16 REGIONAL STANDING CROP (IN THOUSANDS) OF STRIPED BASS YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	12	0	0	0	0	0	1	2	8	12	36
03JUL	SE	0	0	5	0	0	0	0	0	1	2	4	7	10
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	0	8	12	3	3	0	0	0	1	1	1	10	39
15JUL	SE	0	8	8	3	2	0	0	0	1	1	1	8	15
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	4	12	0	0	0	0	0	1	4	2	2	25
28JUL	SE	0	4	8	0	0	0	0	<0.5	1	3	1	2	10
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	0	9	3	2	1	0	0	0	0	0	0	0	14
12AUG	SE	0	5	2	2	1	0	0	0	0	0	0	0	5
	NO. TOWS	5	24	19	6	5	6	5	5	5	9	10	7	106
23AUG-	ST. CROP	0	9	6	6	0	14	1	0	0	0	0	0	37
29AUG	SE	0	4	3	6	0	14	1	0	0	0	0	0	16
	NO. TOWS	5	24	19	8	5	6	5	5	5	9	10	7	108
07SEP-	ST. CROP	2	6	4	0	0	0	1	0	2	0	0	21	36
10SEP	SE	2	3	3	0	0	0	1	0	2	0	0	19	20
	NO. TOWS	5	24	21	5	5	6	5	5	5	9	10	7	107
20SEP-	ST. CROP	2	2	3	0	0	2	48	0	0	2	0	0	58
23SEP	SE	2	2	2	0	0	2	47	<0.5	0	2	0	0	47
	NO. TOWS	5	24	19	7	5	7	6	5	5	9	10	7	109
06OCT-	ST. CROP	2	9	0	2	0	1	0	0	0	0	0	0	14
08OCT	SE	2	5	0	2	0	1	0	0	0	0	0	0	5
	NO. TOWS	5	24	17	5	7	8	5	5	5	9	10	7	107
20OCT-	ST. CROP	0	4	4	0	0	4	1	0	3	0	0	0	16
22OCT	SE	0	3	2	0	0	4	1	0	3	0	0	0	6
	NO. TOWS	5	25	15	6	6	6	5	5	5	9	10	7	104
02NOV-	ST. CROP	0	2	2	0	0	0	0	0	0	0	0	0	4
04NOV	SE	0	2	2	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	15	5	5	6	5	5	5	9	10	7	101

TABLE C-17 REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.04
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.47
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.29	0.04
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.29	0.37
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.74	6.22	30.35	50.96	11.03	8.32
	SE		0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.46	2.71	22.70	17.18	4.58	28.97
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	0.50	0.36	358.49	2.74	0.46	5.16	720.07	449.89	3.33	128.42
	SE		0.00	0.00	0.00	0.50	0.36	357.71	0.85	0.46	2.59	397.02	167.31	3.33	560.00
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.22	0.15	2.65	37.93	45.68	45.65	1006.79	82.05	583.15	13.27	151.46
	SE		0.00	0.00	0.22	0.15	0.75	19.33	31.42	29.26	481.28	77.89	302.04	10.87	575.56
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	6.67	5.48	73.16	4.39	324.93	379.78	538.36	114.10	120.57
	SE		0.00	0.00	0.00	0.00	3.45	4.04	54.73	3.83	129.24	168.32	216.19	46.13	311.35
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	36.55	0.00	15.29	27.26	7.36	493.24	516.74	91.37
	SE		0.00	0.00	0.00	0.00	0.00	26.83	0.00	8.86	14.17	4.56	66.14	204.33	217.13
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	2.27	13.39	1.97	448.03	24.53	12.68	160.82	102.69	58.95
	SE	0.00	0.00	0.00	0.00	0.00	2.27	6.13	1.62	408.29	8.47	6.73	88.92	55.18	421.68
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.45	26.56	8.23	152.73	4.59	7.00	13.64	204.16	32.11
	SE	0.00	0.00	0.00	0.00	0.00	0.45	23.34	8.23	148.85	1.74	1.23	12.92	85.96	174.15
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-17 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.10	0.04	0.17	0.00	0.00	0.00	1.49	2.57	0.34
	SE	0.00	0.00	0.00	0.00	0.00	0.10	0.04	0.17	0.00	0.00	0.00	1.14	1.47	1.87
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	10.70	0.88
	SE	0.00	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	9.89	9.92
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-18 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	82	0	0	82
	SE		0	0	0	0	0	0	0	0	0	82	0	0	82
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	38	0	0	0	20	58
	SE		0	0	0	0	0	0	0	38	0	0	0	20	43
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	70	0	123	880	5351	8190	785	15400
	SE		0	0	0	0	0	57	0	75	383	4002	2762	326	4890
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	104	76	50114	818	77	730	126945	72312	237	251411
	SE		0	0	0	104	76	50005	255	77	366	69993	26892	237	90128
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	33	32	549	5302	13619	7555	142430	14465	93731	944	278661
	SE		0	0	33	32	155	2702	9368	4842	68087	13731	48548	773	85442
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	1384	766	21810	726	45968	66954	86531	8118	232258
	SE		0	0	0	0	715	565	16316	634	18283	29673	34749	3282	51966
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	5109	0	2530	3856	1298	79279	36766	128838
	SE		0	0	0	0	0	3751	0	1466	2004	803	10630	14538	18581
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	471	1871	587	74142	3470	2236	25848	7306	115931
	SE	0	0	0	0	0	471	858	482	67566	1198	1186	14292	3926	69202
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	94	3712	2455	25275	650	1233	2193	14526	50138
	SE	0	0	0	0	0	94	3263	2455	24632	246	217	2077	6116	25792
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-18 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	0	0	0	0	22	6	52	0	0	0	239	183	502
26JUN	SE	0	0	0	0	0	22	6	52	0	0	0	183	105	218
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	0	0	164	0	0	0	0	0	0	761	925
03JUL	SE	0	0	0	0	0	164	0	0	0	0	0	0	704	722
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
14JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
28JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
12AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
25AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
09SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
21SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
05OCT	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-19 REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.10	0.46	1.63	5.59	2.53	0.00	0.53	0.00	0.90
	SE		0.00	0.00	0.00	0.00	0.10	0.39	0.91	2.08	0.83	0.00	0.53	0.00	2.51
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.50	0.00	0.77	2.43	4.54	13.95	33.81	205.96	1331.97	1304.10	281.14	72.76	270.99
	SE		0.50	0.00	0.55	1.35	1.25	4.64	4.78	75.94	298.55	143.84	89.29	34.06	353.23
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.42	1.41	25.36	573.76	793.68	710.89	647.99	468.67	470.46	30.22	310.24
	SE		0.00	0.00	0.42	0.83	11.84	183.16	229.62	45.36	90.75	129.32	50.69	15.11	340.92
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	19.35	29.43	19.55	275.50	68.00	520.70	568.01	207.05	145.75	154.44
	SE		0.00	0.00	0.00	12.72	7.52	3.77	70.06	19.56	206.42	134.45	73.32	57.10	273.58
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.21	1.76	40.15	34.46	25.74	42.74	27.84	98.47	15.32	24.20	25.91
	SE		0.00	0.00	0.21	1.19	12.68	17.24	8.08	12.28	7.40	55.05	4.51	1.98	61.53
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.26	0.22	0.21	5.55	19.70	92.84	37.45	21.58	201.41	120.13	139.67	49.16
	SE	0.00	0.00	0.26	0.22	0.14	2.54	14.38	68.75	8.17	8.97	97.17	30.13	31.76	128.24
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.57	0.00	0.00	0.00	0.00	0.15	2.08	0.69	22.00	27.87	80.25	45.83	52.58	17.85
	SE	0.57	0.00	0.00	0.00	0.00	0.15	1.81	0.69	13.63	10.53	34.39	16.89	16.18	45.06
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-19 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.17	0.55	0.14	0.00	1.64	0.28	4.27	9.40	13.94	2.34
	SE	0.00	0.00	0.00	0.00	0.12	0.46	0.14	0.00	1.01	0.28	3.51	8.19	6.00	10.81
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.05
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.66
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-20 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	20	64	485	925	358	0	85	0	1937
	SE		0	0	0	0	20	55	271	344	118	0	85	0	465
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	114	0	114	507	942	1950	10080	34083	188434	229906	45188	5177	516494
	SE		114	0	81	282	259	649	1424	12567	42236	25359	14352	2423	52909
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	62	294	5261	80207	236623	117642	91670	82624	75619	2150	692151
	SE		0	0	62	172	2457	25604	68458	7506	12838	22799	8147	1075	78464
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	4031	6106	2733	82135	11252	73663	100138	33279	10370	323706
	SE		0	0	0	2649	1561	528	20888	3236	29202	23703	11785	4063	45017
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	31	367	8329	4817	7675	7073	3938	17360	2463	1722	53775
	SE		0	0	31	248	2631	2410	2409	2032	1047	9706	725	141	10889
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	83	32	43	1151	2754	27680	6197	3053	35508	19308	9938	105748
	SE	0	0	83	32	29	527	2010	20498	1353	1269	17130	4843	2260	27385
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	120	0	0	0	0	31	290	206	3641	3943	14148	7366	3741	33486
	SE	120	0	0	0	0	31	253	206	2256	1489	6062	2715	1151	7272
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-20 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	0	0	0	35	114	20	0	271	39	753	1511	992	3736
26JUN	SE	0	0	0	0	25	95	20	0	168	39	619	1317	427	1529
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	94	0	0	0	94
03JUL	SE	0	0	0	0	0	0	0	0	0	94	0	0	0	94
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
14JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
28JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
12AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
25AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
09SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
21SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
05OCT	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-21 REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	0.79	1.70	4.37	14.48	68.09	74.90	3.37	0.46	0.00	14.01
	SE		0.00	0.00	0.00	0.47	0.79	2.04	2.42	30.26	34.19	2.52	0.46	0.00	45.85
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.25	0.00	0.29	3.30	49.02	774.05	706.52	3752.26	3648.24	2546.11	554.58	2.50	1003.09
	SE		0.25	0.00	0.29	1.14	17.02	308.29	319.49	781.38	365.95	604.68	160.92	1.13	1154.74
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	1.08	1.90	290.32	930.77	1730.29	2442.95	3013.28	4230.26	2038.65	1540.47	5.32	1352.11
	SE		0.00	1.08	1.34	110.38	190.54	369.21	421.24	859.00	610.14	435.18	666.37	3.03	1451.16
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	9.72	137.05	1121.60	1406.92	2232.97	2117.51	3472.15	3127.77	1010.09	25.59	1221.78
	SE		0.00	0.00	4.79	42.05	219.73	290.21	349.67	390.96	742.47	659.75	172.28	12.75	1194.06
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.91	1.13	21.35	9.44	517.08	748.37	827.87	1245.13	875.95	1299.19	756.03	900.83	62.06	558.87
	SE	0.91	0.57	18.21	1.89	225.11	218.96	126.66	280.80	62.79	128.50	307.13	246.61	60.08	610.79
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.49	5.06	9.03	26.26	1126.67	680.64	369.09	763.05	637.57	533.94	744.14	231.52	394.42
	SE	0.00	0.49	2.21	3.07	11.51	606.57	88.78	157.30	229.74	47.74	75.12	208.87	89.88	716.31
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-21 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	1.14	34.68	190.30	362.40	592.82	157.37	513.82	690.36	1225.71	420.06	36.09	324.98
	SE	0.00	0.00	0.41	9.05	51.07	40.05	112.14	45.75	52.00	79.56	612.30	92.22	21.29	641.76
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.43	1.90	4.26	39.15	219.80	430.93	233.65	170.80	626.69	443.25	439.98	117.55	209.88
	SE	0.00	0.25	1.49	2.29	11.99	31.50	86.65	41.93	33.83	113.59	67.51	111.58	32.32	206.17
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.40	16.40	91.50	149.38	22.98	42.74	142.22	184.79	190.79	124.49	74.28
	SE	0.00	0.00	0.00	0.40	5.10	19.41	38.02	8.83	15.53	23.54	72.88	77.08	74.20	139.57
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	2.62	7.81	0.00	0.18	1.01	21.60	52.04	63.85	NS	NS	NS	NS	NS	18.64
	SE	2.62	7.26	0.00	0.18	0.79	15.78	10.61	28.59						35.20
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	78.35	0.00	1.08	0.05	0.00	0.10	0.00	NS	NS	NS	NS	NS	9.95
	SE	0.00	78.35	0.00	1.08	0.05	0.00	0.06	0.00						78.35
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	164	352	611	4317	11268	10596	595	73	0	27978
	SE		0	0	0	98	164	285	722	5007	4837	444	73	0	7022
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	57	0	42	687	10169	108205	210637	620941	516116	448868	89138	178	2005038
	SE		57	0	42	238	3532	43096	95251	129306	51770	106603	25865	80	205855
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	348	280	60484	193094	241879	728325	498651	598454	359405	247603	379	2928902
	SE		0	348	199	22997	39529	51613	125584	142152	86317	76720	107107	216	256013
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	1436	28552	232682	196674	665724	350415	491204	551413	162353	1821	2682274
	SE		0	0	708	8760	45585	40569	104247	64698	105037	116310	27690	907	210197
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	190	260	6870	1395	107727	155254	115729	371214	144957	183796	133286	144793	4415	1369885
	SE	190	131	5862	279	46898	45425	17706	83716	10391	18180	54146	39639	4275	128760
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	112	1630	1335	5472	233734	95147	110037	126274	90198	94131	119607	16472	894148
	SE	0	112	710	453	2399	125836	12411	46897	38018	6754	13244	33572	6395	145013
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-22 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	366	5124	39647	75182	82871	46918	85030	97665	216088	67518	2568	718977
	SE	0	0	131	1337	10639	8308	15676	13640	8606	11256	107945	14823	1515	112653
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	98	610	629	8157	45599	60241	69659	28264	88658	78144	70718	8363	459141
	SE	0	57	480	339	2498	6535	12112	12500	5598	16069	11902	17934	2300	33322
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	58	3416	18983	20882	6852	7073	20119	32578	30666	8858	149484
	SE	0	0	0	58	1062	4026	5315	2632	2570	3330	12849	12388	5279	20412
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	547	1791	0	27	211	4481	7275	19034	NS	NS	NS	NS	NS	33366
	SE	547	1665	0	27	164	3274	1483	8523						9416
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	17974	0	159	10	0	14	0	NS	NS	NS	NS	NS	18157
	SE	0	17974	0	159	10	0	8	0						17975
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-23 REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-23 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.11	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.11	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.16
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.91	0.04	0.00	0.39	0.00	NS	NS	NS	NS	NS	0.17
	SE	0.00	0.00	0.00	0.91	0.04	0.00	0.28	0.00						0.95
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.24	0.00	0.29	0.00	0.00	NS	NS	NS	NS	NS	0.07
	SE	0.00	0.00	0.00	0.24	0.00	0.15	0.00	0.00						0.28
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24						0.24
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.20	0.00	0.34	0.28	NS	NS	NS	NS	NS	0.10
	SE	0.00	0.00	0.00	0.00	0.20	0.00	0.34	0.28						0.48
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	NS	NS	NS	NS	NS	0.07
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54						0.54
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22						0.22
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.22	NS	NS	NS	NS	NS	0.05
	SE	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.22						0.26
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-24 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-24 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN- 26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN- 03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL- 09JUL	ST. CROP	0	0	0	0	0	23	27	0	0	0	0	0	0	49
	SE	0	0	0	0	0	23	16	0	0	0	0	0	0	28
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL- 14JUL	ST. CROP	0	0	0	134	9	0	55	0	NS	NS	NS	NS	NS	197
	SE	0	0	0	134	9	0	40	0						140
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL- 28JUL	ST. CROP	0	0	0	36	0	60	0	0	NS	NS	NS	NS	NS	96
	SE	0	0	0	36	0	30	0	0						47
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG- 12AUG	ST. CROP	0	0	0	0	0	0	0	72	NS	NS	NS	NS	NS	72
	SE	0	0	0	0	0	0	0	72						72
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG- 25AUG	ST. CROP	0	0	0	0	42	0	47	82	NS	NS	NS	NS	NS	171
	SE	0	0	0	0	42	0	47	82						103
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP- 09SEP	ST. CROP	0	0	0	0	0	0	0	160	NS	NS	NS	NS	NS	160
	SE	0	0	0	0	0	0	0	160						160
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP- 21SEP	ST. CROP	0	0	0	0	0	0	0	67	NS	NS	NS	NS	NS	67
	SE	0	0	0	0	0	0	0	67						67
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT- 05OCT	ST. CROP	0	0	0	0	0	29	0	67	NS	NS	NS	NS	NS	96
	SE	0	0	0	0	0	29	0	67						73
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-25 REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.03	0.00	0.02	0.03	0.04	0.10	0.13	0.05	0.00	0.00	0.00	0.03
	SE	0.00	0.03	0.00	0.01	0.02	0.04	0.06	0.06	0.03	0.00	0.00	0.00	0.11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.01	0.00	0.00	0.02	0.00	0.15	0.06	0.21	0.10	0.07	0.04	0.00	0.05
	SE	0.01	0.00	0.00	0.02	0.00	0.08	0.06	0.10	0.07	0.07	0.03	0.00	0.18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.02	0.00	0.00	0.00	0.22	0.66	0.22	0.04	0.00	0.10	0.11
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.14	0.52	0.22	0.03	0.00	0.07	0.59
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.19	0.77	0.63	0.11	0.04	0.05	0.29	0.17
	SE	0.00	0.00	0.00	0.00	0.00	0.14	0.34	0.22	0.08	0.03	0.03	0.29	0.53
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.01	0.00	0.13	0.41	0.20	0.11	0.12	0.09	0.11	0.10
	SE	0.00	0.00	0.00	0.01	0.00	0.07	0.29	0.08	0.06	0.06	0.04	0.11	0.34
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.01	0.07	1.07	0.62	0.17	0.07	0.00	0.13	0.18
	SE	0.00	0.00	0.00	0.00	0.01	0.04	0.32	0.42	0.08	0.06	0.00	0.09	0.55
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.02	0.00	2.71	0.23	0.21	0.43	1.09	0.26	0.22	0.86	0.50
	SE	0.00	0.00	0.02	0.00	2.65	0.06	0.09	0.14	0.89	0.17	0.07	0.24	2.82
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.05	0.02	0.07	0.15	1.04	0.22	0.28	0.09	0.06	0.75	0.23
	SE	0.00	0.00	0.04	0.02	0.02	0.10	0.33	0.08	0.13	0.05	0.03	0.27	0.47
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-26 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	11	0	3	5	5	30	22	7	0	0	0	83
	SE	0	11	0	2	3	5	18	10	4	0	0	0	25
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	3	0	0	4	0	21	17	34	14	12	6	0	112
	SE	3	0	0	4	0	11	17	17	10	12	4	0	31
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	3	0	0	0	65	109	32	7	0	7	223
	SE	0	0	3	0	0	0	41	86	32	5	0	5	100
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	27	231	105	16	7	8	21	413
	SE	0	0	0	0	0	20	101	37	12	5	5	21	112
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	1	0	19	122	34	15	21	15	8	235
	SE	0	0	0	1	0	9	88	13	8	10	7	8	91
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	3	9	319	103	24	13	0	9	480
	SE	0	0	0	0	3	5	96	70	12	10	0	6	120
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	3	0	561	32	63	70	154	47	36	61	1027
	SE	0	0	3	0	549	9	27	23	126	31	11	17	566
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	8	4	14	22	311	36	40	15	9	53	511
	SE	0	0	6	4	4	13	99	13	18	8	5	19	105
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-27 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.00	0.63	0.33	0.16	0.25	0.22
	SE	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.00	0.18	0.21	0.09	0.25	1.39
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	1.18	0.57	0.67	0.67	22.00	29.75	16.50	3.38	5.40	2.84	0.42	6.95
	SE	0.00	0.54	0.43	0.67	0.67	16.52	22.90	7.87	2.28	2.75	2.79	0.23	29.68
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	2.18	0.71	0.00	14.67	3.67	16.38	16.50	4.38	4.60	1.32	0.92	5.44
	SE	0.00	1.18	0.71	0.00	6.89	2.33	11.01	3.71	3.68	1.67	0.95	0.42	14.39
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	6.71	1.29	5.60	9.40	9.33	16.00	6.80	5.40	16.44	14.50	0.29	7.65
	SE	0.00	2.50	0.88	5.11	3.70	3.91	6.88	3.22	1.75	4.16	7.87	0.18	14.22
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	5.29	1.86	1.40	4.40	14.33	22.80	22.60	7.80	1.11	13.50	0.14	7.94
	SE	0.00	2.31	1.33	1.17	2.16	5.14	13.34	5.01	5.57	0.56	10.80	0.14	19.76
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	1.71	1.64	3.40	3.20	6.00	15.00	24.60	7.60	8.00	15.10	1.86	7.34
	SE	0.00	0.84	1.64	3.16	1.59	4.59	4.34	5.40	3.17	2.37	13.15	1.70	16.62
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.88	0.86	0.20	2.60	4.50	8.00	17.40	1.20	14.00	7.60	2.43	4.97
	SE	0.00	0.42	0.49	0.20	1.54	2.92	5.50	5.07	0.80	5.44	3.71	2.43	10.82
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	1.33	0.21	0.40	14.60	4.00	12.00	5.60	0.00	2.89	4.00	0.00	3.75
	SE	0.00	0.70	0.15	0.40	7.57	1.44	5.09	2.11	0.00	1.84	1.51	0.00	9.80
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.75	0.00	4.40	6.20	4.83	5.00	6.20	0.00	8.00	17.40	0.00	4.40
	SE	0.00	0.33	0.00	1.81	1.71	2.15	2.12	4.14	0.00	3.88	16.96	0.00	18.31
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.00	0.29	0.29	0.80	11.80	1.00	5.20	3.40	0.00	0.11	0.60	0.00	1.96
	SE	0.00	0.15	0.16	0.37	6.30	0.45	2.75	2.46	0.00	0.11	0.50	0.00	7.35
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-28 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	0	0	0	14	0	0	5	6	3	3	32
03JUL	SE	0	0	0	0	0	14	0	0	2	4	2	3	15
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	0	54	15	6	2	234	211	20	29	95	56	6	728
15JUL	SE	0	24	12	6	2	176	162	10	20	48	55	3	253
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	99	19	0	39	39	116	20	38	81	26	12	489
28JUL	SE	0	54	19	0	18	25	78	5	32	29	19	6	112
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	0	305	35	52	25	99	114	8	46	289	285	4	1261
12AUG	SE	0	114	24	47	10	42	49	4	15	73	155	3	222
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	ST. CROP	0	240	50	13	12	153	162	28	67	20	266	2	1012
29AUG	SE	0	105	36	11	6	55	95	6	48	10	212	2	268
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	ST. CROP	0	78	44	31	8	64	106	31	65	140	297	25	891
10SEP	SE	0	38	44	29	4	49	31	7	27	42	259	23	279
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	ST. CROP	0	40	23	2	7	48	57	22	10	246	150	33	636
23SEP	SE	0	19	13	2	4	31	39	6	7	95	73	33	137
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	ST. CROP	0	61	6	4	38	43	85	7	0	51	79	0	373
08OCT	SE	0	32	4	4	20	15	36	3	0	32	30	0	70
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	ST. CROP	0	34	0	41	16	51	35	8	0	140	342	0	668
22OCT	SE	0	15	0	17	5	23	15	5	0	68	334	0	342
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	ST. CROP	0	13	8	7	31	11	37	4	0	2	12	0	125
04NOV	SE	0	7	4	3	17	5	19	3	0	2	10	0	29
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-29 REGIONAL DENSITY (NO./1,000m3) OF WHITE PERCH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.79	0.74	0.52	0.03	2.21	1.22	1.31	3.10	2.64	2.20	1.54	1.36
	SE	0.00	0.23	0.33	0.18	0.02	0.19	0.42	0.63	1.04	0.62	0.92	0.35	1.79
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.47	0.63	1.47	0.50	0.00	3.51	2.73	1.93	8.31	4.94	2.07	2.50	2.42
	SE	0.18	0.29	0.77	0.17	0.00	1.66	0.86	0.79	2.17	0.86	0.48	1.40	3.54
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.06	1.34	4.31	1.12	0.05	0.97	0.47	0.82	3.46	1.67	2.05	1.29	1.47
	SE	0.04	0.25	1.35	0.42	0.03	0.27	0.27	0.52	1.20	0.30	0.59	0.53	2.15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.29	1.00	2.55	0.81	0.02	1.49	0.71	1.50	2.84	1.85	2.06	3.54	1.55
	SE	0.09	0.29	0.58	0.25	0.02	0.45	0.23	1.05	1.11	0.67	0.59	0.98	2.20
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.04	1.70	3.64	0.23	0.03	0.85	0.77	0.48	3.58	2.23	2.45	1.00	1.42
	SE	0.04	0.38	0.90	0.06	0.03	0.25	0.21	0.17	1.11	0.63	0.78	0.37	1.87
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.03	1.52	3.56	0.82	1.37	1.42	1.84	0.50	3.30	2.37	1.36	1.29	1.61
	SE	0.02	0.43	0.67	0.60	0.73	0.58	0.65	0.14	0.77	0.64	0.32	0.44	1.90
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.09	2.91	1.97	0.64	1.47	0.82	0.18	1.79	3.37	1.60	2.67	10.70	2.35
	SE	0.07	0.54	0.62	0.28	1.32	0.23	0.08	0.60	0.98	0.36	0.73	3.24	3.88
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	1.75	3.77	2.91	0.40	1.25	1.92	1.58	1.88	5.39	1.37	1.08	9.44	2.73
	SE	0.83	0.89	1.11	0.17	0.63	1.03	0.64	0.98	1.10	0.55	0.45	1.86	3.28
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-30 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	0	256	109	109	6	309	363	217	439	466	354	110	2736
24JUL	SE	0	74	49	37	3	26	124	104	146	109	147	25	303
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	107	202	216	104	0	491	815	320	1175	871	333	178	4814
06AUG	SE	41	94	114	35	0	233	256	131	307	151	78	100	543
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	13	430	637	233	10	136	141	135	489	294	329	91	2941
20AUG	SE	9	80	200	88	6	38	80	86	170	53	94	38	334
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	66	321	377	170	3	209	212	248	401	327	332	252	2917
03SEP	SE	22	92	86	52	3	63	68	174	157	118	94	70	332
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	9	548	537	49	6	119	230	79	507	394	394	71	2944
18SEP	SE	9	121	133	13	6	34	62	29	157	112	126	26	304
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	8	488	525	172	284	198	547	84	466	418	218	92	3500
01OCT	SE	6	139	98	126	152	81	194	24	109	112	52	31	375
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	21	937	291	132	306	115	54	296	477	282	429	761	4100
15OCT	SE	16	172	92	59	275	32	23	99	138	63	117	230	467
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	401	1213	429	82	260	269	472	311	763	241	173	671	5287
29OCT	SE	190	288	165	35	130	144	192	162	156	97	73	132	552
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-31 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF WHITE PERCH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	6.00	2.82	2.29	6.00	7.33	10.00	4.00	12.25	7.13	14.40	17.68	12.25	8.51
	SE	5.51	1.15	1.23	5.03	1.33	4.51	2.01	3.36	2.94	2.89	2.95	5.43	12.29
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	2.33	3.91	3.43	0.67	19.33	8.00	6.88	6.63	21.25	34.27	28.26	7.00	11.83
	SE	0.67	1.18	2.47	0.67	8.41	0.58	3.32	1.95	8.63	11.29	12.76	4.11	21.82
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.33	5.36	4.29	12.33	3.00	10.33	5.00	2.25	3.00	12.80	4.37	3.75	5.57
	SE	0.33	2.09	2.30	1.20	1.73	1.76	2.70	1.01	1.07	3.84	1.90	2.41	7.14
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.80	19.08	4.64	9.80	4.80	4.50	2.60	1.40	9.40	9.00	26.50	4.29	8.07
	SE	0.80	15.51	2.65	3.85	2.96	1.12	1.03	0.75	4.25	3.60	8.43	2.25	19.54
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.40	7.54	4.29	19.80	2.60	204.17	3.80	3.20	3.20	4.44	19.70	0.00	22.76
	SE	0.40	5.63	1.45	17.87	1.40	202.57	1.74	0.86	1.53	2.52	9.28	0.00	203.68
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.20	2.71	2.07	6.80	8.20	0.67	5.40	1.20	5.80	8.56	0.70	6.43	4.06
	SE	0.20	0.95	0.74	3.01	6.04	0.49	2.99	1.20	3.02	3.48	0.37	4.97	10.18
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	1.40	3.50	4.71	7.40	2.20	0.67	16.00	4.60	0.80	3.44	5.10	8.86	4.89
	SE	1.40	1.89	1.37	3.03	1.43	0.49	13.77	1.33	0.49	1.46	3.83	8.05	17.10
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.60	0.96	0.00	3.40	4.60	1.67	5.20	2.00	0.00	0.44	0.00	0.00	1.57
	SE	0.40	0.37	0.00	2.36	4.12	1.48	2.06	1.52	0.00	0.34	0.00	0.00	5.63
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	2.40	0.38	0.00	7.40	8.60	2.00	1.40	12.40	0.00	0.89	0.60	0.00	3.01
	SE	0.81	0.15	0.00	2.77	4.27	0.93	0.75	5.16	0.00	0.39	0.50	0.00	7.42
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.40	0.71	4.50	1.80	0.20	0.17	4.20	0.00	0.40	0.00	1.10	0.00	1.12
	SE	0.24	0.20	3.22	0.58	0.20	0.17	2.40	0.00	0.24	0.00	0.67	0.00	4.14
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-32 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE PERCH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	45	128	61	55	19	107	28	15	61	253	348	166	1288
	SE	41	52	33	46	4	48	14	4	25	51	58	74	149
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	18	178	92	6	51	85	49	8	183	602	556	95	1922
	SE	5	54	66	6	22	6	24	2	74	198	251	56	346
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	3	244	115	114	8	110	35	3	26	225	86	51	1019
	SE	3	95	62	11	5	19	19	1	9	67	37	33	144
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	6	867	125	90	13	48	18	2	81	158	521	58	1988
	SE	6	705	71	36	8	12	7	1	37	63	166	31	733
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	3	343	115	182	7	2175	27	4	28	78	388	0	3349
	SE	3	256	39	165	4	2158	12	1	13	44	183	0	2187
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	2	123	56	63	22	7	38	1	50	150	14	87	613
	SE	2	43	20	28	16	5	21	1	26	61	7	68	113
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	11	159	127	68	6	7	114	6	7	60	100	120	785
	SE	11	86	37	28	4	5	98	2	4	26	75	109	194
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	5	44	0	31	12	18	37	2	0	8	0	0	156
	SE	3	17	0	22	11	16	15	2	0	6	0	0	37
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	18	17	0	68	23	21	10	15	0	16	12	0	200
	SE	6	7	0	26	11	10	5	6	0	7	10	0	34
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	3	32	121	17	1	2	30	0	3	0	22	0	230
	SE	2	9	87	5	1	2	17	0	2	0	13	0	90
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-33 REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-33 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-34 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-34 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	11.16	5.40	7.58	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36
	SE		2.65	0.97	2.00	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.10
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	931.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.61
	SE		873.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	873.65
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE		0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	668.73	995.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	138.68
	SE		172.42	432.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	465.96
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	81.38	0.37	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.87
	SE		77.32	0.37	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.32
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	4.50	2.54	0.00	0.53	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74
	SE		3.72	2.54	0.00	0.53	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-35 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	8.90	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
	SE	0.00	8.90	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.06
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	2560	1739	1120	866	0	0	0	0	0	0	0	0	6285
	SE		608	313	295	460	0	0	0	0	0	0	0	0	876
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	213658	0	0	0	0	0	0	0	0	0	0	0	213658
	SE		200432	0	0	0	0	0	0	0	0	0	0	0	200432
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	99	0	0	0	0	0	0	0	0	0	0	99
	SE		0	99	0	0	0	0	0	0	0	0	0	0	99
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	153420	320324	0	0	0	0	0	0	0	0	0	0	473744
	SE		39557	139308	0	0	0	0	0	0	0	0	0	0	144815
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	18670	119	111	0	0	0	0	0	0	0	0	0	18899
	SE		17738	119	111	0	0	0	0	0	0	0	0	0	17739
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	1032	819	0	111	272	0	0	0	0	0	0	0	2234
	SE		853	819	0	111	229	0	0	0	0	0	0	0	1210
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-36 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	2043	0	0	353	0	0	0	0	0	0	0	0	2396
26JUN	SE	0	2043	0	0	353	0	0	0	0	0	0	0	0	2073
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
14JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
28JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
12AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
25AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
09SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
21SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
05OCT	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-37 REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	292.73	5.83	9.18	1.66	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	25.81
	SE		207.50	3.16	3.60	0.64	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	207.56
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	408.29	388.41	19.26	19.48	275.77	9.59	0.00	0.00	0.00	0.00	0.00	0.00	93.40
	SE		178.75	212.87	4.39	7.76	95.76	4.56	0.00	0.00	0.00	0.00	0.00	0.00	294.17
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	280.75	27.68	6.62	61.51	110.30	1.58	2.50	0.00	0.00	0.00	0.00	0.00	40.91
	SE		120.25	8.82	1.42	37.43	63.79	0.97	1.26	0.00	0.00	0.00	0.00	0.00	141.46
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	232.34	43.10	25.13	37.23	52.38	55.80	1.18	1.75	0.44	0.00	0.00	0.00	37.45
	SE		156.49	21.33	10.10	13.96	17.31	21.39	0.63	1.53	0.44	0.00	0.00	0.00	161.25
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	67.53	9.24	9.15	1.28	28.04	11.02	9.19	0.18	1.36	0.27	0.00	0.00	0.00	10.56
	SE	42.94	6.40	6.50	0.64	9.81	5.55	3.97	0.18	0.88	0.27	0.00	0.00	0.00	45.51
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	10.16	29.62	36.60	0.24	1.75	41.38	32.39	3.42	0.38	2.19	0.00	0.00	0.00	12.16
	SE	3.59	20.62	25.47	0.24	0.70	22.05	18.33	2.88	0.16	1.85	0.00	0.00	0.00	43.83
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-37 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	8.10	12.86	1.24	10.74	4.19	19.67	5.82	0.89	1.26	1.36	0.28	0.00	0.00	5.11
	SE	6.71	7.55	0.52	5.04	2.35	6.48	2.18	0.45	0.59	0.82	0.28	0.00	0.00	13.46
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	17.12	14.23	4.12	11.53	13.75	2.88	3.73	3.71	0.00	0.22	0.00	0.00	5.48
	SE	0.00	9.63	2.75	0.98	11.53	5.34	0.82	0.54	1.63	0.00	0.22	0.00	0.00	16.32
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.41	18.24	5.95	3.94	1.04	0.41	0.00	0.00	0.00	0.00	2.31
	SE	0.00	0.00	0.00	0.21	9.25	1.99	2.82	0.45	0.27	0.00	0.00	0.00	0.00	9.89
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	19.83	19.79	0.30	0.60	38.30	15.64	11.76	0.47	NS	NS	NS	NS	NS	13.34
	SE	10.99	12.35	0.30	0.60	19.06	10.65	7.66	0.24						28.44
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.54	0.00	2.91	17.08	19.57	0.00	NS	NS	NS	NS	NS	5.01
	SE	0.00	0.00	0.54	0.00	2.91	2.93	6.99	0.00						8.14
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.58	1.14	46.06	40.04	5.20	NS	NS	NS	NS	NS	11.63
	SE	0.00	0.00	0.00	0.58	0.83	13.58	39.87	3.57						42.28
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	1.29	2.71	0.00	0.00	3.13	24.30	12.50	7.82	NS	NS	NS	NS	NS	6.47
	SE	1.29	1.63	0.00	0.00	2.24	7.45	4.90	6.96						11.72
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	2.58	0.00	0.00	0.00	1.59	5.63	3.26	0.81	NS	NS	NS	NS	NS	1.73
	SE	2.58	0.00	0.00	0.00	1.59	3.68	0.38	0.81						4.85
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	2.01	0.00	0.46	NS	NS	NS	NS	NS	0.31
	SE	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.46						1.19
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00						0.25
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-38 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	67159	1876	1356	347	0	38	0	0	0	0	0	0	70775
	SE		47605	1017	532	133	0	24	0	0	0	0	0	0	47619
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	93670	124994	2846	4058	57211	1340	0	0	0	0	0	0	284118
	SE		41009	68503	649	1616	19867	637	0	0	0	0	0	0	82296
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	64409	8909	978	12814	22883	221	746	0	0	0	0	0	110960
	SE		27587	2837	210	7798	13233	135	377	0	0	0	0	0	31705
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	53304	13870	3712	7756	10866	7800	352	289	62	0	0	0	98012
	SE		35903	6864	1493	2909	3592	2990	186	253	62	0	0	0	36997
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	14115	2119	2944	189	5843	2286	1285	54	225	38	0	0	0	29098
	SE	8975	1468	2092	95	2043	1152	554	54	146	38	0	0	0	9640
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	2123	6796	11779	35	364	8585	4528	1018	63	310	0	0	0	35602
	SE	751	4731	8198	35	146	4574	2562	860	26	261	0	0	0	10884
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-38 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	1693	2950	398	1587	873	4081	814	265	208	192	49	0	0	13110
26JUN	SE	1402	1731	168	744	489	1344	305	134	98	116	49	0	0	2779
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	3927	4579	609	2403	2852	403	1113	614	0	39	0	0	16538
03JUL	SE	0	2210	884	145	2403	1108	115	161	269	0	39	0	0	3578
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	0	61	3801	1235	551	310	69	0	0	0	0	6027
09JUL	SE	0	0	0	31	1928	413	394	133	45	0	0	0	0	2015
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	4145	4540	96	88	7980	3245	1645	141	NS	NS	NS	NS	NS	21879
14JUL	SE	2297	2834	96	88	3970	2209	1071	71						5926
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	0	173	0	606	3544	2735	0	NS	NS	NS	NS	NS	7059
28JUL	SE	0	0	173	0	606	607	977	0						1312
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	86	238	9555	5597	1551	NS	NS	NS	NS	NS	17028
12AUG	SE	0	0	0	86	172	2816	5573	1065						6337
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	270	623	0	0	653	5042	1748	2331	NS	NS	NS	NS	NS	10666
25AUG	SE	270	375	0	0	466	1546	685	2075						2757
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	540	0	0	0	331	1168	456	240	NS	NS	NS	NS	NS	2735
09SEP	SE	540	0	0	0	331	763	53	240						1022
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	417	0	138	NS	NS	NS	NS	NS	555
21SEP	SE	0	0	0	0	0	228	0	138						266
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	35	0	NS	NS	NS	NS	NS	35
05OCT	SE	0	0	0	0	0	0	35	0						35
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-39 REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	4.94	0.94	0.17	0.79	2.23	10.76	0.50	0.00	0.00	0.00	0.00	0.00	1.69
	SE	1.54	0.19	0.06	0.47	0.91	2.76	0.21	0.00	0.00	0.00	0.00	0.00	3.33
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	1.56	0.96	0.19	3.74	14.36	20.39	2.96	0.13	0.14	0.00	0.00	0.00	3.70
	SE	0.61	0.26	0.10	3.64	10.65	6.24	0.95	0.05	0.08	0.00	0.00	0.00	12.93
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	1.85	1.08	0.73	0.32	12.94	6.19	1.15	0.48	0.05	0.02	0.00	0.00	2.07
	SE	0.49	0.32	0.31	0.09	7.58	1.78	0.19	0.17	0.03	0.02	0.00	0.00	7.82
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.33	0.09	0.07	0.40	3.46	5.81	1.25	0.11	0.05	0.00	0.00	0.05	0.97
	SE	0.14	0.03	0.05	0.15	1.22	2.95	0.40	0.04	0.05	0.00	0.00	0.05	3.23
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.28	0.25	35.84	0.16	0.36	2.56	0.67	0.02	0.13	0.02	0.00	0.00	3.36
	SE	0.21	0.05	35.70	0.06	0.17	0.97	0.16	0.02	0.06	0.02	0.00	0.00	35.71
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.09	0.25	1.30	0.53	0.42	0.15	0.06	0.00	0.00	0.23
	SE	0.00	0.00	0.00	0.06	0.06	0.59	0.26	0.10	0.06	0.04	0.00	0.00	0.66
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.04	0.02	0.00	0.00	0.77	0.71	0.39	0.13	0.18	0.24	0.25	0.04	0.23
	SE	0.04	0.02	0.00	0.00	0.27	0.21	0.23	0.06	0.13	0.13	0.09	0.04	0.46
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.17	0.03	0.02	0.09	0.15	0.10	0.46	0.41	0.14	0.04	0.13	0.13	0.16
	SE	0.11	0.03	0.02	0.06	0.10	0.04	0.24	0.22	0.05	0.02	0.06	0.06	0.38
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-40 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	1133	304	25	164	462	1505	148	0	0	0	0	0	3742
	SE	354	60	8	99	188	385	64	0	0	0	0	0	572
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	359	309	28	778	2980	2851	881	22	20	0	0	0	8228
	SE	139	82	15	758	2210	873	285	8	11	0	0	0	2516
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	425	349	108	67	2684	865	344	79	7	4	0	0	4931
	SE	113	104	45	18	1572	249	56	27	5	4	0	0	1601
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	76	28	10	83	717	813	373	18	7	0	0	3	2130
	SE	33	8	8	31	252	413	119	7	7	0	0	3	500
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	64	79	5295	33	74	358	201	3	19	4	0	0	6131
	SE	48	17	5274	12	36	136	49	3	8	4	0	0	5276
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	18	52	182	159	69	21	10	0	0	512
	SE	0	0	0	12	13	82	78	17	9	7	0	0	116
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	9	5	0	0	160	99	118	21	25	42	40	3	522
	SE	9	5	0	0	55	29	69	10	18	23	15	3	99
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	38	11	3	19	31	14	138	68	19	6	21	9	377
	SE	24	9	3	12	21	6	72	37	7	4	9	4	89
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C41 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-42 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	12	0	0	0	0	0	0	0	0	0	0	12
	SE	0	9	0	0	0	0	0	0	0	0	0	0	9
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	4	0	0	0	0	0	0	0	0	0	0	4
	SE	0	3	0	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	6	0	0	0	0	0	0	0	0	0	0	6
	SE	0	4	0	0	0	0	0	0	0	0	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	2	2	0	0	0	0	0	0	0	0	0	0	3
	SE	2	2	0	0	0	0	0	0	0	0	0	0	2
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-43 REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC TOMCOD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.26	0.04	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE	0.12	0.04	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.82	0.26	0.00	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	SE	0.23	0.10	0.00	0.00	0.02	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.26
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.29	0.13	0.04	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.14	0.06	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.07	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	SE	0.05	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.04	0.01	0.34	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE	0.04	0.01	0.34	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.05	0.03	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.04	0.02	0.02	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-44 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	59	13	0	4	3	0	0	0	0	0	0	0	79
24JUL	SE	27	13	0	4	3	0	0	0	0	0	0	0	30
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	189	85	0	0	7	11	0	0	0	0	0	0	291
06AUG	SE	52	32	0	0	4	9	0	0	0	0	0	0	62
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	66	42	6	0	15	0	0	0	0	0	0	0	129
20AUG	SE	32	20	4	0	9	0	0	0	0	0	0	0	39
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	15	0	0	127	0	0	0	0	0	0	0	0	142
03SEP	SE	11	0	0	127	0	0	0	0	0	0	0	0	128
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	9	3	50	3	0	0	0	0	0	0	0	0	65
18SEP	SE	9	3	50	3	0	0	0	0	0	0	0	0	51
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	0	0	0	0	5	0	0	0	0	0	0	5
01OCT	SE	0	0	0	0	0	5	0	0	0	0	0	0	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	0	0	0	0	13	0	0	0	0	0	0	0	13
15OCT	SE	0	0	0	0	6	0	0	0	0	0	0	0	6
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	11	8	3	18	0	0	0	0	0	0	0	0	40
29OCT	SE	9	6	3	14	0	0	0	0	0	0	0	0	18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-45 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF ATLANTIC TOMCOD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	CPUE	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
03JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	CPUE	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
15JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	CPUE	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
28JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	CPUE	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
12AUG	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	CPUE	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
29AUG	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	CPUE	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
10SEP	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	CPUE	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
23SEP	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	CPUE	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
08OCT	SE	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	CPUE	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
22OCT	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	CPUE	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
04NOV	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-46 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC TOMCOD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	6	0	0	0	0	0	0	0	0	0	0	6
	SE	0	3	0	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-47 REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.02
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.24
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	29.39	18.92	0.22	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	4.09
	SE		12.13	7.16	0.22	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	14.10
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	9246.61	1116.90	1.92	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	863.81
	SE		4149.16	428.99	1.04	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4171.27
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	36674.87	2795.12	451.47	0.00	0.00	0.00	0.00	0.80	0.00	0.25	0.00	0.00	0.00	3070.96
	SE	10197.74	2513.45	122.68	0.00	0.00	0.00	0.00	0.80	0.00	0.25	0.00	0.00	0.00	10503.64
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	12636.52	79679.13	40856.97	1145.08	52.44	0.00	0.14	0.00	0.13	0.00	4.11	1.46	1.78	10336.75
	SE	2750.43	17883.98	24347.56	949.75	44.34	0.00	0.14	0.00	0.13	0.00	4.11	1.46	1.78	30349.78
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-47 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	123217.9	76544.59	29036.90	9.00	8.91	0.00	3.06	0.52	0.57	0.00	0.82	5.64	2.08	17602.31
	SE	20275.06	9682.64	10387.93	4.14	4.43	0.00	2.82	0.52	0.46	0.00	0.53	5.15	1.70	24753.60
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	29759.39	29869.85	13358.24	1079.05	2.23	1.06	0.04	0.00	0.00	0.00	2.78	0.00	1.66	5698.02
	SE	14999.68	10415.36	4612.20	637.69	2.14	1.06	0.04	0.00	0.00	0.00	2.78	0.00	0.94	18845.40
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	5092.79	192.06	7811.65	1274.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	1105.53
	SE	1285.63	115.43	2548.83	404.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	2885.52
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	11932.48	49791.48	7816.44	6543.58	22693.14	0.00	0.00	0.00	NS	NS	NS	NS	NS	12347.14
	SE	4465.24	37681.07	4316.20	5991.61	5771.51	0.00	0.00	0.00						39085.04
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	15762.41	18863.47	2133.81	90.92	493.34	0.00	0.00	0.00	NS	NS	NS	NS	NS	4667.99
	SE	3584.85	4373.83	515.37	30.90	113.69	0.00	0.00	0.00						5679.88
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	140.66	224.79	0.72	0.78	1.08	0.00	0.00	0.00	NS	NS	NS	NS	NS	46.00
	SE	47.32	134.19	0.72	0.78	1.08	0.00	0.00	0.00						142.30
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	19.04	52.83	0.00	11.72	31.34	0.00	0.95	0.00	NS	NS	NS	NS	NS	14.48
	SE	11.95	40.75	0.00	7.40	31.29	0.00	0.95	0.00						53.27
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	2.38	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.30
	SE	0.00	0.00	0.00	2.38	0.00	0.00	0.00	0.00						2.38
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.15
	SE	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00						1.12
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-48 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	42	0	0	42
	SE		0	0	0	0	0	0	0	0	0	42	0	0	42
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	6742	6090	32	0	0	0	180	0	0	0	0	0	13045
	SE		2782	2304	32	0	0	0	180	0	0	0	0	0	3617
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	2121360	359430	284	66	0	0	0	0	0	0	0	0	2481141
	SE		951901	138053	153	66	0	0	0	0	0	0	0	0	961859
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	7665512	641258	145290	0	0	0	0	239	0	35	0	0	0	8452333
	SE	2131457	576637	39480	0	0	0	0	239	0	35	0	0	0	2208433
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	2641195	18280008	13148242	169170	10926	0	19	0	21	0	725	235	127	34250667
	SE	574875	4102949	7835323	140313	9237	0	19	0	21	0	725	235	127	8864352
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-48 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	25754136	17560881	9344409	1329	1856	0	427	156	94	0	145	907	148	52664487
	SE	4237749	2221395	3342954	612	923	0	395	156	76	0	94	827	121	5836819
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	6220095	6852750	4298835	159415	464	221	6	0	0	0	490	0	118	17532395
	SE	3135127	2389495	1484259	94210	445	221	6	0	0	0	490	0	67	4213147
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	1064458	44063	2513877	188301	0	0	0	0	0	0	0	0	58	3810758
	SE	268713	26482	820241	59743	0	0	0	0	0	0	0	0	29	865606
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	2494043	11423176	2515421	966727	4727804	0	0	0	NS	NS	NS	NS	NS	22127171
	SE	933293	8644802	1389002	885181	1202415	0	0	0						8930974
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	3294546	4327662	686684	13432	102781	0	0	0	NS	NS	NS	NS	NS	8425106
	SE	749280	1003445	165853	4565	23685	0	0	0						1263492
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	29400	51571	231	115	226	0	0	0	NS	NS	NS	NS	NS	81544
	SE	9891	30786	231	115	226	0	0	0						32338
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	3980	12119	0	1731	6529	0	133	0	NS	NS	NS	NS	NS	24491
	SE	2498	9348	0	1094	6519	0	133	0						11719
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	351	0	0	0	0	NS	NS	NS	NS	NS	351
	SE	0	0	0	351	0	0	0	0						351
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	242	0	0	0	NS	NS	NS	NS	NS	242
	SE	0	0	0	0	233	0	0	0						233
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-49 REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	1.00	1.53	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
	SE	0.00	1.00	1.53	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-49 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	65.02	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63	5.39
	SE	0.00	65.02	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63	65.14
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.04
	SE	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00						0.32
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-50 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	230	493	0	81	0	0	0	0	0	0	0	0	804
	SE	0	230	493	0	64	0	0	0	0	0	0	0	0	548
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-50 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	14916	466	0	0	0	0	0	0	0	0	0	259	15641
	SE	0	14916	466	0	0	0	0	0	0	0	0	0	259	14926
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	103	0	0	0	0	0	NS	NS	NS	NS	NS	103
	SE	0	0	103	0	0	0	0	0						103
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE		0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.30	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
	SE	0.00	0.00	0.30	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	6.46	741.25	163.99	135.47	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.78
	SE	0.00	3.95	358.32	55.70	50.61	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	366.18
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-51 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	1481.93	2732.73	239.51	776.77	3328.93	3.61	20.70	0.52	0.26	3.86	0.00	14.34	107.83	670.08
	SE	642.45	1260.16	79.04	344.01	531.09	2.55	10.29	0.52	0.26	3.86	0.00	14.34	107.83	1555.43
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	182.27	266.76	2044.11	10699.38	4758.32	197.88	41.04	0.00	39.89	0.00	0.00	0.00	0.00	1402.28
	SE	152.19	144.77	252.87	1743.27	727.88	50.07	22.66	0.00	39.63	0.00	0.00	0.00	0.00	1918.71
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	143.85	3542.72	4181.74	7714.76	2531.89	420.74	235.41	13.01	22.14	0.00	0.00	0.49	0.00	1446.67
	SE	7.83	1515.46	600.86	2830.96	1911.80	68.83	70.81	11.28	21.40	0.00	0.00	0.49	0.00	3786.47
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	4004.21	4849.52	7663.81	4819.12	1087.25	443.42	1808.32	1153.12	NS	NS	NS	NS	NS	3228.60
	SE	2421.68	2196.14	2444.60	602.23	241.54	308.00	832.32	562.91						4264.88
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	1022.45	3877.81	5895.06	2728.75	820.42	322.88	458.77	691.37	NS	NS	NS	NS	NS	1977.19
	SE	232.29	690.24	622.29	453.78	171.77	76.27	243.75	140.21						1112.63
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	1605.90	606.01	1263.12	1177.32	280.68	224.90	593.62	537.11	NS	NS	NS	NS	NS	786.08
	SE	588.17	77.81	198.04	432.96	161.01	67.57	386.79	85.02						875.21
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	2299.38	1443.01	177.90	705.48	42.82	68.49	115.67	115.76	NS	NS	NS	NS	NS	621.07
	SE	635.56	271.13	96.41	243.29	19.25	11.84	21.56	42.83						740.77
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	1825.32	1331.67	439.32	712.31	164.29	22.76	53.02	30.42	NS	NS	NS	NS	NS	572.39
	SE	435.56	295.56	187.08	242.21	104.86	5.40	15.87	9.01						618.13
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	1173.09	250.23	453.95	554.38	229.44	21.70	35.70	22.07	NS	NS	NS	NS	NS	342.57
	SE	339.22	13.10	86.96	180.54	74.56	7.49	19.06	13.46						401.95
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	163.04	117.51	302.09	243.86	41.50	8.87	3.42	0.00	NS	NS	NS	NS	NS	110.04
	SE	28.31	42.66	49.08	73.16	14.59	2.70	2.23	0.00						103.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	98	0	0	0	0	0	0	0	0	0	0	98
	SE		0	98	0	0	0	0	0	0	0	0	0	0	98
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	97	158	0	0	0	0	0	0	0	0	0	254
	SE	0	0	97	98	0	0	0	0	0	0	0	0	0	138
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	1483	238543	24228	28223	622	0	0	0	0	0	0	0	293098
	SE	0	905	115313	8228	10544	622	0	0	0	0	0	0	0	116091
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-52 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	309743	626943	77076	114758	693538	749	2894	156	42	546	0	2304	7672	1836421
	SE	134281	289107	25435	50823	110646	529	1439	156	42	546	0	2304	7672	342277
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	38097	61199	657818	1580691	991331	41052	5737	0	6602	0	0	0	0	3382528
	SE	31810	33214	81376	257545	151645	10388	3167	0	6558	0	0	0	0	313406
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	30066	812771	1345733	1139754	527484	87286	32908	3877	3664	0	0	78	0	3983621
	SE	1636	347677	193364	418237	398296	14279	9899	3363	3542	0	0	78	0	701541
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	836930	1112579	2466302	711961	226513	91991	252788	343784	NS	NS	NS	NS	NS	6042847
	SE	506162	503838	786701	88971	50322	63897	116351	167824						1088662
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	213705	889647	1897097	403136	170923	66983	64132	206120	NS	NS	NS	NS	NS	3911743
	SE	48551	158356	200260	67040	35785	15822	34074	41802						276535
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	335652	139032	406487	173933	58476	46657	82982	160131	NS	NS	NS	NS	NS	1403351
	SE	122935	17851	63732	63965	33543	14018	54070	25347						168738
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	480599	331057	57250	104226	8922	14210	16170	34511	NS	NS	NS	NS	NS	1046944
	SE	132840	62203	31026	35942	4010	2455	3014	12770						154804
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	381516	305512	141379	105235	34227	4721	7411	9069	NS	NS	NS	NS	NS	989069
	SE	91037	67806	60205	35784	21845	1120	2219	2686						135208
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	245190	57407	146088	81903	47802	4503	4991	6579	NS	NS	NS	NS	NS	594461
	SE	70902	3005	27986	26672	15533	1553	2665	4014						82448
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	34078	26959	97217	36028	8647	1840	478	0	NS	NS	NS	NS	NS	205246
	SE	5917	9787	15795	10809	3039	561	312	0						22511
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-53 REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	SE	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-53 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.73	0.00	0.00	0.00	0.00	0.21
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.73	0.00	0.00	0.00	0.00	2.73
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.69	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	SE	0.00	0.00	0.69	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	25.31	8.94	2.56	3.69	3.29	0.00	NS	NS	NS	NS	NS	5.47
	SE	0.00	0.00	24.84	8.94	1.65	1.58	1.75	0.00						26.56
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	40.72	624.40	1191.83	758.24	94.21	143.21	72.57	130.02	NS	NS	NS	NS	NS	381.90
	SE	38.42	399.46	230.24	196.33	39.02	44.35	25.60	37.36						508.07
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	141.60	435.81	778.25	2315.23	369.10	143.49	347.37	268.91	NS	NS	NS	NS	NS	599.97
	SE	80.15	75.66	189.69	661.81	245.68	56.65	197.00	162.93						784.25
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	379.90	1159.65	1006.36	909.72	61.79	74.86	245.74	235.37	NS	NS	NS	NS	NS	509.17
	SE	137.56	226.92	262.17	348.24	16.19	19.13	29.02	95.67						520.62
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	597.50	1362.35	927.30	1132.21	139.95	142.64	550.59	373.72	NS	NS	NS	NS	NS	653.28
	SE	73.21	248.50	301.36	216.59	50.41	21.78	66.76	259.35						528.75
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	204.94	251.06	286.62	294.02	64.44	133.34	201.48	500.70	NS	NS	NS	NS	NS	242.08
	SE	85.92	66.68	59.53	80.74	33.72	36.60	46.32	288.21						331.02
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	36.78	149.51	300.12	133.37	101.49	19.34	335.14	38.38	NS	NS	NS	NS	NS	139.27
	SE	11.84	35.14	66.63	38.69	36.23	8.77	162.14	33.65						190.06
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-54 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	283	0	0	0	0	0	0	0	0	0	0	283
	SE	0	0	283	0	0	0	0	0	0	0	0	0	0	283
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-54 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	127	0	0	0	0	0	0	0	0	0	0	0	127
26JUN	SE	0	127	0	0	0	0	0	0	0	0	0	0	0	127
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	0	0	0	0	0	452	0	0	0	0	452
03JUL	SE	0	0	0	0	0	0	0	0	452	0	0	0	0	452
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	222	0	16	0	0	0	0	0	0	0	0	238
09JUL	SE	0	0	222	0	16	0	0	0	0	0	0	0	0	223
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	0	8145	1321	533	766	459	0	NS	NS	NS	NS	NS	11225
14JUL	SE	0	0	7995	1321	343	329	244	0						8121
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	8510	143249	383545	112020	19627	29711	10144	38763	NS	NS	NS	NS	NS	745569
28JUL	SE	8029	91643	74093	29006	8130	9201	3578	11138						122808
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	29596	99983	250449	342045	76898	29767	48559	80171	NS	NS	NS	NS	NS	957467
12AUG	SE	16753	17359	61045	97774	51185	11753	27539	48576						140514
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	79403	266048	323857	134399	12874	15531	34352	70171	NS	NS	NS	NS	NS	936635
25AUG	SE	28753	52060	84369	51448	3373	3968	4057	28523						118992
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	124885	312550	298417	167269	29156	29591	76967	111419	NS	NS	NS	NS	NS	1150255
09SEP	SE	15302	57011	96981	31999	10502	4519	9333	77321						141809
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	42836	57599	92238	43437	13425	27662	28165	149276	NS	NS	NS	NS	NS	454639
21SEP	SE	17958	15297	19159	11928	7025	7593	6475	85925						92724
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	7687	34300	96581	19703	21144	4011	46850	11444	NS	NS	NS	NS	NS	241720
05OCT	SE	2476	8062	21443	5717	7547	1819	22666	10032						35189
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-55 REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	26.39	559.41	189.51	453.97	229.95	160.37	133.77	54.53	93.34	13.29	9.76	0.00	160.36
	SE	9.48	282.17	73.54	134.67	83.40	77.36	77.69	13.56	18.50	9.38	3.48	0.00	350.51
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	354.48	339.43	150.27	211.96	60.46	309.67	243.96	68.51	176.84	9.16	4.56	0.50	160.82
	SE	38.42	68.40	85.82	197.17	39.68	134.20	199.14	41.46	92.68	5.81	2.30	0.28	349.26
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	424.46	133.41	244.40	126.33	159.55	181.13	202.88	14.19	40.41	5.57	10.63	0.00	128.58
	SE	178.74	26.45	45.90	29.81	42.19	84.79	103.37	4.24	10.54	4.08	4.24	0.00	235.51
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	109.52	146.63	355.69	287.57	89.55	132.15	115.29	27.52	48.68	8.09	0.46	0.00	110.10
	SE	25.40	26.46	252.15	154.39	5.62	33.13	44.87	11.23	28.57	2.78	0.29	0.00	304.72
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	235.54	212.78	42.07	47.59	48.55	107.02	209.65	10.20	28.62	2.32	0.57	0.00	78.74
	SE	46.11	23.99	15.90	27.56	12.31	12.48	82.10	8.23	19.25	1.28	0.50	0.00	105.84
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	63.51	78.54	19.98	28.38	33.52	102.23	268.63	21.14	17.77	0.31	0.41	0.00	52.87
	SE	13.38	13.07	3.24	12.74	22.10	38.34	37.05	1.16	7.14	0.31	0.41	0.00	62.50
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	32.85	63.82	140.21	39.37	16.47	133.88	5.97	10.57	17.50	0.00	0.02	0.00	38.39
	SE	20.32	11.06	93.19	9.01	8.82	51.23	2.40	5.68	8.14	0.00	0.02	0.00	110.04
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	92.45	79.08	16.38	5.45	24.12	31.26	5.14	0.94	0.79	0.00	0.00	0.00	21.30
	SE	39.47	16.90	5.10	2.32	14.23	0.83	2.62	0.53	0.54	0.00	0.00	0.00	45.66
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-56 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	6053	180023	27998	94579	47705	22418	39881	9025	13204	2343	1569	0	444798
	SE	2174	90804	10865	28057	17302	10814	23162	2244	2618	1654	560	0	100614
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	81324	109233	22200	44158	12543	43289	72733	11337	25017	1615	732	36	424218
	SE	8814	22013	12679	41078	8233	18760	59369	6861	13112	1024	370	20	81087
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	97379	42934	36107	26319	33099	25320	60484	2349	5716	981	1709	0	332398
	SE	41007	8511	6782	6209	8752	11853	30818	702	1492	719	682	0	54856
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	25127	47188	52548	59911	18578	18474	34371	4554	6887	1427	75	0	269139
	SE	5827	8514	37251	32166	1166	4631	13378	1859	4041	491	47	0	52446
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	54039	68475	6215	9914	10072	14960	62504	1688	4049	409	91	0	232417
	SE	10580	7719	2349	5742	2554	1745	24478	1361	2724	226	80	0	28776
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	14570	25274	2952	5912	6954	14291	80088	3499	2514	54	66	0	156174
	SE	3070	4208	479	2654	4584	5360	11044	192	1010	54	66	0	14394
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	7537	20538	20715	8202	3417	18715	1781	1749	2476	0	3	0	85134
	SE	4662	3559	13768	1877	1829	7162	717	941	1152	0	3	0	16878
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	21209	25449	2419	1135	5004	4370	1533	156	112	0	0	0	61388
	SE	9054	5439	753	484	2951	117	782	88	77	0	0	0	11032
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-57 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	2.67	1.45	1.29	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
	SE	2.67	0.91	0.97	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.78
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	36.33	0.09	121.57	10.67	4.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	14.44
	SE	26.56	0.09	96.24	8.29	4.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	100.26
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	3.63	1.57	11.20	118.80	7.67	0.00	0.00	0.00	0.00	0.00	0.00	11.91
	SE	0.00	1.58	0.99	11.20	64.58	3.93	0.00	0.00	0.00	0.00	0.00	0.00	65.69
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	1.79	0.00	0.80	8.40	3.50	35.60	0.00	0.00	0.00	0.00	0.00	4.17
	SE	0.00	1.33	0.00	0.80	5.80	1.82	35.35	0.00	0.00	0.00	0.00	0.00	35.90
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	5.67	0.00	7.00	277.80	45.17	0.00	0.00	0.00	0.00	0.00	0.00	27.97
	SE	0.00	2.16	0.00	7.00	256.84	28.56	0.00	0.00	0.00	0.00	0.00	0.00	258.53
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	411.60	0.29	1.29	0.00	14.40	24.00	79.00	0.00	0.00	0.00	0.00	0.00	44.21
	SE	339.99	0.25	1.29	0.00	8.24	14.12	78.25	0.00	0.00	0.00	0.00	0.00	349.27
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.54	0.00	0.00	2.60	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	SE	0.00	0.34	0.00	0.00	1.78	0.21	0.00	0.00	0.00	0.00	0.00	0.00	1.82
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	49.40	0.63	0.00	1.20	0.60	0.50	0.00	0.00	0.00	0.00	0.00	0.00	4.36
	SE	49.40	0.43	0.00	1.20	0.40	0.34	0.00	0.00	0.00	0.00	0.00	0.00	49.42
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.00	0.00	0.00	0.40	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	SE	0.00	0.00	0.00	0.40	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-58 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	20	66	35	22	0	0	0	0	0	0	0	0	142
	SE	20	41	26	22	0	0	0	0	0	0	0	0	57
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	274	4	3269	98	11	7	0	0	0	0	0	0	3663
	SE	200	4	2588	76	11	7	0	0	0	0	0	0	2597
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	165	42	103	313	82	0	0	0	0	0	0	705
	SE	0	72	27	103	170	42	0	0	0	0	0	0	217
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	81	0	7	22	37	253	0	0	0	0	0	401
	SE	0	60	0	7	15	19	251	0	0	0	0	0	259
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	257	0	65	732	481	0	0	0	0	0	0	1535
	SE	0	98	0	65	677	304	0	0	0	0	0	0	751
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	3100	13	35	0	38	256	561	0	0	0	0	0	4002
	SE	2561	11	35	0	22	150	555	0	0	0	0	0	2625
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	25	0	0	7	7	0	0	0	0	0	0	39
	SE	0	15	0	0	5	2	0	0	0	0	0	0	16
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	372	28	0	11	2	5	0	0	0	0	0	0	418
	SE	372	20	0	11	1	4	0	0	0	0	0	0	373
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	4	1	0	0	0	0	0	0	0	4
	SE	0	0	0	4	1	0	0	0	0	0	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-59 REGIONAL DENSITY (NO./1,000m3) OF BAY ANCHOVY YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	50.86	6.58	0.31	2.39	0.83	4.87	0.12	0.00	0.00	0.00	0.00	0.00	5.50
	SE	11.15	2.27	0.07	2.24	0.72	4.66	0.07	0.00	0.00	0.00	0.00	0.00	12.52
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	3.14	5.49	0.07	0.03	0.00	0.75	3.81	0.00	0.00	0.00	0.00	0.00	1.11
	SE	1.65	1.60	0.03	0.02	0.00	0.53	3.78	0.00	0.00	0.00	0.00	0.00	4.46
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	6.92	1.69	1.52	1.37	1.42	0.93	2.84	0.00	0.00	0.00	0.00	0.00	1.39
	SE	1.34	0.59	0.94	1.30	1.42	0.66	2.67	0.00	0.00	0.00	0.00	0.00	3.79
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.96	0.61	0.55	0.63	0.68	2.09	0.00	0.00	0.00	0.00	0.25	0.00	0.48
	SE	0.45	0.31	0.42	0.61	0.66	1.65	0.00	0.00	0.00	0.00	0.25	0.00	2.01
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	1.69	1.00	0.08	0.12	1.39	17.47	2.40	0.00	0.00	0.00	0.00	0.00	2.01
	SE	0.99	0.33	0.06	0.05	1.31	10.97	2.36	0.00	0.00	0.00	0.00	0.00	11.34
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	1.47	0.38	0.02	3.64	2.06	0.66	2.54	0.00	0.00	0.00	0.00	0.00	0.90
	SE	0.85	0.24	0.02	2.75	2.00	0.60	2.54	0.00	0.00	0.00	0.00	0.00	4.38
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	1.18	0.33	0.06	0.06	0.71	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	SE	0.67	0.20	0.04	0.02	0.66	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.96
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.18	0.22	0.03	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.08	0.16	0.03	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-60 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	11668	2116	46	497	172	681	37	0	0	0	0	0	15216
24JUL	SE	2559	730	11	466	150	651	20	0	0	0	0	0	2783
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	719	1767	10	6	0	105	1137	0	0	0	0	0	3744
06AUG	SE	379	516	5	5	0	74	1127	0	0	0	0	0	1299
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	1588	545	224	285	295	130	847	0	0	0	0	0	3915
20AUG	SE	308	189	139	271	295	92	797	0	0	0	0	0	977
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	220	197	81	130	141	292	0	0	0	0	40	0	1102
03SEP	SE	103	100	61	127	138	230	0	0	0	0	40	0	338
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	387	320	11	25	289	2441	715	0	0	0	0	0	4190
18SEP	SE	228	106	9	11	272	1533	705	0	0	0	0	0	1728
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	337	123	3	758	427	93	756	0	0	0	0	0	2497
01OCT	SE	195	78	3	574	416	84	756	0	0	0	0	0	1061
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	271	107	9	13	147	1	0	0	0	0	0	0	549
15OCT	SE	153	63	5	5	137	1	0	0	0	0	0	0	215
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	41	70	5	9	3	0	0	0	0	0	0	0	127
29OCT	SE	17	50	5	7	3	0	0	0	0	0	0	0	54
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-61 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF BAY ANCHOVY YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	6.18	0.14	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67
	SE	0.00	3.98	0.14	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.31
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.67
	SE	0.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	320.00
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	SE	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	18.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55
	SE	15.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.99
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-62 REGIONAL STANDING CROP (IN THOUSANDS) OF BAY ANCHOVY YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	281	4	15	0	0	0	0	0	0	0	0	300
	SE	0	181	4	15	0	0	0	0	0	0	0	0	181
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	2949	0	0	0	0	0	0	0	0	2949
	SE	0	0	0	2949	0	0	0	0	0	0	0	0	2949
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	3	4	0	0	0	0	0	0	0	0	0	0	7
	SE	3	4	0	0	0	0	0	0	0	0	0	0	5
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	3	0	0	0	0	0	0	0	3
	SE	0	0	0	0	3	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	140	0	0	0	0	0	0	0	0	0	0	0	140
	SE	120	0	0	0	0	0	0	0	0	0	0	0	120
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-63 REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	3.49	0.36
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	2.46	2.55
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32	15.04	145.83	13.77
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32	6.75	41.01	41.78
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	14.64	16.18	181.51	1665.48	156.51
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	13.14	8.49	37.17	393.81	395.87
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	232.29	466.96	0.72	58.33
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	210.75	208.40	0.72	296.39
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	19.89	7.56	610.53	562.41	100.14
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	6.66	5.38	587.30	551.89	805.97
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.48	7.19	19.11	47.38	3.50	6.58
	SE		0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.48	2.52	7.32	14.83	1.97	16.90
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	3.31	10.68	48.32	2.29	5.41
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	2.72	8.33	23.81	1.87	25.44
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.27	12.86	6.10	1.52
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.27	6.15	3.87	7.28
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	1.03	0.81	0.00	2.63	5.31	0.79
	SE	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	1.03	0.81	0.00	2.63	3.58	4.65
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-63 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	1.27	0.17
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	1.27	1.55
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-64 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	150	0	248	398
	SE		0	0	0	0	0	0	0	0	0	118	0	175	211
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	762	2417	10376	13554
	SE		0	0	0	0	0	0	0	0	0	762	1084	2918	3204
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	42	2071	2852	29175	118498	152637
	SE		0	0	0	0	0	0	0	42	1859	1498	5975	28019	28748
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	40952	75055	51	116058
	SE		0	0	0	0	0	0	0	0	0	37154	33496	51	50024
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	218	2813	1332	98132	40015	142511
	SE		0	0	0	0	0	0	0	218	942	948	94398	39267	102248
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	378	80	1017	3368	7615	249	12708
	SE		0	0	0	0	0	0	378	80	356	1290	2384	140	2764
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	52	468	1884	7767	163	10334
	SE		0	0	0	0	0	0	0	52	385	1468	3827	133	4120
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	73	47	2067	434	2622
	SE	0	0	0	0	0	0	0	0	0	42	47	988	276	1028
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	66	0	0	0	0	171	114	0	423	378	1153
	SE	0	0	0	66	0	0	0	0	171	114	0	423	255	539
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-64 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	142	91	232
	SE	0	0	0	0	0	0	0	0	0	0	0	142	91	168
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-65 REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	0.41	0.00	0.00	0.14	0.94	4.97	4.45	22.45	40.97	6.19
	SE		0.00	0.00	0.00	0.41	0.00	0.00	0.14	0.53	1.78	3.39	6.85	10.25	12.93
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.22	0.00	0.67	0.37	10.20	10.66	8.11	142.67	14.41
	SE		0.00	0.00	0.00	0.00	0.22	0.00	0.67	0.37	4.90	8.83	4.06	68.34	69.21
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.08	2.15	7.64	1.91
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	2.15	4.84	11.36
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.45	17.98	27.38	4.32
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.20	17.98	15.32	24.42
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	15.34	1.27
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	7.87	7.95
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-65 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO.TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-66 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	85	0	0	42	156	704	785	3608	2915	8294
	SE		0	0	0	85	0	0	42	88	252	598	1101	729	1477
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	46	0	200	61	1443	1880	1303	10151	15083
	SE		0	0	0	0	46	0	200	61	693	1558	652	4862	5198
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	2306	346	544	3196
	SE		0	0	0	0	0	0	0	0	0	1771	346	345	1837
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	1137	2891	1948	5976
	SE		0	0	0	0	0	0	0	0	0	1093	2891	1090	3277
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	204	0	1092	1295
	SE	0	0	0	0	0	0	0	0	0	0	204	0	560	596
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-66 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-67 REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.25	15.53	74.45	287.02	31.48
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.25	7.44	37.61	134.77	140.12
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	19.99	165.30	214.67	78.52	39.91
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	14.00	53.83	84.21	22.92	103.49
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.24	3.69	12.84	103.60	298.52	262.52	56.79
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.24	2.06	7.00	74.77	284.55	128.55	321.15
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.95	4.37	9.77	28.58	85.60	175.60	8.18	24.08
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.73	4.37	4.13	12.86	61.93	122.85	7.01	138.49
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	1.24	0.00	0.00	1.36	5.31	11.26	21.77	39.65	7.92	8.09	7.43
	SE	0.00	0.00	0.00	1.24	0.00	0.00	0.72	3.28	5.08	5.64	11.87	2.82	7.27	16.50
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-67 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.49	0.67	0.87	6.74	21.09	14.81	6.12	27.08	5.99
	SE	0.00	0.00	0.00	0.00	0.00	0.49	0.67	0.72	5.11	17.85	10.02	3.63	10.44	23.85
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	1.14	74.45	0.13	0.00	4.20	8.29	62.11	11.56
	SE	0.00	0.00	0.00	0.00	0.00	0.00	1.14	74.45	0.13	0.00	3.74	7.46	46.98	88.44
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	11.04	29.72	3.17
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	6.97	8.57	11.05
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	83	35	2737	11967	20421	35244
	SE		0	0	0	0	0	0	0	83	35	1311	6046	9589	11412
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	71	2827	29142	34504	5587	72131
	SE		0	0	0	0	0	0	0	71	1981	9489	13536	1631	16729
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	70	611	1817	18265	47982	18678	87424
	SE		0	0	0	0	0	0	70	341	990	13182	45736	9147	48480
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	132	1304	1617	4044	15091	28225	582	50995
	SE	0	0	0	0	0	0	102	1304	683	1819	10918	19746	499	22690
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	183	0	0	190	1584	1864	3080	6990	1274	575	15738
	SE	0	0	0	183	0	0	101	979	840	798	2093	453	518	2683
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-68 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	101	94	260	1116	2983	2611	984	1927	10076
	SE	0	0	0	0	0	101	94	215	846	2525	1767	584	743	3343
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	160	22197	22	0	740	1332	4419	28870
	SE	0	0	0	0	0	0	160	22197	22	0	659	1199	3343	22489
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	55	0	0	0	0	1774	2115	3944
	SE	0	0	0	0	0	0	43	0	0	0	0	1121	609	1277
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-69 REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
	SE	0.00	0.00	0.00	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-69 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.56	4.19	0.51	10.04	4.18	6.44	12.93	2.99
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.28	4.19	0.51	7.63	2.29	4.09	7.17	12.23
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	2.53	14.70	1.60	11.76	46.18	15.66	33.28	9.67
	SE	0.00	0.00	0.00	0.00	0.00	0.00	2.53	14.37	0.89	4.29	16.65	11.17	28.00	37.66
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	0.34	2.55	5.59	2.45	2.31	2.83	26.98	48.15	12.93	8.01
	SE	0.00	0.00	0.00	0.00	0.19	1.30	2.93	2.13	1.22	2.28	9.60	22.23	10.55	26.81
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.30	3.85	2.47	3.79	7.14	NS	NS	NS	NS	NS	2.19
	SE	0.00	0.00	0.00	0.30	3.81	2.31	2.08	4.80						6.88
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.23	0.00	0.78	0.00	0.00	NS	NS	NS	NS	NS	0.13
	SE	0.00	0.00	0.00	0.23	0.00	0.78	0.00	0.00						0.81
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00						0.21
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	2.68	0.00	0.56	0.55	0.00	0.00	1.06	0.00	NS	NS	NS	NS	NS	0.61
	SE	1.34	0.00	0.56	0.55	0.00	0.00	0.10	0.00						1.56
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.96	1.19	0.00	0.00	0.31	0.25	NS	NS	NS	NS	NS	0.34
	SE	0.00	0.00	0.96	1.19	0.00	0.00	0.31	0.25						1.58
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.47	0.00	3.68	NS	NS	NS	NS	NS	0.52
	SE	0.00	0.00	0.00	0.00	0.00	0.27	0.00	3.68						3.69
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.67	NS	NS	NS	NS	NS	0.14
	SE	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.67						0.83
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-70 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	303	0	0	0	0	0	0	0	0	303
	SE	0	0	0	0	303	0	0	0	0	0	0	0	0	303
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-70 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	79	1251	84	1421	737	1034	920	5524
	SE	0	0	0	0	0	0	39	1251	84	1079	404	657	510	1895
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	354	4382	265	1664	8141	2516	2368	19689
	SE	0	0	0	0	0	0	354	4285	147	607	2936	1795	1992	5890
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	72	529	782	732	383	400	4757	7740	920	16314
	SE	0	0	0	0	40	270	409	636	201	322	1693	3573	750	4121
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	45	801	513	530	2130	NS	NS	NS	NS	NS	4019
	SE	0	0	0	45	793	480	291	1430						1730
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	34	0	162	0	0	NS	NS	NS	NS	NS	196
	SE	0	0	0	34	0	162	0	0						166
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	48	0	0	0	0	0	0	NS	NS	NS	NS	NS	48
	SE	0	48	0	0	0	0	0	0						48
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	561	0	181	82	0	0	149	0	NS	NS	NS	NS	NS	972
	SE	281	0	181	82	0	0	13	0						344
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	308	176	0	0	44	73	NS	NS	NS	NS	NS	600
	SE	0	0	308	176	0	0	44	73						364
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	96	0	1098	NS	NS	NS	NS	NS	1195
	SE	0	0	0	0	0	57	0	1098						1100
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	156	0	0	0	0	201	NS	NS	NS	NS	NS	356
	SE	0	0	156	0	0	0	0	201						254
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-71 REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.16	0.49	0.18	0.01	0.72	0.59	0.00	0.59	0.14	1.51	6.96	3.85	1.27
	SE	0.06	0.17	0.06	0.01	0.72	0.58	0.00	0.52	0.10	0.69	1.41	0.85	2.09
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.09	0.13	0.24	0.10	0.00	0.08	0.00	0.00	0.77	0.00	0.04	2.51	0.33
	SE	0.08	0.05	0.14	0.05	0.00	0.06	0.00	0.00	0.38	0.00	0.03	1.23	1.30
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.44	0.21	0.84	0.07	0.02	0.07	0.03	0.00	0.34	0.21	1.89	1.16	0.44
	SE	0.34	0.05	0.77	0.04	0.02	0.04	0.03	0.00	0.12	0.14	0.59	0.47	1.15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.07	0.04	0.02	0.00	0.27	0.00	0.02	0.00	0.29	0.19	0.36	0.10
	SE	0.00	0.03	0.03	0.01	0.00	0.15	0.00	0.02	0.00	0.27	0.11	0.24	0.41
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.01	0.04	0.00	0.00	0.04	0.09	0.00	0.04	0.50	0.69	0.52	3.24	0.43
	SE	0.01	0.02	0.00	0.00	0.02	0.05	0.00	0.03	0.21	0.27	0.24	1.15	1.22
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.06	0.02	0.00	0.00	0.03	0.08	0.02	0.00	0.18	0.73	0.47	1.25	0.24
	SE	0.04	0.01	0.00	0.00	0.03	0.04	0.02	0.00	0.08	0.22	0.12	0.37	0.46
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.04	0.01	0.00	0.06	0.72	0.06	0.09	0.04	0.19	0.22	0.69	1.07	0.27
	SE	0.04	0.01	0.00	0.04	0.72	0.04	0.04	0.03	0.06	0.06	0.21	0.23	0.80
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.15	0.02	0.02	0.04	0.01	1.13	0.05	0.08	0.11	0.14	0.79	0.08	0.22
	SE	0.05	0.01	0.02	0.04	0.01	0.61	0.05	0.06	0.06	0.05	0.22	0.05	0.66
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-72 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	36	159	26	3	149	82	0	98	20	266	1118	274	2234
	SE	13	55	8	2	149	81	0	86	14	121	226	61	331
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	21	43	36	21	0	11	0	0	109	0	7	178	427
	SE	19	16	21	10	0	8	0	0	54	0	5	88	109
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	102	68	124	14	4	10	8	0	48	38	304	82	802
	SE	77	16	113	8	4	5	8	0	17	24	95	34	174
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	22	6	3	0	38	0	4	0	51	31	25	180
	SE	0	9	4	2	0	21	0	4	0	48	17	17	58
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	3	11	0	0	9	12	0	7	71	122	83	230	548
	SE	3	7	0	0	4	6	0	4	30	47	38	82	107
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	14	6	0	0	6	11	7	0	25	128	76	89	361
	SE	10	4	0	0	6	6	7	0	11	40	19	27	55
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	9	3	0	12	150	8	27	7	26	40	111	76	470
	SE	9	3	0	8	150	5	11	5	8	11	35	16	157
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	34	6	3	7	3	159	15	13	16	25	127	6	414
	SE	12	4	3	7	3	85	15	10	9	8	35	4	96
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-73 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	1.00	1.67	8.00	1.13	9.00	7.63	3.93	5.63	0.17	3.18
	SE	0.00	0.00	0.00	0.58	1.20	4.62	0.74	3.38	6.32	3.86	2.71	0.17	9.86
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	6.00	1.55	20.29	8.33	25.00	34.33	4.00	4.25	21.50	12.33	1.84	0.08	11.63
	SE	6.00	0.80	18.98	3.18	13.65	10.59	1.30	2.12	8.73	5.46	0.69	0.08	28.60
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.82	0.29	7.00	2.00	2.33	5.88	14.13	11.75	14.73	9.58	21.58	7.51
	SE	0.00	0.33	0.18	4.58	1.15	1.86	1.91	4.60	3.91	3.06	1.83	5.09	10.23
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.20	0.33	0.14	5.20	4.20	6.50	4.00	10.80	16.40	28.22	13.00	14.71	8.64
	SE	0.20	0.33	0.14	3.76	1.59	4.53	1.30	2.35	5.22	11.48	4.43	3.97	15.46
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.08	0.50	1.80	0.60	5.17	5.00	11.60	6.00	15.22	23.50	7.86	6.44
	SE	0.00	0.08	0.27	1.80	0.60	1.33	1.95	9.15	3.78	3.83	9.94	2.20	15.01
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.04	0.21	0.20	7.00	2.00	5.00	8.00	7.80	7.67	10.60	20.57	5.76
	SE	0.00	0.04	0.21	0.20	4.90	0.58	1.22	2.72	4.25	2.22	2.36	5.42	9.55
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.20	0.21	0.64	0.00	1.80	5.33	15.40	7.40	12.60	6.33	17.40	13.43	6.73
	SE	0.20	0.13	0.44	0.00	1.11	1.50	14.17	1.81	6.52	2.36	6.38	6.07	18.26
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.38	0.21	0.40	4.20	6.33	4.60	3.60	16.40	6.00	6.80	4.86	4.48
	SE	0.00	0.33	0.15	0.40	2.22	2.74	1.33	1.83	9.06	2.06	3.82	2.42	11.17
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	1.00	3.58	0.57	1.00	1.60	0.33	2.60	2.60	2.60	0.33	0.10	0.14	1.37
	SE	0.55	1.14	0.43	0.77	1.36	0.21	1.89	0.75	1.03	0.17	0.10	0.14	3.09
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.80	1.58	2.07	1.80	2.40	0.67	0.00	0.00	0.00	0.22	0.30	0.00	0.82
	SE	0.80	0.69	0.83	0.80	2.40	0.33	0.00	0.00	0.00	0.22	0.30	0.00	2.91
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-74 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	0	9	4	85	8	11	66	69	111	2	366
03JUL	SE	0	0	0	5	3	49	5	4	54	68	53	2	114
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	45	70	546	77	66	366	28	5	185	217	36	1	1642
15JUL	SE	45	36	510	29	36	113	9	3	75	96	14	1	542
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	37	8	65	5	25	42	18	101	259	188	293	1040
28JUL	SE	0	15	5	42	3	20	14	6	34	54	36	69	113
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	2	15	4	48	11	69	28	13	141	495	256	200	1283
12AUG	SE	2	15	4	35	4	48	9	3	45	202	87	54	239
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	ST. CROP	0	4	13	17	2	55	35	14	52	267	462	107	1028
29AUG	SE	0	4	7	17	2	14	14	11	33	67	195	30	213
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	ST. CROP	0	2	6	2	18	21	35	10	67	135	209	279	784
10SEP	SE	0	2	6	2	13	6	9	3	37	39	46	74	104
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	ST. CROP	2	9	17	0	5	57	109	9	108	111	342	182	953
23SEP	SE	2	6	12	0	3	16	101	2	56	41	126	83	195
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	ST. CROP	0	17	6	4	11	67	33	4	141	105	134	66	588
08OCT	SE	0	15	4	4	6	29	9	2	78	36	75	33	124
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	ST. CROP	8	163	15	9	4	4	18	3	22	6	2	2	257
22OCT	SE	4	52	12	7	4	2	13	1	9	3	2	2	56
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	ST. CROP	6	72	56	17	6	7	0	0	0	4	6	0	173
04NOV	SE	6	31	22	7	6	4	0	0	0	4	6	0	41
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-75 REGIONAL DENSITY (NO./1,000m3) OF AMERICAN SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-76 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	0	0	0	4	0	0	0	4
	SE	0	0	0	0	0	0	0	0	4	0	0	0	4
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	1	0	0	0	0	0	0	0	0	1
	SE	0	0	0	1	0	0	0	0	0	0	0	0	1
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	0	4	0	0	0	0	0	0	4
	SE	0	0	0	0	0	4	0	0	0	0	0	0	4
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-77 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF AMERICAN SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	CPUE	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
03JUL	SE	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	CPUE	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
15JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	CPUE	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
28JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	CPUE	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
12AUG	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	CPUE	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
29AUG	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	CPUE	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
10SEP	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	CPUE	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
23SEP	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	CPUE	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
08OCT	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	CPUE	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
22OCT	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	CPUE	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
04NOV	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-78 REGIONAL STANDING CROP (IN THOUSANDS) OF AMERICAN SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	15	0	0	0	0	0	0	0	0	0	15
	SE	0	0	15	0	0	0	0	0	0	0	0	0	15
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-79 REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	38.60	3.33
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	25.32	25.33
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.62	12.05	53.25	5.60
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.62	6.99	28.39	29.26
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.34	8.44	82.35	317.35	34.08
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.34	8.44	40.00	80.34	90.14
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.00	0.00	0.13	0.79	0.04	0.00	0.00	10.42	635.36	660.38	19.50	110.55
	SE		0.00	0.00	0.00	0.13	0.79	0.04	0.00	0.00	9.92	371.52	218.24	12.59	431.17
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.67	6.35	221.01	18.55	2077.36	357.27	223.43
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.67	6.16	106.34	13.39	738.47	264.83	791.83
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	7.73	33.92	221.70	1407.89	139.28
	SE		0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	4.16	20.16	70.63	1222.40	1224.61
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.49	233.53	580.05	67.88
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.30	88.27	244.97	260.39
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.26	0.26	0.95	20.19	1.70
	SE	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.26	0.26	0.48	14.63	14.65
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.80	1.12	0.00	10.58	0.99
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.80	1.12	0.00	3.65	3.92
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-79 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.98
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-80 REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	231	0	2746	2977
	SE		0	0	0	0	0	0	0	0	0	136	0	1801	1806
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	205	0	109	1937	3789	6040
	SE		0	0	0	0	0	0	0	146	0	109	1124	2020	2319
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	82	48	1487	13236	22579	37432
	SE		0	0	0	0	0	0	0	65	48	1487	6429	5716	8731
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	28	164	5	0	0	1474	112010	106144	1387	221212
	SE		0	0	0	28	164	5	0	0	1403	65497	35078	895	74317
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	200	1050	31266	3270	333897	25419	395103
	SE		0	0	0	0	0	0	200	1020	15043	2361	118696	18843	121147
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	9	0	0	1094	5980	35634	100170	142887
	SE		0	0	0	0	0	9	0	0	588	3553	11353	86973	87785
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	62	87	37535	41270	78954
	SE		0	0	0	0	0	0	0	0	62	53	14187	17429	22474
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	101	0	0	0	36	46	153	1437	1773
	SE	0	0	0	0	0	101	0	0	0	36	46	77	1041	1050
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	64	113	198	0	753	1128
	SE	0	0	0	0	0	0	0	0	64	113	198	0	260	351
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-80 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	138	0	0	0	0	0	0	138
	SE	0	0	0	0	0	0	138	0	0	0	0	0	0	138
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-81 REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.16	0.00	0.00	0.33	0.00	1.68	0.00	0.00	0.00	0.00	0.18
	SE		0.00	0.00	0.16	0.00	0.00	0.27	0.00	1.06	0.00	0.00	0.00	0.00	1.11
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.00	0.22	2.88	3.69	2.62	6.38	2.98	2.42	0.75	0.53	2.32	2.07
	SE		0.00	0.00	0.22	1.74	1.45	1.21	1.76	1.09	1.51	0.37	0.53	1.20	3.88
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.71	0.39	0.83	5.44	2.91	7.32	8.54	13.61	127.22	280.12	855.98	789.07	174.34
	SE		0.71	0.39	0.59	3.33	1.72	2.75	1.25	3.59	63.70	86.70	202.19	163.59	281.52
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.85	0.00	0.66	9.43	26.44	767.54	1018.82	464.23	196.38	207.03
	SE		0.00	0.00	0.00	0.85	0.00	0.45	4.44	4.95	659.56	355.55	255.39	80.06	795.69
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.44	0.42	5.54	2.33	22.68	284.78	5039.33	806.75	513.52
	SE		0.00	0.00	0.00	0.00	0.44	0.42	1.10	1.95	11.40	113.06	4624.06	383.56	4641.34
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.80	0.00	1.19	0.00	20.12	15.33	174.09	17.63
	SE		0.00	0.00	0.00	0.00	0.00	0.80	0.00	1.19	0.00	20.12	15.33	95.41	98.72
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00	4.92	0.00	27.12	60.50	823.00	70.48
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00	3.85	0.00	10.40	32.45	110.63	115.82
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.22	0.77	0.79	0.05	0.00	45.05	3.77	1.92	6.35	148.06	15.92
	SE	0.00	0.00	0.00	0.22	0.77	0.79	0.05	0.00	45.05	1.82	1.92	4.72	77.67	89.96
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-81 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	92.53	7.15
	SE	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	65.22	65.22
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-82 REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	24	0	0	46	0	278	0	0	0	0	348
	SE		0	0	24	0	0	37	0	176	0	0	0	0	181
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	33	601	765	367	1902	493	342	132	85	165	4885
	SE		0	0	33	363	300	170	524	181	214	66	85	85	790
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	163	127	122	1133	603	1023	2546	2252	17998	49383	137583	56141	269076
	SE		163	127	88	694	356	384	372	594	9012	15284	32498	11639	38829
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	177	0	93	2812	4375	108583	179614	74617	13972	384243
	SE		0	0	0	177	0	63	1324	819	93308	62682	41049	5696	119814
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	92	59	1653	385	3208	50206	809981	57399	922984
	SE		0	0	0	0	92	59	327	322	1613	19931	743234	27290	744003
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	112	0	197	0	3548	2463	12386	18706
	SE		0	0	0	0	0	112	0	197	0	3548	2463	6788	8049
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	99	0	814	0	4782	9725	58555	73975
	SE	0	0	0	0	0	0	99	0	638	0	1833	5216	7871	9640
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	33	159	164	7	0	7455	533	339	1020	10534	20245
	SE	0	0	0	33	159	164	7	0	7455	258	339	759	5526	9323
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-82 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	34	0	0	0	0	42	0	0	0	6583	6659
	SE	0	0	0	34	0	0	0	0	42	0	0	0	4641	4641
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-83 REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	1.58	0.00	0.00	0.58	0.00	0.14	0.00	0.00	1.85	0.00	0.00	0.00	0.34
	SE		1.58	0.00	0.00	0.50	0.00	0.14	0.00	0.00	1.85	0.00	0.00	0.00	2.48
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	1.32	0.15	1.76	3.01	1.79	3.10	2.53	9.52	77.48	48.86	175.59	56.19	31.77
	SE		0.66	0.15	1.05	1.62	0.62	1.48	1.44	6.86	23.61	20.30	61.02	39.11	79.23
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	1.95	6.01	8.55	26.43	86.84	370.43	1209.93	858.00	5214.58	828.71	717.62
	SE		0.00	0.00	0.88	3.72	3.39	7.54	36.48	57.10	196.63	193.51	1024.13	244.33	1090.56
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	1.34	0.00	2.07	5.40	35.62	26.87	72.86	1093.41	3209.52	6608.09	3234.38	384.34	1222.83
	SE		1.22	0.00	0.99	2.56	11.80	11.10	23.23	736.94	888.62	1706.11	1366.16	96.61	2473.88
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	0.33	2.36	4.35	10.68	37.26	100.24	827.31	2628.86	6129.73	2837.71	2435.66	1251.21
	SE		0.00	0.33	1.04	3.11	2.10	10.97	48.48	185.42	475.20	2661.73	624.30	258.72	2793.59
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	2.45	0.00	2.86	3.64	2.08	22.89	66.75	192.28	423.36	1435.71	635.98	2632.40	1714.60	548.85
	SE	2.45	0.00	2.22	1.57	1.31	6.16	14.01	39.42	98.15	261.73	158.91	827.80	227.29	917.66
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	6.12	4.46	42.12	5.98	28.94	114.00	434.01	679.37	410.77	1023.20	840.57	276.12
	SE	0.00	0.00	4.48	1.96	38.34	2.89	4.05	25.35	131.12	105.69	52.11	132.00	305.22	379.24
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-83 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	1.19	2.00	1.03	9.05	14.50	180.81	430.74	882.90	524.32	921.06	541.95	269.97
	SE	0.00	0.00	1.08	0.78	0.56	4.95	5.89	74.42	121.20	187.49	237.89	264.25	232.41	485.67
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	2.15	6.81	91.83	240.61	170.81	1100.66	680.10	712.01	638.08	280.24
	SE	0.00	0.00	0.00	0.00	1.32	2.63	66.34	115.85	48.16	305.59	218.62	144.77	154.93	454.19
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	38.49	0.11	9.86	78.94	79.20	690.39	240.72	984.01	1774.83	299.73
	SE	0.00	0.00	0.00	0.00	36.79	0.11	6.22	23.06	26.75	244.07	51.29	307.15	813.71	906.26
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19	NS	NS	NS	NS	NS	0.15
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75						0.75
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-84 REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	362	0	0	121	0	19	0	0	261	0	0	0	763
	SE		362	0	0	105	0	19	0	0	261	0	0	0	459
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	302	47	260	627	371	434	755	1576	10962	8613	28223	3998	56167
	SE		152	47	156	337	128	207	430	1135	3340	3579	9808	2782	11384
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	287	1253	1773	3694	25890	61301	171169	151262	838149	58962	1313740
	SE		0	0	131	775	703	1054	10876	9449	27817	34115	164611	17384	171890
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	308	0	305	1126	7390	3756	21721	180942	454051	1164978	519868	27345	2381791
	SE		280	0	147	533	2448	1551	6927	121952	125713	300780	219585	6874	411663
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	105	349	907	2215	5209	29885	136907	371904	1080645	456110	173295	2257532
	SE		0	105	153	648	435	1534	14454	30685	67227	469251	100345	18408	486084
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	512	0	920	537	434	4749	9331	57325	70059	203110	112120	423110	121992	1004200
	SE	512	0	715	231	273	1279	1959	11754	16242	37027	28016	133054	16172	143279
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	1970	659	8775	1240	4046	33988	71822	96111	72417	164461	59806	515294
	SE	0	0	1440	290	7988	600	567	7558	21698	14952	9186	21217	21716	42712
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-84 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	384	296	215	1878	2026	53905	71280	124904	92435	148044	38559	533926
	SE	0	0	348	116	117	1027	824	22186	20057	26524	41939	42473	16536	73731
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	447	1414	12837	71734	28267	155711	119899	114443	45399	550150
	SE	0	0	0	0	274	545	9274	34540	7970	43232	38541	23269	11023	73214
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	8019	22	1378	23534	13106	97670	42437	158161	126277	470604
	SE	0	0	0	0	7666	22	870	6874	4426	34529	9042	49368	57895	84790
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	354	NS	NS	NS	NS	NS	354
	SE	0	0	0	0	0	0	0	224						224
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-85 REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-85 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ALOSA SPP. YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.00	0.00	1.32	0.00	1.75	0.00	0.34
	SE	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	1.32	0.00	1.24	0.00	2.20
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.17	0.00	49.39	0.00	4.43
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.53	0.00	49.39	0.00	49.82
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-86 REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-86 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ALOSA SPP. YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	193	0	0	187	0	282	0	662
	SE	0	0	0	0	0	0	175	0	0	187	0	199	0	325
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	1156	0	7939	0	9095
	SE	0	0	0	0	0	0	0	0	0	924	0	7939	0	7992
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-87 REGIONAL DENSITY (NO./1,000m3) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-87 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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	0.02
	SE	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	0.28
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	1.31	83.45	1.28	56.71	9.45	23.43	5.68	13.95
	SE	0.00	0.00	0.00	0.00	0.00	0.00	1.27	83.11	1.28	18.02	7.57	10.34	4.15	86.12
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.15	5.71	29.03	84.20	33.38	87.97	46.85	22.10
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.12	4.19	16.59	34.18	8.06	49.33	42.87	76.14
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	1.59	0.51	3.94	NS	NS	NS	NS	NS	0.76
	SE	0.00	0.00	0.00	0.00	0.00	1.59	0.27	2.08						2.64
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.77	0.19	0.00	NS	NS	NS	NS	NS	0.12
	SE	0.00	0.00	0.00	0.00	0.00	0.77	0.11	0.00						0.78
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.54	0.00	1.85	0.00	NS	NS	NS	NS	NS	0.30
	SE	0.00	0.00	0.00	0.00	0.31	0.00	1.22	0.00						1.26
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	1.29	0.00	0.00	0.00	0.21	0.00	3.01	0.00	NS	NS	NS	NS	NS	0.56
	SE	1.29	0.00	0.00	0.00	0.21	0.00	1.50	0.00						1.99
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.27	NS	NS	NS	NS	NS	0.05
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.27						0.29
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.15	1.36	0.45	NS	NS	NS	NS	NS	0.25
	SE	0.00	0.00	0.00	0.00	0.00	0.15	0.75	0.45						0.89
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-88 REGIONAL STANDING CROP (IN THOUSANDS) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	8	0	0	0	0	0	0	0	0	8
	SE	0	0	0	0	8	0	0	0	0	0	0	0	0	8
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-88 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	39	0	0	0	0	0	0	39
	SE	0	0	0	0	0	0	39	0	0	0	0	0	0	39
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	183	24878	211	8023	1665	3765	404	39131
	SE	0	0	0	0	0	0	177	24778	211	2549	1335	1661	295	25003
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	21	1703	4804	11912	5884	14139	3334	41796
	SE	0	0	0	0	0	0	16	1249	2745	4836	1422	7929	3050	10328
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	331	71	1176	NS	NS	NS	NS	NS	1578
	SE	0	0	0	0	0	331	37	621						704
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	159	27	0	NS	NS	NS	NS	NS	186
	SE	0	0	0	0	0	159	16	0						160
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	112	0	259	0	NS	NS	NS	NS	NS	371
	SE	0	0	0	0	65	0	171	0						183
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	270	0	0	0	44	0	420	0	NS	NS	NS	NS	NS	734
	SE	270	0	0	0	44	0	210	0						345
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	14	80	NS	NS	NS	NS	NS	94
	SE	0	0	0	0	0	0	14	80						81
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	31	191	134	NS	NS	NS	NS	NS	355
	SE	0	0	0	0	0	31	105	134						173
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-89 REGIONAL DENSITY (NO./1,000m3) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.30	0.05	0.03	0.01	0.01	0.00	0.90	2.78	0.68	4.93	1.99	0.97
	SE	0.00	0.18	0.03	0.02	0.01	0.01	0.00	0.55	0.77	0.33	1.74	0.75	2.15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.04	0.16	0.00	0.00	0.00	0.04	0.00	0.00	0.26	0.18	0.04	0.00	0.06
	SE	0.04	0.14	0.00	0.00	0.00	0.02	0.00	0.00	0.12	0.11	0.03	0.00	0.22
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.40	0.02	0.00	0.01	0.00	0.21	0.59	1.07	2.60	0.37	1.42	0.13	0.57
	SE	0.37	0.02	0.00	0.01	0.00	0.13	0.59	0.57	1.01	0.18	0.56	0.06	1.48
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.02	0.00	0.36	0.00	0.00	0.03	0.00	0.00	0.00	0.03
	SE	0.00	0.00	0.00	0.01	0.00	0.23	0.00	0.00	0.03	0.00	0.00	0.00	0.23
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.02	0.00	0.03	0.70	0.04	0.79	0.19	0.48	0.86	0.38	0.74	0.35
	SE	0.00	0.01	0.00	0.02	0.70	0.04	0.73	0.10	0.09	0.32	0.27	0.31	1.15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.02	0.00	0.00	0.00	0.16	0.67	0.55	0.08	0.36	0.38	0.00	0.19
	SE	0.00	0.02	0.00	0.00	0.00	0.07	0.65	0.53	0.04	0.11	0.24	0.00	0.88
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.67	1.33	0.11	0.83	0.52	0.08	0.16	0.04	0.31
	SE	0.00	0.00	0.00	0.00	0.64	1.15	0.03	0.50	0.17	0.05	0.05	0.04	1.42
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.03	0.17	0.13	0.00	0.00	1.73	0.00	0.20	0.11	0.11	0.08	0.00	0.21
	SE	0.02	0.16	0.05	0.00	0.00	0.05	0.00	0.11	0.05	0.05	0.06	0.00	0.22
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-90 REGIONAL STANDING CROP (IN THOUSANDS) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	98	7	7	3	1	0	149	393	120	792	142	1711
	SE	0	59	4	3	3	1	0	91	109	58	279	53	328
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	9	50	0	0	0	5	0	0	37	31	7	0	140
	SE	9	45	0	0	0	2	0	0	17	19	5	0	52
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	91	5	0	2	0	30	175	177	368	65	229	9	1150
	SE	84	5	0	2	0	19	175	94	143	32	90	4	276
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	3	0	51	0	0	4	0	0	0	58
	SE	0	0	0	2	0	32	0	0	4	0	0	0	33
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	6	0	6	145	6	237	31	68	152	62	53	765
	SE	0	4	0	4	145	5	218	17	12	57	44	22	274
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	6	0	0	0	22	199	92	12	63	61	0	456
	SE	0	6	0	0	0	10	193	88	6	19	38	0	217
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	140	186	34	138	73	14	26	3	613
	SE	0	0	0	0	134	160	9	82	25	8	8	3	226
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	8	53	19	0	0	241	0	33	16	19	12	0	401
	SE	4	50	7	0	0	7	0	19	7	9	10	0	56
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-91 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.16
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.00	0.00	0.00	0.00	26.33	0.50	1.13	5.13	2.00	0.00	0.00	2.92
	SE	0.00	0.00	0.00	0.00	0.00	11.62	0.50	0.30	2.78	0.85	0.00	0.00	12.00
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.00	0.00	3.33	4.67	3.88	0.63	3.75	0.87	0.42	0.42	1.50
	SE	0.00	0.00	0.00	0.00	2.85	3.28	3.60	0.26	3.61	0.38	0.28	0.34	6.73
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	2.60	0.00	4.33	2.40	5.20	1.60	2.67	0.10	0.00	1.58
	SE	0.00	0.00	0.00	1.94	0.00	2.55	2.16	3.02	0.81	0.99	0.10	0.00	5.07
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.13	0.00	0.20	3.40	0.00	1.60	0.40	0.00	0.00	0.40	0.00	0.51
	SE	0.00	0.13	0.00	0.20	2.09	0.00	1.17	0.40	0.00	0.00	0.40	0.00	2.47
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.00	0.00	0.40	0.20	0.00	6.60	0.20	0.20	3.44	0.10	0.00	0.93
	SE	0.00	0.00	0.00	0.40	0.20	0.00	3.96	0.20	0.20	1.84	0.10	0.00	4.40
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.00	0.00	0.40	0.67	0.80	3.00	0.80	1.78	0.60	0.43	0.71
	SE	0.00	0.00	0.00	0.00	0.40	0.67	0.37	1.64	0.58	1.53	0.40	0.43	2.55
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.04	0.00	0.00	0.00	0.00	0.60	1.00	0.40	0.00	0.00	0.00	0.17
	SE	0.00	0.04	0.00	0.00	0.00	0.00	0.24	0.77	0.40	0.00	0.00	0.00	0.91
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.00	0.00	0.20	0.00	0.17	0.20	0.00	0.00	0.00	1.00	0.00	0.13
	SE	0.00	0.00	0.00	0.20	0.00	0.17	0.20	0.00	0.00	0.00	1.00	0.00	1.05
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.00	0.00	0.00	7.60	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05
	SE	0.00	0.00	0.00	7.60	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.10
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-92 REGIONAL STANDING CROP (IN THOUSANDS) OF ALEWIFE YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	3	0	3
	SE	0	0	0	0	0	0	0	0	0	0	3	0	3
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	280	4	1	44	35	0	0	365
	SE	0	0	0	0	0	124	4	<0.5	24	15	0	0	127
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	9	50	27	1	32	15	8	6	148
	SE	0	0	0	0	8	35	26	<0.5	31	7	5	5	55
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	24	0	46	17	6	14	47	2	0	156
	SE	0	0	0	18	0	27	15	4	7	17	2	0	41
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	6	0	2	9	0	11	0	0	0	8	0	36
	SE	0	6	0	2	6	0	8	<0.5	0	0	8	0	14
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	4	1	0	47	0	2	60	2	[illegible]	115
	SE	0	0	0	4	1	0	28	<0.5	2	32	2	[illegible]	[illegible]
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	[illegible]	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	1	7	6	4	7	31	12	6	73
	SE	0	0	0	0	1	7	3	2	5	27	8	6	30
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	2	0	0	0	0	4	1	3	0	0	0	11
	SE	0	2	0	0	0	0	2	1	3	0	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	2	0	2	1	0	0	0	20	0	25
	SE	0	0	0	2	0	2	1	0	0	0	20	0	20
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	70	13	0	0	0	0	0	0	0	83
	SE	0	0	0	70	13	0	0	0	0	0	0	0	71
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-93 REGIONAL DENSITY (NO./1,000m3) OF ALEWIFE YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.02	0.01	0.00	0.02	0.00	0.00	0.02	0.02	0.02	0.05	0.01
	SE	0.00	0.00	0.02	0.01	0.00	0.01	0.00	0.00	0.02	0.02	0.02	0.05	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.03	0.02	0.07	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.03	0.02	0.04	0.00	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.01	0.00	0.00	0.01	0.63	0.03	0.00	0.08	0.00	0.00	0.31	0.09
	SE	0.00	0.01	0.00	0.00	0.01	0.59	0.03	0.00	0.06	0.00	0.00	0.27	0.65
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.02	0.74	0.65	0.00	0.02	0.00	0.00	0.00	0.04	0.12
	SE	0.00	0.00	0.00	0.02	0.67	0.52	0.00	0.02	0.00	0.00	0.00	0.04	0.85
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.02	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.02	0.00	0.00	0.00	0.00	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-94 REGIONAL STANDING CROP (IN THOUSANDS) OF ALEWIFE YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	2	2	0	2	0	0	3	3	3	3	19
	SE	0	0	2	2	0	2	0	0	3	3	3	3	7
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	3	0	0	4	0	0	0	6
	SE	0	0	0	0	0	2	0	0	4	0	0	0	4
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	3	3	0	0	4	3	11	0	23
	SE	0	0	0	0	3	3	0	0	4	3	6	0	8
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	1	0	0	0	0	0	0	1
	SE	0	0	0	0	0	1	0	0	0	0	0	0	1
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	3	0	0	3	88	9	0	11	0	0	22	136
	SE	0	3	0	0	3	82	9	0	8	0	0	19	85
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	4	153	91	0	4	0	0	0	3	254
	SE	0	0	0	4	139	72	0	4	0	0	0	3	157
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	3	4	9	4	0	0	0	0	20
	SE	0	0	0	0	3	4	9	4	0	0	0	0	11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	15	6	0	0	0	0	0	0	0	0	0	0	22
	SE	9	4	0	0	0	0	0	0	0	0	0	0	10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-95 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF ALEWIFE YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-96 REGIONAL STANDING CROP (IN THOUSANDS) OF ALEWIFE YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-97 REGIONAL DENSITY (NO./1,000m3) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.14
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-97 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.10	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.10	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.11
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.13	0.39
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.34	4.34
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.81	42.94	164.59	113.40	130.25	439.61	68.89
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	19.38	24.74	78.23	65.92	254.31	275.91
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.90	1.61	14.83	NS	NS	NS	NS	NS	2.17
	SE	0.00	0.00	0.00	0.00	0.00	0.77	0.87	6.61						6.71
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	1.91	1.46	2.59	1.93	1.95	3.36	9.72	NS	NS	NS	NS	NS	2.87
	SE	0.00	1.91	1.07	1.93	1.53	1.01	1.11	7.10						7.97
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.53	0.00	1.47	0.31	12.32	16.74	NS	NS	NS	NS	NS	3.92
	SE	0.00	0.00	0.53	0.00	0.51	0.31	10.24	7.73						12.86
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	6.46	5.87	5.24	1.19	0.80	0.18	18.48	2.42	NS	NS	NS	NS	NS	5.08
	SE	6.46	2.01	1.78	0.84	0.80	0.18	7.54	1.17						10.41
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	3.50	8.54	13.63	NS	NS	NS	NS	NS	3.21
	SE	0.00	0.00	0.00	0.00	0.00	1.31	1.59	5.74						6.10
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.76	0.33	3.68	NS	NS	NS	NS	NS	0.60
	SE	0.00	0.00	0.00	0.00	0.00	0.54	0.25	3.68						3.73
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.25	0.00	0.92	97.80	57.98	NS	NS	NS	NS	NS	19.62
	SE	0.00	0.00	0.00	0.25	0.00	0.79	27.50	24.01						36.51
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-98 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	19	0	0	0	0	0	0	19
	SE	0	0	0	0	0	0	19	0	0	0	0	0	0	19
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-98 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	0	32	0	0	0	6	0	0	0	0	0	0	38
26JUN-	SE	0	0	32	0	0	0	6	0	0	0	0	0	0	32
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	365	365
03JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	309	309
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	0	0	0	0	0	1433	7106	23285	19992	20936	31278	104029
09JUL	SE	0	0	0	0	0	0	0	636	3208	3500	13791	10595	18094	25549
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	0	0	0	0	187	226	4423	NS	NS	NS	NS	NS	4835
14JUL	SE	0	0	0	0	0	160	122	1971						1981
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	438	469	383	402	405	470	2899	NS	NS	NS	NS	NS	5466
28JUL	SE	0	438	345	284	319	209	156	2116						2245
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	172	0	307	64	1722	4989	NS	NS	NS	NS	NS	7254
12AUG	SE	0	0	172	0	106	64	1432	2305						2722
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	1349	1346	1685	175	167	36	2583	722	NS	NS	NS	NS	NS	8064
25AUG	SE	1349	461	572	124	167	36	1053	350						1907
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	0	726	1194	4064	NS	NS	NS	NS	NS	5984
09SEP	SE	0	0	0	0	0	272	222	1711						1747
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	158	46	1098	NS	NS	NS	NS	NS	1302
21SEP	SE	0	0	0	0	0	112	35	1098						1104
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	37	0	191	13671	17286	NS	NS	NS	NS	NS	31185
05OCT	SE	0	0	0	37	0	163	3844	7158						8127
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-99 REGIONAL DENSITY (NO./1,000m3) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.02	0.09	0.00	2.20	1.32	2.06	9.05	17.74	25.33	44.09	14.79	9.72
	SE	0.00	0.01	0.05	0.00	2.16	1.17	1.36	5.52	3.96	16.11	10.11	4.16	20.81
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.07	0.37	1.90	1.56	0.00	2.52	0.06	6.93	29.49	15.93	12.00	13.19	7.00
	SE	0.05	0.18	0.76	1.37	0.00	2.09	0.04	5.31	8.67	6.68	2.30	5.79	13.91
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.70	0.31	0.25	0.05	0.01	0.30	1.02	49.71	37.86	24.65	61.49	31.97	17.36
	SE	0.21	0.09	0.09	0.03	0.01	0.12	0.61	33.32	10.04	6.41	17.55	10.62	40.91
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.01	0.47	0.04	0.03	0.65	2.81	59.71	25.92	14.37	24.77	9.42	11.52
	SE	0.00	0.01	0.41	0.03	0.02	0.27	1.73	43.06	11.30	4.00	4.88	2.72	45.08
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.02	0.00	0.00	0.10	3.89	11.91	18.60	22.88	40.09	38.35	52.62	15.71
	SE	0.00	0.01	0.00	0.00	0.05	1.00	0.95	12.78	4.00	7.57	8.01	15.01	22.98
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.01	0.00	0.00	0.01	1.92	7.40	21.50	13.96	23.94	30.48	14.33	9.46
	SE	0.00	0.01	0.00	0.00	0.01	0.59	3.26	9.49	4.90	4.10	5.53	7.48	15.12
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	2.29	13.30	3.18	10.48	26.43	5.53	7.72	2.86	5.98
	SE	0.00	0.00	0.00	0.00	2.17	4.00	1.05	2.14	9.56	1.75	1.51	1.02	11.14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.14	1.47	8.16	3.70	22.97	17.65	2.31	6.12	8.40	3.45	1.49	0.29	6.35
	SE	0.08	0.52	2.34	2.66	14.55	1.89	0.71	2.73	2.95	1.10	0.37	0.07	15.69
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-100 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	6	13	0	457	185	613	1497	2510	4465	7087	1052	17885
	SE	0	4	8	0	448	163	407	914	560	2840	1625	296	3512
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	15	118	280	326	0	352	18	1147	4173	2808	1929	938	12104
	SE	11	58	112	286	0	292	11	879	1226	1177	370	412	2038
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	161	101	36	10	3	43	305	8226	5356	4346	9884	2275	30746
	SE	48	30	13	5	3	17	182	5514	1420	1130	2821	755	6501
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	3	69	9	7	91	838	9881	3667	2533	3981	671	21748
	SE	0	3	61	5	4	37	517	7126	1599	704	785	194	7400
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	6	0	0	21	544	3550	3079	3237	7068	6164	3744	27413
	SE	0	4	0	0	10	140	283	2115	566	1334	1288	1068	3078
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	3	0	0	3	269	2206	3557	1975	4221	4900	1020	18154
	SE	0	3	0	0	3	82	972	1571	693	723	889	532	2345
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	475	1859	947	1735	3740	976	1240	204	11175
	SE	0	0	0	0	451	560	312	353	1352	308	243	72	1651
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	32	474	1205	771	4764	2467	689	1012	1189	609	239	21	13472
	SE	18	166	346	554	3019	265	212	452	417	193	59	5	3179
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-101 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.17	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.11	0.17
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.00	0.00	0.00	0.00	19.00	34.38	37.00	5.63	0.53	0.11	2.08	8.23
	SE	0.00	0.00	0.00	0.00	0.00	2.65	17.75	13.27	5.63	0.35	0.07	1.99	23.11
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.57	1.00	92.67	2.33	424.38	704.88	10.13	18.40	37.47	19.92	109.31
	SE	0.00	0.00	0.57	1.00	41.28	2.33	378.15	613.39	4.99	9.39	15.27	10.84	722.09
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	11.60	78.00	84.67	5.00	59.60	65.00	150.56	57.20	0.29	42.66
	SE	0.00	0.00	0.00	9.94	50.86	68.53	0.89	40.29	18.92	40.67	19.81	0.18	106.82
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.04	0.00	0.00	2.00	0.50	62.00	40.40	60.80	54.00	104.30	23.14	28.93
	SE	0.00	0.04	0.00	0.00	1.30	0.50	25.35	18.95	32.21	13.04	27.58	8.78	55.22
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.00	0.00	0.00	10.20	3.50	65.00	342.80	50.60	113.11	34.80	42.00	55.17
	SE	0.00	0.00	0.00	0.00	7.07	1.82	23.12	218.45	15.10	57.71	16.77	27.08	229.96
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.04	0.07	0.00	16.80	95.67	9.80	86.40	152.00	97.44	39.90	25.43	43.63
	SE	0.00	0.04	0.07	0.00	12.61	69.85	7.41	51.23	89.84	36.25	16.74	21.95	133.66
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.20	0.33	0.43	0.20	54.60	184.17	7.80	90.40	27.40	14.89	3.70	0.14	32.02
	SE	0.20	0.21	0.29	0.20	28.63	74.13	6.59	73.06	15.99	9.87	2.57	0.14	109.80
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	2.42	0.00	251.60	0.20	4.50	0.40	0.60	2.00	0.11	0.10	0.86	21.90
	SE	0.00	1.85	0.00	232.71	0.20	1.73	0.24	0.60	1.52	0.11	0.10	0.86	232.73
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.20	0.17	0.14	187.20	29.00	35.33	0.00	0.80	12.00	0.22	0.50	0.00	22.13
	SE	0.20	0.13	0.14	178.99	18.16	12.32	0.00	0.80	12.00	0.22	0.50	0.00	180.74
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-102 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEBACK HERRING YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	1	0	0	0	0	2	3
	SE	0	0	0	0	0	0	1	0	0	0	0	2	2
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	202	244	46	48	9	2	28	580
	SE	0	0	0	0	0	28	126	16	48	6	1	27	142
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	15	9	244	25	3011	874	87	323	737	271	5597
	SE	0	0	15	9	109	25	2683	761	43	165	300	147	2816
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	107	206	902	35	74	560	2643	1125	4	5656
	SE	0	0	0	92	134	730	6	50	163	714	390	3	1118
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	2	0	0	5	5	440	50	523	948	2052	314	4341
	SE	0	2	0	0	3	5	180	23	277	229	543	119	686
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	27	37	461	425	436	1986	685	571	4627
	SE	0	0	0	0	19	19	164	271	130	1013	330	368	1178
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	2	2	0	44	1019	70	107	1309	1711	785	345	5394
	SE	0	2	2	0	33	744	53	64	773	636	329	298	1327
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	2	15	12	2	144	1962	55	112	236	261	73	2	2875
	SE	2	10	8	2	75	790	47	91	138	173	51	2	831
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	110	0	2319	1	48	3	1	17	2	2	12	2513
	SE	0	84	0	2145	1	18	2	1	13	2	2	12	2146
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	2	8	4	1725	76	376	0	1	103	4	10	0	2309
	SE	2	6	4	1650	48	131	0	1	103	4	10	0	1659
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-103 REGIONAL DENSITY (NO./1,000m3) OF BLUEBACK HERRING YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.02	0.09	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.02	0.09	0.10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.05
	SE	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.63
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.17	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.17	0.17
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.02	0.00	0.00	0.00	0.06	0.00	0.02	0.00	0.04	0.00	0.22	0.03
	SE	0.00	0.02	0.00	0.00	0.00	0.06	0.00	0.02	0.00	0.04	0.00	0.11	0.14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.02	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.02	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-104 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEBACK HERRING YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	0	0	5	0	0	0	0	0	0	0	0	0	5
24JUL	SE	0	0	3	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
06AUG	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	0	0	0	0	0	0	0	0	4	7	3	6	21
20AUG	SE	0	0	0	0	0	0	0	0	4	5	3	6	9
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	0	0	0	0	131	0	0	0	0	3	0	0	134
03SEP	SE	0	0	0	0	131	0	0	0	0	3	0	0	131
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	0	0	0	0	0	0	0	0	8	0	0	12	19
18SEP	SE	0	0	0	0	0	0	0	0	8	0	0	12	14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	5	0	0	0	9	0	4	0	7	0	16	40
01OCT	SE	0	5	0	0	0	9	0	4	0	7	0	8	15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	0	0	2	0	0	1	9	0	0	0	0	0	12
15OCT	SE	0	0	2	0	0	1	9	0	0	0	0	0	9
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
29OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-105 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF BLUEBACK HERRING YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	0.00	2.33	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.22
	SE	0.00	0.00	0.00	0.00	1.45	0.00	0.25	0.00	0.00	0.00	0.00	0.00	1.47
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.20
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-106 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEBACK HERRING YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	6	0	2	0	0	0	0	0	8
	SE	0	0	0	0	4	0	2	0	0	0	0	0	4
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	3	0	0	0	0	0	0	0	0	0	0	0	3
	SE	3	0	0	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	1	0	0	0	0	0	1
	SE	0	0	0	0	0	0	1	0	0	0	0	0	1
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-107 REGIONAL DENSITY (NO./1,000m3) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-107 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-108 REGIONAL STANDING CROP (IN THOUSANDS) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-108 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-109 REGIONAL DENSITY (NO./1,000m3) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-110 REGIONAL STANDING CROP (IN THOUSANDS) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	3	0	0	0	0	0	0	3
	SE	0	0	0	0	0	2	0	0	0	0	0	0	2
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-111 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	SE	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.47
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	2.40	0.00	0.20	0.11	0.00	0.00	0.23
	SE	0.00	0.00	0.00	0.00	0.00	0.00	2.40	0.00	0.20	0.11	0.00	0.00	2.41
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-112 REGIONAL STANDING CROP (IN THOUSANDS) OF GIZZARD SHAD YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	3	0	0	0	0	4	0	0	0	0	0	0	6
	SE	3	0	0	0	0	4	0	0	0	0	0	0	4
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	17	0	2	2	0	0	21
	SE	0	0	0	0	0	0	17	0	2	2	0	0	17
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	2	0	0	0	0	0	0	0	0	2
	SE	0	0	0	2	0	0	0	0	0	0	0	0	2
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-113 REGIONAL DENSITY (NO./1,000m3) OF GIZZARD SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-114 REGIONAL STANDING CROP (IN THOUSANDS) OF GIZZARD SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	1	0	0	0	0	0	0	0	0	1
	SE	0	0	0	1	0	0	0	0	0	0	0	0	1
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-115 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF GIZZARD SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.13
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.05
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.60
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.20	0.00	0.00	0.00	0.00	0.27
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98	0.00	0.00	0.00	0.00	1.98
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-116 REGIONAL STANDING CROP (IN THOUSANDS) OF GIZZARD SHAD YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	<0.5	0	0	0	0	<0.5
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	1	0	1
	SE	0	0	0	0	0	0	0	0	0	0	1	0	1
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	1	0	0	0	0	1
	SE	0	0	0	0	0	0	0	1	0	0	0	0	1
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	4	0	0	0	0	4
	SE	0	0	0	0	0	0	0	2	0	0	0	0	2
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-117 REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.02
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE		0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-117 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-118 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	19	19
	SE		0	0	0	0	0	0	0	0	0	0	0	19	19
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	27	0	0	0	0	0	0	0	0	0	27
	SE		0	0	27	0	0	0	0	0	0	0	0	0	27
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-118 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-119 REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.02
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.29
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.80	0.16	1.70	2.60	0.73	5.99	1.22	0.00	0.00	0.00	1.10
	SE		0.00	0.00	0.66	0.16	1.57	1.93	0.73	3.85	0.59	0.00	0.00	0.00	4.72
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.00	0.77	0.93	9.28	1.62	5.62	5.38	59.61	36.75	62.02	24.65	2.08	17.39
	SE		0.00	0.55	0.74	5.29	0.76	3.62	1.41	19.55	12.86	32.67	3.89	0.79	40.93
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	0.00	0.15	0.40	2.69	8.06	11.79	33.56	7.43	27.99	26.13	0.00	0.00	9.85
	SE		0.00	0.15	0.40	0.76	3.55	4.20	23.11	3.84	6.26	13.53	0.00	0.00	28.32
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	SE		0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00	1.42
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-119 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-120 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	47	0	47
	SE		0	0	0	0	0	0	0	0	0	0	47	0	47
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	119	34	352	364	219	991	172	0	0	0	2251
	SE		0	0	98	34	325	270	219	636	83	0	0	0	805
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	248	138	1933	337	786	1604	9864	5199	10934	3962	148	35154
	SE		0	176	110	1103	159	506	419	3235	1819	5760	625	56	7004
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	48	59	561	1673	1648	10005	1230	3959	4607	0	0	23791
	SE		0	48	59	159	736	587	6891	635	885	2385	0	0	7435
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	220	0	0	0	0	0	0	220
	SE		0	0	0	0	0	199	0	0	0	0	0	0	199
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-120 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL R VER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	0.00	0.00	0.43	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	SE		0.00	0.00	0.43	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.75
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	0.71	1.90	0.00	1.61	1.91	0.39	0.15	0.50	0.00	0.64	0.00	0.00	0.65
	SE		0.61	1.18	0.00	1.41	0.80	0.39	0.15	0.50	0.00	0.64	0.00	0.00	2.28
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	1.95	1.48	6.47	35.70	71.29	66.76	23.79	41.40	21.08	0.00	0.00	0.00	22.49
	SE		1.43	1.48	1.83	14.96	19.91	22.46	5.26	13.30	14.69	0.00	0.00	0.00	39.40
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	4.90	13.63	21.64	166.10	34.86	26.17	87.06	16.79	4.18	1.64	0.00	0.00	31.41
	SE		2.51	5.25	3.85	56.79	9.57	10.78	33.26	11.68	4.18	1.64	0.00	0.00	68.88
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	6.25	18.74	86.09	100.48	60.45	13.01	11.61	45.04	0.00	6.57	0.00	0.00	29.02
	SE		3.01	3.88	17.83	40.49	6.84	4.69	5.25	24.31	0.00	6.57	0.00	0.00	52.08
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.00	38.86	116.88	103.19	19.08	12.64	43.64	40.69	17.60	4.72	0.00	0.00	33.11
	SE		0.00	14.78	19.75	21.47	4.71	7.21	10.25	26.02	14.29	4.72	0.00	0.00	46.39
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	6.44	32.46	40.62	18.72	44.52	27.57	39.34	11.48	6.62	0.68	0.56	1.07	13.10	18.71
	SE	1.66	5.62	6.27	2.91	7.74	5.59	7.41	4.21	2.82	0.68	0.56	1.07	9.27	18.48
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	7.47	29.97	28.74	24.39	17.40	14.46	13.19	4.44	5.04	0.28	0.57	0.00	11.23
	SE	0.00	4.41	8.77	8.19	15.86	4.68	3.56	4.57	3.15	2.08	0.28	0.57	0.00	22.03
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-121 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	4.94	12.86	44.09	23.16	5.34	27.90	3.19	26.01	0.00	0.00	0.00	1.10	11.43
	SE	0.00	3.88	3.70	8.93	10.72	1.92	5.69	0.94	20.72	0.00	0.00	0.00	1.10	26.29
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	6.26	15.42	22.68	3.61	3.40	3.52	0.17	2.20	0.00	0.00	0.00	0.00	4.41
	SE	0.00	3.00	10.91	15.40	3.11	1.51	2.75	0.17	1.48	0.00	0.00	0.00	0.00	19.67
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	13.08	2.03	10.03	0.00	3.43	1.51	0.63	0.00	0.46	0.00	0.00	0.00	0.42	2.43
	SE	2.24	1.46	7.81	0.00	2.26	1.41	0.55	0.00	0.46	0.00	0.00	0.00	0.42	8.71
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	21.04	2.27	0.00	0.18	2.87	4.78	0.73	0.47	NS	NS	NS	NS	NS	4.04
	SE	21.04	2.27	0.00	0.18	1.89	4.78	0.73	0.47						21.79
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	1.68	21.41	0.00	0.00	0.00	0.77	3.10	0.00	NS	NS	NS	NS	NS	3.37
	SE	1.68	11.30	0.00	0.00	0.00	0.77	2.07	0.00						11.64
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	2.92	0.62	0.00	NS	NS	NS	NS	NS	0.44
	SE	0.00	0.00	0.00	0.00	0.00	2.30	0.62	0.00						2.38
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	1.67	0.32	0.00	NS	NS	NS	NS	NS	0.25
	SE	0.00	0.00	0.00	0.00	0.00	0.83	0.32	0.00						0.89
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.81	0.48	0.95	0.00	NS	NS	NS	NS	NS	0.28
	SE	0.00	0.00	0.00	0.00	0.81	0.48	0.54	0.00						1.09
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	NS	NS	NS	NS	NS	0.11
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89						0.89
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	63	0	0	86	0	0	0	0	0	0	149
	SE		0	0	63	0	0	86	0	0	0	0	0	0	107
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	162	610	0	335	396	54	44	83	0	112	0	0	1796
	SE		140	380	0	293	166	54	44	83	0	112	0	0	549
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	448	475	955	7438	14790	9332	7094	6851	2982	0	0	0	50365
	SE		328	475	270	3116	4130	3139	1569	2201	2079	0	0	0	6975
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	1124	4388	3197	34605	7231	3658	25954	2779	591	288	0	0	83815
	SE		576	1688	568	11832	1986	1507	9915	1933	591	288	0	0	15880
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	1434	6031	12719	20933	12542	1818	3461	7453	0	1159	0	0	67551
	SE		690	1248	2634	8436	1419	655	1565	4023	0	1159	0	0	10127
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	12506	17267	21499	3957	1767	13012	6734	2490	832	0	0	80064
	SE		0	4756	2918	4473	977	1008	3056	4305	2022	832	0	0	9261
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	1346	7447	13070	2766	9276	5720	5499	3423	1096	96	98	172	932	50941
	SE	346	1289	2016	429	1612	1160	1036	1254	467	96	98	172	659	3650
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	1713	9645	4245	5080	3611	2021	3932	734	713	49	92	0	31835
	SE	0	1013	2822	1210	3305	971	497	1362	521	294	49	92	0	4979
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-122 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	1134	4140	6514	4824	1108	3900	951	4304	0	0	0	78	26953
26JUN	SE	0	891	1191	1319	2233	398	795	280	3430	0	0	0	78	4645
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	1436	4964	3351	753	705	492	52	364	0	0	0	0	12117
03JUL	SE	0	688	3511	2275	647	314	384	52	246	0	0	0	0	4325
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	2735	467	3229	0	715	313	88	0	76	0	0	0	30	7652
09JUL	SE	469	335	2512	0	470	293	77	0	76	0	0	0	30	2639
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	4397	522	0	27	597	993	101	141	NS	NS	NS	NS	NS	6778
14JUL	SE	4397	522	0	27	393	993	101	141						4558
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	351	4913	0	0	0	159	434	0	NS	NS	NS	NS	NS	5857
28JUL	SE	351	2593	0	0	0	159	290	0						2637
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	0	0	606	87	0	NS	NS	NS	NS	NS	693
12AUG	SE	0	0	0	0	0	478	87	0						485
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	0	0	0	0	0	346	44	0	NS	NS	NS	NS	NS	390
25AUG	SE	0	0	0	0	0	173	44	0						179
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	169	100	132	0	NS	NS	NS	NS	NS	402
09SEP	SE	0	0	0	0	169	100	75	0						210
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	0	0	267	NS	NS	NS	NS	NS	267
21SEP	SE	0	0	0	0	0	0	0	267						267
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
05OCT	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-123 REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE		0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.29	0.44	6.82	9.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34
	SE	0.00	0.29	0.29	3.16	9.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.75
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-123 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.67	0.62	5.06	0.79	0.68	4.29	0.74	0.41	0.00	0.00	0.00	0.00	1.02
	SE	0.00	0.67	0.40	1.86	0.79	0.68	1.88	0.74	0.41	0.00	0.00	0.00	0.00	3.07
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.24	5.44	20.15	9.12	5.02	10.93	0.00	0.00	0.00	0.00	0.00	0.00	3.92
	SE	0.00	0.24	5.44	20.15	4.37	2.92	5.27	0.00	0.00	0.00	0.00	0.00	0.00	22.16
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	24.05	35.53	3.50	0.22	2.66	1.89	0.34	0.00	0.86	0.00	0.00	0.00	0.00	5.31
	SE	11.42	23.80	2.83	0.22	1.09	1.01	0.28	0.00	0.86	0.00	0.00	0.00	0.00	26.61
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	10.52	2.27	0.62	0.36	16.12	21.26	17.54	0.22	NS	NS	NS	NS	NS	8.62
	SE	10.52	2.27	0.62	0.36	2.90	8.24	6.30	0.22						15.24
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	305.90	0.00	0.00	0.00	22.98	10.13	0.92	NS	NS	NS	NS	NS	42.49
	SE	0.00	294.51	0.00	0.00	0.00	2.76	1.71	0.92						294.53
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.72	0.00	0.00	0.00	0.00	48.26	7.59	0.00	NS	NS	NS	NS	NS	7.07
	SE	0.72	0.00	0.00	0.00	0.00	19.11	4.00	0.00						19.54
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.20	0.00	0.00	1.41	24.41	0.00	2.90	NS	NS	NS	NS	NS	3.61
	SE	0.00	0.20	0.00	0.00	1.41	6.57	0.00	2.90						7.33
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	2.58	0.00	0.00	0.00	0.00	4.40	0.36	0.52	NS	NS	NS	NS	NS	0.98
	SE	2.58	0.00	0.00	0.00	0.00	3.25	0.32	0.52						4.20
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.16	1.06	0.69	2.34	NS	NS	NS	NS	NS	0.53
	SE	0.00	0.00	0.00	0.00	0.16	0.39	0.66	1.77						1.93
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-124 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	19	0	0	0	0	0	0	0	0	0	0	0	19
	SE		19	0	0	0	0	0	0	0	0	0	0	0	19
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	67	140	1008	2067	0	0	0	0	0	0	0	0	3282
	SE	0	67	94	467	1920	0	0	0	0	0	0	0	0	1979
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-124 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	154	200	747	165	141	600	221	67	0	0	0	0	2295
	SE	0	154	129	275	165	141	262	221	67	0	0	0	0	534
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	55	1752	2977	1900	1041	1528	0	0	0	0	0	0	9252
	SE	0	55	1752	2977	911	605	736	0	0	0	0	0	0	3698
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	5027	8151	1127	32	553	391	47	0	143	0	0	0	0	15471
	SE	2387	5460	909	32	227	210	39	0	143	0	0	0	0	6038
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	2199	522	200	53	3359	4411	2452	65	NS	NS	NS	NS	NS	13262
	SE	2199	522	200	53	603	1709	880	65						3035
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	70179	0	0	0	4768	1417	274	NS	NS	NS	NS	NS	76638
	SE	0	67567	0	0	0	573	239	274						67570
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	151	0	0	0	0	10012	1061	0	NS	NS	NS	NS	NS	11224
	SE	151	0	0	0	0	3965	558	0						4007
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	45	0	0	294	5063	0	865	NS	NS	NS	NS	NS	6268
	SE	0	45	0	0	294	1364	0	865						1643
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	540	0	0	0	0	912	51	155	NS	NS	NS	NS	NS	1658
	SE	540	0	0	0	0	674	44	155						879
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	33	219	97	697	NS	NS	NS	NS	NS	1046
	SE	0	0	0	0	33	82	92	527						543
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-125 REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	15.68	0.45	0.00	0.02	19.64	5.62	0.83	0.53	0.00	0.00	0.00	0.00	3.56
	SE	8.50	0.32	0.00	0.02	16.16	2.01	0.71	0.53	0.00	0.00	0.00	0.00	18.40
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.40	0.34	0.02	1.28	8.09	9.85	0.00	0.00	0.00	0.00	0.00	0.00	1.66
	SE	0.33	0.18	0.02	0.64	5.09	5.83	0.00	0.00	0.00	0.00	0.00	0.00	7.77
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.02	0.00	0.00	7.50	2.86	9.20	0.00	0.00	0.02	0.00	0.00	1.63
	SE	0.00	0.02	0.00	0.00	2.69	2.29	5.61	0.00	0.00	0.02	0.00	0.00	6.63
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.65	0.65	0.27	1.66	0.00	0.00	0.00	0.00	0.27
	SE	0.00	0.00	0.00	0.00	0.63	0.58	0.12	0.98	0.00	0.00	0.00	0.00	1.31
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.04	1.40	0.71	0.85	0.02	0.00	0.00	0.00	0.00	0.25
	SE	0.00	0.00	0.00	0.03	1.40	0.58	0.79	0.02	0.00	0.00	0.00	0.00	1.71
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	1.83	3.35	0.00	0.02	0.02	0.03	0.00	0.00	0.00	0.44
	SE	0.00	0.00	0.00	1.80	3.34	0.00	0.02	0.02	0.03	0.00	0.00	0.00	3.80
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.04
	SE	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.47
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-126 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	3597	144	0	4	4074	786	247	87	0	0	0	0	8939
	SE	1951	102	0	4	3354	280	210	87	0	0	0	0	3898
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	92	108	3	267	1679	1377	0	0	0	0	0	0	3525
	SE	75	58	3	134	1055	815	0	0	0	0	0	0	1344
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	5	0	0	1555	400	2742	0	0	4	0	0	4705
	SE	0	5	0	0	558	320	1673	0	0	4	0	0	1792
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	134	91	82	274	0	0	0	0	581
	SE	0	0	0	0	131	82	37	162	0	0	0	0	227
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	9	290	100	254	3	0	0	0	0	656
	SE	0	0	0	6	290	81	235	3	0	0	0	0	382
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	381	696	0	7	3	4	0	0	0	1091
	SE	0	0	0	376	693	0	7	3	4	0	0	0	789
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	3	0	0	81	0	0	0	0	84
	SE	0	0	0	0	3	0	0	78	0	0	0	0	78
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-127 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 199[illegible]

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	SE	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-128 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	9	0	0	0	0	0	0	0	0	9
	SE	0	0	0	9	0	0	0	0	0	0	0	0	9
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-129 REGIONAL DENSITY (NO./1,000m3) OF RAINBOW SMELT YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.00	0.02	3.02	1.17	0.10	0.00	0.00	0.00	0.00	0.00	0.36
	SE	0.00	0.00	0.00	0.02	2.88	1.16	0.07	0.00	0.00	0.00	0.00	0.00	3.11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.00	0.00	1.31	2.12	0.09	0.48	0.00	0.00	0.00	0.00	0.33
	SE	0.00	0.00	0.00	0.00	0.89	1.66	0.04	0.48	0.00	0.00	0.00	0.00	1.94
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	9.23	0.00	0.09	0.93	0.00	0.00	0.00	0.00	0.85
	SE	0.00	0.00	0.00	0.00	6.28	0.00	0.06	0.93	0.00	0.00	0.00	0.00	6.35
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.72	0.01	1.04	0.26	0.00	0.00	0.00	0.00	0.17
	SE	0.00	0.00	0.00	0.00	0.63	0.01	0.61	0.13	0.00	0.00	0.00	0.00	0.89
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.01	0.71	0.41	1.95	0.25	0.00	0.00	0.00	0.00	0.28
	SE	0.00	0.00	0.00	0.01	0.66	0.26	1.59	0.08	0.00	0.00	0.00	0.00	1.74
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	1.82	0.15	0.03	1.77	0.27	0.00	0.00	0.00	0.00	0.34
	SE	0.00	0.00	0.00	1.82	0.09	0.03	0.70	0.17	0.00	0.00	0.00	0.00	1.96
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.69	8.25	3.89	0.10	0.00	0.00	0.00	0.00	1.08
	SE	0.00	0.00	0.00	0.00	0.66	3.74	3.77	0.07	0.00	0.00	0.00	0.00	5.35
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.05	0.01	0.10	3.17	0.17	0.57	0.00	0.00	0.00	0.00	0.34
	SE	0.00	0.00	0.04	0.01	0.07	2.96	0.09	0.48	0.00	0.00	0.00	0.00	3.00
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-130 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	4	626	164	29	0	0	0	0	0	823
	SE	0	0	0	4	598	163	21	0	0	0	0	0	620
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	272	296	26	79	0	0	0	0	674
	SE	0	0	0	0	185	232	11	79	0	0	0	0	307
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	1915	0	26	153	0	0	0	0	2094
	SE	0	0	0	0	1303	0	18	153	0	0	0	0	1312
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	150	1	311	43	0	0	0	0	505
	SE	0	0	0	0	131	1	183	21	0	0	0	0	226
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	2	148	57	581	42	0	0	0	0	829
	SE	0	0	0	2	136	37	475	14	0	0	0	0	495
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	379	32	4	529	45	0	0	0	0	989
	SE	0	0	0	379	19	4	210	29	0	0	0	0	434
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	143	1153	1160	16	0	0	0	0	2472
	SE	0	0	0	0	137	523	1123	11	0	0	0	0	1246
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	8	3	21	444	50	94	0	0	0	0	619
	SE	0	0	6	3	15	414	27	79	0	0	0	0	423
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-131 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF RAINBOW SMELT YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-132 REGIONAL STANDING CROP (IN THOUSANDS) OF RAINBOW SMELT YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
03JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
15JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
12AUG	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
29AUG	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
10SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
23SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
08OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
22OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
04NOV	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-133 REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	3.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
	SE	0.00	0.00	3.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.89
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-133 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	1194.66	740.88	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	149.02
	SE	467.33	261.52	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	535.53
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	70.60	1495.80	31.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	122.88
	SE	34.86	273.90	21.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	276.92
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	846.96	184.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.37
	SE	307.17	40.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	309.83
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	2862.50	55049.15	1076.75	194.85	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	7397.91
	SE	2259.42	35123.15	732.67	180.98	0.00	0.00	0.00	0.00						35203.84
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	488.64	2993.52	35.76	2.55	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	440.06
	SE	275.20	1242.95	19.85	1.39	0.00	0.00	0.00	0.00						1273.20
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	99.26	755.36	3.59	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	107.28
	SE	70.10	337.96	3.59	0.00	0.00	0.00	0.00	0.00						345.18
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	3.92	43.86	0.00	0.84	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	6.08
	SE	2.02	31.91	0.00	0.84	0.00	0.00	0.00	0.00						31.98
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00						0.23
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-134 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	1272	0	0	0	0	0	0	0	0	0	0	1272
	SE	0	0	1251	0	0	0	0	0	0	0	0	0	0	1251
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-134 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	249699	169973	546	0	0	0	0	0	0	0	0	0	0	420218
	SE	97678	59999	546	0	0	0	0	0	0	0	0	0	0	114635
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	14756	343168	10008	0	0	0	0	0	0	0	0	0	0	367932
	SE	7287	62838	6831	0	0	0	0	0	0	0	0	0	0	63627
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	177025	42408	0	0	0	0	0	0	0	0	0	0	0	219432
	SE	64203	9288	0	0	0	0	0	0	0	0	0	0	0	64872
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	598299	12629392	346511	28787	0	0	0	0	NS	NS	NS	NS	NS	13602989
	SE	472249	8057963	235782	26737	0	0	0	0						8075277
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	102132	686774	11508	376	0	0	0	0	NS	NS	NS	NS	NS	800790
	SE	57521	285157	6388	205	0	0	0	0						290971
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	20747	173294	1154	0	0	0	0	0	NS	NS	NS	NS	NS	195195
	SE	14652	77536	1154	0	0	0	0	0						78916
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	819	10062	0	125	0	0	0	0	NS	NS	NS	NS	NS	11006
	SE	422	7320	0	125	0	0	0	0						7334
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	53	0	0	0	0	0	0	NS	NS	NS	NS	NS	53
	SE	0	53	0	0	0	0	0	0						53
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-135 REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-135 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-136 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-136 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-137 REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-137 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	NS	NS	NS	NS	NS	0.11
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87						0.87
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	NS	NS	NS	NS	NS	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00						0.18
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	NS	NS	NS	NS	NS	0.21
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25						1.25
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-138 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-138 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	21	0	0	0	0	0	0	0	0	21
	SE	0	0	0	0	21	0	0	0	0	0	0	0	0	21
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	260	NS	NS	NS	NS	NS	260
	SE	0	0	0	0	0	0	0	260						260
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	25	0	NS	NS	NS	NS	NS	25
	SE	0	0	0	0	0	0	25	0						25
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	504	NS	NS	NS	NS	NS	504
	SE	0	0	0	0	0	0	0	372						372
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-139 REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-139 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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	0.02
	SE	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	0.28
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	NS	NS	NS	NS	NS	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00						0.15
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.59	NS	NS	NS	NS	NS	0.20
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.30						0.63
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.89	1.60	1.61	NS	NS	NS	NS	NS	0.51
	SE	0.00	0.00	0.00	0.00	0.00	0.89	0.82	1.61						2.01
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.31	0.04	0.00	NS	NS	NS	NS	NS	0.04
	SE	0.00	0.00	0.00	0.00	0.00	0.15	0.04	0.00						0.16
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23						0.23
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-140 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	32	0	0	0	0	0	0	0	32
	SE	0	0	0	0	0	32	0	0	0	0	0	0	0	32
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-140 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	49	0	0	49
	SE	0	0	0	0	0	0	0	0	0	0	49	0	0	49
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	30	0	0	NS	NS	NS	NS	NS	30
	SE	0	0	0	0	0	30	0	0						30
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	136	176	NS	NS	NS	NS	NS	312
	SE	0	0	0	0	0	0	77	89						118
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	185	224	480	NS	NS	NS	NS	NS	889
	SE	0	0	0	0	0	185	115	480						527
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	64	6	0	NS	NS	NS	NS	NS	69
	SE	0	0	0	0	0	32	6	0						32
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	68	NS	NS	NS	NS	NS	68
	SE	0	0	0	0	0	0	0	68						68
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-141 REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.23	0.00	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.23	0.00	0.23
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	1.55	0.00	5.45	0.00	0.00	0.08	0.36	0.00	0.00	0.00	0.00	0.00	0.62
	SE	1.55	0.00	4.59	0.00	0.00	0.07	0.36	0.00	0.00	0.00	0.00	0.00	4.86
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.05	0.39	0.07	0.18	0.07	0.18	0.00	0.00	0.00	0.08
	SE	0.00	0.00	0.00	0.04	0.19	0.05	0.07	0.07	0.10	0.00	0.00	0.00	0.25
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.01	0.00	0.05	0.35	0.15	0.59	0.45	0.10	0.35	0.08	0.19	0.00	0.19
	SE	0.01	0.00	0.05	0.10	0.05	0.33	0.13	0.08	0.13	0.04	0.19	0.00	0.45
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.16	0.06	0.07	0.12	0.46	0.15	0.31	0.08	0.00	0.00	0.12
	SE	0.00	0.00	0.07	0.03	0.02	0.06	0.18	0.06	0.13	0.04	0.00	0.00	0.25
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.76	0.00	0.00	0.01	0.39	1.37	0.34	0.36	0.80	0.24	0.00	0.00	0.36
	SE	0.71	0.00	0.00	0.01	0.13	0.29	0.22	0.12	0.33	0.14	0.00	0.00	0.89
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.01	0.53	1.10	0.15	0.99	0.47	0.00	0.98	0.04	0.02	0.00	0.36
	SE	0.00	0.01	0.49	0.69	0.15	0.32	0.20	0.00	0.84	0.03	0.02	0.00	1.26
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-142 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	0	4	0	37	0	41
	SE	0	0	0	0	0	0	0	0	4	0	37	0	37
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	3	0	0	1	0	0	0	0	0	0	4
	SE	0	0	3	0	0	1	0	0	0	0	0	0	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	355	0	805	0	0	11	109	0	0	0	0	0	1280
	SE	355	0	678	0	0	10	109	0	0	0	0	0	773
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	10	81	10	53	11	26	0	0	0	191
	SE	0	0	0	8	40	6	22	11	15	0	0	0	50
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	3	0	8	74	31	82	133	17	50	15	31	0	443
	SE	3	0	8	21	10	46	38	13	18	6	31	0	76
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	24	13	14	17	139	24	45	14	0	0	289
	SE	0	0	11	6	5	9	54	10	18	8	0	0	60
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	175	0	0	3	80	191	101	59	113	43	0	0	765
	SE	164	0	0	3	26	41	67	20	46	24	0	0	192
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	3	78	229	32	138	140	0	139	7	3	0	771
	SE	0	3	73	144	32	44	60	0	119	4	3	0	217
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-143 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.22	0.00	0.00	0.04
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.22	0.00	0.00	0.30
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.29	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.00	0.00	0.29	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.35
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.00	0.00	0.20	1.80	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.18
	SE	0.00	0.00	0.00	0.20	1.56	0.17	0.00	0.00	0.00	0.00	0.00	0.00	1.58
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.00	0.00	0.40	0.40	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	SE	0.00	0.00	0.00	0.40	0.40	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.59
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-144 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	4	0	0	0	0	0	0	0	0	0	4
03JUL	SE	0	0	4	0	0	0	0	0	0	0	0	0	4
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
15JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	0	0	0	0	1	0	0	0	0	0	0	0	1
12AUG	SE	0	0	0	0	1	0	0	0	0	0	0	0	1
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	ST. CROP	0	2	0	0	0	0	0	0	0	0	0	0	2
29AUG	SE	0	2	0	0	0	0	0	0	0	0	0	0	2
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	ST. CROP	0	0	0	0	0	0	1	0	0	4	0	0	5
10SEP	SE	0	0	0	0	0	0	1	0	0	4	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	ST. CROP	0	0	8	0	0	0	1	0	0	0	0	0	9
23SEP	SE	0	0	8	0	0	0	1	0	0	0	0	0	8
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	ST. CROP	0	0	0	2	5	2	0	0	0	0	0	0	8
08OCT	SE	0	0	0	2	4	2	0	0	0	0	0	0	5
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	ST. CROP	0	0	0	4	1	2	0	0	0	0	0	0	7
22OCT	SE	0	0	0	4	1	2	0	0	0	0	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
04NOV	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-145 REGIONAL DENSITY (NO./1,000m3) OF HOGCHOKER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	7.92	17.48	0.74	0.35	0.18	2.55	0.17	0.20	3.09	2.58	0.70	0.65	3.05
	SE	2.85	3.78	0.50	0.16	0.16	0.45	0.11	0.18	0.66	0.76	0.30	0.14	4.90
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	46.51	21.88	4.74	0.70	0.00	1.50	2.25	0.81	6.66	4.79	0.82	1.56	7.68
	SE	13.52	5.54	2.24	0.33	0.00	0.60	1.47	0.53	3.85	1.34	0.40	0.55	15.44
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	8.26	56.08	50.19	4.18	2.23	5.04	0.67	1.35	1.75	0.99	0.31	0.56	10.97
	SE	2.43	8.96	18.12	1.48	0.37	2.15	0.50	0.45	0.56	0.33	0.23	0.32	20.55
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	15.07	23.85	68.07	33.38	3.28	25.60	3.19	0.14	2.88	2.07	2.96	1.28	15.15
	SE	2.93	4.54	37.72	16.77	0.98	16.05	1.34	0.07	1.07	0.87	1.02	0.48	44.69
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	7.40	15.81	31.60	5.83	1.26	29.96	6.94	0.87	9.63	2.45	1.18	1.63	9.55
	SE	2.57	2.31	6.06	2.24	0.37	7.78	1.14	0.62	1.93	1.10	0.33	1.47	11.10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	1.49	1.10	3.03	1.81	4.81	37.55	8.75	5.24	14.36	4.34	0.12	0.00	6.88
	SE	0.88	0.27	0.74	0.78	1.53	25.54	1.63	1.40	3.29	2.48	0.07	0.00	26.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	1.28	4.41	0.92	0.56	12.30	42.88	28.41	7.33	18.75	4.76	1.41	0.45	10.29
	SE	0.63	0.82	0.25	0.26	3.18	17.55	9.47	2.05	7.36	2.05	0.49	0.20	21.72
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	2.13	2.55	1.10	20.97	15.58	50.26	11.12	4.28	9.01	1.28	0.06	0.00	9.86
	SE	1.19	0.71	0.64	13.38	9.62	1.27	3.58	0.77	2.42	0.69	0.06	0.00	17.19
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-146 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	1817	5624	110	72	37	356	51	33	438	454	113	46	9152
	SE	654	1215	74	33	34	63	34	29	93	135	47	10	1395
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	10670	7041	700	145	0	210	672	135	942	845	132	111	21602
	SE	3101	1783	331	69	0	84	438	87	544	236	64	39	3670
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	1895	18047	7415	871	462	705	200	223	248	175	50	40	30332
	SE	556	2884	2676	309	77	300	148	75	79	58	36	23	4003
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	3458	7677	10057	6954	680	3578	951	23	407	365	476	91	34717
	SE	672	1460	5573	3494	203	2244	400	12	151	154	163	34	7153
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	1697	5087	4669	1215	262	4189	2068	145	1362	432	189	116	21430
	SE	591	744	895	467	77	1087	341	103	273	195	52	105	1834
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	342	355	448	378	998	5249	2609	867	2032	764	20	0	14061
	SE	202	88	110	163	318	3571	485	232	465	438	11	0	3692
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	293	1419	135	117	2551	5995	8470	1212	2653	839	226	32	23942
	SE	146	263	37	54	660	2453	2824	339	1041	362	78	14	3982
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	488	822	163	4370	3233	7025	3316	708	1275	226	10	0	21636
	SE	274	227	95	2789	1995	177	1067	127	342	122	10	0	3635
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-147 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF HOGCHOKER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.36	0.57	1.67	1.33	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.33
	SE	0.00	0.28	0.43	1.20	0.88	0.00	0.00	0.00	0.00	0.00	0.05	0.00	1.58
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.33	0.91	1.00	0.00	0.33	0.67	0.50	0.00	0.00	0.00	0.00	0.00	0.31
	SE	0.33	0.64	0.31	0.00	0.33	0.67	0.50	0.00	0.00	0.00	0.00	0.00	1.19
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.67	0.09	0.00	1.67	0.33	0.00	0.00	0.00	0.00	0.13	0.05	0.00	0.25
	SE	0.33	0.09	0.00	1.67	0.33	0.00	0.00	0.00	0.00	0.09	0.05	0.00	1.74
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.20	0.38	0.14	0.20	0.00	0.00	0.00	0.00	0.00	0.33	0.50	0.00	0.15
	SE	0.20	0.15	0.10	0.20	0.00	0.00	0.00	0.00	0.00	0.24	0.27	0.00	0.49
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.54	0.21	0.00	0.00	0.17	0.00	0.00	0.00	0.11	0.00	0.00	0.09
	SE	0.00	0.19	0.11	0.00	0.00	0.17	0.00	0.00	0.00	0.11	0.00	0.00	0.30
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.08	0.07	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE	0.00	0.06	0.07	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.40	0.04	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.10	0.00	0.09
	SE	0.40	0.04	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.10	0.00	0.47
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.08	0.00	0.40	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	SE	0.00	0.06	0.00	0.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-148 REGIONAL STANDING CROP (IN THOUSANDS) OF HOGCHOKER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	17	15	15	4	0	0	0	0	0	1	0	52
	SE	0	13	12	11	2	0	0	0	0	0	1	0	21
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	3	41	27	0	1	7	4	0	0	0	0	0	82
	SE	3	29	8	0	1	7	4	0	0	0	0	0	31
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	5	4	0	15	1	0	0	0	0	2	1	0	29
	SE	3	4	0	15	1	0	0	0	0	2	1	0	16
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	2	17	4	2	0	0	0	0	0	6	10	0	40
	SE	2	7	3	2	0	0	0	0	0	4	5	0	10
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	25	6	0	0	2	0	0	0	2	0	0	34
	SE	0	9	3	0	0	2	0	0	0	2	0	0	10
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	8	0	0	0	0	0	0	0	0	0	0	8
	SE	0	6	0	0	0	0	0	0	0	0	0	0	6
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	4	2	0	1	0	0	0	0	0	0	0	6
	SE	0	3	2	0	1	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	3	2	0	0	0	5	0	0	0	0	2	0	12
	SE	3	2	0	0	0	2	0	0	0	0	2	0	5
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	4	0	4	2	0	0	0	0	0	0	0	9
	SE	0	3	0	4	1	0	0	0	0	0	0	0	5
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-149 REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-149 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	DENSITY	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
26JUN	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	DENSITY	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
03JUL	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	DENSITY	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
09JUL	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
14JUL	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
28JUL	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
12AUG	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
25AUG	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
09SEP	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
21SEP	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
05OCT	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-150 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-150 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER EGGS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-151 REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-151 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-152 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-152 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-153 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.44
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

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, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-154 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	70	0	70
	SE	0	0	0	0	0	0	0	0	0	0	0	70	0	70
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-155 REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-155 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-156 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-156 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	6	0	0	0	0	0	0	6
	SE	0	0	0	0	0	0	6	0	0	0	0	0	0	6
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-157 REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.05	0.00	0.00	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.04
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.02
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.98	0.09
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.63	0.63
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	3.73	0.33
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	1.24	1.24
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.29	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.13	0.13
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-158 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	12	7	0	0	0	18
	SE	0	0	0	0	0	0	0	5	4	0	0	0	7
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	14	14
	SE	0	0	0	0	0	0	0	0	0	0	0	14	14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	25	70	95
	SE	0	0	0	0	0	0	0	0	0	0	13	45	46
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	3	3
	SE	0	0	0	0	0	0	0	0	0	0	0	3	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	0	0	0	0	0	7	38	266	310
	SE	0	0	0	0	0	0	0	0	0	7	17	88	90
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	3	3	0	21	27
	SE	0	0	0	0	0	0	0	0	3	3	0	9	10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-159 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	0.00	0.00	1.33	0.75	4.25	8.38	0.47	0.58	1.58	1.44
	SE	0.00	0.00	0.00	0.00	0.00	0.88	0.49	2.65	5.38	0.27	0.34	0.78	6.15
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.00	0.00	0.00	0.00	7.67	20.38	11.13	6.50	4.67	1.58	22.83	6.23
	SE	0.00	0.00	0.00	0.00	0.00	3.53	10.31	4.89	3.76	2.18	0.76	17.94	22.00
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.00	0.33	0.67	4.00	4.25	14.25	3.75	15.40	7.32	7.25	4.77
	SE	0.00	0.00	0.00	0.33	0.33	4.00	2.14	5.97	1.53	9.95	2.88	3.44	13.34
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	5.40	3.20	8.00	27.60	37.20	7.60	12.67	22.10	7.14	10.91
	SE	0.00	0.00	0.00	5.40	1.46	3.51	10.99	9.88	3.44	3.60	19.23	4.02	25.94
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.00	1.71	0.00	0.60	0.67	14.40	32.00	12.80	2.78	13.40	0.43	6.57
	SE	0.00	0.00	1.57	0.00	0.60	0.49	5.26	16.30	3.51	1.18	11.25	0.43	20.90
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.00	0.00	0.20	1.00	1.17	17.60	18.80	6.60	7.11	10.50	7.00	5.83
	SE	0.00	0.00	0.00	0.20	0.63	0.98	5.71	5.58	3.85	3.81	5.27	4.74	12.03
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.00	0.00	0.20	0.50	4.80	50.00	2.40	7.11	22.40	1.86	7.44
	SE	0.00	0.00	0.00	0.00	0.20	0.34	2.44	33.60	1.08	1.88	11.05	1.16	35.54
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.00	0.00	0.00	0.20	0.33	12.00	25.80	3.20	3.89	0.40	7.71	4.46
	SE	0.00	0.00	0.00	0.00	0.20	0.33	5.41	11.05	2.96	3.28	0.27	4.85	13.95
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.00	0.00	0.80	0.20	0.00	10.40	23.40	10.60	9.78	1.80	0.00	4.75
	SE	0.00	0.00	0.00	0.80	0.20	0.00	3.93	9.93	7.44	8.69	1.80	0.00	15.77
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.00	0.00	0.00	0.00	8.60	7.33	13.00	10.60	2.60	0.11	0.50	2.43	3.76
	SE	0.00	0.00	0.00	0.00	6.90	4.19	6.44	6.53	1.54	0.11	0.34	2.10	12.50
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-160 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	14	5	5	72	8	11	22	138
	SE	0	0	0	0	0	9	3	3	46	5	7	11	49
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	82	145	14	56	82	31	310	719
	SE	0	0	0	0	0	38	73	6	32	38	15	244	263
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	3	2	43	30	18	32	270	144	99	640
	SE	0	0	0	3	1	43	15	7	13	175	57	47	195
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	50	8	85	196	46	65	222	435	97	1205
	SE	0	0	0	50	4	37	78	12	30	63	378	55	401
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	46	0	2	7	102	40	110	49	264	6	625
	SE	0	0	42	0	2	5	37	20	30	21	221	6	232
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	2	3	12	125	23	57	125	207	95	648
	SE	0	0	0	2	2	10	40	7	33	67	104	64	149
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	1	5	34	62	21	125	441	25	713
	SE	0	0	0	0	1	4	17	42	9	33	217	16	225
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	1	4	85	32	28	68	8	105	330
	SE	0	0	0	0	1	4	38	14	25	58	5	66	100
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	7	1	0	74	29	91	172	35	0	409
	SE	0	0	0	7	1	0	28	12	64	152	35	0	172
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	23	78	92	13	22	2	10	33	273
	SE	0	0	0	0	18	45	46	8	13	2	7	29	74
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-161 REGIONAL DENSITY (NO./1,000m3) OF SPOTTAIL SHINER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.30	0.00	0.00	0.25	0.05
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.15	0.00	0.00	0.12	0.20
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.09	0.03	0.00	0.00	0.57	0.06
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.03	0.00	0.00	0.23	0.25
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.72	0.07
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.51	0.51
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.00	0.22	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.00	0.09	0.11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.04	0.56	1.17	0.16
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.03	0.21	0.70	0.74
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.18	0.02	0.04	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.12	0.02	0.04	0.14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.33	0.40	0.29	0.09
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.18	0.15	0.09	0.26
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.04	0.42	0.04
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.22	0.23
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-162 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	0	0	0	0	0	0	0	12	43	0	0	18	73
24JUL	SE	0	0	0	0	0	0	0	8	21	0	0	9	24
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	0	0	0	0	0	0	18	16	4	0	0	40	78
06AUG	SE	0	0	0	0	0	0	18	10	4	0	0	17	27
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	0	0	0	0	0	0	0	4	0	0	7	51	62
20AUG	SE	0	0	0	0	0	0	0	4	0	0	5	36	37
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	0	0	0	0	0	0	0	4	4	8	0	16	31
03SEP	SE	0	0	0	0	0	0	0	4	4	8	0	7	12
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	0	0	0	0	0	0	0	0	27	7	90	84	208
18SEP	SE	0	0	0	0	0	0	0	0	16	5	33	50	62
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	0	0	0	0	0	0	4	7	31	3	3	48
01OCT	SE	0	0	0	0	0	0	0	4	5	21	3	3	22
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	0	0	0	0	0	0	0	3	11	59	64	20	157
15OCT	SE	0	0	0	0	0	0	0	3	11	31	24	7	42
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	13	6	30	48
29OCT	SE	0	0	0	0	0	0	0	0	0	9	4	16	18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-163 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF SPOTTAIL SHINER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.00	4.33	10.67	7.33	1.63	5.63	4.63	1.40	0.74	1.25	3.13
	SE	0.00	0.00	0.00	4.33	2.60	6.84	1.63	3.14	2.45	0.57	0.37	0.63	9.57
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.00	0.00	0.00	31.67	7.67	11.13	7.38	2.88	4.53	0.16	1.33	5.56
	SE	0.00	0.00	0.00	0.00	29.69	2.19	8.68	4.31	1.44	2.45	0.09	0.68	31.44
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.00	0.00	17.00	3.33	5.88	1.25	2.38	0.73	1.89	0.42	2.74
	SE	0.00	0.00	0.00	0.00	9.07	2.85	1.63	0.86	1.59	0.44	1.33	0.29	9.92
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	1.40	0.00	4.00	6.80	1.80	4.60	1.56	8.50	1.43	2.51
	SE	0.00	0.00	0.00	1.40	0.00	2.58	3.68	1.20	3.68	0.63	3.87	1.27	7.36
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	0.00	0.00	0.00	0.40	1.00	0.00	22.60	26.40	0.00	1.33	0.50	0.00	4.35
	SE	0.00	0.00	0.00	0.40	0.63	0.00	14.53	11.59	0.00	1.01	0.27	0.00	18.63
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.00	0.00	0.20	0.60	1.17	5.80	7.00	3.40	2.11	9.50	2.00	2.65
	SE	0.00	0.00	0.00	0.20	0.60	1.17	4.35	2.37	2.44	0.99	8.25	1.84	10.23
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.00	0.00	0.00	0.40	0.00	0.80	4.40	2.40	8.44	6.70	1.00	2.01
	SE	0.00	0.00	0.00	0.00	0.40	0.00	0.80	1.25	1.69	4.52	5.72	0.85	7.68
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.00	0.00	0.00	0.60	0.33	7.60	10.20	2.60	33.78	0.00	1.29	4.70
	SE	0.00	0.00	0.00	0.00	0.24	0.21	4.03	4.20	1.60	27.93	0.00	1.13	28.59
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.00	0.00	0.80	0.60	0.17	4.60	17.40	2.20	16.11	0.60	0.00	3.54
	SE	0.00	0.00	0.00	0.80	0.40	0.17	1.91	9.20	0.86	10.64	0.34	0.00	14.25
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	0.00	0.00	0.00	0.00	0.80	3.83	3.80	0.40	2.80	0.11	0.20	0.57	1.04
	SE	0.00	0.00	0.00	0.00	0.49	2.33	1.96	0.24	1.71	0.11	0.20	0.57	3.59
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-164 REGIONAL STANDING CROP (IN THOUSANDS) OF SPOTTAIL SHINER YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	40	28	78	12	7	40	25	14	17	261
	SE	0	0	0	40	7	73	12	4	21	10	7	9	88
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	83	82	79	9	25	80	3	18	379
	SE	0	0	0	0	78	23	62	5	12	43	2	9	112
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	45	36	42	2	20	13	37	6	200
	SE	0	0	0	0	24	30	12	1	14	8	26	4	51
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	13	0	43	48	2	40	27	167	19	360
	SE	0	0	0	13	0	28	26	1	32	11	76	17	94
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	4	3	0	160	33	0	23	10	0	233
	SE	0	0	0	4	2	0	103	14	0	18	5	0	106
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	2	2	12	41	9	29	37	187	27	346
	SE	0	0	0	2	2	12	31	3	21	17	162	25	170
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	1	0	6	5	21	148	132	14	327
	SE	0	0	0	0	1	0	6	2	15	79	112	11	139
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	2	4	54	13	22	593	0	17	705
	SE	0	0	0	0	1	2	29	5	14	490	0	15	492
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	7	2	2	33	22	19	283	12	0	379
	SE	0	0	0	7	1	2	14	11	7	187	7	0	188
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	2	41	27	0	24	2	4	8	108
	SE	0	0	0	0	1	25	14	<0.5	15	2	4	8	33
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-165 REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC STURGEON YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-166 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC STURGEON YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-167 REGIONAL DENSITY (NO./1,000m3) OF ATLANTIC STURGEON YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01
	SE	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-168 REGIONAL STANDING CROP (IN THOUSANDS) OF ATLANTIC STURGEON YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
24JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	0	0	0	4	0	0	0	0	0	0	0	3	8
06AUG	SE	0	0	0	4	0	0	0	0	0	0	0	3	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	0	0	0	0	0	0	0	0	3	0	0	0	3
20AUG	SE	0	0	0	0	0	0	0	0	3	0	0	0	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
03SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	0	0	0	0	0	5	0	0	0	0	0	0	5
18SEP	SE	0	0	0	0	0	5	0	0	0	0	0	0	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	0	0	0	0	0	0	4	3	0	0	0	7
01OCT	SE	0	0	0	0	0	0	0	4	3	0	0	0	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
15OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	0	0	0	0	0	5	0	0	0	0	0	0	5
29OCT	SE	0	0	0	0	0	5	0	0	0	0	0	0	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-169 REGIONAL DENSITY (NO./1,000m3) OF SHORTNOSE STURGEON YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-	DENSITY	NS	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
16APR	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-	DENSITY	NS	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
23APR	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-	DENSITY	NS	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
01MAY	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-	DENSITY	NS	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
07MAY	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.03
14MAY	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-	DENSITY	NS	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
21MAY	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-	DENSITY	NS	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
29MAY	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-	DENSITY	NS	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
05JUN	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-	DENSITY	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
11JUN	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-	DENSITY	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
18JUN	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-169 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF SHORTNOSE STURGEON YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-170 REGIONAL STANDING CROP (IN THOUSANDS) OF SHORTNOSE STURGEON YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	23	23
	SE		0	0	0	0	0	0	0	0	0	0	0	23	23
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-170 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF SHORTNOSE STURGEON YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-171 REGIONAL DENSITY (NO./1,000m3) OF SHORTNOSE STURGEON POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.88	0.24
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.07	2.07
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.17
	SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09	2.09
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-171 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF SHORTNOSE STURGEON POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-172 REGIONAL STANDING CROP (IN THOUSANDS) OF SHORTNOSE STURGEON POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	205	205
	SE		0	0	0	0	0	0	0	0	0	0	0	147	147
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	148	148
	SE		0	0	0	0	0	0	0	0	0	0	0	148	148
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-172 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF SHORTNOSE STURGEON POST YOLK-SAC LARVAE IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-173 REGIONAL DENSITY (NO./1,000m3) OF SHORTNOSE STURGEON YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-174 REGIONAL STANDING CROP (IN THOUSANDS) OF SHORTNOSE STURGEON YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-175 REGIONAL DENSITY (NO./1,000m3) OF SHORTNOSE STURGEON YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.05	0.14	0.04	0.00	0.00	0.02
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.03	0.08	0.03	0.00	0.00	0.09
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.02	0.00	0.00	0.00	0.09	0.07	0.05	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.05	0.03	0.00	0.00	0.00	0.08
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.04	0.00	0.00	0.00	0.03	0.00	0.03	0.02	0.00	0.00	0.01
	SE	0.00	0.00	0.04	0.00	0.00	0.00	0.03	0.00	0.03	0.02	0.00	0.00	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.05	0.10	0.02	0.00	0.00	0.02
	SE	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.03	0.05	0.02	0.00	0.00	0.07
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.07	0.00	0.01	0.03	0.00	0.02	0.05	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.03	0.00	0.01	0.03	0.00	0.02	0.03	0.00	0.00	0.00	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.02	0.05	0.02	0.01	0.00	0.02	0.00	0.13	0.00	0.00	0.00	0.02
	SE	0.00	0.02	0.03	0.02	0.01	0.00	0.02	0.00	0.06	0.00	0.00	0.00	0.07
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.04	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.00	0.02
	SE	0.04	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.00	0.10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.31	0.00	0.00	0.00	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.26	0.00	0.00	0.00	0.26
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-176 REGIONAL STANDING CROP (IN THOUSANDS) OF SHORTNOSE STURGEON YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	3	0	0	0	7	8	20	7	0	0	44
	SE	0	0	3	0	0	0	7	5	11	5	0	0	15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	3	0	0	0	26	12	7	0	0	0	47
	SE	0	0	3	0	0	0	17	8	5	0	0	0	20
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	6	0	0	0	9	0	4	3	0	0	22
	SE	0	0	6	0	0	0	9	0	4	3	0	0	12
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	5	0	0	3	0	0	7	14	4	0	0	34
	SE	0	5	0	0	3	0	0	5	8	4	0	0	12
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	11	0	3	4	0	3	7	0	0	0	29
	SE	0	0	4	0	3	4	0	3	5	0	0	0	9
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	8	8	4	2	0	7	0	18	0	0	0	49
	SE	0	6	4	4	2	0	7	0	8	0	0	0	14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	9	6	5	0	0	0	0	0	12	3	0	0	35
	SE	9	4	3	0	0	0	0	0	12	3	0	0	16
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	0	0	0	3	44	0	0	0	47
	SE	0	0	0	0	0	0	0	3	37	0	0	0	37
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-177 REGIONAL DENSITY (NO./1,000m3) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	108
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	107
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-177 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	NS	NS	NS	NS	NS	0.03
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28						0.28
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-178 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-178 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26JUN	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
14JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
28JUL	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
12AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	0	0	0	0	0	0	0	82	NS	NS	NS	NS	NS	82
25AUG	SE	0	0	0	0	0	0	0	82						82
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
09SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
21SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
05OCT	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-179 REGIONAL DENSITY (NO./1,000m3) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.39	0.90	0.92	2.38	0.41
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.18	0.40	0.30	0.57	0.79
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.16	0.29	0.37	1.15	2.11	0.34
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.12	0.09	0.15	0.54	0.58
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.35	0.34	0.33	1.91	0.25
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.13	0.08	0.49	0.53
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.08	0.19	0.07	0.42	0.13	0.80	1.01	0.22
	SE	0.00	0.00	0.00	0.00	0.00	0.07	0.12	0.03	0.16	0.06	0.21	0.29	0.42
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.32	0.25	0.06	0.45	0.69	1.02	0.82	0.30
	SE	0.00	0.00	0.00	0.00	0.00	0.15	0.09	0.04	0.17	0.24	0.34	0.41	0.64
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.06	0.06	1.61	0.12	0.17	0.38	0.27	0.53	0.27
	SE	0.00	0.00	0.00	0.00	0.04	0.04	1.23	0.08	0.08	0.08	0.08	0.27	1.27
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.00	0.00	0.01	0.21	0.16	0.00	0.21	0.05	0.39	1.81	0.24
	SE	0.00	0.00	0.00	0.00	0.01	0.06	0.07	0.00	0.06	0.04	0.08	0.42	0.44
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.00	0.00	0.03	0.66	0.12	0.55	0.14	0.09	0.24	0.25	0.17
	SE	0.00	0.00	0.00	0.00	0.02	0.56	0.05	0.47	0.06	0.03	0.07	0.12	0.75
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-180 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	0	0	0	0	0	0	49	55	159	147	169	580
	SE	0	0	0	0	0	0	0	18	26	70	49	41	100
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	0	0	0	0	0	9	26	41	65	185	150	476
	SE	0	0	0	0	0	0	9	12	17	16	23	38	53
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	0	0	0	0	0	0	8	50	60	53	136	307
	SE	0	0	0	0	0	0	0	8	18	23	13	35	48
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	0	0	0	12	56	11	59	23	128	72	361
	SE	0	0	0	0	0	10	37	5	22	10	33	21	60
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	0	0	0	0	44	75	10	64	121	164	58	536
	SE	0	0	0	0	0	21	28	7	24	42	54	29	86
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	12	8	480	21	24	67	43	38	692
	SE	0	0	0	0	7	5	368	13	11	14	13	19	369
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	0	0	0	3	29	48	0	30	9	63	129	312
	SE	0	0	0	0	3	8	22	0	9	7	12	30	42
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	0	0	0	6	92	35	92	19	16	39	17	315
	SE	0	0	0	0	3	78	16	78	8	6	11	9	113
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-181 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-182 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE CATFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	1	1
	SE	0	0	0	0	0	0	0	0	0	0	0	1	1
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	2	0	2
	SE	0	0	0	0	0	0	0	0	0	0	2	0	2
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-183 REGIONAL DENSITY (NO./1,000m3) OF WHITE CATFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.00	0.01	0.10	0.05	0.00	0.05	0.00	0.00	0.05	0.07	0.04	0.13	0.04
	SE	0.00	0.01	0.06	0.02	0.00	0.05	0.00	0.00	0.03	0.05	0.03	0.09	0.13
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.00	0.05	0.02	0.05	0.00	0.04	0.03	0.02	0.00	0.06	0.08	0.04	0.03
	SE	0.00	0.03	0.02	0.04	0.00	0.02	0.03	0.02	0.00	0.03	0.04	0.04	0.10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.01	0.03	0.04	0.02	0.00	0.00	0.02	0.00	0.04	0.11	0.00	0.02
	SE	0.00	0.01	0.02	0.02	0.02	0.00	0.00	0.02	0.00	0.03	0.07	0.00	0.09
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.04	0.03	0.00	0.04	0.00	0.00	0.05	0.08	0.09	0.04	0.03
	SE	0.00	0.00	0.03	0.02	0.00	0.04	0.00	0.00	0.05	0.06	0.06	0.04	0.12
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.01	0.04	0.01	0.00	0.05	0.00	0.02	0.03	0.00	0.02	0.04	0.02
	SE	0.00	0.01	0.04	0.01	0.00	0.04	0.00	0.02	0.03	0.00	0.02	0.04	0.08
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.02	0.02	0.08	0.00	0.01
	SE	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.02	0.04	0.00	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.02	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.08	0.02
	SE	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.05	0.06
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.17	0.02
	SE	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.13	0.14
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-184 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE CATFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	0	4	15	10	0	7	0	0	7	12	7	9	70
	SE	0	4	8	4	0	7	0	0	5	9	5	6	17
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	0	17	3	11	0	5	9	3	0	11	13	3	76
	SE	0	8	3	7	0	3	9	3	0	6	7	3	18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	0	3	5	8	4	0	0	4	0	7	17	0	48
	SE	0	3	4	5	4	0	0	4	0	5	11	0	15
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	0	0	6	7	0	5	0	0	7	14	14	3	56
	SE	0	0	4	5	0	5	0	0	7	11	10	3	19
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	0	3	5	3	0	7	0	3	4	0	3	3	32
	SE	0	3	5	2	0	5	0	3	4	0	3	3	11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	0	0	0	0	6	0	0	0	3	3	14	0	26
	SE	0	0	0	0	4	0	0	0	3	3	6	0	8
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	0	6	0	8	0	1	0	0	0	6	0	6	28
	SE	0	4	0	5	0	1	0	0	0	4	0	4	9
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	0	13	0	0	0	0	0	0	7	0	0	12	31
	SE	0	7	0	0	0	0	0	0	4	0	0	9	13
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-185 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF WHITE CATFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	0.00	0.09	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.02
	SE	0.00	0.09	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.15
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	SE	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.02
	SE	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.16
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.04	0.00	0.40	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.05
	SE	0.00	0.04	0.00	0.40	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.45
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-186 REGIONAL STANDING CROP (IN THOUSANDS) OF WHITE CATFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	8	0	0	0	0	0	0	0	0	0	8
03JUL	SE	0	0	5	0	0	0	0	0	0	0	0	0	5
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	0	4	0	0	0	0	1	0	0	0	0	0	5
15JUL	SE	0	4	0	0	0	0	1	0	0	0	0	0	4
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	0	0	3	0	0	0	0	0	0	0	0	3
28JUL	SE	0	0	0	3	0	0	0	0	0	0	0	0	3
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	0	0	2	0	0	0	0	0	0	0	0	2	4
12AUG	SE	0	0	2	0	0	0	0	0	0	0	0	2	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
29AUG	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
10SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	ST. CROP	0	2	2	0	0	0	0	0	0	0	0	0	4
23SEP	SE	0	2	2	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	ST. CROP	0	2	0	4	0	0	0	0	2	0	0	0	7
08OCT	SE	0	2	0	4	0	0	0	0	2	0	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	ST. CROP	0	2	0	0	0	0	0	0	0	0	0	0	2
22OCT	SE	0	2	0	0	0	0	0	0	0	0	0	0	2
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
04NOV	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-187 REGIONAL DENSITY (NO./1,000m3) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-187 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.00	1.36	0.00	2.99	0.11	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.39
	SE	0.00	0.00	1.36	0.00	2.20	0.11	0.56	0.00	0.00	0.00	0.00	0.00	0.00	2.65
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.00	0.00	0.00	9.15	9.00	0.04	0.00	NS	NS	NS	NS	NS	2.27
	SE	0.00	0.00	0.00	0.00	5.78	5.39	0.04	0.00						7.90
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	14.60	1.04	0.46	0.95	1.51	0.91	0.00	NS	NS	NS	NS	NS	2.43
	SE	0.00	12.52	1.04	0.33	0.95	0.79	0.45	0.00						12.63
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	9.05	2.14	0.00	1.03	0.35	8.50	27.38	0.00	NS	NS	NS	NS	NS	6.06
	SE	7.14	1.26	0.00	0.74	0.35	4.45	24.58	0.00						26.02
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	9.24	5.87	21.91	3.60	3.24	2.83	1.80	0.89	NS	NS	NS	NS	NS	6.17
	SE	5.61	2.01	4.50	2.38	2.08	0.87	0.77	0.03						8.19
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	4.02	1.32	9.00	1.76	4.00	0.05	0.00	NS	NS	NS	NS	NS	2.52
	SE	0.00	1.90	1.32	5.28	1.71	1.78	0.05	0.00						6.27
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	4.08	1.31	0.00	0.00	0.96	0.94	0.95	0.73	NS	NS	NS	NS	NS	1.12
	SE	2.10	1.31	0.00	0.00	0.96	0.94	0.74	0.73						3.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	1.26	0.17	0.14	0.00	0.00	NS	NS	NS	NS	NS	0.20
	SE	0.00	0.00	0.00	1.26	0.17	0.14	0.00	0.00						1.28
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-188 REGIONAL STANDING CROP (IN THOUSANDS) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-188 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	ST. CROP	0	0	437	0	623	22	79	0	0	0	0	0	0	1160
	SE	0	0	437	0	458	22	79	0	0	0	0	0	0	638
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	ST. CROP	0	0	0	0	1906	1868	5	0	NS	NS	NS	NS	NS	3779
	SE	0	0	0	0	1203	1119	5	0						1643
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	ST. CROP	0	3349	333	68	197	313	127	0	NS	NS	NS	NS	NS	4388
	SE	0	2872	333	48	197	165	63	0						2904
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	ST. CROP	1892	492	0	153	73	1764	3827	0	NS	NS	NS	NS	NS	8202
	SE	1492	290	0	109	73	922	3436	0						3871
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	ST. CROP	1931	1346	7051	532	674	587	251	264	NS	NS	NS	NS	NS	12637
	SE	1172	461	1449	352	434	180	107	10						2011
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	ST. CROP	0	922	423	1330	366	829	7	0	NS	NS	NS	NS	NS	3877
	SE	0	437	423	780	355	370	7	0						1114
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	ST. CROP	853	300	0	0	200	196	132	218	NS	NS	NS	NS	NS	1899
	SE	438	300	0	0	200	196	103	218						647
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	ST. CROP	0	0	0	186	36	29	0	0	NS	NS	NS	NS	NS	251
	SE	0	0	0	186	36	29	0	0						192
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-189 REGIONAL DENSITY (NO./1,000m3) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	4.87	0.90	0.30	1.01	0.12	1.77	0.00	0.00	0.00	0.00	0.00	0.00	0.75
	SE	4.09	0.35	0.15	0.43	0.09	0.66	0.00	0.00	0.00	0.00	0.00	0.00	4.18
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	3.32	2.44	0.37	4.98	0.09	1.18	0.30	0.00	0.00	0.00	0.00	0.00	1.06
	SE	0.91	0.46	0.15	2.64	0.04	0.53	0.19	0.00	0.00	0.00	0.00	0.00	2.89
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	5.97	3.10	2.28	3.40	1.76	2.17	1.53	0.00	0.00	0.00	0.00	0.00	1.68
	SE	1.63	0.63	0.92	0.64	0.83	0.71	0.69	0.00	0.00	0.00	0.00	0.00	2.44
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.76	0.69	1.00	1.17	0.65	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.42
	SE	0.11	0.13	0.19	0.75	0.27	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.91
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	1.04	1.43	1.55	0.48	0.35	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.46
	SE	0.18	0.49	0.39	0.29	0.10	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.92
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	0.25	0.36	0.48	0.58	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.15
	SE	0.10	0.08	0.15	0.34	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.39
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.84	1.48	0.29	0.04	0.93	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.30
	SE	0.21	0.30	0.11	0.02	0.73	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.83
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.73	0.31	0.19	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
	SE	0.26	0.11	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-190 REGIONAL STANDING CROP (IN THOUSANDS) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	ST. CROP	1117	289	45	210	26	247	0	0	0	0	0	0	1934
	SE	938	113	23	91	19	93	0	0	0	0	0	0	954
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	ST. CROP	762	785	55	1037	20	165	90	0	0	0	0	0	2914
	SE	209	149	22	550	8	74	57	0	0	0	0	0	615
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	ST. CROP	1369	997	338	709	365	303	457	0	0	0	0	0	4539
	SE	373	201	137	133	172	99	205	0	0	0	0	0	546
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	ST. CROP	174	222	147	244	134	116	0	0	0	0	0	0	1036
	SE	26	41	28	157	55	48	0	0	0	0	0	0	182
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	ST. CROP	239	459	229	100	73	91	0	0	0	0	0	0	1192
	SE	41	158	57	61	21	80	0	0	0	0	0	0	201
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	ST. CROP	57	116	71	122	23	3	0	0	0	0	0	0	393
	SE	22	24	22	71	14	1	0	0	0	0	0	0	82
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	ST. CROP	193	477	44	8	194	4	0	0	0	0	0	0	920
	SE	49	95	17	5	152	4	0	0	0	0	0	0	187
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	ST. CROP	168	101	28	25	0	0	0	0	0	0	0	0	321
	SE	59	36	10	17	0	0	0	0	0	0	0	0	72
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-191 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	CPUE	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
03JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	CPUE	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
15JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	CPUE	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
28JUL	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	CPUE	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
12AUG	SE	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	CPUE	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
29AUG	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	CPUE	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
10SEP	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	CPUE	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
23SEP	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	CPUE	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
08OCT	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	CPUE	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
22OCT	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	CPUE	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
04NOV	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-192 REGIONAL STANDING CROP (IN THOUSANDS) OF WEAKFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
03JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
15JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-	ST. CROP	0	8	0	0	0	0	0	0	0	0	0	0	8
12AUG	SE	0	4	0	0	0	0	0	0	0	0	0	0	4
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
29AUG	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
10SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
23SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
08OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
22OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
04NOV	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-193 REGIONAL DENSITY (NO./1,000m3) OF WEAKFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-194 REGIONAL STANDING CROP (IN THOUSANDS) OF WEAKFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
24JUL	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
06AUG	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	0	3	0	0	0	0	0	0	0	0	0	0	3
20AUG	SE	0	3	0	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
03SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
18SEP	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
01OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	0	0	3	0	0	0	0	0	0	0	0	0	3
15OCT	SE	0	0	3	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	0	0	3	0	0	0	0	0	0	0	0	0	3
29OCT	SE	0	0	3	0	0	0	0	0	0	0	0	0	3
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-195 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF WEAKFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	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
	SE	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
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-196 REGIONAL STANDING CROP (IN THOUSANDS) OF WEAKFISH YEARLING AND OLDER IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-197 REGIONAL DENSITY (NO./1,000m3) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	DENSITY	NS	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
	SE		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
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	DENSITY	NS	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE		0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	DENSITY	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
	SE	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
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	DENSITY	1.01	0.54	0.12	0.43	0.80	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
	SE	0.58	0.54	0.12	0.43	0.77	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-197 (CONT.) REGIONAL DENSITY (NO./1,000m3) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-26JUN	DENSITY	0.00	0.78	0.10	0.64	0.80	0.46	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.27
	SE	0.00	0.62	0.10	0.64	0.70	0.46	0.70	0.00	0.00	0.00	0.00	0.00	0.00	1.42
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-03JUL	DENSITY	0.00	0.00	0.00	1.68	1.13	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.22
	SE	0.00	0.00	0.00	0.57	0.78	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.96
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-09JUL	DENSITY	0.00	0.22	1.89	1.42	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
	SE	0.00	0.22	0.75	0.71	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-14JUL	DENSITY	0.00	0.69	0.79	0.60	1.27	0.15	0.88	0.00	NS	NS	NS	NS	NS	0.55
	SE	0.00	0.58	0.79	0.60	1.27	0.15	0.65	0.00						1.84
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-28JUL	DENSITY	0.00	0.00	0.00	0.23	0.48	0.77	0.26	0.00	NS	NS	NS	NS	NS	0.22
	SE	0.00	0.00	0.00	0.23	0.48	0.77	0.26	0.00						0.97
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-12AUG	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-25AUG	DENSITY	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.07
	SE	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00						0.59
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-09SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-21SEP	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.23	NS	NS	NS	NS	NS	0.06
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.23						0.34
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-05OCT	DENSITY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS	0.00
	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-198 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
12APR-16APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
19APR-23APR	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	9	6	11	6	7	7	8	9	9	107
26APR-01MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		10	12	13	10	6	11	6	7	7	8	9	9	108
03MAY-07MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
10MAY-14MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	9	13	10	16	10	11	7	6	6	10	117
17MAY-21MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	10	13	9	9	15	7	10	7	8	6	6	109
24MAY-29MAY	ST. CROP	NS	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE		0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS		9	11	13	9	9	15	7	10	7	8	6	6	110
31MAY-05JUN	ST. CROP	NS	118	0	0	0	0	0	0	0	0	0	0	0	118
	SE		118	0	0	0	0	0	0	0	0	0	0	0	118
	NO. TOWS		9	11	13	9	9	15	7	10	6	8	6	6	109
07JUN-11JUN	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	6	11	14	11	13	9	13	7	9	7	6	6	6	118
14JUN-18JUN	ST. CROP	211	123	39	64	167	23	0	0	0	0	0	0	0	628
	SE	122	123	39	64	160	23	0	0	0	0	0	0	0	248
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	5	118

TABLE C-198 (CONT.) REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATE		BT	YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
21JUN-	ST. CROP	0	179	32	95	166	96	99	0	0	0	0	0	0	666
26JUN	SE	0	142	32	95	147	96	99	0	0	0	0	0	0	265
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
28JUN-	ST. CROP	0	0	0	249	235	0	6	0	0	0	0	0	0	489
03JUL	SE	0	0	0	84	162	0	6	0	0	0	0	0	0	182
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
06JUL-	ST. CROP	0	52	609	210	274	0	0	0	0	0	0	0	0	1145
09JUL	SE	0	52	241	105	242	0	0	0	0	0	0	0	0	361
	NO. TOWS	6	11	14	11	13	9	13	7	10	7	6	6	6	119
12JUL-	ST. CROP	0	159	254	88	264	30	123	0	NS	NS	NS	NS	NS	920
14JUL	SE	0	134	254	88	264	30	90	0						411
	NO. TOWS	7	11	11	11	10	6	10	6						72
26JUL-	ST. CROP	0	0	0	34	101	159	36	0	NS	NS	NS	NS	NS	330
28JUL	SE	0	0	0	34	101	159	36	0						195
	NO. TOWS	7	11	11	12	10	6	10	6						73
10AUG-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
12AUG	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73
23AUG-	ST. CROP	0	0	0	88	0	0	0	0	NS	NS	NS	NS	NS	88
25AUG	SE	0	0	0	88	0	0	0	0						88
	NO. TOWS	7	11	11	12	10	6	10	6						73
07SEP-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
09SEP	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	6	11	11	12	10	6	10	6						72
20SEP-	ST. CROP	0	0	0	0	0	0	35	69	NS	NS	NS	NS	NS	104
21SEP	SE	0	0	0	0	0	0	35	69						77
	NO. TOWS	7	11	11	12	10	6	10	6						73
04OCT-	ST. CROP	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0
05OCT	SE	0	0	0	0	0	0	0	0						0
	NO. TOWS	7	11	11	12	10	6	10	6						73

TABLE C-199 REGIONAL DENSITY (NO./1,000m3) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-24JUL	DENSITY	0.08	0.18	0.12	0.02	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.05	0.06	0.04	0.01	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-06AUG	DENSITY	0.06	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.04	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-20AUG	DENSITY	0.00	0.05	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	SE	0.00	0.02	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-03SEP	DENSITY	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-18SEP	DENSITY	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.005
	SE	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-01OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-15OCT	DENSITY	0.04	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	SE	0.04	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-29OCT	DENSITY	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
	SE	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
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-200 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
19JUL-	ST. CROP	19	58	17	3	3	7	0	0	0	0	0	0	108
24JUL	SE	11	18	5	2	3	7	0	0	0	0	0	0	23
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
02AUG-	ST. CROP	15	3	0	0	3	0	0	0	0	0	0	0	21
06AUG	SE	10	3	0	0	3	0	0	0	0	0	0	0	11
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
16AUG-	ST. CROP	0	15	59	0	0	0	0	0	0	0	0	0	74
20AUG	SE	0	8	57	0	0	0	0	0	0	0	0	0	57
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
30AUG-	ST. CROP	0	0	6	2	0	0	0	0	0	0	0	0	7
03SEP	SE	0	0	4	2	0	0	0	0	0	0	0	0	4
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
14SEP-	ST. CROP	0	9	0	0	0	0	0	0	0	0	0	0	9
18SEP	SE	0	5	0	0	0	0	0	0	0	0	0	0	5
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
27SEP-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
01OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
11OCT-	ST. CROP	8	0	0	0	0	4	0	0	0	0	0	0	12
15OCT	SE	8	0	0	0	0	4	0	0	0	0	0	0	9
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210
25OCT-	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
29OCT	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	17	46	27	14	8	13	8	10	15	18	21	13	210

TABLE C-201 REGIONAL CATCH-PER-UNIT-EFFORT (CPUE) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	CPUE	0.33	1.00	0.57	2.67	0.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.46
	SE	0.33	0.49	0.30	2.67	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	2.79
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	CPUE	1.33	0.27	2.29	4.00	2.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.91
	SE	1.33	0.14	1.06	4.00	1.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	4.56
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	CPUE	1.00	1.55	0.86	0.67	1.00	0.67	0.25	0.00	0.00	0.00	0.00	0.00	0.50
	SE	0.58	0.88	0.26	0.67	0.00	0.33	0.16	0.00	0.00	0.00	0.00	0.00	1.32
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	CPUE	0.40	1.79	1.00	1.40	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.40
	SE	0.24	0.86	0.49	0.24	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	1.06
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	CPUE	1.00	0.33	0.64	0.40	0.40	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.30
	SE	0.32	0.16	0.31	0.24	0.40	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.77
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	CPUE	0.00	0.17	0.07	0.20	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.05
	SE	0.00	0.10	0.07	0.20	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.31
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	CPUE	0.60	0.00	0.07	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	SE	0.24	0.00	0.07	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	CPUE	0.00	0.04	0.07	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	SE	0.00	0.04	0.07	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	CPUE	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
	SE	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
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

TABLE C-202 REGIONAL STANDING CROP (IN THOUSANDS) OF BLUEFISH YOUNG OF YEAR IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATE		YK	TZ	CH	IP	WP	CW	PK	HP	KG	SG	CS	AL	ALL REGIONS COMBINED
01JUL-03JUL	ST. CROP	3	45	15	25	2	4	0	0	0	0	0	0	93
	SE	3	22	8	25	1	4	0	0	0	0	0	0	34
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
13JUL-15JUL	ST. CROP	10	12	61	37	7	4	0	0	0	0	0	0	131
	SE	10	6	29	37	4	4	0	0	0	0	0	0	48
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
26JUL-28JUL	ST. CROP	8	70	23	6	3	7	2	0	0	0	0	0	118
	SE	4	40	7	6	0	4	1	0	0	0	0	0	41
	NO. TOWS	3	11	7	3	3	3	8	8	8	15	19	12	100
09AUG-12AUG	ST. CROP	3	81	27	13	0	2	0	0	0	0	0	0	126
	SE	2	39	13	2	0	2	0	0	0	0	0	0	41
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
23AUG-29AUG	ST. CROP	8	15	17	4	1	9	0	0	0	0	0	0	54
	SE	2	7	8	2	1	4	0	0	0	0	0	0	12
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
07SEP-10SEP	ST. CROP	0	8	2	2	0	0	1	0	0	0	0	0	13
	SE	0	4	2	2	0	0	1	0	0	0	0	0	5
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20SEP-23SEP	ST. CROP	5	0	2	2	0	0	0	0	0	0	0	0	8
	SE	2	0	2	2	0	0	0	0	0	0	0	0	3
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
06OCT-08OCT	ST. CROP	0	2	2	6	0	0	0	0	0	0	0	0	9
	SE	0	2	2	6	0	0	0	0	0	0	0	0	6
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
20OCT-22OCT	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100
02NOV-04NOV	ST. CROP	0	0	0	0	0	0	0	0	0	0	0	0	0
	SE	0	0	0	0	0	0	0	0	0	0	0	0	0
	NO. TOWS	5	24	14	5	5	6	5	5	5	9	10	7	100

Appendix D

Length Frequency Distribution

APPENDIX D

LIST OF TABLES

APPENDIX D

LIST OF TABLES

TABLE D-1 LENGTH FREQUENCY DISTRIBUTION OF LARVAL AND YOUNG-OF-YEAR STRIPED BASS IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

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	30.0-31.9
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	[illegible]	658	105	0	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	68	674	555	1	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	68	848	1054	92	1	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	33	730	1495	231	34	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	39	575	1481	723	112	12	0	0	0	0	0	0	0	0	0
14JUN-18JUN	0	17	234	931	839	301	26	2	0	0	0	0	0	0	0	0
21JUN-26JUN	0	18	120	284	588	659	322	74	37	10	5	3	2	1	1	0
28JUN-03JUL	0	0	36	153	309	344	466	362	177	54	36	23	8	6	9	3
06JUL-09JUL	0	0	5	28	110	180	181	125	69	43	35	29	21	24	15	31
12JUL-14JUL	0	1	1	9	35	92	78	64	60	61	39	22	35	35	22	25
26JUL-28JUL	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
10AUG-12AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DATES	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	60.0-61.9	62.0-63.9
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14JUN-18JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21JUN-26JUN	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUN-03JUL	2	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	13	14	4	6	3	3	4	0	0	0	0	0	0	0	0	0
12JUL-14JUL	27	25	18	17	11	10	6	3	2	0	0	0	0	0	0	0
26JUL-28JUL	2	4	1	2	1	1	2	1	3	1	1	0	2	0	0	0
10AUG-12AUG	1	0	0	0	1	0	1	1	0	0	3	2	0	0	1	1

DATES	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	90.0-91.9	92.0-93.9	94.0-95.9
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14JUN-18JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21JUN-26JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUN-03JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12JUL-14JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26JUL-28JUL	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10AUG-12AUG	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

DATES	96.0-97.9	98.0-99.9	100.0-101.9	102.0-103.9	104.0-105.9	106.0-107.9	108.0-109.9+	N	MEAN	MIN	MED	MAX	SD
12APR-16APR	0	0	0	0	0	0	0	0	.	.	.	.	.
19APR-23APR	0	0	0	0	0	0	0	0	.	.	.	.	.
26APR-01MAY	0	0	0	0	0	0	0	0	.	.	.	.	.
03MAY-07MAY	0	0	0	0	0	0	0	2	5.9	5.4	5.9	6.4	0.7
10MAY-14MAY	0	0	0	0	0	0	0	847	5.0	2.4	5.1	7.2	0.8
17MAY-21MAY	0	0	0	0	0	0	0	1313	5.6	2.5	5.6	8.0	1.1
24MAY-29MAY	0	0	0	0	0	0	0	2067	6.1	2.1	6.1	10.4	1.2
31MAY-05JUN	0	0	0	0	0	0	0	2529	6.5	2.7	6.4	11.7	1.2
07JUN-11JUN	0	0	0	0	0	0	0	2949	7.1	2.6	7.1	13.6	1.5
14JUN-18JUN	0	0	0	0	0	0	0	2353	8.0	2.9	7.9	14.2	1.7
21JUN-26JUN	0	0	0	0	0	0	0	2127	10.1	2.9	10.1	32.8	2.9
28JUN-03JUL	0	0	0	0	0	0	0	2007	12.8	4.5	12.7	40.0	4.1
06JUL-09JUL	0	0	0	0	0	0	0	948	16.0	4.6	13.6	49.0	7.5
12JUL-14JUL	0	0	0	0	0	0	0	712	21.0	3.5	18.3	57.0	9.9
26JUL-28JUL	0	0	0	0	0	0	0	26	42.8	12.0	41.5	67.0	13.8
10AUG-12AUG	0	0	0	0	0	0	0	18	53.3	33.0	53.5	68.0	8.9

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

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	30.0-31.9
23AUG-25AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07SEP-09SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20SEP-21SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	0	321	3882	6096	2928	1723	1086	628	343	168	115	77	66	66	47	60

DATES	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	60.0-61.9	62.0-63.9
23AUG-25AUG	0	0	0	0	0	2	2	3	2	1	1	5	2	3	5	5
07SEP-09SEP	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	1
20SEP-21SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	46	44	26	25	17	16	15	8	9	4	7	8	5	7	10	7

DATES	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	90.0-91.9	92.0-93.9	94.0-95.9
23AUG-25AUG	6	5	4	6	2	1	1	3	1	2	1	0	0	0	0	0
07SEP-09SEP	1	0	1	2	2	1	1	0	0	1	0	0	0	0	0	0
20SEP-21SEP	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	9	6	7	8	4	3	3	3	1	4	2	0	1	0	0	0

DATES	96.0-97.9	98.0-99.9	100.0-101.9	102.0-103.9	104.0-105.9	106.0-107.9	108.0-109.9+	N	MEAN	MIN	MED	MAX	SD
23AUG-25AUG	0	1	0	0	0	1	0	65	64.1	42.0	64.0	107.0	12.4
07SEP-09SEP	0	0	0	0	0	0	0	13	68.0	50.0	71.0	83.0	9.0
20SEP-21SEP	0	0	0	0	0	0	0	6	74.5	61.0	75.5	85.0	8.9
04OCT-05OCT	0	0	0	0	0	0	0	1	89.0	89.0	89.0	89.0	.
	======	======	======	======	======	======	======	======					
	0	1	0	0	0	1	0	17983					

....

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, 1993

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
19JUL-24JUL	3	1	7	10	19	29	42	23	16	8	1
02AUG-06AUG	0	0	4	8	6	8	16	24	20	30	15
16AUG-20AUG	0	0	0	0	3	3	6	11	25	23	26
30AUG-03SEP	0	0	0	0	0	1	0	5	11	19	23
14SEP-18SEP	0	0	0	0	0	0	0	1	8	17	14
27SEP-01OCT	0	0	0	0	0	0	0	2	2	5	8
11OCT-15OCT	0	0	0	0	0	0	0	1	2	5	6
25OCT-29OCT	0	0	0	0	0	0	1	0	2	1	3
	======	======	======	======	======	======	======	======	======	======	======
	3	1	11	18	28	41	65	67	86	108	96

DATES	65.0-69.9	70.0-74.9	75.0-79.9	80.0-84.9	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9	110.0-114.9	115.0-119.9
19JUL-24JUL	4	0	0	0	0	0	0	0	0	0	0
02AUG-06AUG	15	5	3	3	0	1	0	0	0	0	0
16AUG-20AUG	20	20	11	5	4	2	1	0	0	0	0
30AUG-03SEP	22	30	7	12	6	2	1	1	0	0	0
14SEP-18SEP	24	23	13	13	14	6	6	4	1	0	0
27SEP-01OCT	21	12	18	11	5	4	3	3	1	0	0
11OCT-15OCT	12	16	10	14	5	9	5	1	2	3	4
25OCT-29OCT	5	12	8	13	6	9	4	4	3	3	3
	======	======	======	======	======	======	======	======	======	======	======
	123	118	70	71	40	33	20	13	7	6	7

DATES	120.0-124.9	125.0-129.9	130.0-134.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	164	40.4	10.0	41.0	67.0	10.5
02AUG-06AUG	0	0	0	160	51.8	21.0	53.0	91.0	13.5
16AUG-20AUG	0	0	0	165	61.7	32.0	61.0	99.0	12.4
30AUG-03SEP	0	0	0	145	66.7	37.0	65.0	102.0	10.9
14SEP-18SEP	0	0	0	147	72.6	46.0	71.0	105.0	13.0
27SEP-01OCT	0	0	0	97	73.4	46.0	73.0	106.0	12.2
11OCT-15OCT	1	1	0	99	79.8	48.0	77.0	128.0	17.1
25OCT-29OCT	0	3	1	81	86.0	40.0	83.0	132.0	18.5
	======	======	======	======					
	1	4	1	1058					

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, 1993

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
01JUL-03JUL	10	31	28	40	29	7	0	0	0	0	0
13JUL-15JUL	1	3	15	40	42	28	16	19	11	3	2
26JUL-28JUL	0	0	4	8	6	25	32	31	24	17	10
09AUG-12AUG	0	0	0	3	1	13	22	26	23	29	23
23AUG-29AUG	0	0	0	0	3	11	9	21	29	15	20
07SEP-10SEP	0	0	0	0	1	2	11	5	11	13	16
20SEP-23SEP	0	0	0	0	0	1	0	2	4	10	21
06OCT-08OCT	0	0	0	0	0	0	0	2	5	6	10
20OCT-22OCT	0	0	0	0	0	0	0	0	11	15	12
02NOV-04NOV	0	0	0	0	0	0	0	4	5	6	11
	======	======	======	======	======	======	======	======	======	======	======
	11	34	47	91	82	87	90	110	123	114	125

DATES	70.0-74.9	75.0-79.9	80.0-84.9	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9	110.0-114.9	115.0-119.9	120.0-124.9
01JUL-03JUL	0	0	0	0	0	0	0	0	0	0	0
13JUL-15JUL	0	0	0	0	0	0	0	0	0	0	0
26JUL-28JUL	4	1	0	0	0	0	0	0	0	0	0
09AUG-12AUG	16	12	3	10	2	0	0	0	0	0	0
23AUG-29AUG	19	15	13	4	5	0	2	0	0	0	0
07SEP-10SEP	14	21	9	13	6	7	0	3	0	0	0
20SEP-23SEP	29	24	29	13	8	7	3	0	1	2	0
06OCT-08OCT	17	13	28	15	10	7	6	3	6	6	1
20OCT-22OCT	24	20	19	13	6	11	1	4	3	2	0
02NOV-04NOV	9	13	12	9	5	8	7	1	1	3	1
	======	======	======	======	======	======	======	======	======	======	======
	132	119	113	77	42	40	19	11	11	13	2

DATES	125.0-129.9	130.0-134.9	135.0-139.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	145	29.1	16.0	30.0	44.0	6.6
13JUL-15JUL	0	0	0	183	40.2	18.0	38.0	65.0	9.9
26JUL-28JUL	0	0	0	167	51.0	26.0	50.0	77.0	10.3
09AUG-12AUG	0	0	0	189	60.6	31.0	61.0	93.0	12.5
23AUG-29AUG	0	0	0	168	64.0	35.0	62.0	103.0	13.7
07SEP-10SEP	0	0	0	136	71.2	38.0	71.0	108.0	15.2
20SEP-23SEP	0	0	0	157	77.3	44.0	77.0	119.0	11.8
06OCT-08OCT	0	1	0	138	83.6	53.0	82.0	130.0	16.2
20OCT-22OCT	1	0	1	144	78.8	55.0	76.0	136.0	15.3
02NOV-04NOV	1	0	0	100	80.1	51.0	79.0	125.0	17.0
	======	======	======	======					
	2	1	1	1527					

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, 1993

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
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	34	2	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	758	339	2	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	656	951	4	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	392	1519	76	2	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	181	1221	706	29	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	406	646	923	175	17	0	0	0	0	0	0	0	0	0
14JUN-18JUN	0	265	637	558	374	50	0	0	0	0	0	0	0	0	0
21JUN-26JUN	0	236	450	541	716	222	39	1	1	0	0	0	0	0	0
28JUN-03JUL	0	136	328	497	584	332	88	25	4	0	0	0	0	0	0
06JUL-09JUL	0	7	91	288	466	331	102	21	9	1	0	3	2	0	1
12JUL-14JUL	0	2	9	10	52	71	81	42	16	11	4	3	1	1	0
26JUL-28JUL	0	1	13	12	6	1	0	0	0	0	1	0	0	0	1
10AUG-12AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23AUG-25AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07SEP-09SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20SEP-21SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	0	3074	6206	3617	2404	1024	310	89	30	12	5	6	3	1	2

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
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14JUN-18JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21JUN-26JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUN-03JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0
12JUL-14JUL	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
26JUL-28JUL	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
10AUG-12AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23AUG-25AUG	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
07SEP-09SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20SEP-21SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	1	3	0	0	1	1	0	3	0	0	0	0	1	1	2

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+	N	MEAN	MIN	MED	MAX	SD
12APR-16APR	0	0	0	0	0	0	0	0	0	0	.	.	.	.	.
19APR-23APR	0	0	0	0	0	0	0	0	0	0	.	.	.	.	.
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	.	.	.	.	.
03MAY-07MAY	0	0	0	0	0	0	0	0	0	38	3.6	3.0	3.6	4.1	0.2
10MAY-14MAY	0	0	0	0	0	0	0	0	0	1224	3.7	2.4	3.7	6.1	0.5
17MAY-21MAY	0	0	0	0	0	0	0	0	0	1795	4.0	2.3	4.0	7.1	0.5
24MAY-29MAY	0	0	0	0	0	0	0	0	0	2057	4.4	2.1	4.4	8.1	0.8
31MAY-05JUN	0	0	0	0	0	0	0	0	0	2163	5.5	2.8	5.5	9.2	1.1
07JUN-11JUN	0	0	0	0	0	0	0	0	0	2202	5.8	2.1	6.0	11.1	1.7
14JUN-18JUN	0	0	0	0	0	0	0	0	0	1904	6.2	2.2	6.0	11.8	2.0
21JUN-26JUN	0	0	0	0	0	0	0	0	0	2218	7.3	2.2	7.5	16.4	2.4
28JUN-03JUL	0	0	0	0	0	0	0	0	0	2009	7.9	2.2	8.1	16.5	2.6
06JUL-09JUL	0	0	0	0	0	0	0	0	0	1328	9.3	3.0	9.3	45.0	2.8
12JUL-14JUL	0	0	0	0	0	0	0	0	0	307	12.5	3.2	12.2	33.0	4.0
26JUL-28JUL	0	0	0	0	0	0	0	0	0	38	10.4	3.4	6.8	45.0	10.7
10AUG-12AUG	0	0	0	0	0	0	0	0	0	1	59.0	59.0	59.0	59.0	.
23AUG-25AUG	1	0	0	0	0	0	0	0	0	3	57.0	54.0	57.0	60.0	3.0
07SEP-09SEP	0	0	0	0	0	1	0	0	1	2	73.0	70.0	73.0	76.0	4.2
20SEP-21SEP	0	0	0	0	0	0	0	1	0	1	75.0	75.0	75.0	75.0	.
04OCT-05OCT	0	0	0	0	0	0	0	1	0	2	66.5	58.0	66.5	75.0	12.0
	======	======	======	======	======	======	======	======	======	======					
	1	0	0	0	0	1	0	2	1	17292					

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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, 1993

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
19JUL-24JUL	4	3	0	3	6	1	0	0	0	0	0
02AUG-06AUG	3	1	5	1	2	1	13	6	2	0	0
16AUG-20AUG	0	1	1	3	4	6	2	2	4	0	1
30AUG-03SEP	0	0	0	2	4	6	5	6	3	7	12
14SEP-18SEP	0	0	0	0	1	0	1	4	5	3	8
27SEP-01OCT	0	0	0	0	0	2	2	6	8	5	4
11OCT-15OCT	0	0	0	0	0	0	0	2	2	5	6
25OCT-29OCT	0	0	0	0	2	0	0	1	7	6	14
	======	======	======	======	======	======	======	======	======	======	======
	7	5	6	9	19	16	23	27	31	26	45

DATES	70.0- 74.9	75.0- 79.9	80.0- 84.9	85.0- 89.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	0	17	29.3	16.0	32.0	44.0	8.8
02AUG-06AUG	0	0	0	0	34	41.1	18.0	46.0	57.0	11.9
16AUG-20AUG	0	0	0	0	25	43.6	20.0	41.0	67.0	11.1
30AUG-03SEP	2	0	0	0	50	55.0	30.0	57.5	74.0	11.4
14SEP-18SEP	13	4	1	1	42	65.6	39.0	66.5	85.0	9.8
27SEP-01OCT	14	7	9	2	60	67.3	40.0	70.0	87.0	11.6
11OCT-15OCT	11	13	4	0	44	70.8	52.0	72.0	84.0	7.6
25OCT-29OCT	14	9	6	1	61	68.4	37.0	69.0	85.0	9.8
	======	======	======	======	======					
	54	33	20	4	333					

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, 1993

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
01JUL-03JUL	3	10	6	1	0	0	0	0	0	0	0	0
13JUL-15JUL	3	19	46	43	20	6	0	0	0	0	0	0
26JUL-28JUL	0	0	6	25	38	37	18	3	0	0	0	0
09AUG-12AUG	0	0	1	7	8	19	24	32	19	2	3	1
23AUG-29AUG	0	0	0	0	1	5	12	16	37	23	12	4
07SEP-10SEP	0	0	0	0	1	1	4	11	19	24	28	13
20SEP-23SEP	0	0	0	0	0	0	1	2	12	13	27	23
06OCT-08OCT	0	0	0	0	0	0	0	2	3	16	30	39
20OCT-22OCT	0	0	0	0	0	0	0	3	3	12	19	33
02NOV-04NOV	0	0	0	0	0	0	0	1	5	5	21	15
	======	======	======	======	======	======	======	======	======	======	======	======
	6	29	59	76	68	68	59	70	98	95	140	128

DATES	75.0-79.9	80.0-84.9	85.0-89.9	90.0-94.9	95.0-99.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	0	0	20	23.3	18.0	22.5	30.0	3.7
13JUL-15JUL	0	0	0	0	0	137	29.9	19.0	30.0	44.0	5.2
26JUL-28JUL	0	0	0	0	0	127	38.7	25.0	39.0	54.0	5.8
09AUG-12AUG	1	0	0	0	0	118	48.5	27.0	49.5	75.0	8.8
23AUG-29AUG	1	0	0	0	0	119	57.3	38.0	58.0	75.0	7.4
07SEP-10SEP	2	1	0	0	0	113	62.0	39.0	62.0	80.0	7.6
20SEP-23SEP	12	9	2	0	0	102	68.8	45.0	69.0	85.0	8.0
06OCT-08OCT	20	15	2	0	0	127	71.1	51.0	71.0	89.0	6.8
20OCT-22OCT	36	12	4	2	2	126	72.9	51.0	73.0	98.0	8.2
02NOV-04NOV	15	9	3	2	0	79	71.4	52.0	72.0	92.0	8.3
	======	======	======	======	======	======					
	87	46	11	4	2	1068					

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, 1993

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	95.0-99.9	100.0-104.9
19JUL-24JUL	0	0	0	0	0	9	7	21	24	22	17	9	8	3	1
02AUG-06AUG	0	0	0	1	1	4	14	27	16	25	14	14	12	8	3
16AUG-20AUG	0	0	0	0	0	1	12	25	26	30	26	11	11	12	4
30AUG-03SEP	2	1	2	0	0	3	12	16	12	26	14	13	5	4	2
14SEP-18SEP	0	0	0	0	0	3	7	16	19	22	11	12	6	8	4
27SEP-01OCT	0	0	0	0	0	0	0	8	12	17	19	15	7	2	0
11OCT-15OCT	0	0	1	0	0	0	0	2	1	6	11	6	13	11	9
25OCT-29OCT	0	0	0	0	0	0	0	0	0	0	2	7	5	7	14
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	2	1	3	1	1	20	52	115	110	148	114	87	67	55	37

DATES	105.0-109.9	110.0-114.9	115.0-119.9	120.0-124.9	125.0-129.9	130.0-134.9	135.0-139.9	140.0-144.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	0	0	0	0	0	122	75.0	56.0	74.0	102.0	10.1
02AUG-06AUG	0	3	0	0	0	0	0	0	144	77.1	47.0	76.0	114.0	12.6
16AUG-20AUG	1	2	0	0	0	0	0	0	161	78.6	59.0	77.0	110.0	11.2
30AUG-03SEP	1	0	0	0	0	0	0	0	115	74.8	32.0	76.0	105.0	13.3
14SEP-18SEP	1	1	2	0	0	0	0	0	114	78.9	56.0	77.5	116.0	12.9
27SEP-01OCT	2	1	0	0	1	0	0	0	84	81.3	65.0	81.0	126.0	10.4
11OCT-15OCT	5	3	2	0	1	1	0	1	73	93.6	42.0	94.0	140.0	15.0
25OCT-29OCT	13	8	8	1	3	2	3	1	74	106.7	80.0	106.0	140.0	13.5
	======	======	======	======	======	======	======	======	======					
	23	18	12	1	5	3	3	2	887					

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, 1993

DATES	65.0-69.9	70.0-74.9	75.0-79.9	80.0-84.9	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9	110.0-114.9	115.0-119.9
01JUL-03JUL	1	0	2	0	0	0	0	0	0	0	0
13JUL-15JUL	0	0	0	0	0	0	0	0	0	0	0
26JUL-28JUL	0	0	0	0	0	0	0	0	0	0	0
09AUG-12AUG	0	0	0	0	0	0	0	0	0	0	0
23AUG-29AUG	0	0	0	0	0	0	0	0	0	0	0
07SEP-10SEP	0	0	0	0	0	0	0	0	0	0	0
20SEP-23SEP	0	0	0	0	0	1	0	0	0	1	0
06OCT-08OCT	0	0	0	0	0	0	0	1	0	0	1
20OCT-22OCT	0	0	0	0	0	0	0	0	1	1	0
02NOV-04NOV	0	0	0	0	0	0	0	0	0	0	0
	======	======	======	======	======	======	======	======	======	======	======
	1	0	2	0	0	1	0	1	1	2	1

DATES	120.0-124.9	125.0-129.9	130.0-134.9	135.0-139.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	0	3	73.7	69.0	75.0	77.0	4.2
13JUL-15JUL	0	0	0	0	0	.	.	.	.	.
26JUL-28JUL	0	0	0	0	0	.	.	.	.	.
09AUG-12AUG	0	0	0	0	0	.	.	.	.	.
23AUG-29AUG	0	0	0	0	0	.	.	.	.	.
07SEP-10SEP	0	0	0	0	0	.	.	.	.	.
20SEP-23SEP	0	0	0	0	2	101.0	91.0	101.0	111.0	14.1
06OCT-08OCT	0	0	0	1	3	118.0	100.0	118.0	136.0	18.0
20OCT-22OCT	0	0	0	0	2	110.0	107.0	110.0	113.0	4.2
02NOV-04NOV	0	0	0	0	0	.	.	.	.	.
	======	======	======	======	======					
	0	0	0	1	10					

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 BAY ANCHOVY IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

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
19JUL-24JUL	0	3	32	87	37	5	3	1	0
02AUG-06AUG	1	6	20	33	76	37	2	1	0
16AUG-20AUG	1	1	4	14	35	60	45	14	0
30AUG-03SEP	0	0	7	8	30	45	59	22	4
14SEP-18SEP	0	0	5	10	18	51	47	35	7
27SEP-01OCT	0	0	4	8	33	39	22	35	22
11OCT-15OCT	0	0	5	10	26	48	29	36	17
25OCT-29OCT	0	0	2	16	21	46	33	13	18
	======	======	======	======	======	======	======	======	======
	2	10	79	186	276	331	240	157	68

DATES	55.0-59.9	60.0-64.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	168	27.5	16.0	27.0	45.0	4.4
02AUG-06AUG	0	0	176	30.3	11.0	31.0	46.0	5.4
16AUG-20AUG	0	0	174	36.5	11.0	37.0	49.0	6.0
30AUG-03SEP	0	0	175	38.1	21.0	39.0	54.0	6.2
14SEP-18SEP	3	1	177	39.4	20.0	40.0	63.0	7.1
27SEP-01OCT	14	1	179	41.2	21.0	40.0	61.0	9.0
11OCT-15OCT	4	1	176	39.9	20.0	39.0	63.0	8.0
25OCT-29OCT	8	2	159	39.6	23.0	38.0	62.0	8.3
	======	======	======					
	29	5	1384					

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 BAY ANCHOVY IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

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+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	0	0	0	0	0	0	0	.	.	.	.	.
13JUL-15JUL	10	7	4	0	0	0	0	0	0	21	25.3	20.0	26.0	33.0	4.1
26JUL-28JUL	0	4	9	9	2	0	0	0	0	24	33.7	27.0	33.5	42.0	3.7
09AUG-12AUG	0	2	8	32	39	13	0	0	0	94	39.6	25.0	40.0	47.0	4.4
23AUG-29AUG	0	0	0	13	34	20	4	0	0	71	43.0	35.0	43.0	50.0	3.9
07SEP-10SEP	0	0	1	1	27	33	13	0	0	75	45.8	33.0	46.0	54.0	4.1
20SEP-23SEP	0	0	5	12	23	22	18	6	0	86	45.4	31.0	46.0	59.0	6.3
06OCT-08OCT	1	4	3	2	3	2	8	4	0	27	42.6	22.0	45.0	59.0	11.0
20OCT-22OCT	0	1	7	8	2	4	5	5	0	32	42.2	29.0	40.5	58.0	9.7
02NOV-04NOV	0	0	0	0	0	1	0	2	0	3	53.0	49.0	55.0	55.0	3.5
	======	======	======	======	======	======	======	======	======	======					
	11	18	37	77	130	95	48	17	0	433					

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 LARVAL AND YOUNG-OF-YEAR AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1993

DATES	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	30.0-31.9
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	6	60	[illegible]	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	0	18	111	101	1	0	0	0	0	0	0	0	0
24MAY-29MAY	0	3	12	15	44	42	28	17	0	0	0	0	0	0
31MAY-05JUN	0	4	2	4	16	22	17	15	9	2	1	0	0	0
07JUN-11JUN	0	0	3	1	7	21	44	33	36	29	11	1	0	0
14JUN-18JUN	0	0	0	0	0	1	6	14	34	26	33	5	3	0
21JUN-26JUN	0	0	2	0	0	0	2	2	3	14	26	23	29	41
28JUN-03JUL	0	0	0	0	0	0	10	26	30	8	3	4	6	29
06JUL-09JUL	0	0	0	0	0	0	1	2	12	11	9	2	10	15
12JUL-14JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26JUL-28JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10AUG-12AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DATES	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
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14JUN-18JUN	2	0	1	0	0	0	0	0	0	0	0	0	0	0
21JUN-26JUN	23	12	8	1	0	0	0	0	0	0	0	0	0	0
28JUN-03JUL	32	20	25	18	9	5	7	0	1	1	0	0	0	0
06JUL-09JUL	4	6	7	5	7	19	12	11	10	11	8	3	7	5
12JUL-14JUL	0	0	0	0	0	0	0	0	0	0	0	1	1	5
26JUL-28JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10AUG-12AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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
12APR-16APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19APR-23APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26APR-01MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03MAY-07MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10MAY-14MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17MAY-21MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24MAY-29MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31MAY-05JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07JUN-11JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14JUN-18JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21JUN-26JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28JUN-03JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06JUL-09JUL	4	2	1	0	0	0	0	0	0	0	0	0	0	0
12JUL-14JUL	0	6	10	5	2	4	0	0	1	0	0	0	0	0
26JUL-28JUL	0	0	0	0	0	0	1	0	1	0	0	0	0	0
10AUG-12AUG	0	0	0	0	0	1	0	0	0	0	0	0	0	0

DATES	88.0-89.9	90.0-91.9	92.0-93.9	94.0-95.9	96.0-97.9	98.0-99.9	100.0-101.9+	N	MEAN	MIN	MED	MAX	SD
12APR-16APR	0	0	0	0	0	0	0	0	.	.	.	.	.
19APR-23APR	0	0	0	0	0	0	0	0	.	.	.	.	.
26APR-01MAY	0	0	0	0	0	0	0	0	.	.	.	.	.
03MAY-07MAY	0	0	0	0	0	0	0	0	.	.	.	.	.
10MAY-14MAY	0	0	0	0	0	0	0	143	9.8	7.3	10.0	11.3	0.9
17MAY-21MAY	0	0	0	0	0	0	0	231	11.6	8.6	11.7	14.2	1.1
24MAY-29MAY	0	0	0	0	0	0	0	165	14.3	7.4	14.3	19.5	2.9
31MAY-05JUN	0	0	0	0	0	0	0	93	15.8	6.0	15.7	24.4	3.7
07JUN-11JUN	0	0	0	0	0	0	0	189	19.0	9.1	19.3	26.7	3.3
14JUN-18JUN	0	0	0	0	0	0	0	129	22.7	15.3	22.6	36.0	3.2
21JUN-26JUN	0	0	0	0	0	0	0	192	28.4	9.0	29.0	39.0	4.5
28JUN-03JUL	0	0	0	0	0	0	0	237	29.9	16.2	31.7	50.0	8.1
06JUL-09JUL	0	0	0	0	0	0	0	188	39.1	16.2	41.0	64.0	12.0
12JUL-14JUL	0	0	0	0	0	0	0	35	64.3	55.0	64.0	77.0	4.6
26JUL-28JUL	0	0	0	0	0	0	0	2	74.5	73.0	74.5	76.0	2.1
10AUG-12AUG	0	0	0	0	0	0	0	1	70.0	70.0	70.0	70.0	.

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-11 (CONT.)

DATES	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	30.0-31.9
23AUG-25AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07SEP-09SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20SEP-21SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	0	13	100	205	168	87	108	109	124	90	83	35	48	85

DATES	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
23AUG-25AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07SEP-09SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20SEP-21SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	61	38	41	24	16	24	19	11	11	12	8	4	8	10

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
23AUG-25AUG	0	0	0	1	1	1	2	1	1	2	0	0	0	0
07SEP-09SEP	0	0	0	0	0	0	0	1	1	1	0	1	0	0
20SEP-21SEP	0	0	0	0	0	0	0	0	0	1	0	1	0	1
04OCT-05OCT	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	4	8	11	6	3	6	3	2	4	4	0	3	0	1

DATES	88.0-89.9	90.0-91.9	92.0-93.9	94.0-95.9	96.0-97.9	98.0-99.9	100.0-101.9+	N	MEAN	MIN	MED	MAX	SD
23AUG-25AUG	0	0	0	0	0	0	0	9	73.0	66.0	73.0	79.0	4.4
07SEP-09SEP	0	0	0	0	0	0	0	4	78.3	75.0	78.0	82.0	3.0
20SEP-21SEP	0	1	0	0	0	1	0	5	87.2	79.0	86.0	98.0	7.3
04OCT-05OCT	0	0	1	0	1	0	1	4	93.0	82.0	95.0	100.0	7.9
	======	======	======	======	======	======	======	======					
	0	1	1	0	1	1	1	1627					

....

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 AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATES	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
19JUL-24JUL	1	1	1	5	2	5	3	14	24	13	1	1	0
02AUG-06AUG	0	0	1	0	2	1	3	4	15	27	2	1	2
16AUG-20AUG	0	0	0	0	0	2	4	4	8	30	10	3	0
30AUG-03SEP	0	0	0	0	0	0	0	0	5	10	15	1	2
14SEP-18SEP	0	0	0	0	0	0	0	5	7	7	8	5	1
27SEP-01OCT	0	0	0	0	0	0	0	0	6	5	13	6	2
11OCT-15OCT	0	0	0	0	0	0	0	0	3	7	11	3	4
25OCT-29OCT	0	0	0	0	0	0	0	0	0	1	5	19	16
	======	======	======	======	======	======	======	======	======	======	======	======	======
	1	1	2	5	4	8	10	27	68	100	65	39	27

DATES	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9	110.0-114.9	115.0-119.9	120.0-124.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	0	0	0	0	71	61.9	25.0	66.0	80.0	10.8
02AUG-06AUG	0	0	0	0	0	0	0	59	68.0	36.0	70.0	86.0	8.4
16AUG-20AUG	0	0	0	0	0	0	0	63	70.0	51.0	72.0	84.0	6.8
30AUG-03SEP	1	0	0	0	0	0	0	34	75.4	67.0	75.5	90.0	5.4
14SEP-18SEP	0	0	0	0	0	0	0	34	72.0	60.0	72.0	85.0	6.9
27SEP-01OCT	1	2	0	0	0	0	0	35	77.3	66.0	77.0	97.0	7.8
11OCT-15OCT	2	0	2	0	0	0	0	32	79.0	65.0	78.0	102.0	8.7
25OCT-29OCT	5	2	3	1	0	0	1	53	86.5	70.0	85.0	120.0	8.5
	======	======	======	======	======	======	======	======					
	9	4	5	1	0	0	1	381					

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 AMERICAN SHAD IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

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	75.0-79.9	80.0-84.9
01JUL-03JUL	4	4	6	26	36	21	5	4	0	0	0	0	0
13JUL-15JUL	0	1	4	16	17	20	31	40	18	12	2	0	0
26JUL-28JUL	0	0	1	1	8	13	23	26	36	35	5	0	0
09AUG-12AUG	0	0	0	0	0	1	0	6	22	39	21	4	0
23AUG-29AUG	0	0	0	0	0	0	2	4	6	21	37	11	2
07SEP-10SEP	0	0	0	0	0	0	0	0	0	6	31	36	7
20SEP-23SEP	0	0	0	0	0	0	0	0	0	2	17	36	20
06OCT-08OCT	0	0	0	0	0	0	0	0	1	4	16	38	31
20OCT-22OCT	0	0	0	0	0	0	0	0	0	0	10	36	27
02NOV-04NOV	0	0	0	0	0	0	0	0	0	1	5	21	31
	======	======	======	======	======	======	======	======	======	======	======	======	======
	4	5	11	43	61	55	61	80	83	120	144	182	118

DATES	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9	110.0-114.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	0	0	0	106	40.9	21.0	41.5	58.0	7.4
13JUL-15JUL	0	0	0	0	0	0	163	52.1	26.0	53.0	74.0	9.5
26JUL-28JUL	0	0	0	0	0	0	156	58.5	31.0	60.0	73.0	8.0
09AUG-12AUG	1	0	0	0	0	0	97	66.3	46.0	67.0	85.0	5.4
23AUG-29AUG	0	0	0	0	0	0	83	69.8	51.0	70.0	81.0	5.6
07SEP-10SEP	0	0	0	0	0	0	80	74.8	65.0	75.0	83.0	3.6
20SEP-23SEP	6	0	0	0	0	0	81	77.5	66.0	78.0	89.0	4.4
06OCT-08OCT	8	2	2	0	0	0	102	78.4	64.0	78.0	95.0	5.6
20OCT-22OCT	4	1	0	0	0	1	80	79.1	60.0	79.0	114.0	6.0
02NOV-04NOV	12	4	0	0	0	0	74	80.7	66.0	81.0	93.0	5.1
	======	======	======	======	======	======	======					
	31	7	2	0	0	1	1022					

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 ALEWIFE IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

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
19JUL-24JUL	0	0	1	2	5	8	7	4	3	0	1
02AUG-06AUG	1	0	2	1	5	4	4	4	0	3	0
16AUG-20AUG	0	0	0	0	0	0	6	7	15	4	0
30AUG-03SEP	0	0	0	0	0	1	4	3	3	1	0
14SEP-18SEP	0	0	0	1	0	0	2	2	9	12	3
27SEP-01OCT	0	0	0	1	0	0	0	3	7	5	9
11OCT-15OCT	0	0	0	0	0	0	4	1	8	8	11
25OCT-29OCT	0	0	0	0	1	3	3	7	5	4	7
	======	======	======	======	======	======	======	======	======	======	======
	1	0	3	5	11	16	30	31	50	37	31

DATES	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	0	35	59.7	43.0	60.0	82.0	8.0
02AUG-06AUG	0	1	0	0	26	59.5	30.0	59.5	91.0	12.5
16AUG-20AUG	0	0	0	0	33	69.2	60.0	70.0	76.0	4.3
30AUG-03SEP	0	1	0	0	13	68.8	59.0	68.0	92.0	8.9
14SEP-18SEP	3	0	1	0	33	75.2	49.0	75.0	96.0	8.3
27SEP-01OCT	3	0	0	0	28	76.4	48.0	78.5	89.0	8.4
11OCT-15OCT	7	5	0	0	44	78.7	62.0	80.0	91.0	7.9
25OCT-29OCT	5	1	2	2	42	75.3	54.0	73.5	104.0	12.5
	======	======	======	======	======					
	18	8	3	2	254					

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 ALEWIFE IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

DATES	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
01JUL-03JUL	0	2	0	1	0	0	0	0	0
13JUL-15JUL	1	48	16	5	6	2	0	0	0
26JUL-28JUL	0	1	10	24	19	8	4	1	0
09AUG-12AUG	0	0	2	5	10	14	11	8	0
23AUG-29AUG	0	0	0	0	1	7	13	4	2
07SEP-10SEP	0	0	0	0	1	7	11	14	4
20SEP-23SEP	0	0	0	0	2	7	5	8	10
06OCT-08OCT	0	0	0	0	2	2	1	2	3
20OCT-22OCT	0	0	0	0	0	0	1	5	0
02NOV-04NOV	0	0	0	0	0	0	4	5	5
	======	======	======	======	======	======	======	======	======
	1	51	28	35	41	47	50	47	24

DATES	80.0-84.9	85.0-89.9	90.0-94.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	3	44.7	41.0	41.0	52.0	6.4
13JUL-15JUL	0	0	0	78	45.0	37.0	43.0	64.0	5.7
26JUL-28JUL	0	0	0	68	54.8	42.0	53.0	73.0	6.2
09AUG-12AUG	0	0	0	54	61.8	45.0	62.5	73.0	6.6
23AUG-29AUG	2	0	0	30	67.3	58.0	66.0	80.0	5.5
07SEP-10SEP	4	0	0	44	69.6	59.0	69.5	83.0	6.4
20SEP-23SEP	3	0	0	35	71.2	58.0	73.0	82.0	6.8
06OCT-08OCT	1	0	0	11	69.7	55.0	73.0	80.0	8.9
20OCT-22OCT	1	1	0	8	73.8	66.0	72.5	86.0	6.3
02NOV-04NOV	4	0	2	20	76.2	65.0	75.0	94.0	8.1
	======	======	======	======					
	15	1	2	351					

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 BLUEBACK HERRING IN HUDSON RIVER ESTUARY DETERMINED FROM FALL SHOALS SURVEY, 1993

DATES	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
19JUL-24JUL	0	9	22	18	5	2	1	0
02AUG-06AUG	0	4	10	22	47	8	1	0
16AUG-20AUG	1	3	10	13	54	8	4	2
30AUG-03SEP	3	7	8	12	23	3	3	0
14SEP-18SEP	0	8	7	16	17	6	4	8
27SEP-01OCT	0	1	6	9	13	5	12	10
11OCT-15OCT	0	5	7	17	18	8	11	8
25OCT-29OCT	2	3	7	30	51	19	27	17
	======	======	======	======	======	======	======	======
	6	40	77	137	228	59	63	45

DATES	75.0-79.9	80.0-84.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	59	49.7	41.0	49.0	65.0	5.7
02AUG-06AUG	0	0	98	54.8	41.0	56.0	67.0	4.8
16AUG-20AUG	0	0	107	56.1	36.0	57.0	70.0	5.6
30AUG-03SEP	0	0	65	53.4	36.0	55.0	68.0	7.3
14SEP-18SEP	1	0	77	56.4	40.0	56.0	77.0	8.7
27SEP-01OCT	5	0	67	61.3	41.0	60.0	79.0	8.8
11OCT-15OCT	2	0	79	57.8	40.0	57.0	77.0	8.9
25OCT-29OCT	3	2	172	59.4	37.0	58.0	83.0	8.1
	======	======	======					
	11	2	724					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE D-17 LENGTH FREQUENCY DISTRIBUTION OF BLUEBACK HERRING IN HUDSON RIVER ESTUARY DETERMINED FROM BEACH SEINE SURVEY, 1993

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
01JUL-03JUL	0	0	3	0	0	0	0	0	0
13JUL-15JUL	1	13	56	18	10	1	0	0	0
26JUL-28JUL	0	3	50	54	25	9	3	0	0
09AUG-12AUG	0	4	20	4	19	29	12	5	0
23AUG-29AUG	0	0	0	4	18	28	5	8	1
07SEP-10SEP	0	0	2	6	15	19	10	5	6
20SEP-23SEP	0	0	0	3	9	17	11	22	13
06OCT-08OCT	0	0	4	9	16	17	15	14	7
20OCT-22OCT	0	0	3	9	20	22	7	8	5
02NOV-04NOV	0	0	4	5	15	23	14	10	4
	======	======	======	======	======	======	======	======	======
	1	20	142	112	147	165	77	72	36

DATES	75.0-79.9	80.0-84.9	85.0-89.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	3	41.3	40.0	41.0	43.0	1.5
13JUL-15JUL	0	0	0	99	42.9	34.0	42.0	57.0	4.3
26JUL-28JUL	0	0	0	147	47.3	37.0	46.0	62.0	5.3
09AUG-12AUG	0	0	0	94	53.0	38.0	54.5	68.0	8.0
23AUG-29AUG	0	0	0	65	56.9	45.0	56.0	70.0	5.8
07SEP-10SEP	9	0	0	80	59.9	42.0	59.0	78.0	9.0
20SEP-23SEP	5	1	0	85	63.4	46.0	64.0	82.0	7.9
06OCT-08OCT	5	0	1	95	59.6	42.0	60.0	85.0	8.9
20OCT-22OCT	5	0	0	84	57.9	40.0	58.0	78.0	8.5
02NOV-04NOV	4	0	0	86	58.4	40.0	58.0	79.0	7.9
	======	======	======	======					
	28	1	1	838					

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, 1993

DATES	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
19JUL-24JUL	1	2	1	0	0	0	0	0
02AUG-06AUG	0	0	0	0	0	0	0	0
16AUG-20AUG	0	0	0	2	1	1	0	0
30AUG-03SEP	0	0	0	0	0	0	0	0
14SEP-18SEP	0	0	0	0	0	1	6	4
27SEP-01OCT	0	0	0	0	0	0	0	1
11OCT-15OCT	0	0	0	0	1	3	9	6
25OCT-29OCT	0	0	0	0	0	2	2	1
	======	======	======	======	======	======	======	======
	1	2	1	2	2	7	17	12

DATES	75.0-79.9	80.0-84.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	4	41.0	35.0	41.5	46.0	4.7
02AUG-06AUG	0	0	0	.	.	.	.	.
16AUG-20AUG	0	0	4	55.5	52.0	54.5	61.0	3.9
30AUG-03SEP	0	0	0	.	.	.	.	.
14SEP-18SEP	7	1	19	72.2	63.0	72.0	80.0	5.4
27SEP-01OCT	0	0	1	72.0	72.0	72.0	72.0	.
11OCT-15OCT	1	0	20	67.6	56.0	68.5	77.0	5.2
25OCT-29OCT	3	1	9	72.1	63.0	74.0	82.0	7.2
	======	======	======					
	11	2	57					

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, 1993

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
01JUL-03JUL	2	2	18	41	26	2	1	0	0	0	0
13JUL-15JUL	0	0	2	7	25	68	49	4	0	0	0
26JUL-28JUL	0	0	0	1	2	10	21	37	43	6	0
09AUG-12AUG	0	0	0	0	0	1	10	25	23	23	0
23AUG-29AUG	0	0	0	0	0	0	0	1	12	13	11
07SEP-10SEP	0	0	0	0	0	0	0	0	2	8	20
20SEP-23SEP	0	0	0	0	0	0	0	0	1	2	1
06OCT-08OCT	0	0	0	0	0	0	0	0	1	5	5
20OCT-22OCT	0	0	0	0	0	0	0	0	1	1	3
02NOV-04NOV	0	0	0	0	0	0	0	0	1	3	16
	======	======	======	======	======	======	======	======	======	======	======
	2	2	20	49	53	81	81	67	84	61	56

DATES	65.0-69.9	70.0-74.9	75.0-79.9	80.0-84.9	85.0-89.9+	N	MEAN	MIN	MED	MAX	SD
01JUL-03JUL	0	0	0	0	0	92	27.2	13.0	28.0	41.0	4.4
13JUL-15JUL	0	0	0	0	0	155	37.3	23.0	38.0	45.0	4.4
26JUL-28JUL	0	0	0	0	0	120	47.1	26.0	48.0	57.0	5.6
09AUG-12AUG	0	0	0	0	0	85	51.0	39.0	51.0	60.0	5.2
23AUG-29AUG	10	4	0	0	0	51	60.1	49.0	59.0	73.0	6.5
07SEP-10SEP	11	8	0	0	0	53	63.3	52.0	63.0	71.0	4.8
20SEP-23SEP	9	17	12	3	0	45	71.8	53.0	72.0	82.0	6.4
06OCT-08OCT	12	11	4	3	1	44	68.1	52.0	68.0	85.0	7.7
20OCT-22OCT	6	9	15	12	1	50	73.5	51.0	75.5	85.0	7.8
02NOV-04NOV	8	27	19	7	2	83	71.2	52.0	72.0	87.0	7.1
	======	======	======	======	======	======					
	56	76	50	25	4	778					

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, 1993

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
19JUL-24JUL	0	2	8	7	4	2	0	0	0	0	0	0	0
02AUG-06AUG	2	2	2	1	3	4	6	4	0	0	0	0	0
16AUG-20AUG	0	0	0	0	1	1	6	6	2	3	3	0	0
30AUG-03SEP	0	0	0	0	0	2	0	4	3	4	6	3	0
14SEP-18SEP	0	0	0	0	0	0	0	1	0	0	0	2	12
27SEP-01OCT	0	0	0	0	0	0	0	0	2	3	2	9	4
11OCT-15OCT	0	0	0	0	0	0	0	0	0	1	3	4	6
25OCT-29OCT	0	0	0	0	0	0	0	1	2	1	1	4	5
	======	======	======	======	======	======	======	======	======	======	======	======	======
	2	4	10	8	8	9	12	16	9	12	15	22	27

DATES	80.0-84.9	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	0	0	0	23	30.7	21.0	30.0	43.0	5.7
02AUG-06AUG	0	0	0	0	0	0	24	38.9	15.0	43.5	52.0	11.3
16AUG-20AUG	0	0	0	0	0	0	23	53.4	35.0	52.0	68.0	8.5
30AUG-03SEP	3	1	3	0	0	0	30	66.4	42.0	66.5	93.0	13.8
14SEP-18SEP	10	5	13	2	1	0	46	83.7	50.0	83.5	100.0	8.7
27SEP-01OCT	6	5	9	4	0	0	44	80.4	56.0	81.5	97.0	11.1
11OCT-15OCT	9	4	6	5	0	1	39	83.3	64.0	83.0	105.0	10.0
25OCT-29OCT	7	5	3	3	1	0	34	79.2	54.0	80.5	102.0	12.1
	======	======	======	======	======	======	======					
	35	20	34	14	2	1	263					

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, 1993

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	70.0-74.9	75.0-79.9	80.0-84.9
19JUL-24JUL	1	0	0	3	3	3	11	20	27	20	9	9	2	0	0
02AUG-06AUG	3	5	10	14	8	7	7	1	3	6	5	9	15	10	9
16AUG-20AUG	0	0	0	5	12	14	17	19	19	23	6	5	3	1	13
30AUG-03SEP	0	0	1	0	0	0	0	7	18	23	17	19	9	10	3
14SEP-18SEP	0	0	0	0	3	4	5	3	1	0	2	7	9	24	14
27SEP-01OCT	0	0	0	0	0	0	0	0	0	1	0	0	2	8	8
11OCT-15OCT	0	0	0	0	0	0	0	0	0	3	2	0	2	1	8
25OCT-29OCT	0	0	0	0	0	0	0	0	1	0	0	0	5	2	2
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	4	5	11	22	26	28	40	50	69	76	41	49	47	56	57

DATES	85.0-89.9	90.0-94.9	95.0-99.9	100.0-104.9	105.0-109.9	110.0-114.9	115.0-119.9	120.0-124.9	125.0-129.9	130.0-134.9	135.0-139.9	140.0-144.9	145.0-149.9	150.0-154.9	155.0-159.9
19JUL-24JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02AUG-06AUG	8	3	2	0	0	0	0	0	0	0	0	0	0	0	0
16AUG-20AUG	3	11	3	4	2	1	0	0	0	0	0	0	0	0	0
30AUG-03SEP	4	0	1	0	2	0	1	1	3	2	1	2	0	0	0
14SEP-18SEP	16	4	5	3	0	1	1	2	2	0	2	2	0	1	1
27SEP-01OCT	13	7	10	5	2	1	2	4	1	2	1	2	1	0	4
11OCT-15OCT	8	12	11	10	3	2	4	1	0	1	1	2	2	0	2
25OCT-29OCT	0	4	5	8	7	10	3	3	0	1	2	1	1	0	0
	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
	52	41	37	30	16	15	11	11	6	6	7	9	4	1	7

DATES	160.0-164.9	165.0-169.9	170.0-174.9	175.0-179.9	180.0-184.9	185.0-189.9	190.0-194.9+	N	MEAN	MIN	MED	MAX	SD
19JUL-24JUL	0	0	0	0	0	0	0	111	51.4	12.0	52.0	70.0	10.0
02AUG-06AUG	0	0	0	0	0	0	0	128	53.7	11.0	58.5	98.0	24.3
16AUG-20AUG	0	0	0	0	0	0	0	163	57.7	27.0	53.0	111.0	20.8
30AUG-03SEP	0	0	0	0	0	0	0	131	68.5	22.0	63.0	140.0	21.3
14SEP-18SEP	0	1	0	0	0	0	0	114	81.0	31.0	79.0	165.0	25.8
27SEP-01OCT	1	1	0	2	1	0	0	79	104.2	59.0	95.0	184.0	28.9
11OCT-15OCT	1	1	0	0	1	1	2	81	104.2	58.0	96.0	191.0	29.8
25OCT-29OCT	1	2	0	0	0	0	0	58	106.3	51.0	105.5	169.0	23.2
	======	======	======	======	======	======	======	======					
	3	5	0	2	2	1	2	865					

NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

Appendix E

Numbers of Fish Collected in the Ichthyoplankton, Fall Shoals, and Beach Seine Surveys, 1988-1993

APPENDIX E

LIST OF TABLES

TABLE E-1 TOTAL NUMBER OF FISH COLLECTED IN THE LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1988-1993

GROUP	NAME	YEAR OF DATA COLLECTION 88	89	90	91	92	93
ANADROMOUS	ALEWIFE	8,200	624	60	2,727	555	1,275
	ALOSA UNIDENTIFIED	258,802	423,742	714,369	250,755	465,613	191,558
	AMERICAN SHAD	51,162	62,755	49,242	25,128	30,345	15,867
	ATLANTIC STURGEON	11	2	5	26	4	.
	ATLANTIC TOMCOD	25,414	37,397	38,431	40,804	10,558	21,343
	BLUEBACK HERRING	4,992	2,568	1,230	28,397	30,496	3,290
	HICKORY SHAD	.	.	.	.	.	.
	MORONE UNIDENTIFIED	2,180	13,473	955	17,620	7,246	12,406
	RAINBOW SMELT	24,693	767	6,838	2,494	23,035	12,002
	STRIPED BASS	61,072	225,498	264,907	359,994	462,382	459,384
	STURGEON UNIDENTIFIED	4	6	18	9	.	.
CATADROMOUS	AMERICAN EEL	789	917	848	1,372	827	1,505
ESTUARINE	ATLANTIC SILVERSIDE	152	11	67	49	27	19
	BANDED KILLIFISH	5	2,274	1	.	5	3
	FOURSPINE STICKLEBACK	6	1	1	2	1	7
	HOGCHOKER	301,192	589,469	13,591	908,378	44,337	87,673
	INLAND SILVERSIDE	98	101	.	58	42	209
	MUMMICHOG	1	.	.	.	.	.
	NORTHERN PIPEFISH	1,135	153	102	2,059	137	416
	SCUP	.	.	.	1	.	.
	SEA HORSE	11	.	1	9	.	.
	SHORTNOSE STURGEON	3	.	2	3	3	14
	THREESPINE STICKLEBACK	2	.	1	.	.	2
	WHITE CATFISH	77	100	87	76	52	25
	WHITE PERCH	138,753	198,953	157,348	147,232	265,656	221,021
FRESHWATER	BLUEGILL	.	.	.	5	.	.
	BROWN BULLHEAD	1	12	33	30	4	7
	BROWN TROUT	.	.	1	.	1	.
	CARP	730	651	.	340	731	136
	CATOSTOMIDAE UNIDENT.	.	.	.	1	1	.
	CENTRARCHID UNIDENT	30	66	46	40	132	40
	CHANNEL CATFISH	.	.	.	1	1	.
	COMMON SHINER	.	.	12	.	.	.
	FATHEAD MINNOW	.	.	1	.	.	.
	FRESHWATER DRUM	.	.	.	.	1	1
	FUNDULUS SP.	.	2	4	3	1	111
	GIZZARD SHAD	.	85	5	3	535	123
	GOLDEN SHINER	.	1	7	.	.	1
	GOLDFISH	113	217	.	97	22	7
	LARGEMOUTH BASS	.	1	.	2	.	1
	LOGPERCH	48	20	.	.	179	.
	MINNOW UNIDENTIFIED	470	1,736	6,839	1,764	2,576	2,276
	NORTHERN HOGSUCKER	19	.	.	.	.	.
	PERCID UNIDENTIFIED	2	15	.	18	.	.
	PUMPKINSEED	132	1	.	2	.	4
	ROCK BASS	.	.	.	.	1	.
	SMALLMOUTH BASS	.	3	1	.	23	.
	SPOTTAIL SHINER	60	98	55	83	45	33
	TESSELATED DARTER	2,898	2,805	2,290	1,566	2,836	1,936
	WALLEYE	.	26	.	1	2	12
	WHITE CRAPPIE	.	.	.	.	.	.
	WHITE SUCKER	.	10	44	.	1	.
	YELLOW BULLHEAD	.	.	.	.	.	.
	YELLOW PERCH	152	325	610	157	369	225
MARINE	AMERICAN SANDLANCE	48	8	2	4	4	.
	ATHERINID UNIDENTIFIED	.	1	.	259	.	16
	ATLANTIC COD	68	.	.	.	.	.
	ATLANTIC CROAKER	.	.	.	.	157	1
	ATLANTIC HERRING	522	178	76	1,177	842	1,151
	ATLANTIC MACKEREL	4	.	.	1	2	.
	ATLANTIC MENHADEN	6	12	671	1,301	404	268
	ATLANTIC NEEDLEFISH	.	.	3	.	.	1
	BAY ANCHOVY	2,852,331	444,854	900,354	3,831,982	1,341,076	1,849,143
	BLACK SEA BASS	.	.	.	.	.	.
	BLACKCHEEK TONGUEFISH	.	.	.	.	10	.
	BLUEFISH	85	54	165	151	147	78
	BOTHID UNIDENTIFIED	.	.	.	1	.	.
	BUTTERFISH	143	18	18	27	46	38
	CONGER EEL	132	72	54	29	124	195
	CREVALLE JACK	1	4	.	1	.	.
	CUNNER	11,129	1,429	.	1,955	4,221	996
	FOUR BEARDED ROCKLING	108	209	2	404	691	4
	FOUR SPOT FLOUNDER	.	1	.	.	.	.
	GADIDAE	6	.	.	.	.	10
	GOBIIDAE	9,007	5,593	22,569	78,349	26,599	3,794

TABLE E-1 (CONT.)

GROUP	NAME	88	89	90	91	92	93
		YEAR OF DATA COLLECTION					
MARINE	GOOSEFISH	.	.	.	8	12	.
	GRUBBY	605	387	167	521	248	66
	HIGHTAIL GOBY	.	.	1	.	.	.
	INSHORE LIZARDFISH	8	8	.	3	14	1
	KING MACKEREL	.	.	.	1	.	.
	LABRIDAE UNIDENTIFIED	.	.	.	48	.	.
	LONGHORN SCULPIN	.	2	.	.	.	2
	MENIDIA SP.	12	7	193	.	2	.
	MOONFISH	.	.	.	.	.	.
	NAKED GOBY	279	44	1,619	8	73	9
	NORTHERN KINGFISH	.	118	.	10	10	1
	NORTHERN PUFFER	1	5	32	279	.	2
	NORTHERN SEAROBIN	40	2	17	19	1	4
	NORTHERN STARGAZER	129	.	.	.	.	.
	OYSTER TOADFISH	.	1	.	.	.	.
	PLEURONECTID UNIDENT.	.	.	.	144	.	.
	RED HAKE	3	1	1	.	1	1
	ROCK GUNNEL	9	2	1	5	6	.
	ROUGH SILVERSIDE	110	19	.	41	44	30
	SEA ROBIN	8	.	312	26	.	16
	SEABORD GOBY	1	.	.	4	19	1
	SILVER HAKE	1	3	.	.	.	.
	SILVER PERCH	.	.	.	.	.	.
	SMALLMOUTH FLOUNDER	38	.	1	91	71	32
	SPANISH MACKEREL	.	.	.	20	.	2
	SPECKLED WORM EEL	1	.	.	.	.	.
	SPOT	.	.	2	.	.	20
	SPOTTED HAKE	62	1	1	19	40	13
	STRIPED ANCHOVY	.	.	.	.	.	.
	STRIPED CUSKEEL	2	1	.	4	3	1
	STRIPED KILLIFISH	.	.	.	.	1	.
	STRIPED SEAROBIN	43	4	.	234	5	41
	SUMMER FLOUNDER	.	24	1	39	18	.
	TAUTOG	1,205	3,432	.	969	488	241
	TETRAODONTIDAE	.	3	.	.	.	.
	WEAKFISH	1,586	2,602	122,082	6,821	1,206	1,621
	WINDOWPANE FLOUNDER	8,866	5,162	49	1,500	14,953	166,221
	WINTER FLOUNDER	900	178	64	340	794	188
	YELLOWTAIL FLOUNDER	.	.	.	.	2	.
UNIDENTIFIED	COTTID UNIDENTIFIED	128	.	.	.	.	.
	CYPRINODONTID UNIDENT.	.	8	.	.	.	5
	SCIAENIDAE	.	3	.	.	.	2
	UNIDENTIFIED	49,244	7,031	36,103	113,576	18,496	9,938

SAMPLING STATISTICS FOR LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1988-1993

	88	89	90	91	92	93
	YEAR OF DATA COLLECTION					
START DATE	18APR88	17APR89	19APR90	15APR91	13APR92	12APR93
END DATE	25AUG88	23AUG89	16AUG90	17OCT91	14OCT92	05OCT93
VOLUME SAMPLED (m^3)	524,777	519,252	419,294	537,825	632,978	596,043
SAMPLE SIZE	1,663	1,641	1,561	1,991	1,986	1,987

TABLE E-2 TOTAL NUMBER OF FISH COLLECTED IN THE BEACH SEINE SURVEY, 1985-1993.

		YEAR OF DATA COLLECTION								
		85	86	87	88	89	90	91	92	93
GROUP	NAME									
ANADROMOUS	ALEWIFE	1,272	818	515	675	439	925	2,323	870	638
	ALOSA UNIDENTIFIED	8,272	2,529	5,685	21,022	8,346	10,853	38,966	3,490	5,237
	AMERICAN SHAD	9,171	14,716	7,641	10,780	13,026	12,261	15,771	15,366	5,122
	ATLANTIC STURGEON	1	.	.	.	3	.	.	.	.
	ATLANTIC TOMCOD	243	148	209	230	81	115	46	328	13
	BLUEBACK HERRING	25,362	12,522	31,373	36,245	19,037	43,555	40,731	29,105	29,722
	HICKORY SHAD	.	.	.	.	.	.	.	.	.
	MORONE UNIDENTIFIED	.	.	1	.	.	.	.	.	.
	RAINBOW SMELT	.	1	.	.	.	2	5	.	5
	STRIPED BASS	1,413	1,854	11,987	6,151	5,585	6,906	10,813	6,156	10,765
CATADROMOUS	AMERICAN EEL	315	163	125	151	107	81	208	127	97
ESTUARINE	ATLANTIC SILVERSIDE	1,197	4,406	1,459	6,760	686	8,383	17,291	6,668	14,493
	BANDED KILLIFISH	5,959	3,514	4,369	4,917	1,948	1,513	3,232	1,243	2,708
	FAT SLEEPER	.	1	.	.	.	.	.	.	.
	FOURSPINE STICKLEBACK	359	525	296	194	12	11	24	15	32
	HOGCHOKER	1,033	276	312	305	261	150	652	329	143
	INLAND SILVERSIDE	464	653	146	406	234	190	160	1,129	9
	MUMMICHOG	455	38	496	414	68	109	183	128	208
	NORTHERN PIPEFISH	844	166	348	297	156	86	689	51	124
	SHORTNOSE STURGEON	.	.	.	.	.	.	.	.	.
	STRIPED MULLET	2	6	1	1	.	.	5	.	.
	THREESPINE STICKLEBACK	2	17	10	3	4	2	4	1	.
	WHITE CATFISH	52	83	86	101	66	23	25	18	16
	WHITE MULLET	4	3	.	.	3	1	2	.	1
	WHITE PERCH	9,938	12,082	12,303	14,607	11,407	8,485	10,033	9,497	11,771
FRESHWATER	BLACK CRAPPIE	.	47	52	10	10	8	12	20	4
	BLACKNOSE DACE	2	.	1	1	.	.	.	.	.
	BLUEGILL	64	57	76	355	159	89	69	61	94
	BLUNTNOSE MINNOW	.	.	.	.	.	.	.	.	.
	BROOK SILVERSIDE	.	.	.	.	.	.	.	.	.
	BROOK STICKLEBACK	.	.	.	.	1	.	.	.	.
	BROWN BULLHEAD	6	41	12	53	28	10	42	40	252
	BROWN TROUT	.	.	.	.	.	.	.	.	.
	CARP	50	102	78	133	86	57	111	90	62
	CENTRARCHID UNIDENT	673	327	388	351	100	106	64	29	42
	CHAIN PICKEREL	.	.	.	.	4	.	.	1	.
	CHANNEL CATFISH	.	.	.	.	.	3	.	.	.
	COMELY SHINER	.	.	.	.	.	.	.	.	1
	COMMON SHINER	.	.	.	1	.	.	.	1	1
	CREEK CHUB	1	.	.	.	.	.	4	.	1
	EMERALD SHINER	4	4	5	22	.	11	8	4	2
	FALLFISH	.	2	.	.	.	.	9	8	2
	FATHEAD MINNOW	1	10	.	.	1	.	.	.	.
	GIZZARD SHAD	3	13	100	10	7	28	22	158	38
	GOLDEN SHINER	460	1,223	647	676	640	817	672	787	659
	GOLDFISH	14	25	16	97	1	3	33	1	29
	GRASS PICKEREL	.	.	.	.	.	1	.	.	.
	GREEN SUNFISH	.	.	.	1	.	.	.	.	.
	LARGEMOUTH BASS	44	71	44	57	51	34	85	55	55
	LOGPERCH	.	.	.	.	.	.	.	1	1
	LONGEAR SUNFISH	.	.	.	.	.	10	.	.	.
	LONGNOSE DACE	1	.	.	.	.	.	.	.	.
	MINNOW UNIDENTIFIED	1	6	6	.	.	.	134	.	5
	NORTHERN HOGSUCKER	.	.	1	3	.	1	4	2	.
	NORTHERN PIKE	.	2	4	2	4	2	2	2	3

TABLE E-2 (CONT.)

GROUP	NAME	85	86	87	88	89	90	91	92	93
		YEAR OF DATA COLLECTION								
FRESHWATER	PUGNOSE SHINER	.	.	.	.	.	.	2	.	.
	PUMPKINSEED	740	496	609	1,070	633	724	1,195	602	774
	RAINBOW TROUT	.	.	.	.	.	.	.	.	.
	REDBREAST SUNFISH	115	158	185	160	111	76	200	259	251
	REDFIN PICKEREL	.	.	.	2	.	.	1	.	.
	ROCK BASS	6	8	1	12	3	.	22	1	1
	SATINFIN SHINER	1	2	.	1	.	2	.	.	1
	SILVERY MINNOW	3	13	23	119	2	9	387	68	568
	SMALLMOUTH BASS	7	25	8	28	25	21	25	28	30
	SPOTFIN SHINER	5	8	17	5	.	.	.	.	12
	SPOTTAIL SHINER	5,316	5,177	4,452	5,407	5,129	5,500	12,385	7,727	7,169
	SWALLOWTAIL SHINER	.	.	.	.	.	.	.	3	.
	TESSELATED DARTER	1,198	1,372	820	1,697	415	479	2,385	929	1,251
	TIGER MUSKELLUNGE	.	.	.	.	.	.	.	1	.
	WHITE CRAPPIE	.	4	1	3	.	1	2	1	.
	WHITE SUCKER	7	16	17	32	9	15	12	21	11
	YELLOW PERCH	22	67	44	49	34	12	27	23	22
MARINE	ATLANTIC CROAKER	.	1	.	.	.	26	.	1	.
	ATLANTIC MENHADEN	118	834	30	99	159	1,063	678	415	16
	ATLANTIC NEEDLEFISH	92	77	54	48	41	96	476	9	11
	BAY ANCHOVY	4,081	4,155	3,746	3,989	9,507	4,134	4,669	8,729	8,106
	BLUEFISH	567	400	533	280	224	348	314	375	223
	BUTTERFISH	.	.	.	4	.	1	.	1	9
	CREVALLE JACK	71	10	3	22	40	32	58	53	30
	CUNNER	.	.	.	.	.	.	.	1	.
	GOOSEFISH	.	.	.	.	.	.	1	.	.
	GRAY SNAPPER	7	1	3	.	.	.	2	.	.
	GRUBBY	.	.	.	.	.	.	.	.	.
	INSHORE LIZARDFISH	.	.	.	1	1	.	14	8	11
	LOOKDOWN	18	1	.	.	10	1	.	.	.
	MOONFISH	.	.	.	.	3	.	.	.	.
	NAKED GOBY	20	9	11	4	4	7	14	22	2
	NORTHERN KINGFISH	20	8	.	9	1	4	42	2	17
	NORTHERN PUFFER	2	1	.	1	.	.	10	.	4
	NORTHERN SEAROBIN	.	2	.	.	.	.	8	.	.
	NORTHERN STARGAZER	1	.	.	.	.	.	1	.	1
	ORANGE SPOTTED FILEFISH	.	1	.	.	.	.	.	.	.
	PERMIT	.	.	.	.	.	.	.	1	2
	ROUGH SILVERSIDE	35	4	23	258	9	4	.	2	.
	SEA ROBIN	.	.	.	.	.	.	5	.	.
	SEABORD GOBY	.	.	.	1	.	.	.	.	.
	SILVER HAKE	.	.	.	.	.	1	.	.	.
	SILVER PERCH	13	1	.	19	.	.	29	8	61
	SMALLMOUTH FLOUNDER	1	.	.	.	.	.	.	.	.
	SPANISH MACKEREL	.	.	.	.	.	.	12	.	4
	SPOT	35	106	4	32	.	1	8	2	39
	SPOTFIN MOJARRA	.	.	.	.	.	.	.	.	.
	SPOTTED GOATFISH	.	.	.	.	.	.	.	.	17
	SPOTTED HAKE	.	.	.	.	.	1	.	.	.
	STRIPED ANCHOVY	1	.	.	.	.	.	.	.	1
	STRIPED SEAROBIN	5	16	.	3	.	.	34	1	11
	SUMMER FLOUNDER	48	45	4	1	2	2	46	26	20
	TAUTOG	2	5	2	20	.	6	31	1	.
	WEAKFISH	72	5	.	2	.	27	111	1	4
	WINDOWPANE FLOUNDER	.	.	3	.	.	.	1	.	.
	WINTER FLOUNDER	282	80	29	41	9	23	154	35	74

TABLE E-2 (CONT.)

SAMPLING STATISTICS FOR BEACH SEINE SURVEY, 1985-1993

	YEAR OF DATA COLLECTION								
	85	86	87	88	89	90	91	92	93
START DATE	16JUL85	15JUL86	24JUN87	14JUN88	13JUN89	18JUN90	24JUN91	23JUN92	01JUL93
END DATE	21NOV85	21NOV86	13NOV87	03NOV88	02NOV89	24OCT90	01NOV91	28OCT92	04NOV93
SAMPLE SIZE	1,000	1,000	1,101	1,100	1,100	1,000	1,000	1,000	1,000

TABLE E-3 TOTAL NUMBER OF FISH COLLECTED IN THE FALL SHOALS SURVEY, 1985-1993.

		YEAR OF DATA COLLECTION								
		85	86	87	88	89	90	91	92	93
GROUP	NAME									
ANADROMOUS	ALEWIFE	1,142	554	702	379	327	459	994	790	730
	ALOSA UNIDENTIFIED	3,341	282	2,591	4,193	4,331	3,543	1,276	10,650	1,905
	AMERICAN SHAD	1,717	2,166	776	1,483	3,646	1,323	1,291	3,406	961
	ATLANTIC STURGEON	96	184	149	117	63	6	10	1	7
	ATLANTIC TOMCOD	5,083	10,046	7,908	8,210	14,060	1,105	4,914	7,299	3,664
	BLUEBACK HERRING	41,919	6,525	18,596	37,957	22,112	15,982	55,299	38,090	22,442
	HICKORY SHAD	.	3	.	.	.	.	.	.	.
	MORONE UNIDENTIFIED	1	.	.	.	3	2	.	.	.
	RAINBOW SMELT	126	389	429	576	34	216	256	2,549	757
	SEA LAMPREY	.	.	.	.	.	1	.	.	.
	STRIPED BASS	888	2,348	11,633	18,679	8,472	3,624	4,672	3,773	8,339
CATADROMOUS	AMERICAN EEL	1,872	2,906	2,254	2,076	1,444	342	984	19	1,406
ESTUARINE	ATLANTIC SILVERSIDE	.	2	.	3	1	2	18	2	29
	BANDED KILLIFISH	78	12	3	3	3	.	2	.	6
	FOURSPINE STICKLEBACK	1	9	.	1	1	.	.	.	2
	HOGCHOKER	89,948	108,036	89,042	74,672	73,613	22,760	42,916	62,300	43,064
	INLAND SILVERSIDE	.	.	.	1	.	2	.	.	2
	MUMMICHOG	.	.	.	.	.	4	.	.	.
	NORTHERN PIPEFISH	40	13	22	25	12	4	16	12	65
	SCUP	1	.	.	.	.	.	3	.	.
	SEA HORSE	.	.	.	.	.	.	.	.	.
	SHORTNOSE STURGEON	16	8	11	20	12	2	18	.	82
	WHITE CATFISH	721	677	775	806	740	352	547	72	939
	WHITE PERCH	19,721	31,771	27,008	25,760	20,106	5,381	11,019	13,832	8,341
FRESHWATER	BLACK BULLHEAD	1	.	.	.	.	.	.	.	.
	BLUEGILL	.	.	1	.	1	.	1	3	2
	BROOK TROUT	.	.	.	.	.	.	1	.	.
	BROWN BULLHEAD	37	127	109	171	172	17	125	70	92
	CARP	4	13	5	4	10	1	6	1	7
	CENTRAL MUDMINNOW	.	.	1	.	.	.	.	.	.
	CENTRARCHID UNIDENT	1	4	1	5	3	.	.	.	.
	CHANNEL CATFISH	.	5	10	9	12	1	4	7	38
	EMERALD SHINER	.	.	.	.	1	.	.	.	.
	FRESHWATER DRUM	.	.	.	.	3	.	.	1	2
	GIZZARD SHAD	4	6	8	2	8	1	.	.	3
	GOLDEN SHINER	.	1	.	.	.	.	.	29	.
	GOLDFISH	.	.	.	.	1	.	.	1	.
	LOGPERCH	.	.	.	.	.	.	.	.	4
	MARGINED MADTOM	.	.	1	.	.	.	1	.	.
	MINNOW UNIDENTIFIED	48	.	.	.	.	.	.	.	.
	PUMPKINSEED	57	2	13	5	1	6	12	2	16
	REDBREAST SUNFISH	1	.	.	1	2	.	.	.	.
	ROCK BASS	.	1	.	.	.	.	.	.	.
	SATINFIN SHINER	.	.	.	.	.	1	.	.	.
	SILVERY MINNOW	.	1	.	.	.	.	.	.	.
	SMALLMOUTH BASS	.	.	.	.	1	1	.	.	.
	SPOTTAIL SHINER	244	685	333	369	102	43	404	259	351
	TESSELATED DARTER	89	747	197	370	120	10	187	225	306
	WHITE SUCKER	1	8	4	2	1	.	.	.	.
	YELLOW BULLHEAD	.	.	.	.	30	.	.	.	.
	YELLOW PERCH	.	.	1	1	.	.	.	.	.
MARINE	ATLANTIC CROAKER	1	4	7	.	1	4	.	4	18
	ATLANTIC HERRING	.	.	.	.	.	.	.	.	3
	ATLANTIC MENHADEN	51	139	67	9	38	129	478	81	13
	ATLANTIC NEEDLEFISH	.	.	.	1	.	1	1	.	.

TABLE E-3 (CONT.)

GROUP	NAME	85	86	87	88	89	90	91	92	93
		YEAR OF DATA COLLECTION								
MARINE	BAY ANCHOVY	27,902	20,988	39,348	59,244	41,475	16,465	44,815	37,231	53,437
	BLACK SEA BASS	1	.	.	1	.	.	.	.	.
	BLUEFISH	60	51	107	116	62	82	58	81	53
	BUTTERFISH	61	106	48	110	81	43	35	138	121
	CONGER EEL	.	.	.	14	.	.	.	.	.
	CREVALLE JACK	2	1	1	10	8	7	3	1	10
	CUNNER	.	.	.	.	.	1	.	1	.
	FOUR SPOT FLOUNDER	2	2	.	1	.	1	.	.	.
	GOBIIDAE	.	.	.	4	.	.	.	38	.
	GOOSEFISH	.	.	.	.	.	.	.	.	.
	GRUBBY	.	.	.	2	.	.	.	.	1
	INSHORE LIZARDFISH	1	.	.	1	4	.	1	4	8
	LONGHORN SCULPIN	.	.	.	.	.	.	.	.	3
	LOOKDOWN	1	.	1	1	1	.	.	.	.
	MOONFISH	.	1	2	.	5	.	.	1	.
	NAKED GOBY	3	6	47	9	21	1	7	30	3
	NORTHERN KINGFISH	9	6	.	20	3	3	10	2	4
	NORTHERN PUFFER	9	1	5	3	2	.	36	3	1
	NORTHERN SEAROBIN	.	2	7	21	3	16	7	12	53
	NORTHERN STARGAZER	1	.	.	20	.	4	3	10	2
	OYSTER TOADFISH	.	.	.	.	.	.	.	1	.
	RED HAKE	1	.	.	.	.	1	.	.	.
	ROUGH SILVERSIDE	1	.	3	1	.	.	.	3	2
	SEABORD GOBY	.	.	.	12	.	.	2	.	.
	SILVER HAKE	.	3	.	.	.	1	1	.	.
	SILVER PERCH	.	.	.	13	.	.	1	.	7
	SMALLMOUTH FLOUNDER	.	.	.	8	.	.	.	1	1
	SPANISH MACKEREL	.	.	.	.	.	1	17	.	7
	SPOT	5	14	1	1,257	.	.	2	.	4
	SPOTFIN BUTTERFLYFISH	1	.	.	.	.	.	.	.	.
	SPOTTED HAKE	2	1	.	.	.	.	3	1	7
	STRIPED ANCHOVY	.	.	.	.	.	.	.	1	.
	STRIPED BURRFISH	.	1	.	.	.	.	.	.	.
	STRIPED CUSKEEL	3	.	.	1	.	.	1	1	.
	STRIPED SEAROBIN	321	148	10	101	25	26	310	52	96
	SUMMER FLOUNDER	232	447	58	7	42	35	102	35	39
	TAUTOG	.	.	.	2	.	3	.	1	.
	TETRAODONTIDAE	.	.	1	.	.	.	.	.	.
	WEAKFISH	2,214	1,482	749	3,777	2,842	770	5,878	750	2,332
	WINDOWPANE FLOUNDER	1	1	5	17	.	5	9	32	1
	WINTER FLOUNDER	226	196	92	39	23	13	28	35	51

SAMPLING STATISTICS FOR FALL SHOALS SURVEY, 1985-1993

	85	86	87	88	89	90	91	92	93
	YEAR OF DATA COLLECTION								
START DATE	22JUL85	21JUL86	13JUL87	18JUL88	17JUL89	09JUL90	15JUL91	13JUL92	19JUL93
END DATE	14NOV85	02DEC86	05NOV87	28OCT88	26OCT89	17OCT90	25OCT91	23OCT92	29OCT93
VOLUME SAMPLED (m^3)	1,886,745	2,298,278	2,035,357	1,826,628	1,590,047	1,252,910	1,707,237	1,865,365	2,010,162
SAMPLE SIZE	1,802	2,098	1,958	1,680	1,679	1,680	1,678	1,680	1,680

Appendix F

Sturgeon Ichthyoplankton, 1974-1994

APPENDIX F

LIST OF FIGURES

LIST OF TABLES

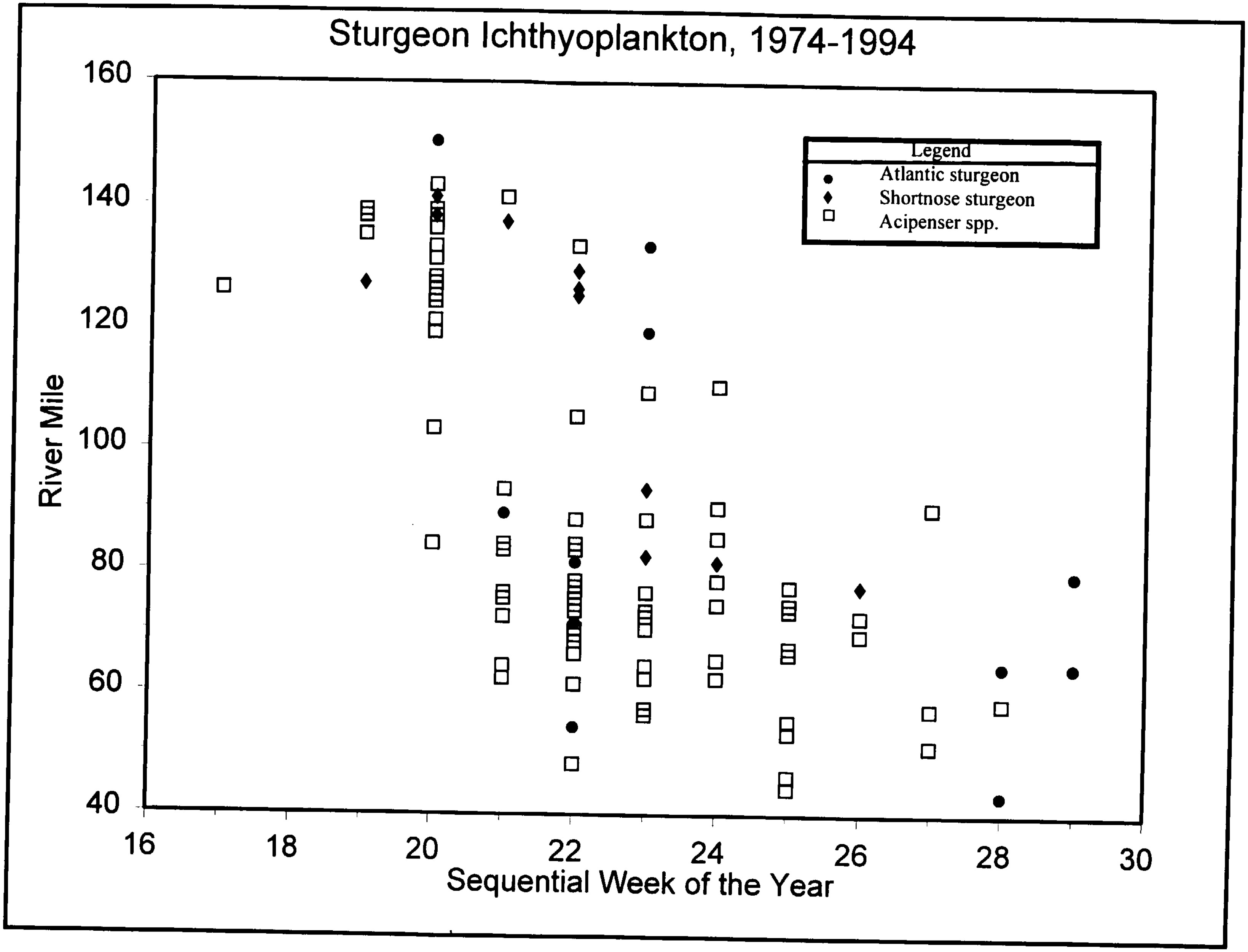

Figure F-1. Occurrence of sturgeon ichthyoplankton by river mile and week in Hudson River estuary determined from Longitudinal River Ichthyoplankton Survey, 1974-1994.

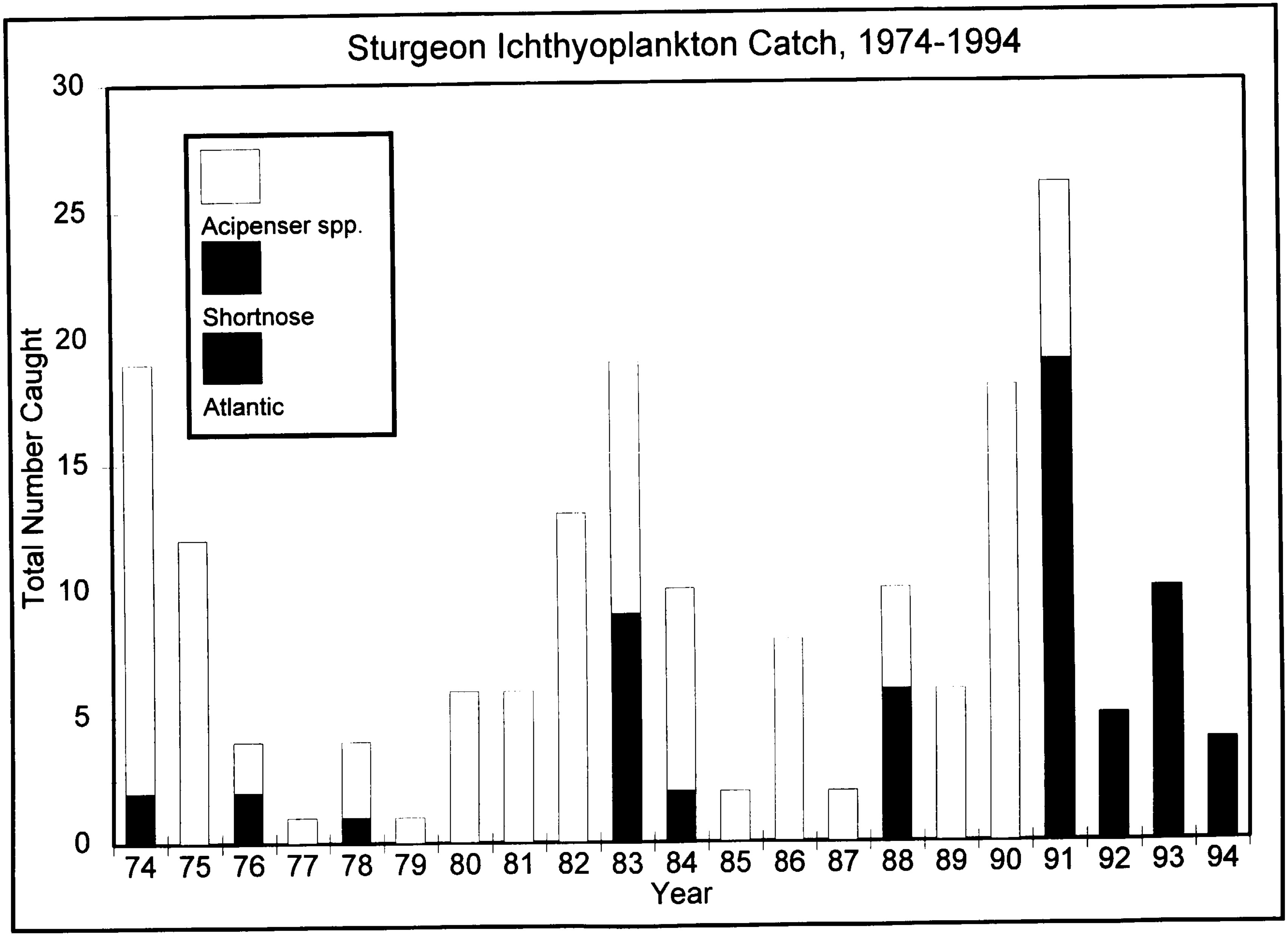

Figure F-2. Total number of sturgeon ichthyoplankton caught each year in Hudson River estuary determined from Longitudinal River Ichthyoplankton Survey, 1974-1994.

TABLE F-1 STURGEON ICHTHYOPLANKTON FROM HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1974-1994.

WEEK OF THE YEAR	REGION	RIVER MILE	SPECIES	NUMBER OF YOLK-SAC LARVAE	NUMBER OF POST-YOLK-SAC LARVAE	NUMBER OF YOUNG OF YEAR	DATE
17	Albany	126	STURGEON UNIDENTIFIED	1	0	0	04/28/87
19	Albany	139	STURGEON UNIDENTIFIED	0	1	0	05/15/91
19	Albany	138	STURGEON UNIDENTIFIED	0	3	0	05/15/91
19	Albany	135	STURGEON UNIDENTIFIED	0	3	0	05/15/91
19	Albany	127	SHORTNOSE STURGEON	1	0	0	05/11/93
20	Albany	150	ATLANTIC STURGEON	0	6	0	05/17/88
20	Albany	143	STURGEON UNIDENTIFIED	1	0	0	05/16/89
20	Albany	141	SHORTNOSE STURGEON	0	4	0	05/17/93
20	Albany	139	STURGEON UNIDENTIFIED	2	0	0	05/16/89
20	Albany	138	STURGEON UNIDENTIFIED	0	2	0	05/14/90
20	Albany	138	SHORTNOSE STURGEON	0	1	0	05/17/93
20	Albany	136	STURGEON UNIDENTIFIED	3	0	0	05/15/84
20	Albany	133	STURGEON UNIDENTIFIED	2	0	0	05/14/90
20	Albany	131	STURGEON UNIDENTIFIED	2	0	0	05/16/83
20	Albany	128	STURGEON UNIDENTIFIED	5	0	0	05/16/83
20	Albany	127	STURGEON UNIDENTIFIED	0	8	0	05/14/90
20	Albany	126	STURGEON UNIDENTIFIED	0	1	0	05/15/90
20	Albany	125	STURGEON UNIDENTIFIED	1	0	0	05/15/84
20	Catskill	124	STURGEON UNIDENTIFIED	1	0	0	05/15/90
20	Catskill	121	STURGEON UNIDENTIFIED	3	0	0	05/15/90
20	Catskill	119	STURGEON UNIDENTIFIED	1	0	0	05/21/74
20	Saugerties	103	STURGEON UNIDENTIFIED	1	0	0	05/15/84
20	Hyde Park	84	STURGEON UNIDENTIFIED	1	0	0	05/20/80
21	Albany	141	STURGEON UNIDENTIFIED	1	0	0	05/23/89
21	Albany	137	SHORTNOSE STURGEON	0	1	0	05/26/92
21	Albany	137	SHORTNOSE STURGEON	0	4	0	05/26/93
21	Kingston	93	STURGEON UNIDENTIFIED	0	1	0	05/25/76
21	Kingston	89	ATLANTIC STURGEON	1	0	0	05/29/74
21	Hyde Park	84	STURGEON UNIDENTIFIED	0	1	0	05/30/85
21	Hyde Park	83	STURGEON UNIDENTIFIED	2	0	0	06/01/74
21	Poughkeepsie	76	STURGEON UNIDENTIFIED	1	0	0	05/29/86
21	Poughkeepsie	75	STURGEON UNIDENTIFIED	2	0	0	05/27/81
21	Poughkeepsie	72	STURGEON UNIDENTIFIED	1	0	0	06/01/74
21	Poughkeepsie	72	STURGEON UNIDENTIFIED	0	1	0	05/30/86
21	Poughkeepsie	64	STURGEON UNIDENTIFIED	1	0	0	05/31/86
21	Poughkeepsie	62	STURGEON UNIDENTIFIED	1	0	0	05/31/86
22	Albany	133	STURGEON UNIDENTIFIED	0	1	0	06/01/89
22	Albany	129	SHORTNOSE STURGEON	0	1	0	05/31/83
22	Albany	126	SHORTNOSE STURGEON	0	3	0	05/31/83
22	Albany	125	SHORTNOSE STURGEON	0	3	0	05/31/83
22	Saugerties	105	STURGEON UNIDENTIFIED	1	0	0	06/04/86
22	Kingston	88	STURGEON UNIDENTIFIED	0	2	0	06/02/84
22	Hyde Park	84	STURGEON UNIDENTIFIED	0	1	0	06/02/77
22	Hyde Park	84	STURGEON UNIDENTIFIED	1	0	0	06/02/82
22	Hyde Park	84	STURGEON UNIDENTIFIED	3	0	0	06/02/88
22	Hyde Park	83	STURGEON UNIDENTIFIED	1	0	0	06/03/81
22	Hyde Park	81	ATLANTIC STURGEON	4	0	0	06/01/94
22	Hyde Park	78	STURGEON UNIDENTIFIED	1	0	0	06/03/86
22	Hyde Park	77	STURGEON UNIDENTIFIED	1	0	0	06/04/80
22	Poughkeepsie	76	STURGEON UNIDENTIFIED	2	0	0	06/02/82
22	Poughkeepsie	75	STURGEON UNIDENTIFIED	1	0	0	06/03/87
22	Poughkeepsie	74	STURGEON UNIDENTIFIED	0	1	0	06/04/75
22	Poughkeepsie	73	STURGEON UNIDENTIFIED	2	1	0	06/03/80
22	Poughkeepsie	71	ATLANTIC STURGEON	0	2	0	06/05/91
22	Poughkeepsie	70	STURGEON UNIDENTIFIED	1	0	0	06/05/81
22	Poughkeepsie	69	STURGEON UNIDENTIFIED	5	0	0	06/02/82
22	Poughkeepsie	68	STURGEON UNIDENTIFIED	3	0	0	06/02/82
22	Poughkeepsie	66	STURGEON UNIDENTIFIED	0	1	0	06/04/75
22	Cornwall	61	STURGEON UNIDENTIFIED	1	0	0	06/02/83
22	West Point	54	ATLANTIC STURGEON	4	0	0	06/04/92
22	West Point	48	STURGEON UNIDENTIFIED	1	0	0	06/03/75
23	Albany	133	ATLANTIC STURGEON	0	0	1	06/10/91
23	Catskill	119	ATLANTIC STURGEON	0	16	0	06/11/91

TABLE F-1 STURGEON ICHTHYOPLANKTON FROM HUDSON RIVER ESTUARY DETERMINED FROM LONGITUDINAL RIVER ICHTHYOPLANKTON SURVEY, 1974-1994.

WEEK OF THE YEAR	REGION	RIVER MILE	SPECIES	NUMBER OF YOLK-SAC LARVAE	NUMBER OF POST-YOLK-SAC LARVAE	NUMBER OF YOUNG OF YEAR	DATE
23	Catskill	109	STURGEON UNIDENTIFIED	1	0	0	06/13/85
23	Kingston	93	SHORTNOSE STURGEON	0	1	0	06/05/84
23	Kingston	88	STURGEON UNIDENTIFIED	1	0	0	06/05/90
23	Hyde Park	82	SHORTNOSE STURGEON	0	0	1	06/07/83
23	Poughkeepsie	76	STURGEON UNIDENTIFIED	0	1	0	06/10/81
23	Poughkeepsie	73	STURGEON UNIDENTIFIED	1	0	0	06/05/78
23	Poughkeepsie	73	STURGEON UNIDENTIFIED	2	0	0	06/10/86
23	Poughkeepsie	72	STURGEON UNIDENTIFIED	1	0	0	06/05/78
23	Poughkeepsie	70	STURGEON UNIDENTIFIED	1	0	0	06/08/83
23	Poughkeepsie	64	STURGEON UNIDENTIFIED	1	0	0	06/11/75
23	Poughkeepsie	62	STURGEON UNIDENTIFIED	0	2	0	06/11/75
23	Cornwall	57	STURGEON UNIDENTIFIED	0	1	0	06/09/82
23	Cornwall	56	STURGEON UNIDENTIFIED	0	1	0	06/09/82
24	Catskill	110	STURGEON UNIDENTIFIED	1	0	0	06/13/84
24	Kingston	90	STURGEON UNIDENTIFIED	0	1	0	06/15/76
24	Hyde Park	85	STURGEON UNIDENTIFIED	1	0	0	06/15/88
24	Hyde Park	81	SHORTNOSE STURGEON	0	1	0	06/13/84
24	Hyde Park	78	STURGEON UNIDENTIFIED	0	1	0	06/19/81
24	Poughkeepsie	74	STURGEON UNIDENTIFIED	0	1	0	06/17/80
24	Poughkeepsie	65	STURGEON UNIDENTIFIED	1	0	0	06/18/75
24	Poughkeepsie	62	STURGEON UNIDENTIFIED	1	0	0	06/17/75
25	Hyde Park	77	STURGEON UNIDENTIFIED	1	0	0	06/25/74
25	Poughkeepsie	74	STURGEON UNIDENTIFIED	2	0	0	06/25/75
25	Poughkeepsie	73	STURGEON UNIDENTIFIED	0	2	0	06/25/74
25	Poughkeepsie	67	STURGEON UNIDENTIFIED	0	2	0	06/26/74
25	Poughkeepsie	67	STURGEON UNIDENTIFIED	0	1	0	06/25/75
25	Poughkeepsie	66	STURGEON UNIDENTIFIED	0	1	0	06/26/74
25	West Point	55	STURGEON UNIDENTIFIED	1	0	0	06/26/74
25	West Point	53	STURGEON UNIDENTIFIED	1	0	0	06/26/74
25	Indian Point	46	STURGEON UNIDENTIFIED	0	1	0	06/23/79
25	Indian Point	44	STURGEON UNIDENTIFIED	0	1	0	06/27/74
26	Hyde Park	77	SHORTNOSE STURGEON	0	0	1	06/28/83
26	Poughkeepsie	72	STURGEON UNIDENTIFIED	1	0	0	07/03/74
26	Poughkeepsie	69	STURGEON UNIDENTIFIED	0	1	0	07/03/75
27	Kingston	90	STURGEON UNIDENTIFIED	1	0	0	07/06/89
27	Cornwall	57	STURGEON UNIDENTIFIED	0	0	1	07/08/78
27	West Point	51	STURGEON UNIDENTIFIED	0	1	0	07/07/83
28	Poughkeepsie	64	ATLANTIC STURGEON	0	0	1	07/14/76
28	Cornwall	58	STURGEON UNIDENTIFIED	0	3	0	07/17/74
28	Indian Point	43	ATLANTIC STURGEON	0	1	0	07/12/76
29	Hyde Park	79	ATLANTIC STURGEON	0	0	1	07/23/74
29	Poughkeepsie	64	ATLANTIC STURGEON	0	0	1	07/19/78