

**JOB 5: MARINE FINFISH SURVEY**  
**LONG ISLAND SOUND TRAWL SURVEY**

**TABLE OF CONTENTS**

LIST OF TABLES .....iv

LIST OF FIGURES .....vi

Cruise results from the 2018 Spring & Fall surveys ..... 1

STUDY PERIOD AND AREA..... 1

GOAL..... 1

OBJECTIVES..... 1

INTRODUCTION..... 2

METHODS..... 2

    Sampling Design ..... 2

    Sampling Procedures..... 3

    Data Analysis..... 5

        Indices of Abundance: Annual Mean Count and Weight per Tow ..... 5

        Indices of Abundance: Indices-at-Age and Age Group ..... 6

        Species Richness by Group ..... 8

        Open Water Forage Abundance ..... 9

RESULTS AND DISCUSSION..... 9

    Overview of LISTS 2018 Spring and Fall Surveys..... 9

    Cooperative Sample and Data Collection..... 10

    Number of Species Identified..... 10

    Total Catch ..... 10

    Length Frequencies ..... 11

    Seasonal Indices of Abundance..... 11

    Indices of Abundance: Important Recreational Species..... 12

    Species Richness by Group ..... 12

MODIFICATIONS..... 12

LITERATURE CITED..... 13

TABLES 5.1 - 5.27 ..... 15

TABLES 5.28 - 5.64 (Length Frequencies) .....41

FIGURES 5.1 - 5.18 ..... 78

APPENDICES ..... 97

Appendix 5.1. List of finfish species identified by *A Study of Marine Recreational Fisheries in Connecticut (F54R)* and other CT DEEP Marine Fisheries Division programs..... 98

Appendix 5.2. Annual total count of finfish, lobster and squid taken in the LISTS, 1984 - 2018..... 101

Appendix 5.3. Annual total weight (kg) of finfish, lobster and squid taken in LISTS, 1992 - 2018. .... 104

Appendix 5.4. Total number and weight (kg) of finfish and invertebrates caught in LISTS, 1984-2018. .... 106

Appendix 5.5. Endangered Species Interactions ..... 120

Appendix 5.6. Cold and warm temperate species captured in LISTS ..... 121

## LIST OF TABLES

Table 5.1.	Specifications for the Wilcox 14 m high-rise trawl net and associated gear.....	16
Table 5.2.	The number of sites scheduled for sampling each month within the 12 depth-bottom type strata.....	16
Table 5.3.	Length and age data collected in 2018. ....	17
Table 5.4.	Number of Long Island Sound Trawl Survey (LISTS) samples taken by year and cruise .....	18
Table 5.5.	Station information for LISTS April 2018. ....	19
Table 5.6.	Station information for LISTS May 2018. ....	20
Table 5.7.	Station information for LISTS June 2018. ....	21
Table 5.8.	Station information for LISTS September 2018.....	22
Table 5.9.	Station information for LISTS October 2018.....	23
Table 5.10.	Samples with non-standard tow durations and reason for incomplete tow, spring and fall 2018.....	24
Table 5.11.	List of finfish species observed in 2018. ....	25
Table 5.12.	List of invertebrates observed in 2018. ....	26
Table 5.13.	Total number and weight (kg) of finfish and invertebrates caught in 2018. ....	27
Table 5.14.	Total counts and weight (kg) of finfish taken in the spring and fall sampling periods, 2018. ....	28
Table 5.15.	Total catch of invertebrates taken in the spring and fall sampling periods, 2018. ....	29
Table 5.16.	Spring indices of abundance for selected species, 1984-2018. ....	30
Table 5.17.	Fall indices of abundance for selected species, 1984-2018.....	31
Table 5.18.	Finfish and invertebrate biomass indices for the spring sampling period, 1992-2018. ...	32
Table 5.19.	Finfish and invertebrate biomass indices for the fall sampling period, 1992-2018.....	33
Table 5.20.	Bluefish indices of abundance, 1984-2018.....	34
Table 5.21.	Scup indices at-age, 1984-2018.....	35
Table 5.22.	Age frequency of striped bass taken in spring, 1984-2018. ....	36
Table 5.23.	Striped bass indices-at-age, 1984-2018. ....	37
Table 5.24.	Summer flounder indices-at-age, 1984-2018. ....	38
Table 5.25.	Tautog indices-at-age, 1984-2018. ....	39
Table 5.26.	Weakfish age 0 and age 1+ indices of abundance, 1984-2018.....	40
Table 5.27.	Winter flounder indices-at-age, 1984-2018.....	41
Table 5.28.	Alewife length frequencies, spring and fall, 1 cm intervals, 1989-2018. ....	42
Table 5.29.	American shad length frequencies, spring and fall, 2 cm intervals (midpoint given), 1989- 2018. ....	43
Table 5.30.	American lobster length frequencies - spring, female, 1 mm intervals, 1984-2018.....	44
Table 5.31.	American lobster length frequencies - fall, female, 1 mm intervals, 1984-2018. ....	45
Table 5.32.	American lobster length frequencies - spring, male, 1mm intervals, 1984-2018.....	46
Table 5.33.	American lobster length frequencies - fall, male, 1 mm intervals, 1984-2018.....	47
Table 5.34.	Atlantic herring length frequencies, spring and fall, 1 cm intervals, 1989-2018. ....	48

Table 5.35. Atlantic menhaden length frequency, spring and fall, 1 cm intervals, 1996-2018. ....	49
Table 5.36. Black sea bass length frequency, spring, 1 cm intervals, 1987-2018. ....	50
Table 5.37. Black sea bass length frequency, fall, 1 cm intervals, 1987-2018. ....	51
Table 5.38. Blueback herring length frequencies, spring and fall, 1 cm intervals, 1989-2018. ....	52
Table 5.39. Bluefish length frequencies, spring, 1 cm intervals (midpoint given), 1984-2018. ....	53
Table 5.40. Bluefish length frequencies, fall, 1 cm intervals (midpoint given), 1984-2018. ....	54
Table 5.41. Butterfish length frequencies, 1 cm intervals, spring and fall, 1986-1990, 1992-2018. ....	55
Table 5.42. Clearnose skate length frequencies, spring, 1 cm intervals, 1993-2018. ....	56
Table 5.43. Clearnose skate length frequencies, fall, 1 cm intervals, 1993-2018. ....	57
Table 5.44. Fourspot flounder length frequencies, spring and fall, 2 cm intervals (midpoint given), 1989, 1990, 1996-2018. ....	58
Table 5.45. Hickory shad length frequencies, spring and fall, 1 cm intervals, 1991-2018. ....	59
Table 5.46. Horseshoe crab length frequencies by sex, spring, 1 cm intervals, 1998-2018. ....	60
Table 5.47. Horseshoe crab length frequencies by sex, fall, 1 cm intervals, 1998-2018. ....	61
Table 5.48. Long-finned squid length frequencies, spring, 1 cm intervals (midpoint given), 1986- 1990, 1992-2018. ....	62
Table 5.49. Long-finned squid length frequencies, fall, 1 cm intervals (midpoint given), 1986-1990, 1992-2018. ....	63
Table 5.50. Scup spring length frequencies, 1 cm intervals, 1984-2018. ....	64
Table 5.51. Scup fall length frequencies, 1 cm intervals, 1984-2018. ....	65
Table 5.52. Striped bass spring length frequencies, 2 cm intervals (midpoint given), 1984-2018. ....	66
Table 5.53. Striped bass fall length frequencies, 2 cm intervals (midpoint given), 1984-2018. ....	67
Table 5.54. Summer flounder length frequencies, spring, 2 cm intervals (midpoint given), 1984-2018. ....	68
Table 5.55. Summer flounder length frequencies, fall, 2 cm intervals (midpoint given), 1984-2018. ....	69
Table 5.56. Tautog length frequencies, spring, 1 cm intervals (midpoint given), 1984-2018. ....	70
Table 5.57. Tautog length frequencies, fall, 1 cm intervals (midpoint given), 1984-2018. ....	71
Table 5.58. Weakfish length frequencies, spring, 2 cm intervals (midpoint given), 1984-2018. ....	72
Table 5.59. Weakfish length frequencies, fall, 2 cm intervals (midpoint given), 1984-2018. ....	73
Table 5.60. Windowpane flounder length frequencies, spring, 1 cm intervals, 1989, 1990, 1994-2018. ....	74
Table 5.61. Windowpane flounder length frequencies, fall, 1 cm intervals, 1989, 1990, 1994-2018. ....	75
Table 5.62. Winter flounder length frequencies, April-May, 1 cm intervals, 1984-2018. ....	76
Table 5.63. Winter flounder length frequencies, fall, 1 cm intervals, 1984-2018. ....	77
Table 5.64. Winter skate length frequencies, spring and fall, 2 cm intervals (midpoint given), 1995-2018. ....	78

## LIST OF FIGURES

Figure 5.1. Trawl Survey site grid .....	80
Figure 5.2. April 2018 sites selected and sampled.....	81
Figure 5.3. May 2018 sites selected and sampled.....	82
Figure 5.4. June 2018 sites selected and sampled.....	83
Figure 5.5. September 2018 sites selected and sampled.....	84
Figure 5.6. October 2018 sites selected and sampled. ....	85
Figure 5.7. The number of finfish species observed annually, 1984-2018. ....	86
Figure 5.8. Plots of abundance indices for: black sea bass, bluefish (total, age 0 and ages 1+), butterfish, cunner, and dogfish (smooth and spiny). ....	87
Figure 5.9. Plots of abundance indices for: flounders (fourspot, summer, windowpane, winter and winter ages 4+) and hakes (red, silver and spotted).....	88
Figure 5.10. Plots of abundance indices for: herrings (alewife, Atlantic, blueback), hogchoker, Northern kingfish, Atlantic menhaden, moonfish, and ocean pout. ....	89
Figure 5.11. Plots of abundance indices for: fourbeard rockling, rough scad, longhorn sculpin, sea raven, and scup (all ages, age 0, and ages 2+).....	90
Figure 5.12. Plots of abundance indices for: searobins (striped and northern), shad (American and hickory), skates (clearnose, little, and winter), and spot. ....	91
Figure 5.13. Plots of abundance indices for: striped bass, Atlantic sturgeon, tautog, and weakfish (all ages, age 0 and ages 1+).....	91
Figure 5.14. Plots of abundance and biomass indices for: crabs (lady, rock and spider), horseshoe crab, American lobster, and long-finned squid.....	93
Figure 5.15. Mean number of finfish species per sample, spring and fall, 1984-2018.....	94
Figure 5.16. Open water forage abundance, 1992-2018. ....	94
Figure 5.17. Geometric mean biomass of finfish and invertebrates per sample, spring and fall, 1992- 2018.....	95
Figure 5.18..Trends in the number of cold temperate versus warm temperate species per sample captured in spring and fall LIS Trawl Surveys.....	96

## **JOB 5: LONG ISLAND SOUND TRAWL SURVEY (LISTS)**

### **CRUISE RESULTS FROM THE 2018 SPRING AND FALL SURVEYS**

#### **STUDY PERIOD AND AREA**

The Connecticut DEEP Marine Fisheries Program completed the thirty-fifth year of the Long Island Sound Trawl Survey in 2018. The Long Island Sound Trawl Survey (LISTS) encompasses an area from New London to Greenwich, Connecticut and includes waters from 5 to 46 meters in depth in both Connecticut and New York state waters. Typically, Long Island Sound (LIS) is surveyed in the spring, from April through June, and during the fall, from September through October. This report includes results from the 2018 spring and fall sampling periods and provides time series information since the commencement of the survey in 1984.

#### **GOAL**

To provide long term monitoring of abundance, biomass and size composition of marine fishery resources along with environmental parameters, in order to evaluate the effects of fishing and environmental conditions on the distribution and abundance of living resources in Long Island Sound.

#### **OBJECTIVES**

- 1) Provide annual indices of counts and biomass per standard tow for 40 common species and age-specific indices of abundance for winter flounder, tautog, scup, summer flounder, bluefish (Age 0, 1+) and weakfish (Age 0, 1+).
- 2) Provide length-frequency distributions of bluefish, scup, summer flounder, winter flounder, tautog, striped bass, weakfish, black sea bass, and other ecologically important species.
- 3) Provide annual total counts and biomass for all finfish species taken and annual total biomass for all common macro-invertebrate species taken.
- 4) Provide species list for LIS based on LISTS sampling, noting the presence of additional species from other sampling conducted by the Marine Fisheries Programs.
- 5) Provide fishery independent survey data to cooperative state researchers or agencies, such as the National Marine Fisheries Service (NMFS), Atlantic States Marine Fisheries Commission (ASMFC), New England and Mid-Atlantic Fishery Management Councils (NEFMC and MAFMC, respectively), and researchers associated with state or local universities

## **INTRODUCTION**

The Long Island Sound Trawl Survey (LISTS) was initiated in 1984 to provide fishery independent monitoring of important recreational species in Long Island Sound (LIS). A stratified-random design based on bottom type and depth interval was chosen and 40 sites were sampled monthly from April through November to establish seasonal patterns of abundance and distribution. Seven finfish species were initially of primary interest: bluefish, scup, striped bass, summer flounder, tautog, weakfish, and winter flounder. Length data for these species were collected from every tow; scup, tautog, and winter flounder were sampled for aging. Lobster were also enumerated and measured from every tow. All fish species were identified and counted.

Since 1984, several changes have been incorporated into the Survey. In 1991, the sampling schedule was changed to a spring/fall format, although sampling is still conducted on a monthly basis (April - June, September, and October). Beginning in 1992, species were weighed in aggregate with an onboard scale to provide indices of biomass. Furthermore, more species have been sampled for lengths, such as windowpane and fourspot flounders, and important forage species such as butterfish, long-finned squid, and several herring species. By 2003, the list of species measured expanded to 20 finfish species and two invertebrate species (lobster and long-finned squid), plus rarely occurring species. Beginning in 2014, lengths were collected from all finfish species on each tow. In addition, at various times during the time-series, age structures were collected from bluefish, menhaden, tautog, scup, winter flounder, weakfish or summer flounder. All of these changes serve to improve the quality and quantity of information made available to fishery managers for local and regional assessment of stock condition, and to provide a more complete annual inventory of LIS fishery resources.

## **METHODS**

### **Sampling Design**

LISTS is conducted from longitude 72° 03' (New London, Connecticut) to longitude 73° 39' (Greenwich, Connecticut). The sampling area includes Connecticut and New York waters from 5 to 46 m in depth and is conducted over mud, sand and transitional (mud/sand) sediment types. Sampling is divided into spring (April-June) and fall (Sept-Oct) periods, with 40 sites sampled monthly for a total of 200 sites annually. The sampling gear employed is a 14 m otter trawl with a 51 mm mesh codend (Table 5.1). To reduce the bias associated with day-night changes in catchability of some species, sampling is conducted during daylight hours only (Sissenwine and Bowman 1978).

LISTS employs a stratified-random sampling design. The sampling area is divided into 1.85 x 3.7 km (1 x 2 nautical miles) sites (Figure 5.1), with each site assigned to one of 12 strata defined by depth interval (0 - 9.0 m, 9.1 - 18.2 m, 18.3 - 27.3 m or, 27.4+ m) and bottom type (mud, sand, or transitional as defined by Reid et al. 1979). For each monthly sampling cruise, sites are selected randomly from within each stratum. The number of sites sampled in each stratum was determined by dividing the total stratum area by 68 km<sup>2</sup> (20 square nautical miles), with a minimum of two sites sampled per stratum (Table 5.2, Gottschall et al. 2000). Discrete stratum areas smaller than a sample site are not sampled.

## Sampling Procedures

Prior to each tow, temperature (°C) and salinity (ppt), conductivity (mS/m) and dissolved oxygen (mg/l) were measured using an YSI model EXO2 data sonde. 2017 was the first year the EXO2 sonde was used by LISTS, previously a hand-held YSI meter was used. The sonde records numerous water quality parameters while descending from surface to bottom and values are subsequently extracted at the depths most closely matching the 1m below surface and 0.5m above bottom depths used previously in the LISTS timeseries.

The survey's otter trawl was towed from the 15.2 m aluminum R/V John Dempsey for 30 minutes at approximately 3.5 knots, depending on the tide. At completion of the tow, the catch was placed onto a sorting table and sorted by species. Finfish, lobsters and squid were counted and weighed in aggregate (to the nearest 0.1 kg) by species with a precision marine-grade scale (30 kg, +/- 10 gm capacity). Catches weighing less than 0.1 kg were recorded as 0.1 kg. During the initial two years of the survey (1984 & 1985), lobsters were the only invertebrates recorded. Squid abundance has been recorded since 1986. Since 1992, additional invertebrate species have been weighed in aggregate, and some have been counted. The complete time series of species counted and weighed in the survey is documented in Appendix 5.4.

For all species where length was collected, electronic measuring boards were used to capture lengths to the millimeter. For finfish, either fork or total length was collected. Lobsters were measured to 0.1 mm carapace length. Squid were measured using the mantle length (mm), horseshoe crab measurements were taken using prosomal width (mm) and whelk (knobbed and channeled) shell widths were measured in millimeters. For analysis purposes, the lengths were put into centimeter grouped bins (e.g. measurements from 100 mm to 109 mm were processed as 10 cm).

The number of individuals measured from each tow varied by species, the size of the catch and range of lengths (Table 5.3). If a species was subsampled, the length frequency of the catch was determined by multiplying the proportion of measured individuals in each centimeter interval by the total number of individuals caught. Some species were sorted and subsampled by length group so that, for example, all large individuals were measured and a subsample of small (often young-of-year) specimens was measured. All individuals not measured in a length group were counted. The length frequency of each group was estimated as described above, i.e. the proportion of individuals in each centimeter interval of the subsample was expanded to determine the total number of individuals caught in the length group. The estimated length frequencies of each size group were then appended to complete the length frequency for that species. This procedure was often used with catches of bluefish, scup, and weakfish, which were usually dominated by young-of-year or discrete age/length classes.

Bluefish, menhaden, scup, summer flounder, tautog and winter flounder were sampled for age determination (Table 5.3). The target number of age samples (otolith) for bluefish were 50 from the spring period (defined by ASMFC Bluefish Technical Committee as Jan-July) and 50 from the fall period (August-December). However, bluefish catches are hard to predict so the number of age samples varied greatly; sometimes more than the target number was collected solely from LISTS samples but other times LISTS samples needed to be augmented with samples from the recreational fishery to meet the target number. Sufficient numbers of bluefish age samples from LIS would also make it possible to develop an LIS-specific age key, so



bluefish age samples were sometimes still collected even after the target number was reached. Subsamples of scup, stratified by length group, were measured to the nearest mm (fork length) and scales from each individual were taken for ageing. Scup scales were removed posterior to the pectoral fin and ventral to the lateral line. The scales were pressed onto plastic laminate with an Ann Arbor roller press to obtain an impression of the scale, which was then viewed with a microfiche reader at 21x. Scales were also taken from all summer flounder greater than 59 cm. At least 15 scales were removed from the caudal peduncle area. These scales were pressed and aged to supplement the NMFS age key and were also included in the formulation of LISTS summer flounder catch-at-age matrix (see below). Subsamples of winter flounder, stratified by length group and area (as listed in bottom of Table 5.3), were iced and taken to the lab where they were measured to the millimeter (total length), weighed (gm) and sexed. Their maturity stage was determined (NMFS 1989), and otoliths were collected for age determination later. Amendment 2 of the ASMFC Atlantic menhaden Fishery Management Plan introduced a requirement of 10 fish for age samples per 300 metric tons landed in the commercial bait fishery to support improved stock assessments. Connecticut has such a small menhaden commercial fishery that one 10-fish sample would suffice. The same size/age component of the menhaden population taken in the commercial fishery was available to LISTS so menhaden scales were collected during LISTS sampling; 96 menhaden age samples were taken in 2018. LISTS age samples of menhaden provide one of the few fishery independent sources of age data for adult menhaden in northern waters and are therefore valuable for stock assessments. Menhaden fork length (mm), and sex were recorded and scales were taken about mid-body (lateral line) and below the insertion of the dorsal fin. The ASMFC Tautog Fishery Management Plan (FMP) requires CT DEEP to collect a minimum of 200 age structures per. Due to the low numbers of tautog caught in LISTS in recent years (less than 250 fish), age structures were collected from most tautog taken in LISTS. Tautog were iced and taken to the lab, where their total length (mm), sex, and total weight (gm) were recorded and age structures were collected. LISTS has used opercula to age tautog since 1984 (Cooper 1967). The ASMFC Tautog Technical Committee requested that states collect paired age structures for comparison studies; therefore, LISTS began collecting tautog otoliths in addition to opercula in 2012. Results from an ASMFC Tautog Ageing Workshop in May 2012 indicated there was no clear benefit to switching from opercula to otoliths for Connecticut, so otoliths were collected (minimum of 50 paired structures per ASMFC) and archived for potential use in the future. Subsequent to the 2012 workshop, a study conducted by Massachusetts Division of Marine Fisheries showed pelvic fin spine sections may be a better structure (easier to read and non-lethal to collect) for ageing tautog (Elzey and Trull 2016). In 2016, LISTS started to collect tautog pelvic fin spines, archiving them for future ageing work.

In reports prior to 2001, three species were not included in annual and seasonal totals: American sand lance, bay anchovy, and striped anchovy. These species, with the possible exception of striped anchovy, can be very abundant in Long Island Sound, but are not retained well in the otter trawl. Additionally, many of these fish are young-of-year and often drop out of the net as it is retrieved and wound on the net reel. For this reason they were not included in the list of species to be counted when LISTS was started in 1984. However, to document the occurrence of these species in LISTS catches, American sand lance was added in 1994, striped anchovy was added in 1996, and bay anchovy was added in 1998. Since 2001, adults of these three species have been included in the annual and seasonal totals and young-of-year listed if present in the year's catch but are not quantified (Table 5.13, Appendix 5.4). Young-of-year for

these three species are included in the database but are cataloged with a separate species identifier and quantities are considered estimates (Appendix 5.2).

Although endangered species research and monitoring work is not eligible for Sport Fish Restoration funding, there is the possibility of encountering protected species during the course of conducting the work authorized by this funding for eligible species. Aside from the handling and processing of incidental catches of protected species mandated by the NOAA Greater Atlantic Regional Fisheries Office (GARFO) Protected Species Division, no additional project resources are used on protected species work. Sampling procedures have been modified in recent years to minimize the likelihood of injury to Atlantic Sturgeon (a Federally listed endangered species since 2012). When sampling in a season and area where the chance of catching a sturgeon is high (based on historic LISTS catch) and water depth is greater than 27 m, gear retrieval speed is reduced to decrease the stress induced by rapid changes in pressure. When an endangered species is detected in the net, it is removed as quickly and carefully as possible. Subsequent handling and processing of endangered species adhere to the Reasonable and Prudent Measures as well as the Terms and Conditions specified in the ESA Section 7 Biological Opinion's Incidental Take Statement issued by NOAA for CT in January 2013 ([http://www.greateratlantic.fisheries.noaa.gov/protected/section7/bo/actbiops/usfws\\_state\\_fisheries\\_surveys\\_2013.pdf](http://www.greateratlantic.fisheries.noaa.gov/protected/section7/bo/actbiops/usfws_state_fisheries_surveys_2013.pdf)). Additionally, handling and processing of sturgeon follow protocols described in A Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons (Kahn and Mohead. 2010. U.S. Dep. Commerce, NOAA Tech Memo, NMFS-OPR-45, 62p., [http://www.nmfs.noaa.gov/pr/pdfs/species/kahn\\_mohead\\_2010.pdf](http://www.nmfs.noaa.gov/pr/pdfs/species/kahn_mohead_2010.pdf)). Seven (7) Atlantic Sturgeon were captured on five (5) of the 172 tows completed in 2018. No other protected species were encountered. All interactions with endangered species are detailed in Appendix 5.5.

## **Data Analysis**

### ***Indices of Abundance: Annual Mean Count and Weight per Tow***

To evaluate the relative abundance of common species, an annual spring (April - June) and fall (September - October) geometric mean number per tow and weight per tow (biomass, kg) was calculated for the common finfish and invertebrate species. To calculate the geometric mean, the numbers and weight per tow were logged ( $\log_e$ ) to normalize the highly skewed catch frequencies typical of trawl surveys:

$$\text{Transformed variable} = \ln(\text{variable}+1).$$

Means were computed on the log scale and then retransformed to the geometric mean:

$$\text{geometric mean} = \exp(\text{mean})-1.$$

The geometric mean count per tow was calculated from 1984 - 2018 for 38 finfish species, lobster, and long-finned squid (1986 - 2018). The geometric mean weight per tow was calculated using weight data collected since 1992 for the same species, plus an additional 13 invertebrates.

For the seven finfish species that were measured on every tow in the time-series (bluefish, scup, striped bass, summer flounder, tautog, weakfish, and winter flounder), biomass

indices were calculated for the years 1984 - 1991 by using length/weight equations to convert length frequencies to weight per tow. Bluefish, scup, weakfish and winter flounder lengths were converted using equations from Wilk et al. (1978); striped bass conversions were accomplished using an equation from Young et al. (1994); summer flounder and tautog conversions were accomplished using equations developed from LISTS data from 1984 - 1987 and 1984 - 1996 respectively.

### ***Indices of Abundance: Indices-at-Age and Age Group***

Annual age specific indices (indices-at-age matrices) were calculated for scup, striped bass, summer flounder, winter flounder and tautog. The age data used to calculate the indices came from three sources: striped bass ages were derived using the von Bertalanffy (1938) equation; summer flounder age-length keys were obtained from the NMFS Northeast Fisheries Science Center spring and fall trawl surveys combined with LISTS ages (>59 cm); scup, winter flounder and tautog age-length keys (in 1 cm intervals) were obtained directly from LISTS. Since fish growth can fluctuate annually as a function of population size or other environmental factors, a year and season specific age-length key was used wherever possible. Once lengths had been converted to age, the proportion at age was multiplied by the abundance index of the appropriate season to produce an index of abundance at age.

Recruitment (young-of-year) and age 1+ (all fish age one and older) indices were calculated for bluefish and weakfish by using observed modes in the LISTS length frequencies to separate the two groups.

The specific methods used to calculate indices-at-age for each species were as follows:

- ◆ **Bluefish.** Age samples (otoliths) were taken from 161 bluefish caught in LISTS 2018, four (4) from the spring period and 157 from the fall period. In 2012 a coast wide biological sampling program was initiated through ASMFC Addendum 1 of the bluefish management plan. Since a robust age-length key was still not available for the Long Island Sound region, the method of using modes observed in the fall length frequencies to separate bluefish into age 0 and age 1+ groups, and calculating a geometric mean catch per tow for each group (Table 5.20) was continued through 2018. Comparison of the mean lengths-at-age reported for young-of-year and age 1 bluefish in the New York Bight (Chiarella and Conover 1990) and LIS (Richards 1976) with LISTS length frequencies suggests that bluefish can easily be identified as either age 0 (snapper bluefish) or adults (age 1+). Richards (1976) and Chiarella and Conover (1990) determined that most bluefish less than 30 cm are age 0. A discontinuity in the LISTS fall length frequencies occurs most years between 26 cm and 39 cm (Table 5.42). Therefore 30 cm was determined to be a suitable length for partitioning age 0 and age 1 fish. With the addition the biological sampling programs along the coast, a regional northeast key is being compiled through ASMFC.

Prior to 2012, there was limited bluefish ageing in the northeast. Although North Carolina state biologists have aged bluefish for some time, their age keys were not used to age Long Island Sound bluefish because North Carolina mean lengths-at-age are not consistent with modes observed in Long Island Sound bluefish length frequencies. This difference suggests that growth may vary by region, or that early and late spawned

bluefish may be differentially distributed along the coast (Kendall and Walford 1979).

- ◆ **Scup.** Scales from 715 scup were collected in 2018; 459 from the spring cruise and 256 from the fall cruise. An index-at-age matrix was developed for 1984-2018 using spring (May-June only) and fall (September-October) LISTs data (Table 5.1). April data was omitted since very few scup are taken during the month. A total of 15,852 scup aged between 1984 and 2018 were used to make year and season specific age-length keys (1 cm intervals). In the relatively few instances when the season/year specific key failed at a given 1 cm length interval, a three-year pooled key was used to determine the age. Three-year pooled keys were calculated using the years preceding and following the “run” year. For the terminal year, only two years were used for the pooled key. Indices-at-age were computed for both spring and fall each year. Since very few scup older than age 9 are taken (less than 4% in any given year), an age 10+ group was calculated by summing indices for ages 10 and up. To represent the full adult portion of the population an age 2+ index was calculated by summing the indices for ages 2 through 10+.
- ◆ **Striped bass.** To approximate the ages of striped bass taken in the spring survey (Table 5.22), the average of the Chesapeake Bay and Hudson River striped bass von Bertalanffy parameters ( $L_{\max} = 49.9$  in,  $K = 0.13$ ,  $t_0 = 0.16$ , Vic Crecco, pers. comm.) were used in the rearranged von Bertalanffy equation:

$$t = (1/K) * (-\log_e ((L_{\max} - L_t) / L_{\max})) + t_0$$

Since this equation estimates age  $t$  as a fraction of a year, the estimates were rounded to the nearest year (e.g. age 3 = ages 2.5 to 3.4). A spring catch-at-age matrix was developed for 1984 through 2018 by apportioning the spring index by the percentage of fish at each age (Table 5.23).

- ◆ **Summer flounder.** The year and season specific age-length keys (1 cm intervals) used to age LISTs catches were provided by NMFS from their spring and fall trawl surveys. These keys were supplemented with fish caught and aged by LISTs (typically 60 cm and over). LISTs also provides the age data from these fish (> 60cm) to NMFS. Only summer flounder greater than or equal to 60cm were sampled for age structures during the Spring 2017 LISTs cruise. Since the 2017 fall cruise, however, LISTs has also collected representative scale samples from smaller fluke to ensure a robust age-key once it became known that there would be no samples from NMFS for the fall 2017 period. The age-key was constructed using both LISTs and NMFS age data. In 2018, 407 summer flounder were aged: 205 from the spring (17 – 74 cm) and 202 from the fall (15 – 64 cm). Since 2001, whenever the season/year specific key failed at a given 1 cm length interval a pooled year key using only adjacent years was used (Gottschall and Pacileo 2002).
- ◆ **Tautog.** An index-at-age matrix was developed for 1984-2015 using all survey months (Gottschall and Pacileo 2007) (Table 5.25). Ageing for 2006-2012 has been completed and preliminary ageing for 2013-2015 has been done. Age samples from 2016 (n=276), 2017 (n=75), and 2018 (n=201) have not yet been aged. The index-at-age matrix will be updated once additional structures have been aged.

- ◆ **Weakfish.** Age 0 and age 1+ indices were calculated for both spring (1984 – 2017) and fall surveys (1984 – 2009, 2011 - 2017) (Table 5.26). Since few weakfish are taken in April, the spring geometric mean was calculated using only May and June. All weakfish taken in spring are assumed to be age 1+. Similar to bluefish, the fall age 0 and 1+ indices were calculated by using length frequencies to separate the catch. Since a break in the fall length frequencies generally occurs between 24 and 32 cm each year (Table 5.57), weakfish less than 30 cm are considered to be age 0 while those greater than or equal to 30 cm are ages 1+.
- ◆ **Winter flounder.** An index-at-age matrix was developed for 1984-2018 using April and May LISTS data (Table 5.27). June data were not used since length frequency data suggest that many adult winter flounder have left the Sound by this time (an exception was made for 1984, the first year of LISTS, because very few samples were taken in the spring months). A total of 24,525 winter flounder aged between 1984 and 2018 were used to make year and region (east of Stratford Shoal, west of Stratford Shoal) specific age-length keys in 1 cm intervals. Similar to scup and summer flounder, three year pooled keys using only the adjacent years (two years for the terminal year runs) were used to assign ages if year specific keys were not available.

Each flounder aged as described above was also assessed for maturity stage by sex following Burnett (1989). CT DEEP staging of winter flounder was verified in a cooperative study with NMFS in 2009-2010 (Gottschall and Pacileo 2011). The percentage of male and female fish in each centimeter length group that was sexually mature (ripe, resting, or spent) was calculated in order to determine the length group at which 50% was mature each year.

### ***Species Richness by Group***

The Long Island Sound Trawl Survey monitors species richness using groups of species classified as either cold temperate or warm temperate. For the purposes of tracking species richness, American sand lance, bay anchovy, and striped anchovy were omitted (see *Sampling Procedures* section). All other finfish species captured in LISTS were divided into groups based on their temperature preferences and seasonal spawning habits as documented in the literature (Collette and Klein-MacPhee 2002, Murdy et al. 1997). Species in the cold temperate group prefer water temperatures below 15<sup>0</sup>C (60<sup>0</sup>F), tend to spawn at the lower end of their temperature tolerance range, and are more abundant north of Long Island Sound than south of New York. Species in the warm temperate group prefer warmer temperatures (11-22<sup>0</sup>C or 50-77<sup>0</sup>F), tend to spawn in the upper range of their temperature tolerance, and are more abundant south of the Sound than north of Cape Cod (Appendix 5.6). Species that are not tolerant of cold temperatures, are abundant only south of Chesapeake Bay but stray into northern waters mostly as juveniles, and spawn only in the mid-Atlantic Bight and south were placed into a separate group (subtropical) and were not included in the analysis because they are typically only present in the fall LISTS.

### ***Open Water Forage Abundance***

A Long Island Sound open water forage index of abundance was compiled to measure the available food base which supports resident and migratory species within the Sound. This index is formulated as a biomass index that is assembled from 11 of the forage species that are most common in LISTS catches along with three other species that are considered forage at an early life stage (young-of-year or YOY). The species used to generate the index are: Atlantic herring, long-finned squid, butterfish, alewife, blueback herring, American shad, hickory shad, menhaden, whiting, spotted hake, and red hake along with young-of-year scup, bluefish, and weakfish (Figure 5.16). The geometric mean biomass is calculated using the aggregate of these 14 species on a per tow basis and calculated using the same methodology as described above for individual species biomass indices.

## **RESULTS AND DISCUSSION**

### **Overview of LISTS 2018 Spring and Fall Surveys**

As noted in previous reports, LISTS staff have spent considerable time and effort investigating options for converting the bulk of data collection from the manual, paper-based system employed for over 30 years to an electronic data acquisition system. The process of converting to electronic data acquisition without significantly changing standard LISTS data collection methods and, just as importantly, without altering the data outputs and analyses has been quite arduous. Happily, there has been significant progress to-date, in fact, the core LISTS database of counts, weights and lengths were all collected electronically in 2018. Paper records were only used for ancillary notes (also known as metadata) and as a backup. See Job 6 in this report for details on the LISTS transition to electronic data acquisition.

Only twelve (12) tows were completed during the April 2018 survey due to difficulty in getting a contractor to service the research vessel's fire suppression system (HALON). Repair and inspections were not completed until the fourth week of the month, which left only four days available for trawl sampling. One day in April was also lost to sampling due to failure of the clutch plate for the power-take-off on the hydraulics (PTO). May sampling started on May 7 and continued until May 25, completing 40 sites in eleven (11) days underway. June sampling began on June 11 and ended on June 27, taking ten (10) days underway to complete the 40 sites. The PTO failed again in June and took four days to complete repairs. The September Survey commenced on September 4 and concluded on September 26, completing 40 tows on 11 days underway, not including six (6) days lost to inclement weather. The 40 sites for October were completed in ten (10) days underway but took from October 9 until November 1 due to time lost to rough weather (6 days) and one day lost to battery charging issues. In total, 172 LISTS sites were completed in 46 days underway during the spring and fall 2018 surveys (Table 5.4), not including transit or changeover days.

Maps showing the sites selected versus the sites sampled during each month of sampling are provided in Figure 5.2 (April), Figure 5.3 (May), Figure 5.4 (June), Figure 5.5 (September) and Figure 5.6 (October). Within each figure the red bordered sites are the sites selected for the month and the solid blue dots indicate the actual sites sampled. If a site had to be relocated during sampling, an explanation of why it was moved is provided under the figure. Additional site/station information is provided in Table 5.5 (April), Table 5.6 (May), Table 5.7 (June), Table

5.8 (September) and Table 5.9 (October). These tables provide date of sample, time, tow duration, latitude/longitude, surface and bottom temperature and salinity, average tow speed, distance towed and approximate area swept for each tow.

Sometimes, a full 30-minute tow cannot be completed. Typical reasons for short tows include lack of room because of observed pot gear set in the immediate area, a drop in speed due to entanglement with some object on the bottom (frequently derelict pot gear), or a complete stop in forward motion (submerged wreck or rock pile). Survey crew will often attempt to finish an interrupted tow by clearing the net (if needed) and resetting beyond the obstruction or observed gear. If this is not possible, a site may have to be moved to another site nearby with the same stratum (bottom type and depth). If the site was moved, the data from the initial site will not be used. Typically, a minimum of 15-20 minutes of tow time is required for a LISTS tow to be recorded. However, there are occasions when a tow with less than 15 minutes will be accepted, usually because there is no alternate site in the designated strata in the vicinity. Short tow information for each month in the survey is summarized in Table 5.10.

### **Cooperative Sample and Data Collection**

As resources permit, LISTS staff participate in cooperative efforts for sample collections, data requests, and special projects using survey personnel, equipment, and other resources. Most of these cooperative efforts are with state researchers or agencies such as the National Marine Fisheries Service (NMFS), Atlantic States Marine Fisheries Commission (ASMFC), New England and Mid-Atlantic Councils (Councils), and researchers or graduate students associated with state or local universities. In recent years, many requests for samples have also come from high schools, aquariums, or other educational organizations needing finfish and invertebrates for teaching purposes. Additionally, Fisheries Division staff often have sample or data requests for media or other public outreach events (see Job 11 of this report). In 2018, a significant amount of project staff time went toward fulfilling large data requests for NMFS, ASMFC, and the Councils. Samples were provided to NY Department of Environmental Conservation, NMFS, CT Health Department, University of Connecticut, Audubon and New England Science and Sailing.

### **Number of Species Identified**

LISTS observed 55 finfish species in 2018 (Table 5.11). No new vertebrate species were encountered in either of the spring or fall surveys. From 1984 to 2018, LISTS has identified 111 finfish species (Appendix 5.1), averaging 57 species per year with a range of 43 to 70 species (Figure 5.7). In addition, a total of 39 types of invertebrates were collected in 2018 (Table 5.12). Most invertebrates are identified to species, however, in some cases, invertebrates were identified to genus or a higher level taxon. One invertebrate species, green crab (*Carcinus maenas*), was encountered by LISTS for the first time in 2018 although it had previously been documented by other CT DEEP sampling efforts in Long Island Sound.

### **Total Catch**

Appendix 5.4 presents a time series (1984-2018) of the finfish species collected each year and their respective rank by numbers. Annual total biomass of invertebrates is also included in this appendix (1992-2018), ranked by weight (kg). A total of 152,220 finfish weighing 23,074.2 kg were sampled in 2018 (Table 5.13). In the spring of 2018, a total of 70,160 finfish weighing

15,138.8 kg were sampled and a total of 82,062 finfish weighing 7,935.4 kg were sampled in fall of 2018 (Table 5.14). A total of 1,156.5 kg of invertebrates were taken in 2018 (Table 5.13). The total biomass of invertebrate catch taken in the spring of 2018 was 465 kg while a total of 691.6 kg of invertebrates were taken in fall (Table 5.15).

### **Length Frequencies**

Length frequency tables are provided primarily to give the reader an understanding of the size range of various species taken in LISTS. Lengths are converted to age frequencies for analysis of principal species such as scup, bluefish, striped bass, summer flounder, tautog, winter flounder, and weakfish. Changes such as an expansion in the size (age) range for some important recreational species are apparent in recent years including more large black sea bass (Table 5.36-5.37), scup (Table 5.50-5.51), and summer flounder (Table 5.54-5.55).

Length frequencies were prepared for 22 species:

alewife	spring and fall	1989 - 2018	Table 5.28;
American shad	spring and fall	1989 - 2018	Table 5.29;
American lobster	spring and fall (M&F)	1984 - 2018	Table 5.30-Table 5.33;
Atlantic herring	spring and fall	1989 - 2018	Table 5.34;
Atlantic menhaden	spring and fall	1996 - 2018	Table 5.35;
black sea bass	spring and fall	1987 - 2018	Table 5.36, Table 5.37
blueback herring	spring and fall	1989 - 2018	Table 5.38;
bluefish	spring and fall	1984 - 2018	Table 5.39, Table 5.40;
butterfish	spring and fall	1986 - 1990, 1992 - 2018	Table 5.41;
clearnose skate	spring and fall	1993 - 2018	Table 5.42, Table 5.43;
fourspot flounder	spring and fall	1989 - 1990, 1996 - 2018	Table 5.44;
hickory shad	spring and fall	1991 - 2018	Table 5.45;
horseshoe crab	spring and fall (M&F)	1998 - 2018	Table 5.46, Table 5.47;
long-finned squid	spring and fall	1986 - 1990, 1992 - 2018	Table 5.48, Table 5.49;
scup	spring and fall	1984 - 2018	Table 5.50, Table 5.51;
striped bass	spring and fall	1984 - 2018	Table 5.52, Table 5.53;
summer flounder	spring and fall	1984 - 2018	Table 5.54, Table 5.55;
tautog	spring and fall	1984 - 2018	Table 5.56, Table 5.57;
weakfish	spring and fall	1984 - 2018	Table 5.58, Table 5.59;
windowpane flounder	spring and fall	1989, 1990, 1994 - 2018	Table 5.60, Table 5.61;
winter flounder	April-May and fall	1984 - 2018	Table 5.62, Table 5.63;
winter skate	spring and fall	1995 - 2018	Table 5.64.

For the years where length data are available, length frequencies were prepared for the seasons or months for which the preferred indices of abundance and catch-at-age matrices are calculated; for some species length frequencies are provided for both seasons.

### **Seasonal Indices of Abundance**

Relative indices of abundance, or the geometric mean counts per tow, were calculated from 1984-2018 for 38 finfish species plus lobster and long-finned squid (squid since 1986). All spring (April-June) and fall (September-October) data were used to compute the abundance



indices presented in Tables 5.16 (spring) and 5.17 (fall), with the preferred seasonal index (for counts) denoted by an asterisk. Geometric mean biomass-per-tow indices have been calculated for 38 finfish and 15 invertebrate species (or species groups) since 1992, for both spring and fall (Table 5.18 and 5.19, respectively). Age specific indices of abundance were calculated for selected important recreational species, including scup, striped bass, summer flounder, and winter flounder (see below). Bluefish and weakfish recruitment indices were calculated using modal analyses of the length frequencies. For each of the 38 finfish species, plots including catch per tow in numbers and biomass in kilograms are illustrated in Figures 5.8 through 5.13. These figures also include plots of each of the age specific indices and recruitment indices mentioned above. Figure 5.14 provides plots of abundance (biomass) indices for crabs (lady, rock, spider; 1992-2018), American lobster (1984-2018), horseshoe crab (1992-2018), and long-finned squid (1986-2018).

### **Indices of Abundance: Important Recreational Species**

Spring and fall abundance indices are presented in Tables 5.16-5.17. Indices of abundance at age were also calculated for seven important recreational species: bluefish (Table 5.20), scup (Table 5.21), striped bass (Table 5.22 age frequency, Table 5.23 indices at age), summer flounder (Table 5.24), tautog (Table 5.25), weakfish (Table 5.26) and winter flounder (Table 5.27). Bluefish and striped bass indices-at-age are based on the fall and spring surveys, respectively, whereas winter flounder indices-at-age are based on only the April and May cruises of the spring survey. Summer flounder, scup and weakfish indices-at-age are calculated and presented separately for each season. Modal distributions were used to calculate recruitment indices for bluefish and weakfish. Although age structures for bluefish are now being collected, it may take a few years before there is enough age data to construct a robust age key (see methods).

### **Species Richness by Group**

The number of cold temperate and warm temperate species captured in each tow was averaged by seasonal cruise (April-June and September-October) for each year from 1984-2018 as an indicator of annual biological diversity or species richness. Trends in these indicators were tested for statistical significance by regression analysis. Results (Figure 5.18) show that the average number of warm temperate species captured/tow in spring and fall cruises has increased ( $F=32.2$  and  $86.7$  respectively,  $p<0.0001$ ); while the average number of cold temperate species has decreased, especially in spring ( $F=52.5$ ,  $p<0.0001$ ) but also in fall cruises ( $F=20.2$ ,  $p<0.0001$ ). Essentially, over the past couple decades, the finfish community structure in LIS has shifted away from the historical, two distinct winter-spring and summer-fall species assemblages and more toward a single spring-summer-fall species assemblage better adapted to the warming bottom water temperatures (Howell and Auster 2012).

### **MODIFICATIONS**

None.

## LITERATURE CITED

- von Bertalanffy, L. 1938. A quantitative theory of organic growth (Inquiries on growth laws. II). Hum. Biol. 10 (2): 181-213.
- Burnett, J., L. O'Brien, R.K. Mayo, J.A. Darde and M. Bohan. 1989. Finfish maturity sampling and classification schemes used during Northeast Fisheries Center bottom trawl surveys, 1963 – 89. NOAA Technical Memorandum NMFS-F/NEC-76: 14 pp. (<http://www.nefsc.noaa.gov/nefsc/publications/tm/tm76.pdf>).
- Chiarella, L.A. and D.O. Conover. 1990. Spawning season and first-year growth of adult bluefish from the New York Bight. Transactions of the American Fisheries Society 119:455-462.
- Collette, B. and G. Klein-MacPhee, 2002, editors. Bigelow and Schroeder's Fishes of the Gulf of Maine, 3rd edition. Smithsonian Institution Press, Washington DC.
- Cooper, R.A. 1967. Age and growth of the tautog, *Tautog onitis* (Linnaeus), from Rhode Island. Trans. Amer. Fish. Soc. 96: 132-134.
- Elzey, S.P. and K.J. Trull. 2016. Identification of a nonlethal method for aging tautog (*Tautoga onitis*). Fish. Bull. 114: 377-385.
- Fahay, M.P., P.L. Berrien, D.L. Johnson and W.W. Morse. 1999. Essential Fish Habitat Source document: Atlantic Cod, *Gadus morhua*, Life History and habitat characteristics. NOAA Technical Memorandum NMFS-NE-124: 41 pp. (<http://www.nefsc.noaa.gov/publications/tm/tm124/tm124.pdf>).
- Flescher, D.D. 1980. Guide to some trawl-caught marine fishes from Maine to Cape Hatteras, North Carolina. NOAA Tech. Rpt. NMFS Circular 431, 34 pp.
- Gosner, K.L. 1978. A Field Guide to the Atlantic Seashore. Peterson Field Guide Series. Houghton Mifflin Company, Boston, MA. 329 pp.
- Gottschall, K.F, M.W. Johnson and D.G. Simpson. 2000. The distribution and size composition of finfish, American lobster, and long-finned squid in Long Island Sound based on the Connecticut Fisheries Division Bottom Trawl Survey, 1984-1994. U.S. Dep. Commer., NOAA Tech Rep. NMFS 148, 195p.
- Gottschall, K and D. Pacileo. 2011. Marine Finfish Survey, Job 2. In: A Study of Marine Recreational Fisheries in Connecticut. Annual Progress Report, CT DEP/Marine Fisheries Division, Old Lyme, CT. 203 pp.
- Gottschall, K and D. Pacileo. 2008. Expansion of the DEP Long Island Sound Trawl Survey, Job 2 (100 pp). In: Assessment and Monitoring of the American Lobster Resource and Fishery in Long Island Sound. State of CT, Final Project Report to NOAA NMFS Northeast Region for Grant # NA16FW1238, 474 pp.
- Gottschall, K and D. Pacileo. 2007. Marine Finfish Survey, Job 2. In: A Study of Marine Recreational Fisheries in Connecticut. Annual Progress Report, CT DEP/Fisheries Division, Old Lyme, CT. 203 pp.
- Gottschall, K and D. Pacileo. 2002. Marine Finfish Survey, Job 2. In: A Study of Marine Recreational Fisheries in Connecticut. Annual Progress Report, CT DEP/Fisheries Division, Old Lyme, CT. 176 pp.

- Howell, P. and P.J. Auster. 2012. Phase shift in an estuarine fish community associated with warming temperatures. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 4(1): 481-495.
- Howell, P., J. Pereira, E. Schultz, and P. Auster, 2016. Habitat use in a depleted population of Winter Flounder *Pseudopleuronectes americanus*: Insights into impediments to population recovery. *Transactions of the American Fisheries Society*. In press.
- Johnson, M and D. Shake. 2000. Marine Finfish Survey, Job 2. In: A Study of Marine Recreational Fisheries in Connecticut. Annual Progress Report, CT DEP/Fisheries Division, Old Lyme, CT. 160 pp.
- Kahn, Jason, and Malcolm Mohead. 2010. A Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons. U.S. Dep. Commerce, NOAA Tech Memo, NMFS-OPR-45, 62p.
- Kendall, A.W., Jr., and L.A. Walford. 1979. Sources and distribution of bluefish, *Pomatomus saltatrix*, larvae and juveniles off the east coast of the United States. U.S. Fish and Wildlife Service Fishery Bulletin 77:213-227.
- Murdy, E., R. Birdsong and J. Musick, 1997, editors. *Fishes of Chesapeake Bay*. Smithsonian Institution Press, Washington DC.
- Nelson, J.S., E.J. Crossman, H. Espinosa-Perez, L.T. Findley, C.R. Gilbert, R.N. Lea, and J.D. Williams. 2004. Common and scientific names of fishes from the United States, Canada, and Mexico, Sixth Edition. American Fisheries Society, Special Publication 29, Bethesda, MD. 386 pp.
- O'Brien, L., J. Burnett and R. Mayo. 1993. Maturation of Nineteen Species of Finfish off Northeast Coast of the United States, 1985-1990. NOAA Technical Report NMFS 113. 66 pp.
- Reid, R.N., A.B. Frame and A.F. Draxler. 1979. Environmental baselines in Long Island Sound, 1972-73. NOAA Tech. Rpt. NMFS SSRF-738, 31 pp.
- Richards, S. W. 1976. Age, growth and food of the bluefish (*Pomatomus saltatrix*) from east-central Long Island Sound from July through November 1975. *Transactions of the American Fisheries Society* 105:523-525.
- Simpson, D.G., P.H. Howell and M. Johnson. 1988. Marine Finfish Survey, Job 2. In: A Study of Marine Recreational Fisheries in Connecticut. Final report, Ct DEP/Fisheries Division, Old Lyme, CT. 265 pp.
- Simpson, D.G., K Gottschall and M Johnson. 1991. Marine Finfish Survey, Job 2. In: A Study of Marine Recreational Fisheries in Connecticut. Annual performance report, CT DEP/Fisheries Division, Old Lyme, CT. 80 pp.
- Sissenwine, M.P. and L. Bowman. 1978. Factors affecting the catchability of fish by bottom trawls. *ICNAF Research Bulletin* No.13: 81-87.
- Wilk, S.J., W.W. Morse and D.E.Ralph. 1978. Length-weight relationships of fishes collected in the New York Bight. *Bull. New Jersey Acad. Sci.* Vol 23, No 2, pp58-64.
- Young, B.H., K.A. McKnown and P.S. Savona. 1994. A study of the striped bass in the marine district for New York, VII. Completion Rept., N.Y. DEC. 133pp.

**TABLES 5.1 - 5.27**  
**LISTS**

**Table 5.1. Specifications for the Wilcox 14 m high-rise trawl net and associated gear.**

<b>Component</b>	<b>Description</b>
<b>Headrope</b>	9.1 m long, 13 mm combination wire rope
<b>Footrope</b>	14.0 m long, 13 mm combination wire rope
<b>Sweep</b>	Combination type, 9.5 mm chain in belly, 7.9 mm chain in wing
<b>Floats</b>	7 floats, plastic, 203 mm diameter
<b>Wings</b>	102 mm mesh, #21 twisted nylon
<b>Belly</b>	102 mm mesh, #21 twisted nylon
<b>Tail Piece</b>	76 mm mesh, #21 twisted nylon
<b>Codend</b>	51 mm mesh, #54 braided nylon
<b>Ground Wires</b>	18.2 m long, 6x7 wire, 9.5 mm diameter
<b>Bridle Wires:</b>	top legs 27.4 m long, 6x7 wire, 6.4 mm diameter
<b>Bottom Legs</b>	27.4 m long, 6x7 wire, 11.1 mm, rubber disc type, 40 mm diameter
<b>Doors</b>	Steel "V" type, 1.2 m long x 0.8 m high, 91 kg
<b>Tow Warp</b>	6x7 wire, 9.5 mm diameter

**Table 5.2. The number of sites scheduled for sampling each month within the 12 depth-bottom type strata.**

<b>Bottom type</b>	<b>Depth Interval (m)</b>				<b>Totals</b>
	<b>0 - 9.0</b>	<b>9.1 - 18.2</b>	<b>18.3 - 27.3</b>	<b>27.4+</b>	
<b>Mud</b>	2	3	5	5	15
<b>Sand</b>	2	2	2	2	8
<b>Transitional</b>	3	5	5	4	17
<b>Totals</b>	<b>7</b>	<b>10</b>	<b>12</b>	<b>11</b>	<b>40</b>

**Table 5.3. Length and age data collected in 2018.**

*In addition to the species listed below, other rarely occurring species (typically totaling less than 30 fish/year each) were measured. During 2018, 21 other species were measured during LISTS sampling as either rarely occurring species or for other research related projects.*

Species measured	Measurement	# tows/day	# fish measured
Alewife	FL (mm)	All	min of 15 / tow
American lobster	CL (0.1 mm)	All	min of 50 / tow
American shad	FL (mm)	All	min of 15 / tow
anchovy, bay	FL (mm)	All	min of 10 / tow
Atlantic herring	FL (mm)	All	min of 15 YOY and min of 30 adults / tow
Atlantic menhaden	FL (mm)	All	min of 15 / tow
Atlantic sturgeon	FL (mm)	All	All
Blueback herring	FL (mm)	All	min of 15 / tow
Bluefish	FL (mm)	All	min of 30 YOY / tow, all adults
black sea bass	TL (mm)	All	All
butterfish	FL (mm)	All	min of 15 YOY and 15 adults / tow
cunner	TL (mm)	All	All
dogfish, smooth	FL (mm)	All	All
dogfish, spiny	FL (mm)	All	All
fourspot flounder	TL (mm)	All	min of 30 / tow
hake, red	TL (mm)	All	min of 30 / tow
hake, silver (whiting)	TL (mm)	All	min of 30 / tow
hake, spotted	TL (mm)	All	min of 30 / tow
hickory shad	FL (mm)	All	All
hogchoker	TL (mm)	All	min of 30 / tow
horseshoe crab	PW (mm)	All	All
northern searobin	FL (mm)	All	min of 30 / tow
moonfish	FL (mm)	All	min of 10 / tow
smallmouth flounder	TL (mm)	All	min of 10 / tow
skate, clearnose	TL (mm)	All	min of 30 / tow
skate, little	TL (mm)	All	min of 30 / tow
skate, winter	TL (mm)	All	All
striped bass	FL (mm)	All	All
striped searobin	FL (mm)	All	min of 30 / tow
scup	FL (mm)	All	min of 15 YOY and 30 / mode for age 1+
long-finned squid	ML (mm)	All	min of 30 / tow
summer flounder	FL (mm)	All	All
tautog	TL (mm)	All	All
weakfish	FL (mm)	All	min of 15 YOY / tow, all adults
whelk , channeled	PW (mm)	All	All
whelk , knobbed	PW (mm)	All	All
windowpane flounder	TL (mm)	All	min of 50 / tow
winter flounder	TL (mm)	All	min of 100 / tow

Species aged	Structure	Subsample
bluefish	scales / otoliths	Collected each season. For each season, minimum of 50 scale and otolith samples collected from full length distribution. Spring collection may use other means of sampling to obtain the required minimum.
menhaden	scales	Collected each season. For each season, minimum of 50 scale samples collected from full length distribution.
scup	scales	Collected every month. For each month scales are taken from the following: 3 fish/cm <20 cm; 5/cm from 20-29 cm; and all fish > 30 cm.
summer flounder	scales	all fish > = 60 cm: for fish < 60 cm, scales collected from 3 fish / cm
tautog	opercular bones otoliths or pelvic fin rays	Collected from a minimum of 200 fish/year. collected from minimum 50 fish/year
weakfish	scales / otoliths	Ageing/collections discontinued in October 2014
winter flounder	otoliths	Collected during April and May from two areas in the Sound: eastern-central and western. For each month and area, subsamples are taken as follows: in the eastern-central area 7 fish / cm < 30 cm, 14 / cm from 30-36 cm, all fish > 36 cm. In the western area 5 fish / cm < 30 cm, 10/cm from 30-36 cm, all fish > than 36 cm.

Notes: min = minimum; YOY = young-of-year; FL = fork length; TL = total length; CL = carapace length; ML = mantle length; PW = prosomal width.

**Table 5.4. Number of Long Island Sound Trawl Survey (LISTS) samples taken by year and cruise.**

*In 1984, thirty-five sites per monthly cruise from April through November were scheduled for sampling. Starting in 1985, forty sites per cruise were scheduled. In 1991, the Trawl Survey was modified to a spring (April - June) and fall (September - October) format--July, August and November sampling was suspended. In 1993 and 1994, an additional cruise of 40 sites was added to the fall period. The additional fall cruise was suspended in 1995. One hundred twenty tows were conducted in 2006 due to delays in rebuilding the main engine on the R/V John Dempsey (spring) and mechanical failure/overhaul of the hydraulic power take-off (fall). Delays in overhauling the transmission in the fall of 2008 resulted in missing September sampling. The June cruise and all of fall sampling in 2010 were canceled for an engine replacement in the R/V John Dempsey. Due to delays in engine replacement, begun in 2010 but not completed until late April 2011, April sampling in 2011 was abbreviated. In 2017, commencement of the spring survey was delayed until late-May due to repairs to the research vessel. In 2018, April sampling was curtailed due to delays in getting the Halon fire suppression system inspected/repared on the research vessel.*

Cruise	Year																																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
April	-	-	35	40	40	40	40	40	-	40	40	40	40	40	40	40	40	40	40	40	40	-	40	40	40	40	12	40	40	40	40	40	36	-	12	
May	13	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	40	40	40	40	40	24	40	
June	19	5	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	40	40	40	-	40	40	40	40	40	40	40	40	40	
July	35	40	40	40	40	40	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
August	34	40	40	40	40	40	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
September	35	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	-	40	-	40	40	40	40	40	40	40	40	40	
Sept/Oct	-	-	-	-	-	-	-	-	-	40	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
October	35	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	-	40	40	-	40	40	-	40	40	40	39	40	40	40	40		
November	29	40	40	40	40	40	40	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>200</b>	<b>246</b>	<b>316</b>	<b>320</b>	<b>320</b>	<b>320</b>	<b>297</b>	<b>205</b>	<b>160</b>	<b>240</b>	<b>240</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>201</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>199</b>	<b>200</b>	<b>120</b>	<b>200</b>	<b>160</b>	<b>200</b>	<b>78</b>	<b>172</b>	<b>200</b>	<b>200</b>	<b>199</b>	<b>200</b>	<b>196</b>	<b>144</b>	<b>172</b>	

**Table 5.5. Station information for LISTS April 2018.**

Standard LISTS tows in the spring begin with SP and fall begins with FA. Latitude (N) and Longitude (W) are displayed in decimal degrees. Water temperature and salinity data are not yet available. Area swept is estimated by assuming the effective sweep is 2/3rds of the footrope length.

Note: only 12 tows were conducted for the April 2018 cruise (see Results and Discussion).

Sample Number	Date	Site Number	Bottom Type	Depth Interva	Time Start	Duration (min)	Latitude	Longitude	S_Temp (sfc, C)	S_Salinity (sfc, ppt)	B_Temp (btm, C)	B_Salinity (btm, ppt)	Ave Speed (knots)	distance (nm)	Area Swept
SP2018001	4/19/2018	1738	T	2	14:42	30	41.2860	-72.1518	.	.	.	.	.	.	.
SP2018002	4/23/2018	0831	S	4	9:34	30	41.1440	-72.4445	.	.	.	.	1.8	0.8793	0.0044
SP2018003	4/23/2018	0427	T	3	11:41	30	41.0878	-72.6002	.	.	.	.	.	.	.
SP2018004	4/23/2018	0023	M	4	13:40	30	41.0323	-72.7859	.	.	.	.	3.4	1.7233	0.0087
SP2018005	4/23/2018	0727	S	3	16:18	30	41.1318	-72.6140	.	.	.	.	3.6	1.7811	0.0090
SP2018006	4/24/2018	1332	S	1	7:20	30	41.2308	-72.3925	.	.	.	.	2.5	1.2627	0.0064
SP2018007	4/24/2018	1026	T	4	9:32	30	41.1757	-72.6515	.	.	.	.	2.4	1.2137	0.0061
SP2018008	4/24/2018	1127	T	3	10:55	30	41.1810	-72.6578	.	.	.	.	3.6	1.7753	0.0090
SP2018009	4/24/2018	1529	T	1	12:50	30	41.2368	-72.6240	.	.	.	.	3.3	1.6729	0.0085
SP2018010	4/27/2018	1227	T	3	8:26	30	41.2141	-72.5918	.	.	.	.	3.9	1.9651	0.0099
SP2018011	4/27/2018	0921	M	2	10:40	30	41.1793	-72.8636	.	.	.	.	3.1	1.5596	0.0079
SP2018012	4/27/2018	0722	M	3	12:16	30	41.1191	-72.8950	.	.	.	.	3.2	1.6083	0.0081



**Table 5.6. Station information for LISTS May 2018.**

Standard LISTS tows in the spring begin with SP and fall begins with FA. Latitude (N) and Longitude (W) are displayed in decimal degrees. Water temperature and salinity data are not yet available. Area swept is estimated by assuming the effective sweep is 2/3rds of the footrope length.

Sample Number	Date	Site Number	Bottom Type	Depth Interval	Time Start	Duration (min)	Latitude	Longitude	S_Temp (sfc, C)	S_Salinity (sfc, ppt)	B_Temp (btm, C)	B_Salinity (btm, ppt)	Ave Speed (knots)	distance (nm)	Area Swept (sq.nm)
SP2018013	5/7/2018	0831	S	4	8:54	30	41.1440	-72.4470	.	.	.	.	2.2	1.1151	0.0056
SP2018014	5/7/2018	0730	S	4	11:19	30	41.1310	-72.4661	.	.	.	.	3	1.4845	0.0075
SP2018015	5/7/2018	0529	S	3	13:12	30	41.0978	-72.5473	.	.	.	.	3.4	1.6820	0.0085
SP2018016	5/7/2018	1333	S	1	15:51	30	41.2311	-72.4066	.	.	.	.	2.6	1.2942	0.0065
SP2018017	5/9/2018	0126	T	3	9:34	30	41.0313	-72.6361	.	.	.	.	2.9	1.4369	0.0073
SP2018018	5/9/2018	0023	M	4	11:58	30	41.0316	-72.7858	.	.	.	.	2.9	1.4747	0.0075
SP2018019	5/9/2018	5921	M	3	13:42	30	41.0006	-72.8589	.	.	.	.	3.3	1.6254	0.0082
SP2018020	5/9/2018	0022	M	4	15:05	30	41.0056	-72.8785	.	.	.	.	2.9	1.4553	0.0074
SP2018021	5/14/2018	1534	T	1	9:17	30	41.2481	-72.3196	.	.	.	.	3.3	1.6428	0.0083
SP2018022	5/14/2018	1533	S	1	11:01	30	41.2488	-72.3823	.	.	.	.	3.3	1.6466	0.0083
SP2018023	5/14/2018	1433	S	2	13:16	30	41.2477	-72.3471	.	.	.	.	1.3	0.6476	0.0033
SP2018024	5/14/2018	1432	S	2	14:54	30	41.2343	-72.4047	.	.	.	.	2.3	1.1677	0.0059
SP2018025	5/15/2018	0627	S	3	8:32	30	41.1126	-72.6048	.	.	.	.	3.7	1.8711	0.0095
SP2018026	5/15/2018	0826	T	3	10:28	30	41.1317	-72.7000	.	.	.	.	2.5	1.2573	0.0064
SP2018027	5/15/2018	0525	T	4	12:09	30	41.0996	-72.6993	.	.	.	.	2.9	1.4543	0.0073
SP2018028	5/15/2018	0521	M	4	13:44	30	41.0963	-72.8671	.	.	.	.	2.6	1.3177	0.0067
SP2018029	5/15/2018	0517	T	3	15:14	30	41.1035	-73.0298	.	.	.	.	2.6	1.3239	0.0067
SP2018030	5/16/2018	0112	M	4	9:31	25	41.0280	-73.2345	.	.	.	.	2.8	1.1641	0.0059
SP2018031	5/16/2018	5613	T	2	11:46	30	40.9483	-73.1935	.	.	.	.	3.2	1.6001	0.0081
SP2018032	5/16/2018	5911	M	3	13:53	30	41.0010	-73.2711	.	.	.	.	3	1.4865	0.0075
SP2018033	5/16/2018	0414	M	3	15:37	30	41.0718	-73.1890	.	.	.	.	.	.	.
SP2018034	5/17/2018	0210	T	2	9:23	30	41.0482	-73.3192	.	.	.	.	3.8	1.9021	0.0096
SP2018035	5/17/2018	0512	M	2	11:05	30	.	.	.	.	.	.	2.7	1.3615	0.0069
SP2018036	5/17/2018	0211	T	2	13:54	30	41.0418	-73.3571	.	.	.	.	3.2	1.6055	0.0081
SP2018037	5/21/2018	0614	M	2	8:38	30	41.1173	-73.1590	.	.	.	.	3	1.4942	0.0076
SP2018038	5/21/2018	0314	M	3	10:44	30	41.0508	-73.2106	.	.	.	.	3.3	1.6468	0.0083
SP2018039	5/21/2018	0215	M	4	12:08	30	41.0423	-73.1263	.	.	.	.	3.2	1.6249	0.0082
SP2018040	5/21/2018	0417	T	3	13:45	30	41.0773	-73.0701	.	.	.	.	2.7	1.3602	0.0069
SP2018041	5/21/2018	0617	T	2	15:11	30	41.1005	-73.0959	.	.	.	.	2.5	1.2691	0.0064
SP2018042	5/22/2018	1320	M	1	8:42	30	41.2018	-72.9894	.	.	.	.	3.6	1.8157	0.0092
SP2018043	5/22/2018	1322	T	1	11:04	30	41.2240	-72.8801	.	.	.	.	3.3	1.6693	0.0084
SP2018044	5/23/2018	1121	M	2	8:41	23	41.1818	-72.9399	.	.	.	.	3.6	1.3669	0.0069
SP2018045	5/23/2018	0922	M	3	11:03	30	41.1705	-72.8335	.	.	.	.	3.1	1.5620	0.0079
SP2018046	5/23/2018	1124	T	2	13:22	30	41.1905	-72.8011	.	.	.	.	3.2	1.6087	0.0081
SP2018047	5/23/2018	1428	T	1	15:20	30	41.2360	-72.6363	.	.	.	.	2.7	1.3306	0.0067
SP2018048	5/24/2018	1028	T	4	8:32	30	41.1768	-72.5706	.	.	.	.	2.9	1.4583	0.0074
SP2018049	5/24/2018	1026	T	4	10:08	30	41.1763	-72.6429	.	.	.	.	2.4	1.2013	0.0061
SP2018050	5/24/2018	1425	M	1	12:14	30	41.2430	-72.7311	.	.	.	.	3.3	1.6324	0.0082
SP2018051	5/25/2018	1027	T	4	8:15	30	41.1837	-72.6333	.	.	.	.	3.4	1.6983	0.0086
SP2018052	5/25/2018	1127	T	3	10:18	30	41.1812	-72.6559	.	.	.	.	3.5	1.7426	0.0088

**Table 5.7. Station information for LISTS June 2018.**

Standard LISTS tows in the spring begin with SP and fall begins with FA. Latitude (N) and Longitude (W) are displayed in decimal degrees. Water temperature and salinity data are not yet available. Area swept is estimated by assuming the effective sweep is 2/3rds of the footrope length.

Sample Number	Date	Site Number	Bottom Type	Depth Interval	Time Start	Duration (min)	Latitude	Longitude	S_Temp (sfc, C)	S_Salinity (sfc, ppt)	B_Tem p (btm,	B_Salinity (btm,	Ave Speed	distance (nm)	Area Swept (sq.nm)
SP2018053	6/11/2018	1737	T	1	10:14	30	41.2883	-72.1992	.	.	.	.	3	1.5109	0.0076
SP2018054	6/11/2018	1740	T	2	12:11	30	41.2758	-72.0773	.	.	.	.	3	1.4846	0.0075
SP2018055	6/15/2018	1738	T	2	8:27	30	41.2830	-72.1983	.	.	.	.	1.9	0.9589	0.0048
SP2018056	6/15/2018	1437	T	4	10:37	28	41.2430	-72.2170	.	.	.	.	4.2	1.9805	0.0100
SP2018057	6/15/2018	0931	S	4	12:48	30	41.1595	-72.4456	.	.	.	.	3	1.5025	0.0076
SP2018058	6/15/2018	1434	S	1	16:11	30	41.2405	-72.3350	.	.	.	.	1	0.5152	0.0026
SP2018059	6/18/2018	0428	S	3	9:03	30	41.0823	-72.5792	.	.	.	.	2.6	1.3245	0.0067
SP2018060	6/18/2018	0129	S	2	10:49	30	41.0293	-72.5668	.	.	.	.	3.5	1.7296	0.0087
SP2018061	6/18/2018	0227	T	3	12:33	30	41.0453	-72.6043	.	.	.	.	3.6	1.7826	0.0090
SP2018062	6/18/2018	0527	T	3	14:26	30	41.0832	-72.6803	.	.	.	.	2.7	1.3472	0.0068
SP2018063	6/19/2018	0831	S	4	8:35	30	41.1428	-72.4442	.	.	.	.	1.7	0.8591	0.0043
SP2018064	6/19/2018	1029	S	3	10:30	27	41.1711	-72.5318	.	.	.	.	4.3	1.9151	0.0097
SP2018065	6/19/2018	1027	T	4	11:54	30	41.1808	-72.6460	.	.	.	.	3.7	1.8430	0.0093
SP2018066	6/19/2018	5823	S	1	14:10	30	40.9813	-72.8245	.	.	.	.	2.9	1.4320	0.0072
SP2018067	6/20/2018	1534	T	1	7:37	30	41.2483	-72.3141	.	.	.	.	1.2	0.6015	0.0030
SP2018068	6/20/2018	0526	T	3	12:10	30	41.1005	-72.6370	.	.	.	.	3.2	1.6151	0.0082
SP2018069	6/20/2018	0325	T	3	14:21	30	.	.	.	.	.	.	3.7	1.8362	0.0093
SP2018070	6/21/2018	0624	T	4	9:58	30	41.1213	-72.7423	.	.	.	.	2.6	1.2989	0.0066
SP2018071	6/21/2018	0623	M	4	11:35	30	41.1115	-72.7955	.	.	.	.	2.9	1.4622	0.0074
SP2018072	6/21/2018	5922	M	3	13:38	30	40.9955	-72.8422	.	.	.	.	3.3	1.6500	0.0083
SP2018073	6/21/2018	0521	M	4	15:20	30	41.0963	-72.8687	.	.	.	.	3.6	1.8204	0.0092
SP2018074	6/22/2018	0715	T	1	8:01	30	41.1281	-73.1258	.	.	.	.	3.4	1.7072	0.0086
SP2018075	6/22/2018	0110	T	3	10:07	30	41.0310	-73.3250	.	.	.	.	3	1.5046	0.0076
SP2018076	6/22/2018	1018	T	2	13:57	30	41.1670	-73.0626	.	.	.	.	.	.	.
SP2018077	6/25/2018	0617	T	2	8:02	30	41.1136	-73.0436	.	.	.	.	3.6	1.8217	0.0092
SP2018078	6/25/2018	0012	M	4	9:41	30	41.0190	-73.2175	.	.	.	.	3.2	1.6237	0.0082
SP2018079	6/25/2018	5709	S	2	11:27	30	40.9502	-73.4084	.	.	.	.	3	1.4881	0.0075
SP2018080	6/25/2018	0111	M	3	13:40	30	41.0306	-73.3149	.	.	.	.	3.2	1.6168	0.0082
SP2018081	6/26/2018	0615	M	2	8:21	23	41.1042	-73.1485	.	.	.	.	3.6	1.3939	0.0070
SP2018082	6/26/2018	0211	T	2	10:10	30	41.0505	-73.3082	.	.	.	.	3.5	1.7568	0.0089
SP2018083	6/26/2018	0414	M	3	12:28	30	41.0736	-73.1856	.	.	.	.	3.5	1.7469	0.0088
SP2018084	6/26/2018	0514	M	2	14:19	25	41.1005	-73.1488	.	.	.	.	2.7	1.1139	0.0056
SP2018085	6/27/2018	0118	M	4	8:51	30	41.0295	-73.0073	.	.	.	.	3.4	1.7057	0.0086
SP2018086	6/27/2018	0015	T	4	10:30	25	41.0105	-73.1237	.	.	.	.	.	.	.
SP2018087	6/27/2018	0017	M	4	12:28	15	41.0103	-73.0703	.	.	.	.	3.3	0.8273	0.0042
SP2018088	6/27/2018	0719	M	3	13:52	15	41.1168	-73.0145	.	.	.	.	3.7	0.9353	0.0047
SP2018089	6/27/2018	0821	M	3	14:51	15	41.1086	-72.9175	.	.	.	.	3.5	0.8698	0.0044
SP2018090	6/27/2018	1022	M	2	15:52	15	41.1872	-72.8198	.	.	.	.	2.5	0.6158	0.0031
SP2018091	6/27/2018	1319	M	1	17:18	15	41.2040	-73.0030	.	.	.	.	3.3	0.8169	0.0041
SP2018092	6/27/2018	1320	M	1	18:28	15	41.2305	-72.9578	.	.	.	.	3.4	0.8410	0.0043

**Table 5.8. Station information for LISTS September 2018.**

Standard LISTS tows in the spring begin with SP and fall begins with FA. Latitude (N) and Longitude (W) are displayed in decimal degrees. Water temperature and salinity data are not yet available. Area swept is estimated by assuming the effective sweep is 2/3rds of the footrope length.

Sample Number	Date	Site Number	Bottom Type	Depth Interval	Time Start	Duration (min)	Latitude	Longitude	S_Temp (sfc, C)	S_Salinity (sfc, ppt)	B_Temp (btm, C)	B_Salinity (btm, ppt)	Ave Speed	distance (nm)	Area Swept (sq.nm)
FA2018001	9/4/2018	1737	T	1	12:19	30	41.2873	-72.1980	.	.	.	.	2.9	1.4726	0.0074
FA2018002	9/4/2018	1432	S	2	14:17	30	41.2313	-72.3918	.	.	.	.	3.5	1.7299	0.0087
FA2018003	9/4/2018	1434	S	1	15:30	30	41.2330	-72.3861	.	.	.	.	2.1	1.0362	0.0052
FA2018004	9/5/2018	0830	S	4	9:20	30	41.1480	-72.4832	.	.	.	.	2.3	1.1409	0.0058
FA2018005	9/5/2018	0526	T	3	11:25	30	41.1000	-72.6417	.	.	.	.	2.6	1.2752	0.0064
FA2018006	9/5/2018	5825	S	1	13:28	30	40.9777	-72.7391	.	.	.	.	3.4	1.7170	0.0087
FA2018007	9/5/2018	5924	M	3	14:54	30	40.9950	-72.7886	.	.	.	.	2.8	1.4125	0.0071
FA2018008	9/6/2018	0731	S	4	9:50	30	41.1360	-72.4688	.	.	.	.	2	1.0052	0.0051
FA2018009	9/6/2018	0729	S	3	11:51	30	41.1265	-72.5222	.	.	.	.	1.8	0.9034	0.0046
FA2018010	9/6/2018	0325	T	3	13:58	30	41.0646	-72.7093	.	.	.	.	3	1.5186	0.0077
FA2018011	9/7/2018	1534	T	1	8:24	30	41.2585	-72.3545	.	.	.	.	3	1.4805	0.0075
FA2018012	9/7/2018	1429	T	2	10:32	30	41.2357	-72.5767	.	.	.	.	2.8	1.4230	0.0072
FA2018013	9/7/2018	1225	T	2	11:56	30	41.2068	-72.7153	.	.	.	.	2.6	1.3000	0.0066
FA2018014	9/7/2018	0927	T	4	13:37	30	41.1533	-72.6794	.	.	.	.	3.7	1.8354	0.0093
FA2018015	9/12/2018	0828	S	3	9:21	30	41.1482	-72.5626	.	.	.	.	3.7	1.8428	0.0093
FA2018016	9/12/2018	0426	T	3	11:03	30	41.0761	-72.6470	.	.	.	.	3.9	1.9552	0.0099
FA2018017	9/12/2018	0624	T	4	12:39	18	41.0981	-72.7565	.	.	.	.	2.5	0.7453	0.0038
FA2018018	9/12/2018	0827	T	3	15:39	30	41.1338	-72.6645	.	.	.	.	3.6	1.7991	0.0091
FA2018019	9/13/2018	1026	T	4	9:48	30	41.1782	-72.6523	.	.	.	.	3.7	1.8684	0.0094
FA2018020	9/13/2018	0625	T	4	11:29	30	41.1080	-72.7130	.	.	.	.	3.8	1.9136	0.0097
FA2018021	9/13/2018	0921	M	2	13:05	18	41.1793	-72.8613	.	.	.	.	3.5	1.0392	0.0053
FA2018022	9/13/2018	1118	M	1	14:34	30	41.1928	-73.0117	.	.	.	.	3.3	1.6603	0.0084
FA2018023	9/14/2018	0519	M	3	9:12	30	41.0960	-72.9721	.	.	.	.	3.1	1.5643	0.0079
FA2018024	9/14/2018	5614	T	2	11:27	30	40.9415	-73.1835	.	.	.	.	3.6	1.7934	0.0091
FA2018025	9/17/2018	0417	T	3	9:57	30	41.0860	-73.0276	.	.	.	.	2.9	1.4615	0.0074
FA2018026	9/17/2018	5713	T	2	11:55	30	40.9665	-73.2015	.	.	.	.	3.1	1.5564	0.0079
FA2018027	9/17/2018	5513	S	2	13:29	30	40.9295	-73.2505	.	.	.	.	3.2	1.6250	0.0082
FA2018028	9/17/2018	0119	M	4	15:46	30	41.0197	-73.0170	.	.	.	.	2.5	1.2709	0.0064
FA2018029	9/19/2018	0715	T	1	9:16	30	41.1275	-73.1276	.	.	.	.	3.1	1.5472	0.0078
FA2018030	9/19/2018	5911	M	3	11:02	30	41.0000	-73.2745	.	.	.	.	3	1.5105	0.0076
FA2018031	9/19/2018	5812	M	3	12:34	30	40.9786	-73.2991	.	.	.	.	3.1	1.5490	0.0078
FA2018032	9/20/2018	0615	M	2	9:22	30	41.1038	-73.1458	.	.	.	.	3.2	1.5836	0.0080
FA2018033	9/20/2018	0211	T	2	11:15	30	41.0470	-73.3213	.	.	.	.	2.9	1.4395	0.0073
FA2018034	9/20/2018	0612	M	1	12:41	30	41.0995	-73.3180	.	.	.	.	3.3	1.6473	0.0083
FA2018035	9/20/2018	0514	M	2	14:03	30	41.0848	-73.2198	.	.	.	.	3.1	1.5649	0.0079
FA2018036	9/26/2018	0821	M	3	9:09	30	41.1510	-72.9276	.	.	.	.	3.1	1.5345	0.0078
FA2018037	9/26/2018	0222	M	4	10:42	30	41.0418	-72.8365	.	.	.	.	3.4	1.6951	0.0086
FA2018038	9/26/2018	0122	M	4	12:18	30	41.0226	-72.8388	.	.	.	.	2.9	1.4560	0.0074
FA2018039	9/26/2018	0319	M	4	14:01	30	41.0570	-72.9668	.	.	.	.	2.5	1.2459	0.0063
FA2018040	9/26/2018	0418	M	4	15:24	30	41.0662	-73.0408	.	.	.	.	3.7	1.8377	0.0093

**Table 5.9. Station information for LISTS October 2018.**

Standard LISTS tows in the spring begin with SP and fall begins with FA. Latitude (N) and Longitude (W) are displayed in decimal degrees. Water temperature and salinity data are not yet available. Area swept is estimated by assuming the effective sweep is 2/3rds of the footrope length

Sample Number	Date	Site Number	Bottom Type	Depth Interval	Time Start	Duration (min)	Latitude	Longitude	S_Temp (sfc, C)	S_Salinity (sfc, ppt)	B_Temp (btm, C)	B_Salinity (btm, ppt)	Ave Speed (knots)	distance (nm)	Area Swept (sq.nm)
FA2018041	10/9/2018	0530	S	3	9:24	22	41.0937	-72.5135	.	.	.	.	3.3	1.2098	0.0061
FA2018042	10/9/2018	0328	T	3	10:57	30	41.0590	-72.5908	.	.	.	.	3.6	1.7788	0.0090
FA2018043	10/9/2018	0125	T	4	12:32	30	41.0105	-72.7385	.	.	.	.	3.3	1.6695	0.0084
FA2018044	10/9/2018	0929	S	3	14:20	30	41.1533	-72.5803	.	.	.	.	3.8	1.8757	0.0095
FA2018045	10/10/2018	0931	S	4	9:02	30	41.1602	-72.4438	.	.	.	.	3.9	1.9345	0.0098
FA2018046	10/10/2018	0430	T	3	10:32	30	41.0850	-72.4921	.	.	.	.	3.8	1.9200	0.0097
FA2018047	10/10/2018	5825	S	1	12:36	30	40.9798	-72.7357	.	.	.	.	3.1	1.5343	0.0078
FA2018048	10/10/2018	0128	T	2	14:10	30	41.0213	-72.6287	.	.	.	.	3.9	1.9273	0.0097
FA2018049	10/10/2018	0330	S	1	15:54	30	41.0463	-72.5280	.	.	.	.	3.3	1.6550	0.0084
FA2018050	10/11/2018	1428	T	1	9:04	30	41.2481	-72.5798	.	.	.	.	3.9	1.9316	0.0098
FA2018051	10/11/2018	1227	T	3	10:41	30	41.2011	-72.6465	.	.	.	.	2.2	1.0804	0.0055
FA2018052	10/11/2018	1432	S	2	12:27	30	41.2290	-72.4521	.	.	.	.	3.1	1.5531	0.0078
FA2018053	10/23/2018	0831	S	4	11:52	30	41.1423	-72.4485	.	.	.	.	2.2	1.0871	0.0055
FA2018054	10/23/2018	0527	T	3	14:03	30	41.0993	-72.6212	.	.	.	.	2	1.0073	0.0051
FA2018055	10/25/2018	1529	T	1	7:52	30	41.2483	-72.5724	.	.	.	.	3.9	1.9436	0.0098
FA2018056	10/25/2018	1124	T	2	9:22	30	41.1995	-72.7548	.	.	.	.	3.7	1.8600	0.0094
FA2018057	10/25/2018	1322	T	1	10:38	30	41.2233	-72.8665	.	.	.	.	3	1.5011	0.0076
FA2018058	10/25/2018	0921	M	2	11:54	30	41.1760	-72.8748	.	.	.	.	2.8	1.3882	0.0070
FA2018059	10/25/2018	0920	T	2	13:48	30	41.1638	-72.9202	.	.	.	.	2.5	1.2675	0.0064
FA2018060	10/25/2018	1120	T	2	15:20	30	41.1930	-72.9193	.	.	.	.	2.4	1.1848	0.0060
FA2018061	10/26/2018	0018	M	3	9:05	30	41.0125	-73.0092	.	.	.	.	3.6	1.8078	0.0091
FA2018062	10/26/2018	5918	M	3	10:45	30	40.9968	-72.9955	.	.	.	.	3.4	1.7126	0.0087
FA2018063	10/26/2018	5513	S	2	12:48	30	40.9257	-73.2493	.	.	.	.	3.4	1.6841	0.0085
FA2018064	10/26/2018	5914	M	4	14:12	30	40.9923	-73.2115	.	.	.	.	3.3	1.6683	0.0084
FA2018065	10/26/2018	0219	M	4	16:02	30	41.0402	-72.9940	.	.	.	.	3.4	1.7121	0.0087
FA2018066	10/29/2018	1320	M	1	9:02	30	41.2050	-72.9896	.	.	.	.	3.4	1.6863	0.0085
FA2018067	10/30/2018	0513	M	2	8:45	30	41.0970	-73.2134	.	.	.	.	2.6	1.3104	0.0066
FA2018068	10/30/2018	0110	T	3	10:18	30	41.0312	-73.3258	.	.	.	.	2.8	1.3787	0.0070
FA2018069	10/30/2018	0611	M	1	12:15	30	41.1020	-73.3156	.	.	.	.	3	1.5102	0.0076
FA2018070	10/30/2018	0615	M	2	13:34	30	41.0948	-73.1956	.	.	.	.	2.6	1.2985	0.0066
FA2018071	10/30/2018	0617	T	2	15:03	30	41.1018	-73.0923	.	.	.	.	2.9	1.4531	0.0073
FA2018072	10/31/2018	0719	M	3	8:02	30	41.1173	-73.0120	.	.	.	.	3.7	1.8746	0.0095
FA2018073	10/31/2018	0022	M	4	9:42	30	41.0046	-72.8851	.	.	.	.	3.2	1.6042	0.0081
FA2018074	10/31/2018	0522	M	4	11:30	30	41.1036	-72.8333	.	.	.	.	3	1.5183	0.0077
FA2018075	10/31/2018	0518	M	3	13:45	30	41.1012	-72.9988	.	.	.	.	3.2	1.6073	0.0081
FA2018076	10/31/2018	0618	M	3	15:13	30	41.1015	-73.0513	.	.	.	.	2.9	1.4306	0.0072
FA2018077	11/1/2018	0424	M	4	8:57	30	41.0675	-72.8116	.	.	.	.	3.4	1.6913	0.0085
FA2018078	11/1/2018	0724	T	4	10:38	30	41.1105	-72.7986	.	.	.	.	3.4	1.6851	0.0085
FA2018079	11/1/2018	0725	T	4	12:11	30	41.1201	-72.7483	.	.	.	.	3	1.5176	0.0077
FA2018080	11/1/2018	0926	T	4	13:50	30	41.1500	-72.6931	.	.	.	.	2.5	1.2632	0.0064

**Table 5.10. Samples with non-standard tow durations and reasons for incomplete tows, spring and fall 2018.**

*Standard LISTS tows begin with SP (spring) or FA (fall).*

Sample	Date	Site	Bottom Type	Depth Interval	Time	Duration	Reason	Comments
<b>MAY</b>								
SP2018030	5/16/2018	0112	M	4	9:31	25	pots	old gear with obsolete trap tags
SP2018044	5/23/2018	1121	M	2	8:41	23	ran out of room	started boost early because known hang ahead
<b>JUNE</b>								
SP2018056	6/15/2018	1437	T	4	10:37	28		hauled back at boost - timer malfunction
SP2018064	6/19/2018	1029	S	3	10:30	27	pots	pots ahead; ran out of room
SP2018081	6/26/2018	0615	M	2	8:21	23	pots	started boost early; pots ahead; ran out of room
SP2018084	6/26/2018	0514	M	2	14:19	25	pots	pots ahead; ran out of room
SP2018086	6/27/2018	0015	T	4	10:30	25	pots	pot gear in net; damage to net
SP2018087	6/27/2018	0017	M	4	12:28	15	pots	conch pot gear in net
SP2018088	6/27/2018	0719	M	3	13:52	15	ran out of room	
SP2018089	6/27/2018	0821	M	3	14:51	15	time constraints	running out of time to complete survey
SP2018090	6/27/2018	1022	M	2	15:52	15	time constraints	running out of time to complete survey
SP2018091	6/27/2018	1319	M	1	17:18	15	time constraints	running out of time to complete survey
SP2018092	6/27/2018	1320	M	1	18:28	15	time constraints	running out of time to complete survey
<b>SEPT</b>								
FA2018017	9/12/2018	0624	T	4	12:39	18	weather	inclement weather - lots of lightening close-by
FA2018021	9/13/2018	0921	M	2	13:05	18	speed drop	no gear in net; no damage in net
<b>OCT</b>								
FA2018041	10/9/2018	0530	S	3	9:24	22	pots	pot buoy on door; no gear in net

**Table 5.11. List of finfish species observed in 2018.**

*Fifty-five finfish species were observed in 2018. Since 1984, one hundred-eleven species of finfish have been identified in LISTS (see Appendix 5.1 for the full list of species).*

<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
anchovy, bay	<i>Anchoa mitchilli</i>	hogchoker	<i>Trinectes maculatus</i>
anchovy, striped	<i>Anchoa hepsetus</i>	jack, crevalle	<i>Caranx hippos</i>
black sea bass	<i>Centropristis striata</i>	kingfish, northern	<i>Menticirrhus saxatilis</i>
blue runner	<i>Caranx crysos</i>	lizardfish, inshore	<i>Synodus foetens</i>
bluefish	<i>Pomatomus saltatrix</i>	mackerel, Atlantic	<i>Scomber scombrus</i>
butterfish	<i>Peprilus triacanthus</i>	mackerel, Spanish	<i>Scomberomorus maculatus</i>
cod, Atlantic	<i>Gadus morhua</i>	menhaden, Atlantic	<i>Brevoortia tyrannus</i>
croaker, Atlantic	<i>Micropogonias undulatus</i>	moonfish	<i>Selene setapinnis</i>
cunner	<i>Tautoglabrus adspersus</i>	pipefish, northern	<i>Syngnathus fuscus</i>
cusck-eel, striped	<i>Ophidion marginatum</i>	puffer, northern	<i>Spherooides maculatus</i>
dogfish, smooth	<i>Mustelus canis</i>	ray, roughtail stingray	<i>Dasyatis centroura</i>
dogfish, spiny	<i>Squalus acanthias</i>	rockling, fourbeard	<i>Enchelyopus cimbrius</i>
eel, conger (yoy)	<i>Conger oceanicus</i>	scup	<i>Stenotomus chrysops</i>
filefish, planehead	<i>Monacanthus hispidus</i>	searobin, northern	<i>Prionotus carolinus</i>
flounder, fourspot	<i>Paralichthys oblongus</i>	searobin, striped	<i>Prionotus evolans</i>
flounder, smallmouth	<i>Etropus microstomus</i>	shad, American	<i>Alosa sapidissima</i>
flounder, summer	<i>Paralichthys dentatus</i>	shad, hickory	<i>Alosa mediocris</i>
flounder, windowpane	<i>Scophthalmus aquosus</i>	skate, clearnose	<i>Raja eglanteria</i>
flounder, winter	<i>Pseudopleuronectes american</i>	skate, little	<i>Leucoraja erinacea</i>
goosefish	<i>Lophius americanus</i>	skate, winter	<i>Leucoraja ocellata</i>
haddock	<i>Melanogrammus aeglefinus</i>	spot	<i>Leiostomus xanthurus</i>
hake, red	<i>Urophycis chuss</i>	stargazer, northern	<i>Astroscopus guttatus</i>
hake, silver	<i>Merluccius bilinearis</i>	striped bass	<i>Morone saxatilis</i>
hake, spotted	<i>Urophycis regia</i>	sturgeon, Atlantic	<i>Acipenser oxyrinchus</i>
harvestfish	<i>Peprilus paru</i>	tautog	<i>Tautoga onitis</i>
herring, Atlantic	<i>Clupea harengus</i>	toadfish, oyster	<i>Opsanus tau</i>
herring, alewife	<i>Alosa pseudoharengus</i>	weakfish	<i>Cynoscion regalis</i>
herring, blueback	<i>Alosa aestivalis</i>		

**Table 5.12. List of invertebrates observed in 2018.**

*In 2018, thirty-nine invertebrate "species" were identified. In most cases, invertebrates are identified to species; however, species that are very similar are identified to genus, and in difficult cases, to a higher taxon.*

<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
arks	<i>Noetia-Anadara spp.</i>	lobster, American	<i>Homarus americanus</i>
bryozoan, bushy	<i>Phylum Bryozoa</i>	mussel, blue	<i>Mytilus edulis</i>
clam, hard clams	<i>Artica-Mercinaria-Pitar sp.</i>	northern moon snail	<i>Lunatia heros</i>
clam, surf	<i>Spisula solidissima</i>	polychaetes	<i>Class polychfeta</i>
clams, jingle shell	<i>Anomiidae sp.</i>	sea grape	<i>Molgula spp.</i>
coral, star	<i>Astrangia poculata</i>	sea urchin, green	<i>Strongylocentrotus droebach</i>
crab, mud	<i>Family Xanthidae</i>	sea urchin, purple	<i>Arbacia punctulata</i>
crab, Japanese shore	<i>Hemigrapsus sanguineus</i>	shrimp, coastal mud	<i>Upogebia affinis</i>
crab, Jonah	<i>Cancer borealis</i>	shrimp, mantis	<i>Squilla empusa</i>
crab, blue	<i>Callinectes sapidus</i>	shrimp, sand	<i>Crangon septemspinosa</i>
crab, flat claw hermit	<i>Pagurus pollicaris</i>	slipper shell, common	<i>Crepidula fornicata</i>
crab, green	<i>Carcinus maenas</i>	sponge spp.	<i>sponge spp.</i>
crab, horseshoe	<i>Limulus polyphemus</i>	sponge, boring	<i>Cliona celate</i>
crab, lady	<i>Ovalipes ocellatus</i>	sponge, red bearded	<i>Microciona prolifera</i>
crab, rock	<i>Cancer irroratus</i>	squid, longfin inshore	<i>Loligo pealeii</i>
crab, spider	<i>Libinia emarginata</i>	Tubularia hydroids	<i>Tubularia, spp.</i>
hydroid spp.	<i>hydroid spp.</i>	whelk, channeled	<i>Busycotypus canaliculatus</i>
jelly, comb	<i>Phylum Ctenophora</i>	whelk, knobbed	<i>Busycon carica</i>
jelly, water	<i>Rhacostoma atlanticum</i>	worms, fan	<i>Myxicola infundibulum</i>
jellyfish, lion's mane	<i>Cyanea capillata</i>		

Names taken from: A Field Guide to the Atlantic Seashore, Peterson Field Guide Series, 1978 (Gosner, 1978).

**Table 5.13. Total number and weight (kg) of finfish and invertebrates caught in 2018.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year anchovies and Gadids are neither separated by species nor quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size) = 172.*

species	count	%	weight	%	species	count	%	weight	%
scup	81,228	53.4	12,947.2	56.1					
butterfish	42,025	27.6	1,412.7	6.1	<b>Finfish not ranked</b>				
weakfish	7,544	5.0	270.2	1.2	anchovy spp, (yoy)				
striped searobin	4,223	2.8	1,582.6	6.9	Atlantic herring, (yoy)				
northern searobin	2,949	1.9	460.8	2.0	American sand lance (yoy)				
smooth dogfish	1,598	1.0	3,024.9	13.1	gadid spp, (yoy)				
black sea bass	1,434	0.9	690.7	3.0					
windowpane flounder	1,266	0.8	189.6	0.8	<b>Invertebrates</b>				
alewife	1,052	0.7	87.5	0.4	horseshoe crab	264	1.9	512.3	44.3
spotted hake	1,015	0.7	151.7	0.7	longfin inshore squid	13,146	92.2	408.8	35.3
hogchoker	811	0.5	98.9	0.4	spider crab	nc		77.1	6.7
summer flounder	753	0.5	397.0	1.7	bushy bryozoan	nc		39.4	3.4
fourspot flounder	711	0.5	147.6	0.6	common slipper shell	nc		29.4	2.5
bluefish	702	0.5	161.4	0.7	lion's mane jellyfish	458	3.2	13.8	1.2
bay anchovy	641	0.4	3.3	0.0	mantis shrimp	297	2.1	11.6	1.0
blueback herring	579	0.4	36.5	0.2	mixed sponge species	nc		10.8	0.9
winter flounder	500	0.3	132.2	0.6	hydroid spp.	nc		10.2	0.9
silver hake	450	0.3	18.3	0.1	flat claw hermit crab	nc		8.7	0.7
red hake	361	0.2	25.8	0.1	knobbed whelk	15	0.1	6.5	0.6
Atlantic herring	352	0.2	45.0	0.2	American lobster	15	0.1	3.8	0.3
striped bass	269	0.2	457.4	2.0	channeled whelk	23	0.2	3.4	0.3
American shad	230	0.2	17.6	0.1	Tubularia, spp.	nc		3.2	0.3
tautog	230	0.2	209.0	0.9	rock crab	nc		2.7	0.2
Atlantic menhaden	227	0.1	80.5	0.3	blue crab	18	0.1	2.7	0.2
striped anchovy	222	0.1	4.1	0.0	sand shrimp	nc		1.7	0.1
blue runner	195	0.1	19.9	0.1	northern moon snail	nc		1.3	0.1
little skate	151	0.1	82.4	0.4	arks	nc		1.2	0.1
moonfish	143	0.1	2.6	0.0	hard clams	3	0.0	1.2	0.1
smallmouth flounder	86	0.1	2.9	0.0	lady crab	nc		1.1	0.1
clearnose skate	81	0.1	149.8	0.6	star coral	nc		0.9	0.1
northern kingfish	75	0.0	9.9	0.0	fan worm tubes	nc		0.8	0.1
spot	36	0.0	3.8	0.0	mud crabs	nc		0.7	0.1
Atlantic cod	11	0.0	3.2	0.0	sea grape	nc		0.6	0.1
Atlantic mackerel	10	0.0	0.7	0.0	surf clam	4	0.0	0.6	0.0
Atlantic sturgeon	7	0.0	98.6	0.4	blue mussel	nc		0.4	0.0
inshore lizardfish	7	0.0	0.5	0.0	Jonah crab	nc		0.4	0.0
crevalle jack	6	0.0	0.5	0.0	comb jelly spp	nc		0.4	0.0
hickory shad	6	0.0	2.2	0.0	red bearded sponge	nc		0.3	0.0
northern puffer	5	0.0	0.3	0.0	water jelly	3	0.0	0.2	0.0
spiny dogfish	5	0.0	16.7	0.1	purple sea urchin	2	0.0	0.2	0.0
cunner	4	0.0	0.5	0.0	Japanese shore crab	nc		0.2	0.0
northern pipefish	3	0.0	0.2	0.0	boring sponge	nc		0.1	0.0
winter skate	3	0.0	4.1	0.0	coastal mud shrimp	1	0.0	0.1	0.0
harvestfish	2	0.0	0.2	0.0	green sea urchin	1	0.0	0.1	0.0
rougtail stingray	2	0.0	18.9	0.1	jingle shell clams	1	0.0	0.1	0.0
oyster toadfish	2	0.0	0.8	0.0	green crab	1	0.0	0.1	0.0
Atlantic croaker	1	0.0	0.1	0.0	polychaetes	nc		0.1	0.0
planehead filefish	1	0.0	0.1	0.0					
goosefish	1	0.0	0.9	0.0	<b>Total</b>	<b>14,252</b>		<b>1,156.5</b>	
haddock	1	0.0	1.6	0.0	Note: nc= not counted				
fourbeard rockling	1	0.0	0.1	0.0					
striped cusk-eel	1	0.0	0.1	0.0					
Spanish mackerel	1	0.0	0.1	0.0					
northern stargazer	1	0.0	0.2	0.0					
<b>Total</b>	<b>152,220</b>		<b>23,074.2</b>						



**Table 5.14. Total counts and weight (kg) of finfish taken in the spring and fall sampling periods, 2018.**

*Species are listed in order of descending count. Young-of-year bay anchovy, striped anchovy, Atlantic herring, American sand lance and Gadids are not included. Number of tows (sample sizes): Spring = 92 and Fall = 80.*

Spring					Fall				
species	count	%	weight	%	species	count	%	weight	%
scup	53,145	75.7	9,898.2	65.4	butterfish	38,727	47.2	1,195.7	15.1
butterfish	3,298	4.7	217.0	1.4	scup	28,083	34.2	3,049.0	38.4
striped searobin	2,808	4.0	1,041.4	6.9	weakfish	7,537	9.2	267.8	3.4
northern searobin	2,447	3.5	386.9	2.6	striped searobin	1,415	1.7	541.2	6.8
black sea bass	1,269	1.8	608.1	4.0	smooth dogfish	977	1.2	1,525.4	19.2
alewife	1,018	1.5	86.6	0.6	bluefish	697	0.8	157.9	2.0
windowpane flounder	810	1.2	132.5	0.9	spotted hake	544	0.7	106.1	1.3
smooth dogfish	620	0.9	1,499.5	9.9	bay anchovy	528	0.6	2.2	0.0
fourspot flounder	601	0.9	127.2	0.8	northern searobin	502	0.6	73.9	0.9
blueback herring	573	0.8	36.4	0.2	hogchoker	465	0.6	58.9	0.7
summer flounder	487	0.7	224.0	1.5	windowpane flounder	456	0.6	57.1	0.7
winter flounder	483	0.7	125.9	0.8	summer flounder	267	0.3	173.1	2.2
spotted hake	471	0.7	45.6	0.3	striped anchovy	222	0.3	4.1	0.1
silver hake	389	0.6	12.9	0.1	blue runner	195	0.2	19.9	0.3
hogchoker	347	0.5	40.0	0.3	black sea bass	165	0.2	82.7	1.0
Atlantic herring	338	0.5	44.0	0.3	American shad	161	0.2	14.5	0.2
red hake	279	0.4	16.1	0.1	Atlantic menhaden	151	0.2	50.8	0.6
tautog	178	0.3	182.1	1.2	moonfish	143	0.2	2.6	0.0
striped bass	137	0.2	251.3	1.7	striped bass	132	0.2	206.1	2.6
bay anchovy	113	0.2	1.1	0.0	fourspot flounder	110	0.1	20.4	0.3
little skate	95	0.1	52.6	0.3	red hake	82	0.1	9.7	0.1
Atlantic menhaden	76	0.1	29.7	0.2	northern kingfish	75	0.1	9.9	0.1
American shad	69	0.1	3.1	0.0	silver hake	62	0.1	5.4	0.1
smallmouth flounder	41	0.1	1.6	0.0	clearnose skate	58	0.1	105.8	1.3
clearnose skate	24	0.0	44.0	0.3	little skate	55	0.1	29.8	0.4
Atlantic cod	11	0.0	3.2	0.0	tautog	52	0.1	26.9	0.3
weakfish	7	0.0	2.4	0.0	smallmouth flounder	45	0.1	1.3	0.0
bluefish	5	0.0	3.5	0.0	spot	35	0.0	3.6	0.0
cunner	4	0.0	0.5	0.0	alewife	34	0.0	0.9	0.0
spiny dogfish	4	0.0	14.8	0.1	winter flounder	17	0.0	6.3	0.1
winter skate	3	0.0	4.1	0.0	Atlantic herring	14	0.0	1.0	0.0
hickory shad	2	0.0	0.7	0.0	Atlantic mackerel	10	0.0	0.7	0.0
northern pipefish	2	0.0	0.2	0.0	Atlantic sturgeon	7	0.0	98.6	1.2
goosefish	1	0.0	0.9	0.0	inshore lizardfish	7	0.0	0.5	0.0
fourbeard rockling	1	0.0	0.1	0.0	blueback herring	6	0.0	0.2	0.0
striped cusk-eel	1	0.0	0.1	0.0	crevalle jack	6	0.0	0.5	0.0
spot	1	0.0	0.2	0.0	northern puffer	5	0.0	0.3	0.0
northern stargazer	1	0.0	0.2	0.0	hickory shad	4	0.0	1.5	0.0
oyster toadfish	1	0.0	0.4	0.0	harvestfish	2	0.0	0.2	0.0
<b>Total</b>	<b>70,160</b>		<b>15,138.8</b>		rougtail stingray	2	0.0	18.9	0.2
					Atlantic croaker	1	0.0	0.1	0.0
					planehead filefish	1	0.0	0.1	0.0
					haddock	1	0.0	1.6	0.0
					northern pipefish	1	0.0	0.1	0.0
					Spanish mackerel	1	0.0	0.1	0.0
					spiny dogfish	1	0.0	1.9	0.0
					oyster toadfish	1	0.0	0.4	0.0
					<b>Total</b>	<b>82,062</b>		<b>7,935.4</b>	

**Table 5.15. Total catch of invertebrates taken in the spring and fall sampling periods, 2018.**  
*Species are ranked by total weight (kg). Number of tows (sample sizes): Spring = 92 and Fall = 80.*

Spring					Fall				
species	count	%	weight	%	species	count	%	weight	%
horseshoe crab	109	5.4	196.66	42.3	horseshoe crab	155	1.3	315.6	45.6
longfin inshore squid	1,383	68.5	93.36	20.1	longfin inshore squid	11,763	96.2	315.4	45.6
spider crab	nc		66.41	14.3	bushy bryozoan	nc		14.6	2.1
bushy bryozoan	nc		24.78	5.3	spider crab	nc		10.7	1.5
common slipper shell	nc		23.77	5.1	mantis shrimp	270	2.2	9.6	1.4
mixed sponge species	nc		10.68	2.3	common slipper shell	nc		5.7	0.8
hydroid spp.	nc		9.88	2.1	knobbed whelk	13	0.1	5.6	0.8
lion's mane jellyfish	448	22.2	9.09	2	lion's mane jellyfish	10	0.1	4.7	0.7
flat claw hermit crab	nc		5.63	1.2	flat claw hermit crab	nc		3.0	0.4
American lobster	14	0.7	3.39	0.7	channeled whelk	11	0.1	1.5	0.2
Tubularia, spp.	nc		3.15	0.7	fan worm tubes	nc		0.7	0.1
rock crab	nc		2.44	0.5	blue crab	3	0.0	0.7	0.1
blue crab	15	1	2	0.4	lady crab	nc		0.5	0.1
mantis shrimp	27	1	1.93	0.4	American lobster	1	0.0	0.4	0.1
channeled whelk	12	0.6	1.89	0.4	arks	nc		0.4	0.1
sand shrimp	nc		1.68	0.4	hydroid spp.	nc		0.3	0.0
hard clams	3	0.1	1.15	0.2	red bearded sponge	nc		0.3	0.0
northern moon snail	nc		1.01	0.2	northern moon snail	nc		0.3	0.0
arks	nc		0.87	0.2	rock crab	nc		0.3	0.0
knobbed whelk	2	0.1	0.86	0.2	surf clam	2	0.0	0.3	0.0
star coral	nc		0.68	0.1	star coral	nc		0.2	0.0
lady crab	nc		0.62	0.1	water jelly	3	0.0	0.2	0.0
sea grape	nc		0.62	0.1	blue mussel	nc		0.2	0.0
mud crabs	nc		0.52	0.1	mud crabs	nc		0.2	0.0
Jonah crab	nc		0.4	0.1	comb jelly spp	nc		0.1	0.0
surf clam	2	0.1	0.3	0.1	jingle shell clams	1	0.0	0.1	0.0
comb jelly spp	nc		0.25	0.1	Japanese shore crab	nc		0.1	0.0
blue mussel	nc		0.25	0.1	mixed sponge species	nc		0.1	0.0
purple sea urchin	2	0.1	0.17	0	<b>Total</b>	<b>12,232</b>		<b>691.6</b>	
boring sponge	nc		0.1	0					
coastal mud shrimp	1	0	0.1	0					
fan worm tubes	nc		0.1	0					
green sea urchin	1	0	0.1	0					
green crab	1	0	0.05	0					
Japanese shore crab	nc		0.05	0					
polychaetes	nc		0.05	0					
<b>Total</b>	<b>2,020</b>		<b>465.0</b>						

Note: nc= not counted



**Table 5.17. Fall indices of abundance for selected species, 1984-2018.**

The geometric mean count per tow was calculated for 38 finfish and 2 invertebrates using September-October data. An asterisk next to the species name and a time series mean, indicates that the fall index provides a better estimate than the spring index (Simpson et al. 1991). Two asterisks indicate that both the spring and the fall indices provide good estimates. There was no fall sampling in 2010.

Species	Fall																												84-17 Mean							
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011		2012	2013	2014	2015	2016	2017	2018
alewife	0.42	0.01	0.05	0.04	0.19	0.16	0.11	0.07	0.19	0.40	0.66	0.16	0.24	1.23	0.11	0.42	0.25	0.55	0.22	0.58	0.26	0.43	0.05	0.95	0.42	0.18	-	0.43	0.07	0.40	0.18	0.64	0.11	0.15	0.19	
black sea bass	0.03	0.11	0.01	0.03	0.05	0.01	0.06	0.14	0.01	0.04	0.06	0.01	0.05	0.03	0.07	0.23	0.18	0.43	1.01	0.15	0.35	0.17	0.24	0.36	0.93	0.26	-	0.29	1.49	0.99	1.35	0.65	1.37	0.91	1.29	
bluefish *	23.41	19.01	13.66	14.32	15.49	26.25	23.88	33.43	25.22	18.92	32.06	24.46	20.80	37.90	31.41	45.31	20.57	24.24	18.75	28.53	29.13	18.89	15.66	30.66	14.28	18.11	-	11.10	15.06	9.71	18.61	8.42	11.25	8.05	4.00	21.41
butterfish *	51.93	89.72	63.41	60.09	146.67	174.87	154.65	170.59	301.72	87.73	93.05	320.06	173.74	186.62	355.49	477.91	125.97	142.89	165.07	112.86	175.37	197.24	140.23	154.53	181.71	409.75	-	39.62	132.47	60.24	132.54	96.23	172.44	116.05	101.39	165.56
cunner	0.09	0.05	0.05	0.06	0.05	0.06	0.05	0.08	0.09	0.05	0.05	0.03	0.01	0.05	0.08	0.06	0.07	0.04	0.03	0.06	0.04	0.05	0.02	0.01	0.05	0.05	-	0.01	0.03	0.01	0.02	0.01	0.00	0.00	0.00	0.00
dogfish, smooth *	2.47	1.92	1.43	0.81	0.91	0.41	0.55	0.46	0.78	0.95	0.49	0.46	0.80	0.59	0.72	0.93	1.88	1.69	3.58	3.10	1.44	1.41	0.94	2.27	0.63	1.13	-	1.43	2.41	4.13	5.78	7.30	5.24	8.29	7.17	2.04
dogfish, spiny	0.04	0.00	0.00	0.03	0.01	0.00	0.12	0.00	0.02	0.05	0.10	0.00	0.01	0.04	0.07	0.03	0.04	0.16	0.05	0.00	0.18	0.22	0.00	0.00	0.11	0.08	-	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01
flounder, fourspot	1.18	1.03	0.50	0.37	1.73	0.80	1.47	0.74	1.44	1.55	1.33	0.44	2.05	3.29	1.63	1.19	1.15	1.17	1.09	0.96	1.14	1.11	0.65	0.73	1.30	1.82	-	1.35	0.81	0.42	0.86	0.41	0.24	0.04	0.48	
flounder, summer *	0.99	1.19	1.73	1.40	1.42	0.14	0.87	1.26	1.02	1.11	0.55	0.54	2.19	2.50	1.72	2.68	1.91	4.42	6.12	3.39	1.95	2.41	1.35	1.89	3.09	3.12	-	2.56	3.74	3.07	1.71	2.03	1.92	1.35	2.43	2.04
flounder, windowpane	22.11	11.56	7.32	6.85	12.10	8.68	7.19	4.71	6.79	9.48	3.89	2.43	28.13	13.36	4.64	2.53	2.81	1.81	1.86	3.39	2.27	6.14	1.54	3.65	7.95	5.59	-	5.32	3.38	3.13	2.42	1.67	1.10	1.01	2.19	0.00
flounder, winter	7.31	2.75	3.86	5.42	10.07	11.03	15.42	6.10	6.41	9.32	6.13	3.77	12.29	7.75	6.69	8.66	7.08	3.07	1.74	1.25	2.19	2.15	0.94	0.82	2.26	1.55	-	1.27	1.37	0.33	0.44	0.81	0.28	0.09	0.14	
hake, red	0.74	0.33	1.00	0.37	0.75	1.14	0.44	0.33	0.39	1.81	0.59	0.20	1.62	0.89	0.53	0.29	1.20	0.41	0.15	0.73	0.76	0.45	0.33	0.54	0.41	0.90	-	0.60	0.21	0.39	0.66	1.14	0.01	0.16	0.41	
hake, silver	0.55	0.23	1.65	0.01	0.30	0.60	0.96	0.32	0.48	0.20	3.34	0.22	0.06	0.80	0.07	0.16	0.09	0.07	0.07	0.18	0.18	0.09	0.64	0.04	0.28	0.18	-	0.41	0.40	0.12	0.11	0.16	0.02	0.12	0.35	0.75
hake, spotted *	0.28	0.17	0.21	0.14	0.10	0.05	0.11	0.03	0.39	1.48	0.50	0.16	1.68	0.12	0.41	0.61	1.18	0.35	0.86	1.95	0.14	0.32	0.56	0.39	0.69	1.11	-	2.62	1.15	1.93	1.49	0.91	0.74	2.04	3.72	0.75
herring, Atlantic	0.00	0.00	0.01	0.02	0.40	0.08	0.04	0.03	1.47	0.14	0.14	0.00	0.19	0.06	0.25	0.00	0.02	0.00	0.00	0.38	0.02	0.02	0.03	0.02	0.02	0.06	-	0.04	0.00	0.03	0.03	0.10	0.00	0.00	0.07	0.00
herring, blueback *	0.38	0.16	0.07	0.13	0.53	0.34	0.10	0.04	0.08	0.11	0.93	0.27	0.05	0.75	0.16	0.06	0.06	0.20	0.06	0.10	0.09	0.06	0.15	0.24	0.05	0.09	-	0.08	0.01	0.00	0.04	0.17	0.21	0.24	0.04	0.18
hogchoker *	0.90	0.56	0.21	0.17	0.30	0.17	0.22	0.38	0.15	0.18	0.05	0.07	0.18	0.05	0.05	0.19	0.10	0.15	0.21	0.26	0.15	0.13	0.11	0.20	0.12	0.09	-	0.59	0.94	0.65	0.67	1.06	0.89	1.18	2.55	0.34
kingfish, northern *	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.02	0.06	0.03	0.19	0.04	0.04	0.12	0.05	0.01	0.02	0.01	0.00	0.04	0.03	0.00	0.04	0.05	0.05	-	0.21	0.24	0.09	0.23	0.38	0.16	0.08	0.34	0.07
lobster, American **	7.41	3.33	4.75	5.95	3.54	3.75	7.29	9.90	9.52	11.50	10.13	8.05	10.07	19.60	10.47	11.18	6.83	4.28	2.68	3.03	3.68	2.10	1.48	1.21	2.07	1.82	-	0.38	0.29	0.16	0.09	0.08	0.02	0.02	0.01	5.05
menhaden, Atlantic *	0.23	0.15	0.79	0.14	0.13	0.45	0.66	0.59	2.00	0.40	1.02	0.56	0.43	0.57	0.73	1.08	0.97	0.32	0.76	0.95	1.63	0.94	0.23	0.80	0.47	0.28	-	0.74	0.94	0.39	0.61	2.49	0.80	0.43	0.75	0.72
moonfish *	0.05	0.33	0.11	0.04	0.41	0.10	0.04	0.17	0.22	0.04	0.34	0.25	1.99	0.91	2.08	1.15	2.11	0.82	1.36	0.69	0.74	1.55	1.51	1.66	5.08	10.03	-	1.50	0.79	2.62	3.92	1.06	0.77	1.16	0.79	1.38
ocean pout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rockling, fourbeard	0.08	0.01	0.04	0.05	0.21	0.15	0.07	0.04	0.06	0.03	0.06	0.01	0.11	0.07	0.03	0.04	0.12	0.03	0.01	0.04	0.04	0.01	0.00	0.02	0.06	0.04	-	0.03	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
scad, rough *	0.13	0.08	0.03	0.27	0.42	0.08	0.08	0.01	0.00	0.21	0.03	0.00	0.18	0.05	0.00	0.00	0.00	0.07	0.07	0.14	0.09	0.19	0.15	0.08	0.00	0.38	-	0.32	0.12	0.14	0.04	0.37	0.01	0.06	0.00	0.12
sculpin, longhorn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
scup *	10.72	30.97	25.76	18.54	39.70	65.09	69.48	311.57	83.73	77.06	92.52	59.14	61.46	41.28	103.27	537.68	521.10	177.64	348.70	152.23	291.46	424.06	116.75	475.29	303.26	139.38	-	198.23	223.52	40.68	182.58	422.23	307.01	212.15	228.62	186.80
sea raven	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
searobin, northern	0.20	0.22	0.31	0.03	0.38	0.18	0.43	0.43	0.15	0.25	0.80	0.12	0.27	0.14	0.93	0.62	0.47	1.15	1.25	0.51	1.03	0.68	0.21	1.05	1.11	0.88	-	1.19	2.07	1.56	2.70	0.84	1.24	0.79	2.32	0.00
searobin, striped *	2.75	3.44	1.64	0.90	3.44	3.83	2.39	1.97	2.75	4.44	2.00	0.74	4.03	2.62	3.68	4.48	5.68	3.34	4.85	6.44	4.67	3.26	0.81	2.25	3.66	3.54	-	4.10	7.06	5.29	5.83	6.93	3.51	3.13	6.34	3.62
shad, American *	3.13	0.19	0.27	0.29	2.66	3.10	0.65	0.72	0.54	1.11	1.84	1.90	0.27	0.91	1.22	1.73	0.55	0.41	0.76	0.75	0.95	0.54	0.12	0.38	0.41	0.46	-	0.42	0.44	0.31	0.20	0.71	0.85	0.63	0.80	0.89
shad, hickory *	0.02	0.01	0.03	0.01	0.00	0.00	0.01	0.00	0.05	0.04	0.10	0.04	0.09	0.10	0.05	0.12	0.09	0.03	0.04	0.09	0.13	0.25	0.24	0.08	0.03	0.06	-	0.05	0.19	0.16	0.04	0.02	0.02	0.02	0.03	0.07
skate, clearnose *	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.05	0.04	0.01	0.02	0.01	0.03	0.12	0.10	0.10	0.34	0.18	0.33	0.10	0.48	0.23	0.44	0.38	0.24	-	0.27	0.73	0.68	0.34	0.47	0.43	0.36	0.33	0.20
skate, little	4.41	3.62	4.01	2.72	8.13	4.31	7.50	5.24	5.52	10.00	6.41	3.37	11.55	6.90	7.73	5.23	5.25	5.07	5.39	2.99	3.12	3.90	1.03	1.09	1.28	0.99	-	0.84	1.14	0.63	0.82	0.55	0.48	0.20	0.26	0.00
skate, winter	0.00	0.01	0.00	0.00	0.03	0.03	0.05	0.02	0.07	0.09	0.12	0.07	0.17	0.08	0.05	0.06	0.01	0.13	0.13	0.00	0.07	0.10	0.00	0.06	0.21	0.10	-	0.05	0.17	0.12	0.09	0.04	0.02	0.10	0.00	0.00
spot *	0.00	0.18	0.20	0.02	0.09	0.00	0.04	0.02	0.00	0.38	0.18	0.03	0.99	0.08	0.00	0.28	0.63	0.08	0.35	0.00	0.07	0.00	0.19	0.00	0.26	0.01	-	0.04	1.60	1.70	0.16	0.10	0.07			

**Table 5.18. Finfish and invertebrate biomass indices for the spring sampling period, 1992-2018.**

*The geometric mean weight (kg) per tow was calculated for 38 finfish and 15 invertebrate species for the spring (April-June) sampling period.*

	Spring																											
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
alewife	0.06	0.17	0.32	0.15	0.50	0.25	0.20	0.37	0.34	0.15	0.25	0.19	0.25	0.22	0.21	0.31	0.22	0.24	0.16	0.17	0.17	0.20	0.18	0.12	0.37	0.01	0.30	
black sea bass	0.01	0.03	0.06	0.03	0.06	0.06	0.02	0.05	0.07	0.17	0.40	0.17	0.15	0.07	0.04	0.14	0.10	0.21	0.18	0.18	0.34	0.43	1.37	1.44	1.48	3.05	2.20	
bluefish	0.45	0.08	0.13	0.04	0.10	0.23	0.17	0.35	0.09	0.08	0.36	0.20	0.12	0.14	0.23	0.21	0.11	0.30	0.03	0.24	0.11	0.18	0.03	0.01	0.05	0.05	0.02	
butterfish	0.43	0.10	0.31	0.19	0.73	1.27	1.06	0.52	0.69	0.79	1.48	0.64	0.41	0.55	2.30	0.66	1.06	1.37	0.49	2.69	1.87	0.66	0.61	0.66	2.03	1.54	1.06	
cunner	0.02	0.04	0.01	0.03	0.02	0.03	0.04	0.04	0.03	0.04	0.05	0.03	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.00	0.01	0.00	0.01	0.01	
dogfish, smooth	1.04	0.44	1.14	0.63	0.83	0.42	0.90	1.05	0.85	0.82	2.31	1.10	0.87	0.77	2.83	1.14	1.88	2.07	0.18	2.90	1.68	1.32	1.27	1.41	3.21	6.17	2.58	
dogfish, spiny	0.10	0.02	0.12	0.00	0.00	0.01	0.03	0.02	0.00	0.08	0.06	0.07	0.07	0.05	0.21	0.25	0.15	0.84	0.07	0.37	0.11	0.16	0.12	0.20	0.09	0.09	0.05	
flounder, fourspot	2.19	0.75	0.75	1.48	1.37	2.08	1.28	0.96	1.31	1.28	1.35	1.01	1.03	0.44	0.60	1.05	0.93	0.64	0.62	1.23	1.60	0.75	0.65	0.34	0.61	0.59	0.74	
flounder, summer	0.35	0.27	0.48	0.16	0.53	0.60	1.15	1.09	1.35	1.21	2.38	2.45	1.69	0.67	0.61	1.72	1.44	1.40	1.28	2.73	2.22	2.16	2.09	1.07	1.05	1.36	1.51	
flounder, windowpane	1.96	2.53	2.96	1.60	4.76	4.16	3.21	2.38	1.69	1.97	1.31	1.21	1.32	0.54	0.63	2.51	2.04	1.29	2.20	1.86	1.74	1.32	1.26	0.78	0.56	0.71	0.86	
flounder, winter	8.72	7.54	9.44	6.51	14.61	10.63	9.65	6.67	7.46	9.77	6.31	6.64	3.87	2.94	1.65	4.99	3.84	2.94	4.26	3.60	2.72	2.26	1.46	1.01	0.82	0.26	0.77	
hake, red	0.78	0.85	0.14	0.66	0.21	0.33	0.94	1.05	0.59	0.45	0.96	0.13	0.20	0.22	0.25	0.67	0.61	0.23	0.47	0.09	0.65	0.24	0.11	0.03	0.24	0.10	0.13	
hake, silver	0.20	0.14	0.40	0.36	0.12	0.39	0.48	0.56	0.19	0.54	0.52	0.06	0.16	0.05	0.33	0.10	1.02	0.27	0.33	0.26	0.87	0.15	0.07	0.03	0.20	0.13	0.12	
hake, spotted	0.01	0.01	0.00	0.02	0.03	0.09	0.03	0.13	0.27	0.17	0.20	0.13	0.18	0.05	0.14	0.11	0.31	0.07	0.14	0.21	0.22	0.20	0.15	0.05	0.53	0.50	0.30	
herring, Atlantic	1.06	2.03	1.09	1.77	0.55	0.88	0.25	0.22	0.42	0.26	0.14	0.19	0.12	0.32	0.09	0.55	0.19	0.37	0.65	0.30	0.17	0.60	0.32	0.18	0.16	0.02	0.16	
herring, blueback	0.05	0.02	0.06	0.03	0.04	0.04	0.02	0.00	0.04	0.02	0.01	0.02	0.04	0.04	0.02	0.04	0.02	0.06	0.04	0.02	0.01	0.03	0.02	0.03	0.02	0.00	0.07	
hogchoker	0.04	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.03	0.04	0.04	0.04	0.04	0.03	0.02	0.05	0.03	0.02	0.04	0.06	0.07	0.09	0.10	0.05	0.14	0.28	0.26	
kingfish, northern	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
menhaden, Atlantic	0.07	0.03	0.03	0.04	0.01	0.01	0.00	0.00	0.02	0.00	0.03	0.01	0.01	0.00	0.02	0.07	0.03	0.04	0.03	0.07	0.29	0.22	0.37	0.39	0.23	0.39	0.15	
moonfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ocean pout	0.07	0.09	0.04	0.04	0.04	0.03	0.02	0.02	0.03	0.01	0.03	0.02	0.03	0.00	0.01	0.02	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00
rockling, fourbeard	0.13	0.10	0.05	0.10	0.05	0.11	0.08	0.13	0.09	0.12	0.06	0.06	0.08	0.05	0.02	0.05	0.05	0.03	0.03	0.03	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00
scad, rough	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sculpin, longhorn	0.06	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.03	0.01	0.01	0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
scup	0.48	0.49	0.58	0.65	0.73	0.75	0.75	0.56	4.56	2.85	13.16	2.28	3.93	1.65	10.41	3.35	5.88	6.40	3.14	0.21	9.55	9.99	6.47	5.61	3.53	20.25	58.66	27.24
sea raven	0.03	0.00	0.00	0.00	0.01	0.00	0.05	0.03	0.05	0.02	0.03	0.01	0.01	0.00	0.00	0.02	0.00	0.01	0.02	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
searobin, northern	0.26	0.35	0.28	0.27	0.28	0.33	0.17	0.22	0.70	0.51	0.51	0.40	0.29	0.08	0.35	0.26	0.23	0.44	0.52	0.30	0.81	0.34	0.39	0.22	0.50	0.98	0.71	
searobin, striped	0.86	0.30	0.51	0.77	0.46	0.40	0.87	1.14	1.99	1.40	2.21	1.21	0.97	0.22	0.49	0.56	0.65	1.34	0.47	1.81	2.25	1.54	1.53	1.21	3.13	6.54	3.09	
shad, American	0.29	0.09	0.21	0.10	0.11	0.23	0.13	0.20	0.05	0.01	0.11	0.03	0.04	0.05	0.05	0.07	0.08	0.07	0.07	0.10	0.06	0.07	0.06	0.15	0.01	0.03	0.03	
shad, hickory	0.01	0.01	0.01	0.01	0.03	0.02	0.05	0.06	0.05	0.03	0.09	0.05	0.04	0.10	0.11	0.05	0.00	0.01	0.00	0.00	0.02	0.01	0.05	0.02	0.03	0.01	0.01	
skate, clearnose	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.04	0.06	0.13	0.07	0.04	0.02	0.08	0.12	0.08	0.11	0.02	0.11	0.54	0.17	0.21	0.23	0.39	0.30	0.21	
skate, little	5.89	5.99	8.87	3.38	9.35	6.00	6.27	4.25	3.43	4.47	4.56	4.35	4.01	1.05	0.91	1.82	0.97	0.71	0.66	0.79	1.34	0.74	0.71	0.41	0.30	0.37	0.33	
skate, winter	0.37	0.52	0.28	0.21	0.46	0.29	0.46	0.27	0.25	0.21	0.25	0.24	0.28	0.12	0.22	0.23	0.19	0.23	0.15	0.25	0.46	0.25	0.33	0.12	0.10	0.05	0.02	
spot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
striped bass	0.31	0.43	0.45	0.49	0.77	1.13	1.15	1.86	1.13	0.93	2.10	1.38	0.87	1.52	1.27	1.37	0.86	0.93	0.66	0.96	0.58	0.98	0.54	0.29	0.50	0.57	0.81	
sturgeon, Atlantic	0.05	0.05	0.08	0.03	0.02	0.04	0.13	0.08	0.05	0.03	0.16	0.00	0.00	0.05	0.15	0.06	0.02	0.02	0.02	0.08	0.10	0.06	0.00	0.00	0.07	0.00	0.00	
tautog	1.00	0.51	0.51	0.19	0.63	0.42	0.49	0.51	0.59	0.78	1.09	0.61	0.62	0.65	0.84	0.61	0.60	0.51	0.30	0.44	0.38	0.40	0.51	0.42	0.53	0.48	0.56	
weakfish	0.11	0.03	0.01	0.05	0.06	0.15	0.20	0.31	0.12	0.11	0.12	0.03	0.04	0.09	0.12	0.08	0.02	0.04	0.01	0.04	0.39	0.22	0.08	0.01	0.23	0.33	0.02	
<b>Invertebrates</b>																												
crab, blue	0.03	0.02	0.00	0.02	0.00	0.02	0.02	0.03	0.04	0.01	0.04	0.01	0.01	0.00	0.01	0.04	0.02	0.00	0.02	0.03	0.04	0.03	0.00	0.00	0.02	0.04	0.02	
crab, flat claw hermit	0.15	0.08	0.18	0.02	0.09	0.04	0.10	0.10	0.07	0.12	0.14	0.32	0.17	0.05	0.04	0.11	0.09	0.12	0.08	0.09	0.05	0.07	0.07	0.03	0.03	0.03	0.06	
crab, horseshoe	0.35	0.45	0.60	0.13	0.61	0.33	0.55	0.80	0.74	0.94	0.76	1.33	0.96	0.39	0.25	0.86	0.62	0.65	0.52	0.81	0.55	0.70	0.45	0.38	0.29	0.15	0.80	
crab, lady	0.25	0.23	0.16	0.18	0.50	0.50	0.39	0.16	0.13	0.04	0.07	0.01	0.01	0.01	0.04	0.02	0.02	0.01	0.06	0.11	0.06	0.01	0.01	0.01	0.00	0.03	0.01	
crab, rock	1.17	0.61	0.64	0.14	0.45	0.32	1.04	0.55	0.25	0.35	0.31	0.36	0.14	0.05	0.16	0.16	0.20	0.18	0.13	0.25	0.16	0.06	0.03	0.02	0.05	0.01	0.02	
crab, spider	0.98	1.08	1.22	0.32	0.96	0.52	0.69	0.39	0.35	1.02	1.30	1.85	1.42	0.36	0.27	0.55	0.57	0.46	0.70	0.78	0.74	0.62	0.55	0.42	0.72	0.69	0.51	
jellyfish, lion's mane	0.01	0.11	0.01	0.15	0.10	0.08	0.19	0.06	0.06	0.03	0.02	0.23	0.14	0.38	0.11	0.00	0.10	0.03	0.08	0.08	0.01	0.16	0.14	0.05	0.01	0.03	0.09	
lobster, American	2.80	2.32	1.53	3.24	2.72	3.02	6.56	4.95	3.90	3.04	2.55	1.48	1.03	1.00														

**Table 5.19. Finfish and invertebrate biomass indices for the fall sampling period, 1992-2018.**

The geometric mean weight (kg) per tow was calculated for 38 finfish and 15 invertebrate species for the fall (Sept-Oct) sampling period. There was no fall sampling in 2010.

	Fall																											
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
alewife	0.03	0.08	0.10	0.02	0.04	0.22	0.02	0.07	0.02	0.09	0.03	0.09	0.04	0.05	0.01	0.14	0.04	0.02	-	0.06	0.01	0.03	0.03	0.10	0.01	0.01	0.01	
black sea bass	0.01	0.01	0.01	0.00	0.01	0.01	0.05	0.07	0.07	0.23	0.31	0.08	0.08	0.08	0.07	0.14	0.23	0.07	-	0.15	0.33	0.46	0.82	0.49	0.59	0.47	0.71	
bluefish	16.39	9.91	9.45	8.09	7.62	6.53	5.06	8.51	8.34	6.11	7.87	8.99	16.39	8.75	3.92	9.74	9.19	6.40	-	3.84	3.72	2.73	3.91	2.06	2.97	1.65	1.20	
butterfish	6.31	4.12	3.40	10.26	9.30	6.97	13.27	15.43	4.45	7.80	6.56	3.47	6.24	7.85	7.73	5.82	8.97	14.39	-	2.81	6.14	3.62	5.97	4.08	6.58	5.56	5.69	
cunner	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.01	-	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
dogfish, smooth	1.20	1.75	0.76	0.85	1.16	1.09	1.32	1.27	2.85	3.02	6.09	6.18	2.95	2.70	2.46	6.23	1.25	2.80	-	3.66	4.69	7.93	11.05	11.70	8.30	14.82	9.57	
dogfish, spiny	0.03	0.08	0.18	0.00	0.01	0.05	0.10	0.05	0.06	0.24	0.07	0.00	0.27	0.34	0.00	0.00	0.18	0.18	-	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	
flounder, fourspot	0.14	0.16	0.14	0.08	0.48	0.24	0.19	0.14	0.35	0.17	0.25	0.30	0.29	0.19	0.06	0.19	0.16	0.21	-	0.11	0.14	0.05	0.10	0.06	0.06	0.02	0.16	
flounder, summer	0.87	0.85	0.47	0.43	1.61	1.84	1.77	2.27	1.77	3.19	4.41	3.27	1.74	1.93	1.36	1.65	1.97	2.41	-	1.82	2.74	2.18	1.41	1.54	1.69	0.97	1.58	
flounder, windowpane	0.51	0.73	0.42	0.32	2.11	1.30	0.61	0.38	0.45	0.30	0.38	0.43	0.26	0.57	0.29	0.42	0.98	0.64	-	0.68	0.61	0.57	0.47	0.37	0.26	0.28	0.44	
flounder, winter	0.84	0.99	0.78	0.45	1.56	1.04	0.87	1.37	1.28	0.62	0.55	0.34	0.32	0.41	0.16	0.22	0.49	0.26	-	0.28	0.40	0.11	0.17	0.22	0.11	0.03	0.06	
hake, red	0.11	0.34	0.19	0.04	0.48	0.18	0.10	0.06	0.32	0.07	0.02	0.19	0.14	0.10	0.06	0.12	0.09	0.13	-	0.14	0.04	0.08	0.14	0.28	0.00	0.04	0.09	
hake, silver	0.04	0.02	0.28	0.02	0.01	0.06	0.01	0.03	0.01	0.01	0.01	0.02	0.02	0.01	0.08	0.01	0.03	0.02	-	0.04	0.05	0.02	0.01	0.03	0.00	0.02	0.06	
hake, spotted	0.09	0.30	0.15	0.04	0.37	0.03	0.08	0.17	0.34	0.09	0.19	0.41	0.03	0.08	0.17	0.10	0.16	0.23	-	0.53	0.27	0.38	0.36	0.28	0.14	0.51	0.96	
herring, Atlantic	0.07	0.01	0.01	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.01	-	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	
herring, blueback	0.01	0.01	0.12	0.03	0.01	0.09	0.02	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.03	0.00	0.01	-	0.01	0.00	0.00	0.01	0.03	0.05	0.03	0.00	
hogchoker	0.02	0.03	0.01	0.01	0.04	0.01	0.01	0.04	0.02	0.03	0.05	0.04	0.03	0.03	0.02	0.04	0.02	0.02	-	0.11	0.17	0.11	0.10	0.23	0.17	0.24	0.53	
kingfish, northern	0.00	0.01	0.00	0.03	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	-	0.04	0.04	0.02	0.03	0.07	0.03	0.02	0.08	
menhaden, Atlantic	0.36	0.22	0.36	0.25	0.25	0.24	0.09	0.39	0.22	0.05	0.35	0.25	0.49	0.43	0.06	0.29	0.12	0.10	-	0.39	0.47	0.18	0.31	0.99	0.17	0.18	0.35	
moonfish	0.02	0.00	0.03	0.03	0.12	0.05	0.13	0.09	0.13	0.04	0.08	0.03	0.04	0.07	0.11	0.27	0.21	-	-	0.07	0.04	0.11	0.20	0.12	0.06	0.05	0.03	
ocean pout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
rockling, fourbeard	0.01	0.00	0.01	0.00	0.02	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
scad, rough	0.00	0.03	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.03	-	0.05	0.01	0.01	0.01	0.06	0.00	0.01	0.00	
sculpin, longhorn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
scup	4.96	3.72	3.33	4.63	3.68	2.49	4.50	22.72	30.76	11.28	23.69	28.95	16.31	13.79	10.49	24.42	16.53	13.73	-	20.28	13.54	6.47	10.71	20.95	22.28	13.68	20.09	
sea raven	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
searobin, northern	0.02	0.05	0.06	0.02	0.04	0.02	0.08	0.06	0.08	0.13	0.18	0.11	0.11	0.09	0.05	0.08	0.09	0.08	-	0.11	0.22	0.23	0.24	0.10	0.18	0.20	0.51	
searobin, striped	0.82	0.54	0.32	0.34	0.81	0.60	1.04	1.37	1.59	1.27	2.12	2.43	0.96	0.82	0.38	0.37	0.94	0.61	-	1.12	2.81	2.66	2.26	2.84	1.72	1.74	2.91	
shad, American	0.14	0.35	0.39	0.43	0.06	0.16	0.26	0.42	0.14	0.07	0.16	0.17	0.15	0.10	0.02	0.05	0.08	0.11	-	0.09	0.08	0.06	0.03	0.12	0.14	0.13	0.14	
shad, hickory	0.03	0.02	0.04	0.02	0.05	0.05	0.02	0.07	0.05	0.02	0.02	0.05	0.07	0.14	0.11	0.03	0.01	0.02	-	0.01	0.09	0.08	0.02	0.01	0.01	0.01	0.02	
skate, clearnose	0.06	0.05	0.01	0.04	0.01	0.05	0.17	0.15	0.15	0.53	0.30	0.46	0.17	0.71	0.30	0.69	0.64	0.40	-	0.41	1.01	0.93	0.54	0.66	0.65	0.60	0.50	
skate, little	2.47	4.61	3.47	1.78	5.66	3.81	4.06	2.85	2.92	2.88	3.00	1.96	2.02	2.32	0.67	0.65	0.82	0.64	-	0.58	0.66	0.44	0.58	0.38	0.32	0.14	0.17	
skate, winter	0.11	0.15	0.21	0.09	0.25	0.10	0.09	0.08	0.01	0.21	0.21	0.00	0.11	0.16	0.00	0.12	0.31	0.18	-	0.07	0.20	0.15	0.12	0.05	0.02	0.14	0.00	
spot	0.00	0.07	0.03	0.00	0.14	0.01	0.00	0.06	0.13	0.01	0.08	0.00	0.01	0.00	0.03	0.00	0.34	0.00	-	0.01	0.41	0.47	0.02	0.02	0.02	0.11	0.03	
striped bass	0.09	0.16	0.11	0.15	0.21	0.68	0.38	0.39	0.51	0.48	0.70	0.26	1.25	0.48	0.88	0.64	0.79	0.61	-	0.43	0.26	0.44	0.26	0.38	0.20	0.30	0.52	
sturgeon, Atlantic	0.21	0.19	0.13	0.10	0.02	0.06	0.04	0.21	0.08	0.23	0.18	0.27	0.09	0.12	0.23	0.13	0.21	0.29	-	0.10	0.10	0.03	0.11	0.04	0.27	0.05	0.18	
tautog	0.22	0.22	0.15	0.09	0.07	0.14	0.27	0.31	0.30	0.20	0.27	0.43	0.21	0.23	0.23	0.16	0.20	0.07	-	0.05	0.08	0.11	0.12	0.08	0.19	0.07	0.17	
weakfish	0.47	0.56	1.26	1.27	1.88	1.70	0.94	3.39	3.17	2.41	2.86	1.72	2.85	2.52	0.42	3.51	1.17	0.66	-	1.37	1.88	0.99	2.13	3.12	1.07	1.10	1.80	
<b>Invertebrates</b>																												
crab, blue	0.15	0.17	0.05	0.04	0.04	0.11	0.10	0.17	0.11	0.05	0.10	0.06	0.02	0.00	0.01	0.07	0.02	0.04	-	0.09	0.07	0.05	0.02	0.04	0.02	0.01	0.01	
crab, flat claw hermit	0.17	0.40	0.15	0.11	0.26	0.16	0.35	0.16	0.17	0.33	0.30	0.13	0.18	0.16	0.05	0.12	0.24	0.16	-	0.12	0.13	0.12	0.05	0.04	0.06	0.06	0.04	
crab, horseshoe	1.01	1.16	0.55	0.32	1.27	1.32	0.93	1.09	1.31	1.39	1.76	1.67	1.93	0.93	1.00	1.40	1.92	1.21	-	1.25	0.65	1.21	0.87	0.58	0.75	0.95	1.72	
crab, lady	1.52	1.58	1.52	1.56	3.54	1.84	0.82	0.48	0.60	0.17	0.14	0.10	0.08	0.14	0.07	0.07	0.25	0.18	-	0.30	0.20	0.07	0.06	0.02	0.02	0.01	0.01	
crab, rock	0.58	0.55	0.18	0.09	0.45	0.32	0.37	0.22	0.19	0.13	0.12	0.04	0.08	0.02	0.10	0.04	0.28	0.09	-	0.09	0.05	0.03	0.01	0.00	0.00	0.00	0.00	
crab, spider	0.53	1.89	0.46	0.25	0.71	0.42	0.25	0.24	0.21	0.30	0.27	0.47	0.32	0.13	0.10	0.15	0.25	0.29	-	0.21	0.18	0.21	0.10	0.07	0.13	0.12	0.11	
jellyfish, lion's mane	0.02	0.01	0.03	0.17	0.18	0.50	0.17	0.03	0.22	0.17	0.10	0.01	0.13	0.12	0.46	0.45	0.02	0.58	-	0.01	0.03	0.59	0.07	0.00	0.43	0.01	0.04	
lobster, American	3.17	4.11	3.58	3.03	3.48	7.22	4.24	4.16	2.65	1.91	1.10	1.28	1.46	0.84	0.61	0.51	0.80	0.77	-	0.12	0.10	0.06	0.04	0.04	0.01	0.01	0.00	
mussel, blue	0.07	0.06	0.12	0.02	0.00	0.01	0.09	0.00	0.04	0.12	0.11	0.02	0.															

**Table 5.20. Bluefish indices of abundance, 1984-2018.**

*Using September and October length data, the geometric mean catch per tow was calculated for two age groups of bluefish: age-0 and all fish age 1 and older. Age-0 was defined as bluefish less than 30 cm fork length.*

Year	Fall			
	age 0 count / tow	age 0 kg / tow	ages 1+ count / tow	ages 1+ kg / tow
1984	20.34	2.51	1.61	2.03
1985	11.27	1.64	4.16	6.25
1986	8.05	1.13	3.77	5.96
1987	9.01	0.88	3.11	4.85
1988	10.73	1.59	2.20	4.43
1989	21.07	3.17	1.92	3.80
1990	12.82	2.09	6.14	8.92
1991	22.57	2.75	5.59	8.49
1992	9.23	1.27	8.44	14.88
1993	11.61	1.96	3.34	7.11
1994	24.85	2.54	3.07	6.09
1995	16.85	2.48	4.07	5.32
1996	13.85	2.27	2.34	4.09
1997	31.26	2.56	2.35	3.68
1998	25.89	2.08	1.65	2.70
1999	39.19	5.43	0.86	1.61
2000	14.67	2.97	2.18	3.75
2001	19.04	2.11	2.62	3.87
2002	12.35	2.25	3.63	4.81
2003	16.85	3.16	2.16	3.31
2004	13.30	2.39	10.38	13.96
2005	12.10	2.39	2.65	5.04
2006	12.43	1.49	2.14	2.74
2007	23.98	4.14	2.44	4.22
2008	6.14	0.82	4.52	8.18
2009	11.65	1.16	3.18	5.09
2010	-	-	-	-
2011	8.21	1.34	1.40	2.36
2012	13.11	1.86	0.97	1.67
2013	7.86	0.87	0.96	1.82
2014	16.54	2.22	0.88	1.47
2015	7.47	1.04	0.42	0.93
2016	8.83	1.20	1.25	1.65
2017	7.49	1.13	0.28	0.55
2018	3.01	0.61	0.61	0.57
<b>84-17</b>				
<b>mean</b>	<b>15.17</b>	<b>2.09</b>	<b>2.93</b>	<b>4.72</b>

**Table 5.21. Scup indices-at-age, 1984-2018.**

Spring (May and June) and fall (September and October) catch and age data were used to determine the geometric mean indices-at-age<sup>1</sup>. The spring and fall age keys were used to expand length frequencies to age frequencies and then the spring and fall overall indices were proportioned by the percentage of fish in each age. The 0-10+ index represents the overall index (sum of ages 0-10+), and the adult 2+ index is provided as the sum of ages 2-10+ index. Fish older than age 9 were included in the age 10+ index<sup>2</sup>.

Spring (May-June)													
Year	0-10+	2+	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10+
1984	2.797	2.308	0	0.489	1.311	0.577	0.307	0.074	0.004	0.002	0	0	0.034
1985	5.648	2.707	0	2.941	2.002	0.327	0.244	0.047	0.025	0.050	0	0.004	0.008
1986	7.230	2.785	0	4.444	1.651	0.988	0.137	0.003	0.003	0.003	0	0	0.003
1987	2.186	1.758	0	0.428	1.646	0.071	0.034	0.007	0	0	0	0	0
1988	2.061	0.893	0	1.168	0.309	0.502	0.054	0.026	0	0	0	0	0.003
1989	6.249	0.615	0	5.634	0.563	0.034	0.016	0.000	0.001	0.001	0	0	0
1990	4.867	2.345	0	2.521	2.098	0.206	0.037	0.005	0	0	0	0	0
1991	7.046	2.795	0	4.251	1.436	1.258	0.086	0.012	0.002	0	0	0	0
1992	1.749	1.360	0	0.389	1.212	0.093	0.052	0.002	0	0.002	0	0	0
1993	2.530	2.492	0	0.038	2.286	0.189	0.006	0.006	0.002	0.002	0	0	0
1994	3.892	3.093	0	0.799	2.038	0.931	0.100	0.015	0.003	0.007	0	0	0
1995	13.587	0.645	0	12.943	0.387	0.199	0.052	0.003	0.003	0	0	0	0
1996	7.766	2.562	0	5.204	2.477	0.074	0.004	0.006	0.002	0	0	0	0
1997	7.558	4.394	0	3.164	2.610	1.679	0.063	0.009	0.023	0.005	0.005	0	0
1998	10.826	0.761	0	10.065	0.578	0.115	0.063	0.005	0	0	0	0	0
1999	4.732	2.021	0	2.711	1.755	0.162	0.074	0.030	0	0	0	0	0
2000	146.224	21.711	0	124.513	17.184	4.237	0.195	0.064	0.030	0	0	0	0
2001	22.486	20.837	0	1.649	18.988	1.575	0.252	0.018	0.003	0.001	0	0	0
2002	257.914	208.764	0	49.150	66.611	123.248	17.437	1.294	0.099	0.035	0.040	0	0
2003	13.116	12.980	0	0.136	4.047	3.284	4.964	0.608	0.069	0.005	0.005	0	0
2004	26.915	26.902	0	0.014	3.965	8.956	4.904	8.207	0.764	0.079	0.018	0.009	0
2005	8.483	7.325	0	1.157	1.278	1.055	1.511	1.269	1.944	0.223	0.045	0	0
2006	59.052	40.570	0	18.482	23.719	5.629	2.072	2.557	3.160	2.897	0.529	0.007	0
2007	32.802	25.288	0	7.514	15.865	5.845	1.489	0.548	0.536	0.541	0.385	0.073	0.007
2008	92.100	75.143	0	16.957	40.620	27.815	4.936	0.911	0.158	0.303	0.236	0.148	0.016
2009	104.454	72.840	0	31.614	28.228	28.413	12.491	2.498	0.613	0.215	0.134	0.250	0
2010	68.138	67.717	0	0.421	24.265	21.998	14.002	6.019	1.187	0.118	0.058	0.041	0.029
2011	36.112	33.985	0	2.127	3.285	11.378	9.812	4.116	3.391	1.421	0.248	0.071	0.263
2012	114.410	65.371	0	49.039	25.925	11.982	9.231	9.567	4.671	2.755	0.871	0.144	0.226
2013	57.922	53.309	0	4.613	29.415	8.721	3.150	4.982	4.451	1.545	0.758	0.169	0.117
2014	60.483	45.822	0	14.661	10.635	23.833	5.069	1.504	2.323	1.486	0.608	0.319	0.045
2015	36.141	17.961	0	18.180	5.546	3.985	5.037	1.747	0.570	0.595	0.266	0.121	0.093
2016	972.305	318.511	0	653.794	191.206	68.931	15.618	29.868	5.192	3.221	2.646	1.294	0.535
2017	362.667	328.064	0	34.603	208.316	81.228	14.656	7.525	11.522	1.836	1.186	0.939	0.856
2018	200.594	190.608	0	9.986	39.936	110.787	29.408	2.909	4.540	2.077	0.547	0.243	0.161
84-17													
Mean	75.366	43.430	0.000	31.936	21.866	13.221	3.769	2.457	1.199	0.510	0.236	0.106	0.066

Fall (Sept-Oct)													
Year	0-10+	2+	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10+
1984	10.721	1.692	7.986	1.043	0.783	0.519	0.280	0.092	0.018	0	0	0	0
1985	30.972	1.277	24.914	4.781	0.425	0.587	0.190	0.044	0.030	0.002	0	0	0
1986	25.761	2.519	12.863	10.379	2.277	0.219	0.013	0.005	0.005	0	0	0	0
1987	18.544	2.063	12.468	4.013	1.405	0.579	0.058	0.009	0.009	0.004	0	0	0
1988	39.699	2.092	31.687	5.920	1.818	0.242	0.032	0	0	0	0	0	0
1989	65.087	1.596	40.920	22.571	1.501	0.083	0.012	0	0	0	0	0	0
1990	69.477	7.396	54.350	7.731	6.946	0.398	0.034	0.005	0.008	0	0	0.005	0
1991	311.570	2.953	291.568	17.050	1.759	1.040	0.147	0.008	0	0	0	0	0
1992	83.731	6.244	50.971	26.516	5.540	0.398	0.287	0.013	0.007	0	0	0	0
1993	77.057	1.165	74.061	1.831	1.019	0.121	0.012	0.010	0	0	0.003	0	0
1994	92.523	0.657	90.778	1.088	0.457	0.185	0.012	0.003	0	0	0	0	0
1995	59.136	0.150	32.465	26.521	0.144	0.006	0	0	0	0	0	0	0
1996	61.459	1.400	51.497	8.562	1.365	0.029	0	0.005	0	0	0	0	0
1997	41.276	0.809	31.791	8.677	0.630	0.172	0.008	0	0	0	0	0	0
1998	103.272	0.628	90.404	12.240	0.537	0.069	0.022	0	0	0	0	0	0
1999	537.683	8.574	498.180	30.930	8.349	0.195	0.019	0.011	0	0	0	0	0
2000	521.103	9.265	250.391	261.446	8.323	0.794	0.140	0.008	0	0	0	0	0
2001	177.641	20.239	140.506	16.897	18.421	1.607	0.186	0.025	0	0	0	0	0
2002	348.703	41.179	259.902	47.623	23.321	16.812	0.665	0.325	0.048	0	0.007	0	0
2003	152.227	83.963	52.910	15.354	32.065	22.394	26.440	2.493	0.539	0.016	0.016	0	0
2004	291.458	36.277	251.052	4.129	8.338	15.082	5.978	6.245	0.534	0.072	0.008	0.021	0
2005	424.063	18.183	373.318	32.562	8.144	2.437	4.015	1.505	1.689	0.332	0.060	0	0
2006	116.755	13.575	52.164	51.016	9.525	2.341	0.257	0.351	0.377	0.681	0.044	0	0
2007	475.295	37.346	319.893	118.056	29.335	5.929	0.896	0.226	0.302	0.313	0.313	0.033	0
2008	303.256	24.478	243.679	35.099	11.921	7.044	3.556	1.055	0.502	0.137	0.124	0.140	0
2009	139.380	31.506	67.486	40.388	20.786	6.934	2.615	0.735	0.214	0.131	0.068	0.022	0
2010	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	198.226	40.786	119.032	38.409	8.157	14.894	9.669	3.922	3.225	0.586	0.167	0.025	0.140
2012	223.522	15.983	153.235	54.305	9.963	2.846	2.063	0.567	0.137	0.323	0.076	0.007	0
2013	40.683	16.235	17.744	6.704	9.187	4.069	0.807	1.058	0.746	0.237	0.090	0.031	0.011
2014	182.583	14.003	144.702	23.878	4.325	6.505	1.188	0.426	0.808	0.476	0.193	0.051	0.032
2015	422.228	31.773	330.498	59.957	14.802	4.859	8.230	1.723	0.551	0.917	0.410	0.209	0.072
2016	307.010	97.769	55.695	153.546	54.808	18.187	9.458	10.490	2.765	1.150	0.700	0.195	0.017
2017	212.145	47.700	127.558	36.887	28.211	11.197	2.266	2.209	2.492	0.448	0.589	0.196	0.093
2018	228.622	87.177	120.894	20.552	24.723	45.670	12.192	3.010	1.246	0.201	0.089	0.029	0.016
84-17													
Mean	186.795	18.833	132.020	35.943	10.139	4.508	2.411	1.017	0.455	0.177	0.087	0.028	0.011

- (1) In some years, less than the number of scheduled tows were conducted in some months (Table 5.4).
- (2) Fish in the age 10+ group include: 6 fish taken 1984-1988, 8 fish taken 2002-2010, 81 taken in 2011, 28 taken in 2012, 26 taken in 2013, 15 taken in 2014, 37 fish in 2015, 29 fish in 2016, 51 fish in 2017, and 33 fish in 2018. The oldest scup aged were two 15-year-old fish taken in 2015.





**Table 5.24. Summer flounder indices-at-age, 1984-2018.**

Year and season specific age keys obtained from the NMFS spring and fall surveys were used to convert LISTS length frequencies to ages. Starting in 2000 LISTS ageing data (60 cm and over) were added to the age key to supplement the older age groups. In 2015-2018, LISTS age data for smaller fish were also incorporated into the age key. Indices-at-age were determined for each season by apportioning the spring and fall overall indices (from Table 5.18 and Table 5.19) by the percentage of fish in each age.

Year	Spring													
	0-12	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12
1984	0.6291	0	0.3236	0.2610	0.0445	0	0	0	0	0	0	0	0	0
1985	0.4410	0	0.0166	0.3168	0.0489	0.0587	0	0	0	0	0	0	0	0
1986	0.9510	0	0.7700	0.0892	0.0742	0.0126	0.0050	0	0	0	0	0	0	0
1987	1.0572	0	0.9515	0.0793	0.0202	0.0036	0.0026	0	0	0	0	0	0	0
1988	0.4986	0	0.2317	0.2232	0.0352	0.0085	0	0	0	0	0	0	0	0
1989	0.1016	0	0.0111	0.0550	0.0191	0.0164	0	0	0	0	0	0	0	0
1990	0.3475	0	0.3053	0.0201	0.0156	0.0065	0	0	0	0	0	0	0	0
1991	0.6391	0	0.3892	0.2059	0.0205	0.0235	0	0	0	0	0	0	0	0
1992	0.5546	0	0.3182	0.1906	0.0229	0	0.0229	0	0	0	0	0	0	0
1993	0.5074	0	0.3216	0.1504	0.0101	0.0152	0.0101	0	0	0	0	0	0	0
1994	0.8601	0	0.4959	0.3136	0.0324	0	0	0	0.0182	0	0	0	0	0
1995	0.2796	0	0.2023	0.0608	0.0110	0	0	0	0.0055	0	0	0	0	0
1996	0.9609	0	0.6216	0.2370	0.0868	0	0.0052	0	0.0103	0	0	0	0	0
1997	0.9991	0	0.4481	0.4461	0.0740	0.0121	0.0134	0.0054	0	0	0	0	0	0
1998	1.3067	0	0.0734	0.5952	0.4693	0.1167	0.0324	0.0197	0	0	0	0	0	0
1999	1.4401	0	0.3263	0.5563	0.3521	0.1110	0.0696	0.0248	0	0	0	0	0	0
2000	1.7898	0	0.3805	0.7853	0.4240	0.0538	0.1316	0.0092	0	0.0054	0	0	0	0
2001	1.7468	0	0.8408	0.3395	0.3653	0.1073	0.0488	0.0333	0.0067	0.0051	0	0	0	0
2002	3.1851	0	1.0571	1.2637	0.4646	0.2233	0.0930	0.0362	0.0236	0.0145	0.0091	0	0	0
2003	3.4211	0	1.6080	1.0159	0.3949	0.2316	0.0851	0.0462	0.0327	0.0025	0.0042	0	0	0
2004	1.8381	0	0.2592	0.8180	0.4100	0.1878	0.0338	0.0817	0.0302	0.0145	0.0029	0	0	0
2005	0.8038	0	0.2523	0.2641	0.1495	0.0334	0.0364	0.0393	0.0196	0.0046	0.0046	0	0	0
2006	0.6129	0	0.0383	0.3597	0.0676	0.0654	0.0337	0.0263	0.0168	0.0051	0	0	0	0
2007	2.5073	0	1.1569	0.2053	0.5595	0.3163	0.1150	0.0888	0.0428	0.0152	0.0065	0.0010	0	0
2008	1.6145	0	0.6008	0.2912	0.2374	0.2633	0.1165	0.0622	0.0236	0.0033	0.0054	0.0054	0.0054	0
2009	1.9295	0	0.7772	0.3770	0.2905	0.1804	0.1949	0.0700	0.0258	0.0101	0.0036	0	0	0
2010	2.6878	0	1.8671	0.2805	0.2113	0.1439	0.0944	0.0416	0.0244	0.0142	0.0052	0.0052	0	0
2011	3.8479	0	1.0024	1.0839	0.8014	0.3820	0.3159	0.1098	0.0628	0.0580	0.0171	0.0146	0	0
2012	3.0620	0	0.4684	0.6283	0.9746	0.6346	0.2044	0.0754	0.0333	0.0224	0.0050	0.0113	0.0043	0
2013	3.2359	0	0.8843	0.6681	0.6637	0.6734	0.2047	0.0818	0.0201	0.0184	0.0041	0.0044	0.0129	0
2014	3.0018	0	0.9679	0.7073	0.4854	0.4332	0.2981	0.0466	0.0369	0.0126	0.0072	0.0022	0.0022	0.0022
2015	1.6341	0	0.7770	0.3569	0.2050	0.1232	0.0904	0.0487	0.0176	0.0093	0.0017	0.0018	0.0020	0.0005
2016	1.3568	0	0.1449	0.4154	0.3449	0.1985	0.0952	0.0771	0.0503	0.0216	0.0055	0.0006	0.0028	0
2017	1.6498	0	0.5364	0.4108	0.3073	0.1483	0.1105	0.0495	0.0463	0.0235	0.0074	0.0098	0	0
2018	2.6395	0	1.5411	0.4948	0.2277	0.1749	0.0985	0.0390	0.0146	0.0182	0.0170	0.0083	0.0054	0
84-17														
Mean	1.5147	0.0000	0.5714	0.4139	0.2557	0.1407	0.0725	0.0316	0.0161	0.0077	0.0026	0.0017	0.0009	0.0001

Year	Fall													
	0-12	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12
1984	0.9888	0	0.5648	0.3269	0.0713	0.0140	0.0042	0.0042	0.0034	0	0	0	0	0
1985	1.1931	0.2453	0.3605	0.4984	0.0804	0	0.0085	0	0	0	0	0	0	0
1986	1.7157	0.1738	1.1902	0.2681	0.0817	0.0019	0	0	0	0	0	0	0	0
1987	1.3963	0.0749	1.0573	0.2309	0.0305	0.0027	0	0	0	0	0	0	0	0
1988	1.4159	0.0150	0.8739	0.4782	0.0366	0.0122	0	0	0	0	0	0	0	0
1989	0.1363	0	0.0227	0.1051	0.0085	0	0	0	0	0	0	0	0	0
1990	0.8678	0.0321	0.6720	0.1214	0.0339	0.0042	0.0042	0	0	0	0	0	0	0
1991	1.2557	0.0363	0.8141	0.3457	0.0432	0.0082	0.0041	0.0041	0	0	0	0	0	0
1992	1.0178	0.0131	0.5685	0.3578	0.0561	0.0134	0.0089	0	0	0	0	0	0	0
1993	1.1113	0.0842	0.8371	0.1490	0.0362	0.0029	0	0.0019	0	0	0	0	0	0
1994	0.5517	0.1325	0.3008	0.0957	0.0138	0.0089	0	0	0	0	0	0	0	0
1995	0.5408	0.0424	0.3812	0.1043	0.0090	0.0039	0	0	0	0	0	0	0	0
1996	2.1914	0.0840	1.0394	1.0276	0.0375	0.0029	0	0	0	0	0	0	0	0
1997	2.4980	0.0693	0.8494	1.2261	0.3016	0.0321	0.0099	0.0084	0.0012	0	0	0	0	0
1998	1.7153	0	0.3251	1.0456	0.2867	0.0392	0.0187	0	0	0	0	0	0	0
1999	2.6787	0.0482	0.8000	1.4412	0.2963	0.0823	0.0084	0.0023	0	0	0	0	0	0
2000	1.9134	0.1151	0.5117	0.8244	0.2971	0.1122	0.0433	0.0067	0	0.0029	0	0	0	0
2001	4.4181	0.0208	2.6891	1.1372	0.4342	0.1095	0.0153	0.0078	0	0.0042	0	0	0	0
2002	6.1211	0.4415	3.0870	1.9304	0.4769	0.1216	0.0429	0.0168	0.0040	0	0	0	0	0
2003	3.3879	0	1.4584	1.3192	0.4069	0.0873	0.0908	0.0164	0.0089	0	0	0	0	0
2004	1.9537	0.2545	0.3848	0.7551	0.4398	0.0804	0.0241	0.0150	0	0	0	0	0	0
2005	2.4099	0.0671	1.0930	0.7441	0.3554	0.0866	0.0316	0.0123	0.0166	0.0032	0	0	0	0
2006	1.3148	0.0976	0.2170	0.5915	0.2299	0.0957	0.0435	0.0214	0.0182	0	0	0	0	0
2007	1.8880	0.1295	0.5669	0.3869	0.4676	0.2012	0.0778	0.0408	0.0087	0.0043	0	0	0.0043	0
2008	3.0853	0.7816	0.4848	0.9581	0.4458	0.3256	0.0804	0.0090	0	0	0	0	0	0
2009	3.1169	0.4054	0.6606	0.8883	0.6241	0.3182	0.1330	0.0437	0.0244	0.0070	0.0122	0.0000	0.0000	0
2010	0.0000	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	2.5578	0.1173	0.6933	0.9333	0.5641	0.1232	0.0543	0.0275	0.0130	0.0130	0.0061	0.0052	0.0075	0
2012	3.5522	0.1633	0.4592	0.8283	1.4239	0.5848	0.0631	0.0296	0	0	0	0	0	0
2013	3.0664	0.2181	0.5709	0.6080	0.8049	0.6328	0.1789	0.0291	0.0139	0.0016	0	0.0082	0	0
2014	1.7086	0.1231	0.4034	0.3945	0.3620	0.2825	0.0823	0.0294	0.0205	0.0078	0	0.0031	0	0
2015	2.0218	0.0547	0.5740	0.6717	0.3957	0.1830	0.0821	0.0347	0.0135	0.0086	0	0.0038	0	0
2016	1.9198	0.0361	0.2401	0.6223	0.5563	0.2687	0.1223	0.0319	0.0421	0	0	0	0	0
2017	1.3544	0.2231	0.6948	0.1862	0.1197	0.0746	0.0320	0.0160	0.0000	0	0	0	0	0
2018	2.4292	0.3096	0.8139	0.6373	0.2754	0.2147	0.1076	0.0161	0.0274	0.0181	0.0053	0.0015	0.0023	0
84-17														
Mean	1.9725	0.1303	0.7711	0.6546	0.2978	0.1187	0.0375	0.0134	0.0066	0.0018	0.0006	0.0006	0.0004	0.0000

note: 1984-1999 indices-at-age were run using a GT 60cm group in the age key.

**Table 5.25. Tautog indices-at-age, 1984-2015.**

Year and season specific age keys obtained from the LISTS spring and fall surveys were used to convert LISTS length frequencies to ages. Indices-at-age were then determined for each season by apportioning the spring and fall overall indices (from Table 5.18 and Table 5.19) by the percentage of fish in each age, and then summing the spring and fall indices-at-age. The age 1-20+ index is the sum of indices ages 1 – 20+. The age 20+ category includes 36 fish ranging from 20 to 30 years of age.

Year	Age										
	1 - 20+	1	2	3	4	5	6	7	8	9	10
1984	3.4691	0.0109	0.0816	0.1898	0.3030	0.4587	0.4955	0.2903	0.2852	0.3101	0.3529
1985	1.7967	0	0.0199	0.0962	0.1902	0.1651	0.1281	0.1836	0.3005	0.2020	0.0902
1986	1.7199	0.0012	0.0275	0.0961	0.0483	0.1029	0.2012	0.2409	0.2452	0.2863	0.1017
1987	1.2128	0.0237	0.0801	0.0594	0.0602	0.0999	0.1345	0.1910	0.1348	0.0957	0.0522
1988	0.9007	0.0031	0.0323	0.0474	0.0720	0.0445	0.0401	0.0755	0.1008	0.1641	0.0790
1989	1.2589	0	0.0433	0.0684	0.1365	0.0889	0.1154	0.1495	0.1600	0.1046	0.0817
1990	1.1615	0.0102	0.0829	0.1569	0.1117	0.1142	0.0498	0.0500	0.1245	0.0874	0.0623
1991	1.1466	0.0053	0.0251	0.0575	0.1184	0.1241	0.1486	0.0931	0.1253	0.1071	0.1067
1992	1.0254	0.0196	0.0489	0.0708	0.0414	0.0490	0.1231	0.1323	0.0849	0.0632	0.0636
1993	0.5695	0.0033	0.0212	0.0519	0.0302	0.0163	0.0606	0.0595	0.0423	0.0489	0.0522
1994	0.5837	0.0087	0.0368	0.0327	0.0678	0.0557	0.0551	0.0555	0.0799	0.0516	0.0312
1995	0.2530	0.0033	0.0093	0.0090	0.0295	0.0608	0.0267	0.0212	0.0346	0.0150	0.0219
1996	0.5628	0.0073	0.0518	0.0305	0.0086	0.0762	0.0452	0.0654	0.0712	0.0667	0.0609
1997	0.5079	0	0.0390	0.0675	0.0568	0.0574	0.0639	0.0491	0.0556	0.0486	0.0101
1998	0.6442	0	0.0425	0.0281	0.0701	0.0821	0.0876	0.0875	0.0848	0.0465	0.0575
1999	0.7614	0.0498	0.0792	0.0583	0.0666	0.1015	0.1379	0.0748	0.0843	0.0431	0.0203
2000	0.8004	0.0009	0.0468	0.0578	0.0832	0.0737	0.1403	0.1376	0.0897	0.0392	0.0467
2001	0.8946	0.0062	0.0305	0.0862	0.0830	0.1294	0.1197	0.1193	0.1058	0.0715	0.0454
2002	1.1665	0.0098	0.0237	0.0599	0.1009	0.1749	0.1972	0.1895	0.2091	0.0739	0.0419
2003	0.8977	0.0027	0.0132	0.0080	0.0598	0.1485	0.2385	0.1596	0.0893	0.0778	0.0185
2004	0.6936	0.0071	0.0209	0.0152	0.0360	0.0710	0.1930	0.1096	0.0494	0.0812	0.0441
2005	0.7596	0.0100	0.0367	0.0618	0.0261	0.0922	0.1437	0.1576	0.1064	0.0303	0.0268
2006	0.8405	0	0.0334	0.0345	0.1039	0.1274	0.1140	0.1196	0.1521	0.0620	0.0479
2007	0.6135	0.0034	0.0125	0.0170	0.0462	0.0478	0.0608	0.0918	0.0935	0.0966	0.0533
2008	0.7268	0.0061	0.0272	0.0439	0.0620	0.0848	0.1164	0.0708	0.0649	0.0831	0.0640
2009	0.4822	0.0145	0.0364	0.0070	0.0026	0.0394	0.0681	0.1013	0.0658	0.0319	0.0324
2010	0.2472	0	0.0053	0.0455	0.0093	0.0053	0.0315	0.0503	0.0294	0.0096	0.0093
2011	0.4456	0.0180	0.0401	0.0532	0.0303	0.0301	0.0612	0.0630	0.0415	0.0267	0.0167
2012	0.5809	0.0270	0.1148	0.0919	0.0808	0.0635	0.0389	0.0384	0.0499	0.0489	0.0115
2013	0.5781	0.0075	0.0653	0.0561	0.1211	0.0857	0.0912	0.0532	0.0386	0.0215	0.0214
2014	0.6958	0	0.0281	0.1540	0.0854	0.1112	0.1286	0.0754	0.0522	0.0243	0.0185
2015	0.6160	0.0422	0.0494	0.0710	0.0722	0.0758	0.0981	0.0900	0.0584	0.0266	0.0149
<b>84-14</b>											
<b>Mean</b>	<b>0.9031</b>	<b>0.0084</b>	<b>0.0405</b>	<b>0.0617</b>	<b>0.0755</b>	<b>0.0962</b>	<b>0.1179</b>	<b>0.1083</b>	<b>0.1049</b>	<b>0.0813</b>	<b>0.0562</b>

Year	Age									
	11	12	13	14	15	16	17	18	19	20+
1984	0.1259	0.2281	0.0933	0.0507	0.0448	0.0322	0.0468	0.0156	0.0006	0.0531
1985	0.1595	0.0982	0.0226	0.0994	0	0.0249	0.0039	0.0124	0	0
1986	0.1423	0.0863	0.0374	0.0522	0.0232	0.0071	0.0114	0.0003	0.0023	0.0061
1987	0.0606	0.0543	0.0479	0.0313	0.0246	0.0267	0.0105	0.0004	0.0048	0.0202
1988	0.0469	0.0395	0.0295	0.0225	0.0493	0.0086	0.0063	0.0055	0.0052	0.0286
1989	0.0569	0.0932	0.0430	0.0404	0.0348	0.0172	0.0067	0.0048	0	0.0136
1990	0.0979	0.0375	0.0568	0.0397	0.0221	0.0250	0.0089	0.0169	0.0035	0.0033
1991	0.0609	0.0258	0.0399	0.0361	0.0216	0.0007	0.0159	0.0117	0.0080	0.0148
1992	0.0599	0.0512	0.0440	0.0581	0.0236	0.0208	0.0167	0.0298	0.0167	0.0078
1993	0.0368	0.0351	0.0351	0.0129	0.0157	0.0152	0.0129	0.0097	0.0097	0
1994	0.0234	0.0238	0.0071	0.0118	0.0118	0.0096	0.0024	0.0047	0.0070	0.0071
1995	0.0036	0.0036	0.0073	0	0	0	0.0036	0	0	0.0036
1996	0.0230	0.0127	0.0103	0.0048	0.0099	0.0090	0.0086	0.0004	0.0001	0.0002
1997	0.0072	0.0119	0.0144	0.0048	0.0121	0.0071	0	0.0024	0	0
1998	0.0192	0.0164	0.0055	0.0055	0	0.0027	0.0055	0	0	0.0027
1999	0.0191	0.0090	0.0087	0.0029	0	0	0.0030	0.0029	0	0
2000	0.0213	0.0130	0.0123	0.0101	0.0084	0.0104	0.0023	0	0.0027	0.0040
2001	0.0407	0.0161	0.0152	0.0004	0.0053	0.0105	0.0036	0.0001	0.0026	0.0031
2002	0.0257	0.0185	0.0107	0.0070	0.0147	0.0039	0	0	0	0.0052
2003	0.0274	0.0088	0.0059	0.0184	0.0029	0.0124	0	0.0029	0	0.0031
2004	0.0204	0.0221	0.0119	0.0003	0.0028	0.0031	0.0026	0.0002	0	0.0027
2005	0.0347	0.0257	0.0039	0.0037	0	0	0	0	0	0
2006	0.0183	0.0200	0.0037	0	0.0037	0	0	0	0	0
2007	0.0294	0.0156	0.0194	0.0108	0.0019	0.0116	0	0.0019	0	0
2008	0.0322	0.0225	0.0228	0.0163	0.0098	0	0	0	0	0
2009	0.0343	0.0064	0.0091	0.0217	0.0070	0.0032	0.0011	0	0	0
2010	0.0192	0.0139	0.0048	0.0046	0.0046	0	0	0	0.0046	0
2011	0.0167	0.0161	0.0080	0.0080	0.0040	0	0.0040	0.0080	0	0
2012	0	0.0077	0.0038	0	0.0038	0	0	0	0	0
2013	0.0066	0	0	0.0033	0.0033	0.0033	0	0	0	0
2014	0.0148	0	0	0.0033	0	0	0	0	0	0
2015	0.0060	0.0016	0.0033	0.0049	0	0	0.0016	0	0	0
<b>84-14</b>										
<b>Mean</b>	<b>0.0414</b>	<b>0.0333</b>	<b>0.0205</b>	<b>0.0187</b>	<b>0.0118</b>	<b>0.0086</b>	<b>0.0057</b>	<b>0.0042</b>	<b>0.0022</b>	<b>0.0058</b>

**Table 5.26. Weakfish age 0 and age 1+ indices of abundance, 1984-2018.**

Using spring (May, June) and fall (September, October) length data, the geometric mean catch per tow was calculated for three groups of weakfish: fall age-0, spring - all fish age 1 and older (1+), and fall - all fish age 1 and older (1+). Weakfish less than 30 cm fork length in the fall were defined as age-0.

Year	Fall		Fall		Spring	
	age 0 count / tow	age 0 kg / tow	ages 1+ count / tow	age 1+ kg / tow	ages 1+ count / tow	ages 1+ kg / tow
1984	1.00	0.14	0.53	0.84	0.02	0.15
1985	6.19	0.74	0.24	0.46	0.00	0.10
1986	13.16	0.91	0.24	0.51	0.10	0.33
1987	0.63	0.13	0.11	0.16	0.02	0.11
1988	3.49	0.30	0.06	0.13	0.05	0.17
1989	8.69	0.94	0.02	0.10	0.04	0.16
1990	5.56	0.56	0.08	0.13	0.07	0.13
1991	11.95	1.44	0.31	0.41	0.28	0.26
1992	3.05	0.31	0.18	0.24	0.12	0.22
1993	4.08	0.46	0.12	0.18	0.10	0.15
1994	11.19	1.23	0.06	0.13	0.04	0.12
1995	5.22	0.84	0.70	0.64	0.18	0.16
1996	15.23	1.49	0.56	0.52	0.19	0.19
1997	12.38	1.03	0.89	0.81	0.42	0.34
1998	5.02	0.76	0.28	0.36	0.37	0.41
1999	30.93	3.21	0.39	0.51	0.45	0.59
2000	63.31	3.34	0.30	0.32	0.18	0.28
2001	40.09	2.20	0.52	0.54	0.27	0.26
2002	41.35	2.85	0.16	0.26	0.16	0.26
2003	49.41	1.77	0.07	0.17	0.04	0.14
2004	58.98	2.99	0.21	0.25	0.15	0.16
2005	25.86	2.50	0.12	0.18	0.27	0.23
2006	1.05	0.20	0.29	0.30	0.14	0.22
2007	63.93	3.86	0.06	0.14	0.11	0.22
2008	9.03	1.17	0.08	0.14	0.05	0.12
2009	6.48	0.57	0.30	0.22	0.08	0.16
2010	-	-	-	-	0.02	0.12
2011	11.64	0.87	0.68	0.55	0.10	0.15
2012	21.96	1.47	0.73	0.69	0.62	0.56
2013	7.01	0.59	0.52	0.52	0.52	0.44
2014	41.53	2.27	0.08	0.12	0.17	0.23
2015	30.91	3.11	0.46	0.35	0.03	0.11
2016	5.87	0.73	0.81	0.59	0.85	0.43
2017	8.20	0.94	0.43	0.40	0.57	0.42
2018	25.66	1.68	0.56	0.15	0.04	0.12
<b>84-17</b>						
<b>mean</b>	<b>18.92</b>	<b>1.39</b>	<b>0.32</b>	<b>0.36</b>	<b>0.20</b>	<b>0.24</b>

**Table 5.27. Winter flounder indices-at-age, 1984-2018.**

The Long Island Sound Trawl Survey April and May catch and age data was used to calculate the geometric mean indices-at-age. An April-May age key was used to convert lengths to ages, and an overall April-May index (the ages 1-13 index in the table) was apportioned by the percentage of fish at age. The 4+ index is the sum of indices ages 4-13 and represents the abundance of winter flounder that are recruited to the fishery. The age-0 indices were obtained from the Estuarine Seine Survey (Job 8).

Year	Catch-at-age: numbers			April-May												
	1-13	4+	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12	Age 13
1984	111.96	27.91	-	8.21	44.01	31.83	20.96	4.23	1.23	0.67	0.74	0.04	0.01	0.03	0	0
1985	83.58	18.13	-	4.11	28.46	32.88	14.17	2.33	0.82	0.45	0.19	0.11	0.04	0.02	0	0
1986	63.65	15.43	-	6.69	26.00	15.53	12.26	2.05	0.50	0.24	0.24	0.10	0.01	0.03	0	0
1987	79.92	13.35	-	7.32	44.69	14.56	5.05	6.55	1.28	0.11	0.24	0.13	0	0	0	0
1988	137.59	12.13	15.40	14.49	71.87	39.10	8.59	1.83	1.46	0.16	0.04	0.02	0.02	0	0	0
1989	148.19	14.97	1.66	13.56	78.43	41.23	10.85	2.84	0.98	0.14	0.09	0.06	0.01	0	0	0
1990	223.09	15.29	2.80	11.31	131.52	64.97	8.97	4.09	1.96	0.19	0.05	0	0.02	0	0	0
1991	150.20	14.31	5.23	8.52	66.99	60.39	9.31	4.05	0.80	0.14	0	0	0	0.01	0	0
1992	61.39	10.49	11.90	6.80	31.32	12.78	8.97	1.10	0.36	0.05	0	0	0	0	0	0
1993	63.60	9.16	5.68	19.11	19.87	15.46	4.81	3.24	0.80	0.15	0.11	0.04	0.01	0	0	0
1994	84.44	4.87	14.23	9.57	64.14	5.86	3.01	1.14	0.49	0.17	0.05	0.01	0.01	0	0	0
1995	50.12	2.31	10.10	14.35	23.69	9.77	1.36	0.63	0.20	0.08	0.02	0.02	0.00	0	0	0
1996	110.62	15.92	19.22	11.46	59.07	24.17	14.41	0.97	0.28	0.14	0.06	0.04	0.01	0	0	0
1997	71.31	13.84	7.47	12.53	25.53	19.41	9.45	3.76	0.51	0.07	0.03	0.01	0.01	0.01	0	0
1998	72.91	17.06	9.16	11.22	32.40	12.23	12.67	3.15	0.99	0.14	0.02	0.07	0	0	0	0
1999	41.35	11.10	8.70	6.56	12.42	11.27	6.09	3.20	1.14	0.61	0.04	0.01	0.02	0	0	0
2000	45.41	13.25	4.33	7.11	16.66	8.40	7.70	3.42	1.53	0.31	0.26	0.01	0.01	0	0.01	0
2001	54.50	15.61	1.34	8.45	19.60	10.85	8.06	5.46	1.28	0.68	0.05	0.08	0	0	0	0
2002	43.71	7.99	3.06	6.27	19.90	9.56	4.43	1.95	1.02	0.35	0.11	0.03	0.10	0	0	0
2003	27.84	8.83	8.07	2.47	7.83	8.71	4.79	1.95	0.77	0.82	0.29	0.07	0.14	0	0	0
2004	20.46	6.81	10.96	6.32	3.88	3.45	3.88	1.92	0.64	0.21	0.11	0.03	0.01	0	0	0.01
2005	16.10	2.03	5.63	7.06	6.18	0.84	0.81	0.67	0.21	0.16	0.10	0.05	0.01	0.01	0	0
2006	5.59	0.74	0.93	1.14	2.60	1.10	0.19	0.14	0.17	0.09	0.01	0.09	0.03	0.02	0	0
2007	28.68	4.16	4.73	2.98	10.83	10.70	3.10	0.61	0.15	0.11	0.12	0.04	0.01	0.01	0.01	0
2008	24.11	4.97	1.97	11.46	3.49	4.18	4.12	0.65	0.12	0.04	0.03	0.01	0	0	0.01	0
2009	22.65	2.86	0.77	7.56	11.21	1.02	1.31	1.21	0.22	0.06	0.04	0	0.01	0	0.01	0
2010	20.88	1.84	0.96	6.64	8.45	3.94	0.71	0.57	0.44	0.11	0.01	0	0	0	0	0
2011	27.95	5.55	1.12	6.54	9.34	6.53	3.66	1.15	0.30	0.39	0.04	0	0	0	0	0
2012	15.80	2.83	0.29	4.84	5.61	2.51	1.97	0.62	0.09	0.06	0.05	0.03	0	0	0	0
2013	10.08	4.03	0.27	0.61	3.50	1.94	1.96	1.33	0.48	0.10	0.08	0.05	0.02	0	0	0
2014	5.90	2.34	0.47	0.84	0.64	2.08	1.36	0.62	0.26	0.06	0.03	0.01	0	0	0	0
2015	3.94	1.92	0.64	0.89	0.85	0.29	0.64	0.65	0.22	0.27	0.11	0.02	0	0.005	0.01	0
2016	3.98	1.32	0.63	1.02	0.98	0.66	0.32	0.46	0.16	0.11	0.17	0.06	0	0	0	0
2017	0.99	0.25	1.03	0.02	0.32	0.40	0.20	0	0.02	0	0.02	0	0	0	0	0
2018	3.59	1.28	0.42	0.96	0.50	0.86	0.81	0.24	0.06	0.09	0.03	0.01	0.03	0	0	0
<b>84-17</b>																
Mean	56.84	8.93	5.29	7.30	26.24	14.37	5.89	2.02	0.64	0.22	0.10	0.04	0.02	0.00	0.00	0.00

Year	Catch-at-age: biomass (kg)			April-May												
	1-13	4+	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12	Age 13
1984	15.68	7.81	NA	0.31	3.06	4.50	5.18	1.51	0.49	0.30	0.28	0.03	0.01	0.01	0	0
1985	13.91	5.96	NA	0.15	2.54	5.26	3.97	0.97	0.46	0.33	0.11	0.08	0.03	0.02	0	0
1986	10.33	5.39	NA	0.24	2.16	2.55	3.68	0.88	0.32	0.21	0.16	0.09	0.01	0.03	0	0
1987	11.76	4.94	NA	0.30	4.03	2.50	1.39	2.59	0.64	0.08	0.14	0.09	0	0	0	0
1988	18.28	4.51	NA	0.54	6.06	7.17	2.64	0.93	0.74	0.12	0.03	0.02	0.03	0	0	0
1989	22.62	5.64	NA	0.43	7.99	8.56	3.62	1.32	0.47	0.10	0.07	0.05	0.01	0	0	0
1990	29.01	7.09	NA	0.33	10.37	11.21	3.79	2.19	0.89	0.14	0.04	0	0.04	0	0	0
1991	24.59	5.54	NA	0.32	6.82	11.92	3.53	1.47	0.43	0.10	0	0	0	0.01	0	0
1992	12.29	4.79	NA	0.27	3.82	3.41	3.81	0.71	0.25	0.02	0	0	0	0	0	0
1993	10.26	4.43	NA	0.54	1.93	3.36	1.96	1.73	0.51	0.11	0.08	0.04	0.01	0	0	0
1994	12.20	2.95	NA	0.34	7.13	1.79	1.51	0.77	0.43	0.16	0.06	0.01	0.01	0	0	0
1995	7.72	1.39	NA	0.51	2.70	3.12	0.71	0.39	0.18	0.08	0.02	0.01	0.01	0	0	0
1996	20.41	7.36	NA	0.41	6.11	6.53	6.32	0.61	0.22	0.12	0.06	0.03	0.01	0	0	0
1997	15.53	6.96	NA	0.48	2.61	5.48	4.26	2.23	0.36	0.07	0.03	0.01	0.01	0.01	0	0
1998	14.66	7.28	NA	0.36	3.59	3.43	4.88	1.64	0.60	0.09	0.02	0.05	0	0	0	0
1999	10.29	5.32	NA	0.23	1.41	3.33	2.60	1.59	0.69	0.39	0.02	0.00	0.03	0	0	0
2000	12.63	7.22	NA	0.32	2.31	2.78	3.68	2.05	0.96	0.29	0.21	0.01	0.01	0	0.01	0
2001	14.02	7.94	NA	0.27	2.33	3.48	3.39	3.05	0.87	0.51	0.05	0.07	0	0	0	0
2002	10.83	4.41	NA	0.31	3.05	3.06	2.13	1.12	0.70	0.28	0.09	0.02	0.07	0	0	0
2003	8.87	5.03	NA	0.09	0.96	2.79	2.35	1.21	0.50	0.59	0.23	0.06	0.08	0	0	0
2004	6.11	4.19	NA	0.19	0.53	1.20	2.13	1.24	0.50	0.18	0.10	0.02	0.01	0	0	0.01
2005	3.37	1.75	NA	0.28	0.96	0.38	0.57	0.61	0.22	0.17	0.09	0.06	0.02	0.01	0	0
2006	1.82	0.71	NA	0.06	0.48	0.58	0.16	0.13	0.17	0.08	0.02	0.09	0.05	0.02	0	0
2007	7.02	2.34	NA	0.12	1.18	3.38	1.55	0.37	0.14	0.10	0.11	0.03	0.01	0.01	0.01	0
2008	5.08	3.00	NA	0.39	0.39	1.30	2.31	0.47	0.11	0.05	0.04	0.01	0	0	0.01	0
2009	3.96	1.89	NA	0.28	1.48	0.32	0.68	0.88	0.20	0.05	0.04	0	0.01	0	0.02	0
2010	4.26	1.38	NA	0.24	1.16	1.49	0.40	0.45	0.42	0.10	0.01	0	0	0	0	0
2011	6.72	3.19	NA	0.23	1.34	1.96	1.81	0.78	0.22	0.35	0.04	0	0	0	0	0
2012	3.88	1.85	NA	0.20	0.93	0.90	1.13	0.47	0.09	0.06	0.06	0	0	0	0	0
2013	3.42	2.45	NA	0.02	0.37	0.57	0.98	0.86	0.39	0.07	0.08	0.06	0	0	0	0
2014	2.33	1.48	NA	0.03	0.09	0.73	0.74	0.44	0.21	0.06	0.03	0.01	0	0	0	0
2015	1.19	0.99	NA	0.02	0.09	0.08	0.27	0.33	0.13	0.16	0.07	0.01	0	0.01	0.004	0
2016	1.08	0.73	NA	0.03	0.13	0.19	0.14	0.25	0.10	0.07	0.10	0.04	0.03	0	0	0
2017	0.34	0.18	NA	0.00	0.04	0.16	0.10	0	0.02	0	0.02	0	0	0	0	0
2018	1.22	0.83	NA	0.03	0.06	0.30	0.46	0.16	0.06	0.09	0.02	0.01	0.03	0	0	0
<b>84-17</b>																
Mean	10.19	4.06	NA	0.26	2.65	3.22	2.30	1.07	0.40	0.16	0.07	0.03	0.01	0.00	0.00	0.00

Note years with non-standard # of tows: 1984: April = 0 tows, May = 13 tows, and 19 tows in June used to increase sample size; 1985: April = 0 tows, May = 41 tows; 1992 and 2006: April = 0 tows, May = 40; 1996: April = 17 tows, May = 63 tows; 2005: April = 35 tows, May = 45 tows; 2007: April = 35 tows, May = 45 tows; 2008: April = 36, and May = 44 tows; 2010: May = 38 tows; 2011: April = 12 tows; 2016: April = 36 tows; 2017: April = 0 tows, May = 24 tows; 2018: Apr=12 tows, May 40 tows.

**TABLES 5.28 - 5.64  
LENGTH FREQUENCIES  
LISTS**

**Table 5.28. Alewife length frequencies, spring and fall, 1 cm intervals, 1989–2018.**

*From 1989 - 1990, lengths were recorded from the first three tows of each day; since 1991, lengths have been recorded from every tow.*

length	Spring																														
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
7	0	0	0	0	2	0	0	0	0	0	0	4	0	0	1	0	1	0	0	4	0	2	1	0	0	0	3	1	0	0	
8	0	0	0	0	18	3	3	0	0	0	2	9	16	0	3	1	2	0	0	4	1	10	0	1	3	2	12	9	0	1	
9	0	0	2	0	15	9	6	1	6	0	6	21	32	1	18	6	16	0	0	4	6	10	0	3	7	5	11	27	0	4	
10	0	0	0	1	11	19	18	2	22	7	6	28	23	5	32	55	32	0	8	5	11	23	5	6	16	7	16	81	0	4	
11	0	0	5	4	10	44	11	2	64	11	20	52	14	6	27	87	26	29	13	32	10	9	22	8	11	16	13	230	0	33	
12	6	0	4	7	6	83	17	8	127	12	32	43	5	29	25	100	55	44	34	131	17	6	54	27	19	15	7	303	0	46	
13	1	0	4	4	47	122	48	16	63	44	42	99	4	70	11	83	61	15	38	193	24	12	48	98	18	24	6	181	0	67	
14	0	0	9	7	77	172	35	26	69	61	56	234	7	139	28	63	37	9	37	178	51	6	50	187	14	33	6	351	0	111	
15	3	0	8	5	68	140	54	32	56	51	120	334	6	157	25	33	50	49	85	86	101	8	59	123	12	48	7	407	0	103	
16	2	0	8	5	84	159	38	86	44	50	144	320	4	86	26	31	74	25	128	46	106	7	37	56	5	53	5	375	0	119	
17	5	4	4	16	63	108	32	203	28	34	330	85	5	82	21	33	73	78	161	47	142	5	7	27	10	16	5	353	0	50	
18	4	4	9	8	59	81	7	254	32	22	136	15	4	15	19	18	71	93	182	25	196	2	11	17	21	30	5	263	6	53	
19	6	7	7	2	37	33	7	180	9	11	99	20	3	6	26	42	59	86	122	49	215	7	11	24	22	24	9	89	1	61	
20	3	1	7	2	27	24	10	161	17	17	82	22	9	17	13	30	26	76	105	38	137	7	9	19	10	50	3	32	0	90	
21	1	0	3	1	13	17	14	107	34	22	72	27	12	28	22	50	21	40	71	21	53	18	9	18	28	58	9	51	1	132	
22	4	2	8	2	10	26	12	103	48	18	47	41	18	46	25	48	18	18	41	14	29	22	10	24	34	25	20	21	0	83	
23	5	1	8	6	3	12	12	76	44	16	47	90	36	63	40	36	7	5	28	16	13	12	16	27	39	8	17	7	0	31	
24	7	0	3	2	1	12	7	34	28	14	21	58	45	49	42	13	6	1	10	7	14	4	7	18	15	18	12	4	0	24	
25	3	2	1	0	3	5	2	9	9	2	11	11	23	12	29	11	3	1	3	0	11	2	4	11	4	12	10	3	0	6	
26	1	0	1	2	1	5	1	3	1	2	2	1	5	7	17	5	2	0	2	0	1	0	2	3	3	4	7	4	0	3	
27	2	0	1	0	0	1	0	0	0	0	0	1	2	1	2	2	1	0	0	0	0	0	1	0	1	0	1	3	0	0	
28	1	0	0	0	1	1	0	0	0	1	0	0	0	0	1	0	2	1	0	0	1	0	0	2	0	0	0	0	0	0	
29	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>56</b>	<b>21</b>	<b>93</b>	<b>74</b>	<b>556</b>	<b>1,076</b>	<b>334</b>	<b>1,304</b>	<b>701</b>	<b>395</b>	<b>1,275</b>	<b>1,515</b>	<b>274</b>	<b>820</b>	<b>452</b>	<b>749</b>	<b>642</b>	<b>569</b>	<b>1,068</b>	<b>901</b>	<b>1,138</b>	<b>172</b>	<b>364</b>	<b>698</b>	<b>291</b>	<b>449</b>	<b>185</b>	<b>2,796</b>	<b>8</b>	<b>1,021</b>	

length	Fall																														
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	4	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	1	0	0	-	0	0	0	0	0	0	0	0	
9	0	0	0	0	3	1	0	0	1	0	0	1	6	1	1	0	1	0	3	2	0	-	1	0	0	1	3	0	0	2	
10	0	0	0	0	5	1	4	1	1	0	1	4	23	0	7	1	7	0	8	2	1	-	1	0	0	2	9	0	1	2	
11	0	0	0	0	27	30	5	5	6	1	3	5	59	0	33	6	14	0	22	1	2	-	9	0	8	0	23	0	0	11	
12	0	0	0	1	120	82	9	25	12	9	6	9	86	4	64	7	8	0	44	0	2	-	22	2	14	7	32	0	9	9	
13	0	0	3	0	88	84	14	21	21	7	9	17	72	0	4	12	17	0	87	5	10	-	14	3	16	27	88	0	12	4	
14	0	0	2	4	16	36	11	30	31	0	11	10	23	3	3	16	15	0	134	14	10	-	22	0	34	48	26	3	3	0	
15	0	0	1	8	21	31	0	9	53	0	5	8	24	3	5	28	15	2	118	4	8	-	28	2	6	12	53	8	1	1	
16	3	0	3	10	53	14	4	1	110	1	25	2	36	17	20	30	12	4	31	0	1	-	14	1	2	4	37	4	2	0	
17	2	0	0	12	25	33	1	2	194	4	34	0	27	8	19	12	3	0	8	3	1	-	19	2	2	0	11	0	0	1	
18	3	0	0	9	13	24	1	1	62	3	11	1	5	0	0	1	5	0	6	0	1	-	17	0	0	2	14	0	2	0	
19	0	0	0	2	1	11	0	0	0	1	4	1	0	1	0	0	0	0	7	1	0	-	1	0	1	0	3	0	0	0	
20	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0	
21	0	0	0	0	3	1	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	
22	0	1	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	-	0	0	0	1	1	0	0	0	
24	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
25	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>8</b>	<b>1</b>	<b>9</b>	<b>46</b>	<b>377</b>	<b>354</b>	<b>50</b>	<b>95</b>	<b>492</b>	<b>27</b>	<b>117</b>	<b>58</b>	<b>364</b>	<b>38</b>	<b>156</b>	<b>113</b>	<b>98</b>	<b>6</b>	<b>468</b>	<b>33</b>	<b>37</b>	<b>0</b>	<b>148</b>	<b>10</b>	<b>83</b>	<b>104</b>	<b>301</b>	<b>15</b>	<b>30</b>	<b>34</b>	

**Table 5.29. American shad length frequencies, spring and fall, 2.0 cm intervals (midpoint given), 1989-2018.**

*From 1989 - 1990, lengths were recorded from the first three tows of each day; since 1991, lengths have been recorded from every tow.*

length	Spring																													
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
7	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
9	0	0	0	0	8	2	17	0	6	9	5	5	2	13	6	1	6	0	0	0	1	0	0	0	11	7	1	16	0	2
11	0	0	1	3	7	2	16	5	24	27	20	46	1	101	12	8	11	0	5	26	12	12	5	3	48	41	38	89	0	15
13	4	0	10	8	4	4	11	9	59	85	31	29	2	87	11	14	10	0	20	78	36	21	28	34	38	32	27	203	2	23
15	49	1	82	17	6	22	22	191	177	108	65	21	2	41	0	45	25	38	54	180	66	77	100	106	20	9	13	127	0	17
17	29	8	49	23	10	72	68	154	319	97	52	32	4	49	3	6	4	14	44	51	40	47	25	45	11	3	5	150	0	3
19	5	5	4	33	6	374	40	47	62	32	20	13	0	17	0	2	0	5	8	11	15	5	3	5	2	1	2	87	0	1
21	1	3	10	25	6	158	6	9	2	1	35	1	0	4	4	2	6	0	3	3	3	2	1	0	1	1	1	16	0	0
23	0	3	31	20	5	18	2	16	5	8	50	4	0	7	7	4	7	0	4	3	4	0	0	10	8	16	19	3	0	5
25	0	2	10	7	1	6	0	15	1	7	14	2	3	4	0	0	3	0	7	0	0	1	0	22	1	2	5	4	0	3
27	0	1	1	0	0	2	0	5	0	1	1	1	0	0	0	0	2	0	4	0	0	0	0	4	0	2	0	1	0	0
29	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	1	3	0	3	3	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
35	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0
37	0	0	0	2	0	1	0	0	4	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0
39	1	0	0	3	2	2	1	0	2	0	4	0	0	2	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0
41	1	0	1	5	2	3	2	0	3	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	1	4	2	1	0	0	1	1	6	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0
45	1	0	1	7	2	3	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
47	0	0	0	2	0	1	2	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	0	0	0
49	0	0	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
51	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	91	24	202	163	61	675	189	452	669	378	313	157	14	337	43	83	79	60	152	353	178	165	162	231	142	120	113	698	3	69

length	Fall																													
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
7	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	-	0	0	0	1	0	0	0	1
9	0	0	7	1	2	6	7	0	6	1	5	0	1	1	4	5	4	0	2	4	0	-	4	4	0	9	0	2	0	3
11	0	1	4	5	23	26	16	1	20	14	27	0	4	1	14	6	3	0	19	4	27	-	4	4	0	2	13	5	6	3
13	0	0	7	21	54	208	24	7	28	13	44	0	1	0	22	4	5	0	26	3	22	-	2	2	1	2	18	4	12	1
15	0	0	4	2	33	245	14	2	5	4	6	0	0	0	2	0	0	13	0	36	-	2	0	2	5	7	9	0	5	
17	0	0	22	7	10	20	2	0	12	64	13	2	5	11	15	77	3	1	2	0	3	-	6	2	8	0	2	80	8	13
19	32	34	93	41	53	57	84	0	67	290	130	16	47	199	121	155	23	6	5	6	42	-	35	5	31	9	26	134	48	48
21	129	143	22	102	466	229	335	15	99	123	251	104	34	44	80	21	46	0	8	28	88	-	42	52	32	9	62	11	125	72
23	30	27	0	30	394	197	83	19	12	0	179	39	3	0	6	0	14	1	8	7	25	-	14	21	5	1	27	0	27	15
25	0	0	0	1	24	50	3	4	0	0	17	0	1	0	0	1	0	0	0	0	0	-	0	0	0	2	6	0	0	0
27	0	0	0	3	2	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
41	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
49	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
51	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
Total	192	205	159	214	1,061	1,047	568	48	251	509	674	161	96	256	262	273	98	8	83	52	243	-	109	90	79	40	161	245	226	161





**Table 5.31. American lobster length frequencies—fall, female, 1 mm intervals, 1984–2018.**  
*Lobsters were measured from each tow.*

Length	Female										Fall																									
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
	(70)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(120)	(120)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(40)	(80)	(80)	(40)	(80)	(40)	(80)	(80)	(80)	(80)	(79)	(80)	(80)	(80)	(80)		
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	3	2	2	3	3	2	8	1	24	9	23	1	18	17	2	13	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	6	0	10	1	1	0	9	15	32	6	22	0	7	22	2	4	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	5	0	2	4	4	2	16	23	30	39	52	16	20	25	5	15	3	0	1	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	29	7	1	8	1	6	11	32	32	29	63	14	46	47	9	17	5	0	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	18	0	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	10	0	1	11	6	6	26	34	42	43	63	20	33	50	12	18	9	3	2	1	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
47	21	7	3	12	2	12	18	52	47	44	41	27	32	42	5	16	2	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	10	5	4	14	8	18	19	35	58	52	69	28	33	58	14	15	7	2	6	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
49	29	6	7	14	15	11	15	27	77	58	47	47	19	71	11	27	10	2	4	2	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
50	27	9	6	21	12	4	31	41	52	38	69	54	28	61	13	31	10	6	2	2	2	4	3	2	3	0	0	0	0	0	0	0	0	0	0	0
51	35	8	2	12	3	11	10	44	73	72	94	45	41	49	15	30	13	6	3	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	26	11	3	15	3	11	21	40	66	54	59	51	42	120	18	34	13	3	6	3	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
53	33	8	3	22	10	7	22	55	82	94	55	43	106	29	18	16	9	3	1	6	10	2	3	1	3	0	0	0	0	0	0	0	0	0	0	0
54	16	8	18	11	12	14	20	41	61	83	76	38	58	82	17	45	28	8	1	3	2	2	3	1	2	3	0	0	0	0	0	0	0	0	0	
55	23	10	27	21	2	6	22	59	58	59	54	39	45	102	48	32	18	9	1	3	7	8	1	1	3	1	0	0	0	0	0	0	0	0	0	0
56	45	10	11	36	10	24	22	29	82	87	74	45	41	90	23	32	33	12	1	3	6	0	3	2	1	6	0	0	0	0	0	0	0	0	0	0
57	16	15	16	18	7	7	15	52	71	78	50	44	121	24	39	22	13	5	2	13	5	2	1	10	6	0	0	0	0	0	0	0	0	0	0	0
58	23	16	11	19	13	17	36	55	63	119	79	69	47	114	29	31	23	14	6	5	5	8	1	2	2	5	0	0	0	0	0	0	0	0	0	0
59	21	11	13	26	13	23	30	79	66	110	84	48	110	35	36	28	18	5	6	10	4	4	0	2	5	0	0	0	0	0	0	0	0	0	0	0
60	30	18	20	18	7	17	16	74	53	115	70	53	51	140	29	35	34	8	6	9	7	6	1	4	5	2	0	0	0	0	0	0	0	0	0	0
61	10	4	17	24	12	14	37	46	52	91	79	51	56	119	34	37	27	9	5	2	12	7	2	1	2	6	0	0	0	0	0	0	0	0	0	0
62	27	16	23	21	14	32	41	64	53	107	117	44	53	133	39	44	32	19	3	5	10	3	5	1	2	8	0	0	0	0	0	0	0	0	0	0
63	31	14	13	22	8	20	22	53	66	130	93	58	41	126	51	45	29	19	6	6	16	12	4	4	4	5	0	0	0	0	0	0	0	0	0	0
64	25	10	15	29	23	31	26	71	38	100	86	79	38	139	34	44	29	21	9	12	19	5	4	4	4	7	0	0	0	0	0	0	0	0	0	0
65	17	9	39	24	15	28	26	77	44	93	89	49	43	146	49	42	37	18	9	6	15	9														



**Table 5.33. American lobster length frequencies—fall, male, 1 mm intervals, 1984–2018.**

*Lobsters were measured from each tow.*

Male Length	Fall																																				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
25	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
26	0	0	2	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
27	0	0	0	0	0	0	2	0	0	1	9	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0		
28	1	2	0	0	0	0	0	3	0	0	3	4	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0		
29	0	0	0	0	0	1	3	0	0	0	6	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
30	0	0	0	0	0	0	3	0	3	0	4	0	0	3	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
31	0	0	2	0	1	0	2	0	2	0	4	2	3	0	6	2	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0		
32	4	0	0	4	0	0	0	5	13	2	3	0	4	5	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
33	1	0	0	2	0	1	0	3	4	0	9	1	11	3	1	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
34	1	0	0	2	1	0	2	1	13	4	11	0	4	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0		
35	3	0	0	1	0	0	3	7	13	15	12	1	8	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
36	3	0	0	1	0	1	5	8	25	8	21	1	7	14	2	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
37	3	0	6	0	1	1	7	4	38	4	21	1	11	7	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
38	2	2	3	2	0	0	6	40	6	34	1	17	14	3	5	0	0	0	0	0	1	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	
39	0	0	2	1	2	1	5	8	34	5	25	4	16	28	7	17	3	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0		
40	3	0	6	2	1	5	10	8	35	21	35	6	15	14	5	7	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0		
41	6	1	1	3	4	5	12	13	43	14	54	5	11	24	1	6	1	0	1	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	
42	4	6	2	0	11	3	12	13	43	34	55	5	29	25	9	8	5	0	1	1	2	1	0	0	1	0	0	1	1	0	0	0	0	0	0		
43	1	0	3	3	2	1	7	49	17	56	12	23	41	5	21	2	2	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
44	4	1	1	5	11	1	6	13	35	13	63	26	16	40	5	19	3	2	1	1	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	
45	7	3	3	3	8	10	11	42	44	34	43	20	44	53	9	18	5	3	2	1	2	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	
46	2	2	1	7	4	14	10	31	44	19	58	33	18	35	7	16	5	2	3	0	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	
47	13	4	3	10	10	5	16	14	66	60	26	26	33	41	13	20	7	2	2	1	2	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	
48	15	3	5	7	14	4	16	10	67	49	72	19	49	72	8	20	9	9	1	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
49	4	2	10	8	2	12	18	45	48	100	56	33	30	48	10	37	9	1	0	1	6	3	2	0	0	1	2	0	0	0	0	0	0	0	0	0	
50	13	5	8	21	9	11	16	37	63	56	55	53	28	56	15	44	9	3	2	0	5	4	3	1	0	0	0	1	2	0	0	0	0	0	0	0	
51	51	6	5	17	10	11	24	46	74	30	88	27	22	88	21	37	18	6	3	3	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	
52	15	5	11	17	3	16	31	43	65	78	82	56	30	80	36	42	9	4	2	0	3	4	1	1	1	3	0	0	0	1	0	0	0	0	0	0	
53	13	9	3	30	5	15	22	57	55	83	83	61	37	103	29	29	15	8	3	1	7	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	
54	24	12	19	26	21	17	25	76	47	59	97	59	30	116	23	43	21	7	2	3	8	5	2	1	3	3	0	0	0	0	0	0	0	0	0	0	
55	23	4	17	23	13	26	25	47	83	84	70	80	32	96	26	46	38	9	2	2	12	3	3	1	0	0	7	1	1	0	0	0	0	0	0	0	
56	18	12	25	18	13	13	13	37	65	104	90	52	43	89	39	39	21	10	3	4	10	3	3	0	2	6	0	0	0	0	0	0	0	0	0	0	0
57	9	0	10	30	26	18	36	43	64	101	79	92	27	111	44	42	27	10	5	4	8	8	1	7	2	4	0	0	0	0	0	0	0	0	0	0	0
58	29	15	24	23	13	30	34	51	68	68	107	58	48	80	42	57	21	10	8	5	6	7	3	1	1	5	0	0	0	0	0	0	0	0	0	0	0
59	47	8	26	31	16	14	23	43	86	109	78	76	40	143	33	54	29	24	10	10	13	6	5	1	6	0	0	2	0	0	0	0	0	0	0	0	0
60	16	6	11	26	7	26	39	56	77	103	109	69	30	134	56	61	37	9	9	7	13	7	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0
61	23	5	10	25	30	12	24	57	68	138	120	78	59	128	53	64	44	15	8	5	17	8	5	4	1	3	0	0	0	0	0	0	0	0	0	0	
62	50	17	26	23	10	13	36	37	57	125	92	80	42	145	57	49	28	19	10	6	7	10	6	3	1	4	7	0	0	2	0	0	0	0	0	0	
63	14	18	37	20	15	28	63	68	144	107	74	41	149	60	63	39	29	15	7	4	9	5	4	1	10	0	0	2	0	0	0	0	0	0	0	0	0
64	28	17	22	24	35	19	25	86	74	87	106	73	77	138	57	68	42	35	9	8	19	12	2	2	2	8	0	0	3	0	0	0	0	0	0	0	0
65	36	10	39	31	20	16	39	87	49	107	83	75	73	161	75	48	37	34	17	10	14	14	3	4	6	11	0	1	1	0	0	0	0	0	0	0	0
66	22	13	21	41	31	27	22	60	59	81	87	93	40	130	63	61	41	24	12	7	21	6	4	2	6	11	0	3	1	1	1	0	1	0	0	0	
67	14	16	39	28	21	24	30	78	82	108	119	63	46	136	51	38	43	38	13	7	17	12	2	7	7	14	0	1	3	0	0	1	0	0	0	0	
68	16	18	30	31	17	19	42	71	69	107	79	55	34	113	67	61	57	33	21	7	15	12	5	5	4	16	0	4	1	0	0	0	0	0	0	0	0
69	46	13	22	32	31	30	24	51	81	131	101	75	28	121	52	54	41	21	20	11	23	10	2	5	5	8	0	2	0	0	0	0	0	0	0	0	0
70	32	11	28	31	14	24	26	63	56	117	112	79	36	122	60	78	42	22	12	8	30	7	1	4	3	6	0	3	0	0	1	0	0	0	0	0	0
71	8	14	25	23	21	25	24	58	63	115	83	52	63	126	69	75	48	47	21	13	20	6	6	0	4	12	0	1	0	0	0	0	0	0	0	0	0
72	23	20	31	36	29	19	33	89	61	86	76	65	66	86	77	64	47	52	13	9	19	10	6	9	2	8	0	1	2	0	0	0	0	0	0	0	0
73	40	18	42	29	13	42	40	53	44	85	83	51	44	98	74	70	47																				

**Table 5.34. Atlantic herring length frequencies, spring and fall, 1 cm intervals, 1989-2018.**

*From 1989 - 2013, Atlantic herring lengths were recorded from the first three tows of each day; since 2014, lengths have been recorded from every tow.*

length	Spring																														
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
3	0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	
4	0	0	0	0	4	0	0	0	0	18	504	61	0	0	1	2	0	0	0	1	213	2	12	0	29	3	2	0	0	5	
5	0	2	0	11	3	1	0	0	1	149	1,547	104	0	0	8	30	76	3	20	36	3,416	28	35	15	429	29	51	18	2	79	
6	1	3	3	16	1	0	1	3	0	92	237	1	3	0	9	10	140	2	2	13	449	12	59	2	227	0	7	5	1	10	
7	0	1	4	15	2	0	2	15	69	84	18	7	11	1	0	8	118	1	0	12	44	1	103	2	38	2	1	3	2	4	
8	0	0	7	0	1	0	0	5	165	28	5	1	6	1	0	9	73	11	0	23	48	1	132	0	10	1	0	3	0	5	
9	0	0	3	0	1	0	1	1	27	11	4	0	8	0	0	3	8	10	0	16	59	0	43	1	1	2	0	0	1	0	
10	0	0	0	0	3	1	0	0	0	2	0	0	1	0	0	0	0	0	0	2	6	0	3	1	0	5	0	0	0	1	
11	0	0	0	0	3	1	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	46	0	0	0	0	
12	0	0	0	0	38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	492	0	0	0	0	
13	0	8	0	0	215	8	0	0	5	0	0	0	0	0	1	3	0	0	0	0	0	5	1	1	0	483	0	0	0	0	
14	0	1	0	0	203	11	0	1	29	0	0	0	1	0	0	9	7	0	0	0	1	29	26	6	23	200	0	0	0	0	
15	2	0	8	0	122	9	6	0	59	5	0	0	2	0	0	49	14	0	9	1	9	39	55	16	112	48	1	0	0	0	
16	3	1	38	0	174	17	7	3	12	8	0	3	0	0	0	65	20	0	14	0	91	49	19	12	121	6	4	0	0	0	
17	2	31	33	0	100	42	8	2	4	5	0	6	2	0	0	140	63	0	27	2	149	25	3	3	119	18	2	4	0	2	
18	2	4	29	2	28	32	12	0	10	2	0	0	1	0	3	275	98	0	166	6	28	31	7	0	49	95	8	41	0	4	
19	0	16	19	29	21	39	12	6	21	0	1	0	11	2	1	117	57	0	467	1	203	86	14	20	32	85	39	63	0	2	
20	0	161	67	15	41	43	78	10	40	5	1	6	65	3	2	67	67	0	228	7	521	222	14	107	50	52	47	36	0	1	
21	0	333	72	24	35	29	283	26	14	4	2	11	85	17	0	12	19	0	99	11	279	106	8	196	148	16	60	10	0	1	
22	0	424	70	111	96	14	399	15	19	11	10	38	77	32	0	16	11	3	105	9	162	71	24	91	847	4	58	3	0	12	
23	0	201	160	61	387	111	245	20	7	4	15	36	14	87	4	0	15	4	106	13	144	97	59	23	824	60	29	10	0	25	
24	0	195	297	311	436	224	290	22	18	1	19	47	33	71	17	0	25	3	150	27	71	105	173	21	268	71	90	30	2	19	
25	0	315	337	751	645	485	416	46	117	2	9	99	31	18	36	3	21	5	122	38	87	108	214	16	104	30	90	47	1	44	
26	1	447	360	503	921	560	1,028	85	202	31	10	70	46	30	63	3	78	3	125	39	108	110	210	18	96	50	72	47	0	55	
27	0	347	514	382	807	947	723	93	236	33	35	80	24	27	65	14	106	9	122	38	69	95	147	11	30	30	34	10	1	59	
28	0	338	513	391	825	604	706	64	234	44	37	104	34	19	72	9	87	6	116	36	85	62	65	4	5	4	16	9	0	8	
29	2	247	319	492	550	387	337	37	82	21	25	69	29	52	1	40	3	47	15	44	26	48	4	1	0	1	0	0	1	0	
30	0	156	383	142	287	204	231	29	31	1	11	24	8	3	27	3	19	1	6	6	27	7	2	0	0	0	0	0	0	0	
31	2	127	139	77	129	29	14	4	15	2	0	0	4	0	8	1	0	0	0	2	6	0	2	0	0	0	0	0	0	0	
32	0	50	22	1	33	6	14	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
33	0	11	13	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	8	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>15</b>	<b>3,427</b>	<b>3,411</b>	<b>3,341</b>	<b>6,119</b>	<b>3,808</b>	<b>4,814</b>	<b>489</b>	<b>1,421</b>	<b>566</b>	<b>2,491</b>	<b>767</b>	<b>497</b>	<b>363</b>	<b>368</b>	<b>847</b>	<b>1,165</b>	<b>64</b>	<b>1,931</b>	<b>355</b>	<b>6,319</b>	<b>1,317</b>	<b>1,479</b>	<b>570</b>	<b>3,563</b>	<b>1,834</b>	<b>612</b>	<b>339</b>	<b>10</b>	<b>337</b>	

length	Fall																															
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	1		
8	0	0	0	99	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0		
9	0	0	0	328	16	4	0	0	2	3	0	0	0	0	1	0	0	0	0	0	4	-	1	0	1	0	0	0	0	1		
10	0	0	0	176	3	6	0	14	6	59	0	0	0	0	12	1	0	0	0	0	2	-	0	0	1	0	0	0	0	5		
11	0	3	0	34	5	9	0	11	3	49	0	1	0	0	47	0	0	2	0	0	1	-	0	0	1	0	2	0	0	1		
12	0	0	0	3	9	11	0	1	0	0	0	0	0	0	20	1	0	0	1	0	0	-	0	0	0	0	1	0	0	0		
13	0	0	0	0	13	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-	0	0	0	0	0	0	0	0		
14	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0		
15	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0		
16	0	0	0	1	7	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0	0	0	1	3	0	0	0		
17	0	0	1	0	7	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-	1	0	0	2	2	0	0	0		
18	0	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	-	1	0	0	0	6	0	0	1		
19	0	0	5	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	1	0	0	1		
20	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0		
21	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	1	0	0	0	0	0	0	0	0	
23	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	-	0	0	0	0	1	0	0	0	0	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	-	0	0	0	0	1	0	0	1	0	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	2	0	0	1	0	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	1	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>3</b>	<b>12</b>	<b>642</b>	<b>110</b>	<b>40</b>	<b>0</b>	<b>27</b>	<b>12</b>	<b>112</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b></b>													

**Table 5.35. Atlantic menhaden length frequency, spring and fall, 1 cm intervals, 1996-2018.**

*Menhaden are scheduled to be measured from every tow. However, the following numbers of menhaden were not measured: 5 juveniles and 4 adults in 1996, and 7 adults in 1997.*

length	Spring																						
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0
9	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	125	0	0
10	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	7	0	0	0	115	0	0
11	0	0	0	1	0	0	13	0	0	0	0	0	0	0	0	0	3	0	0	0	72	0	0
12	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	15	0	0	0	39	0	0
13	0	0	0	0	0	0	6	0	0	0	2	0	0	0	0	0	8	0	0	0	8	0	0
14	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	5	0	0	0	3	0	0
15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	0	1	1	1	0
26	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	2	3	6	0	3	8	9
27	0	0	0	0	0	0	1	0	0	0	0	6	2	3	1	4	14	25	46	24	10	15	10
28	0	1	0	0	1	0	1	0	0	0	5	4	9	5	10	33	32	81	53	23	36	22	
29	0	1	0	0	1	0	0	1	3	0	1	5	2	2	1	18	53	59	79	75	34	40	17
30	0	1	0	0	0	0	1	1	0	0	0	4	1	5	0	10	28	27	34	54	13	18	13
31	0	3	0	0	0	0	0	0	1	0	2	4	1	0	0	1	12	13	19	20	3	4	3
32	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	1	0	1	2	1	0	0	0
33	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	6	0	1	9	0	47	2	5	1	5	33	10	19	7	43	195	162	267	229	557	122	77

length	Fall																						
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	2	0	0	0	1	0	0	-	0	0	0	0	1	0	0	0
6	0	0	0	0	0	0	0	17	1	0	0	24	0	0	-	0	1	1	0	1	0	2	0
7	1	0	0	20	12	0	2	32	26	0	1	39	2	0	-	0	0	0	0	34	1	9	1
8	0	1	18	51	73	0	6	22	178	11	0	32	2	2	-	0	0	0	58	1	10	0	
9	0	11	53	152	128	0	8	9	135	22	0	12	6	0	-	0	0	0	73	0	8	0	
10	1	5	120	471	125	1	9	1	143	19	0	34	3	3	-	0	1	0	2	70	0	3	
11	0	6	49	337	51	25	14	1	47	13	2	51	2	4	-	0	0	1	30	2	1	0	
12	0	11	44	25	35	30	10	1	18	9	8	24	1	5	-	6	0	4	5	22	11	3	
13	0	0	20	2	15	16	14	4	1	1	1	49	0	4	-	7	1	5	0	5	42	7	
14	0	2	0	0	7	20	2	0	3	2	7	0	3	-	9	0	4	0	2	112	3	1	
15	0	0	0	0	2	4	24	0	0	1	0	1	1	5	-	6	1	1	0	0	90	1	
16	0	0	0	0	2	8	0	0	2	1	1	4	4	-	3	0	1	0	0	19	0	0	
17	0	0	0	0	3	0	12	0	0	0	0	3	0	-	0	1	0	0	0	2	0	0	
18	0	0	0	0	0	17	0	0	0	0	0	0	1	-	0	2	0	0	0	0	0	0	
19	0	0	0	0	0	16	0	0	0	0	0	0	0	-	0	2	0	0	0	0	0	0	
20	0	0	0	1	0	0	0	0	0	0	0	0	0	-	0	2	0	0	0	0	0	0	
21	0	0	0	1	0	0	1	0	0	1	0	0	0	-	0	1	0	0	0	0	0	0	
22	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
24	0	0	0	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	3	1	2	1	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	7	5	1	2	4	
26	0	0	0	0	0	0	1	0	0	0	3	0	0	-	0	7	2	2	14	2	3	13	
27	2	0	0	0	0	0	1	0	0	1	0	21	9	4	-	4	27	6	68	131	11	11	
28	3	1	0	3	0	0	2	0	3	4	0	35	2	7	-	18	68	13	164	249	17	22	
29	23	17	0	6	1	0	18	5	10	21	2	31	1	1	-	48	66	12	132	233	4	14	
30	30	25	0	28	3	0	29	8	44	54	2	18	0	5	-	30	35	14	63	100	1	11	
31	11	17	1	42	7	1	39	8	65	43	2	7	0	2	-	4	11	5	2	18	0	4	
32	2	6	1	27	12	0	27	3	51	21	1	2	0	0	-	2	0	1	9	2	0	1	
33	0	1	0	19	4	2	25	2	10	5	0	0	0	0	-	0	0	0	0	0	0	0	
34	0	0	0	1	4	0	9	1	7	2	1	0	0	0	-	0	0	0	0	0	0	0	
35	0	0	0	0	1	0	5	0	1	1	0	0	0	0	-	0	0	0	0	0	0	0	
Total	73	103	306	1,187	484	86	320	119	740	234	23	392	36	51	-	137	226	70	455	1,051	317	117	151

**Table 5.36. Black sea bass length frequencies, spring, 1 cm intervals, 1986-2018.**

*Since 1987, black sea bass have been measured from every tow.*

length	Spring																																			
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018			
5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0		
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0		
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8	0	0	0	0	1	1	2	0	0	3	0	2	0	0	0	0	0		
9	0	0	0	0	0	2	0	0	0	0	0	0	0	1	2	0	9	0	0	0	0	1	1	1	0	0	9	2	2	0	0	0	0	1		
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5	0	0	0	0	7	7	2	0	0	8	2	9	0	0	0	0	2		
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	1	2	1	0	0	11	0	10	0	0	0	0	0		
12	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	5	0	0	0	0	1	2	2	0	1	14	0	2	1	2	0	1	1		
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	9	0	0	0	0	2	1	1	0	1	12	1	0	0	0	0	0	2		
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	1	0		
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2	0	0	1	7	1	7	1		
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	2		
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	14	2	14	2	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	1	1	0	0	6	1	0	1	15	1	15	1		
19	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	14	1	1	1	12	9	12	9		
20	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	24	9	0	2	22	15	23	7		
21	0	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	1	1	1	0	0	1	1	0	0	1	33	9	2	0	23	7	23	7		
22	0	2	0	1	0	0	0	1	1	0	1	0	0	0	1	2	0	1	0	0	1	4	2	2	1	2	2	34	6	0	2	14	24	24		
23	0	1	0	0	2	0	0	1	1	0	3	0	1	0	1	0	1	2	1	0	0	4	3	3	1	2	4	22	10	8	2	13	25	25		
24	0	3	0	0	0	0	1	1	3	3	2	1	2	1	8	1	5	4	0	0	0	0	0	3	1	2	1	12	19	1	5	8	27	27		
25	2	0	0	2	0	0	1	2	2	1	0	2	1	0	0	2	0	1	0	0	4	1	2	0	2	1	11	39	4	6	3	51	51	51		
26	0	0	1	0	1	0	1	0	1	3	0	1	1	0	1	5	2	0	1	0	0	1	2	1	1	0	3	3	67	6	4	3	87	87		
27	0	0	0	0	0	0	0	0	1	1	0	1	1	2	2	4	1	0	1	0	0	1	0	0	2	0	6	2	93	7	5	2	124	124		
28	1	0	0	0	4	0	0	1	0	0	0	0	0	0	3	0	2	0	1	0	1	1	0	2	0	3	2	125	5	2	2	155	155			
29	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2	0	6	0	0	1	1	2	4	0	3	0	152	17	2	1	132	132			
30	0	0	0	1	2	0	0	1	2	0	0	1	0	1	1	3	1	0	4	0	0	0	0	2	4	1	2	0	139	41	8	14	100	100		
31	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	3	10	0	7	0	0	0	3	2	2	3	1	96	51	8	6	79	79			
32	0	0	2	0	1	0	0	2	1	0	1	4	0	1	1	3	15	1	5	0	0	4	5	2	3	3	6	6	91	94	12	10	30	30		
33	0	0	1	0	1	0	0	0	2	0	2	1	0	0	1	11	12	1	3	0	0	1	2	2	0	1	7	5	43	91	27	10	32	32		
34	2	0	0	1	1	0	0	0	1	0	1	1	1	1	3	6	11	1	2	0	0	3	3	4	6	1	10	9	49	106	50	13	22	22		
35	0	0	0	0	0	0	0	1	0	0	1	3	0	0	1	7	11	2	1	1	0	5	0	4	1	3	6	4	19	129	57	13	19	19		
36	1	0	1	0	1	0	0	1	1	2	1	0	0	1	0	3	13	0	3	4	0	5	0	7	0	2	7	8	14	107	89	31	14	14		
37	0	0	0	0	1	0	0	0	0	0	0	1	1	0	2	0	5	6	2	0	1	0	1	1	3	2	5	3	10	11	81	110	52	18	18	
38	1	0	1	0	0	1	0	0	0	0	0	0	0	1	3	2	11	3	0	1	0	1	0	4	2	4	8	4	9	62	102	60	21	21		
39	1	0	0	0	2	0	0	2	0	1	0	0	0	0	0	3	13	1	0	1	0	0	1	7	0	5	12	6	3	56	72	60	22	22		
40	0	0	0	1	0	1	0	0	0	0	3	0	0	0	1	2	15	2	1	0	0	2	0	4	0	3	4	9	6	38	77	80	23	23		
41	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	3	11	4	4	0	1	1	5	2	2	11	8	8	37	69	62	17	17	17		
42	0	1	0	1	0	0	0	0	1	1	0	0	0	1	1	1	11	3	0	4	1	0	0	7	1	2	1	2	3	21	67	44	30	30		
43	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	5	3	2	2	0	1	1	3	0	2	6	1	0	9	53	44	34	34		
44	2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	5	2	1	1	1	0	0	0	0	1	2	3	1	10	36	44	22	22		
45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7	0	1	0	0	1	1	0	1	0	3	2	1	4	36	25	24	24		
46	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	6	2	1	0	0	0	1	0	0	1	2	2	2	2	25	24	22	22		
47	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	5	0	2	0	0	1	0	2	0	0	2	1	3	1	10	17	23	23			
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	1	4	15	14	8	8	8		
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	0	0	0	0	1	3	0	4	10	20	8	8	8		
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	2	11	9	9	9		
51	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1	1	2	0	10	5	5	5		
52	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	4	6	6	6		
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3	6	6		
54	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	2	1	2		
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	
57	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0																																

**Table 5.37. Black sea bass length frequencies, fall, 1 cm intervals, 1986-2018.**

*Since 1987, black sea bass have been measured from every tow.*

length	Fall																																	
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	1	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	2	0	0	1	-	0	1	3	3	0	1	2	2	
5	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	-	4	0	2	0	0	2	0	2	
6	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	3	1	0	7	0	0	1	1	0	-	4	1	3	5	1	1	1	3	
7	0	0	0	0	4	0	3	1	0	1	0	0	3	0	6	4	0	23	2	0	3	2	0	-	2	1	3	2	1	0	5	5		
8	0	2	0	1	0	4	0	1	2	0	1	0	0	1	5	8	0	15	2	0	4	0	2	-	1	2	1	2	1	0	4	1		
9	0	0	0	0	1	3	0	0	4	0	0	0	1	0	3	6	0	10	2	0	1	2	0	-	1	2	0	4	0	1	5	2		
10	0	0	0	0	0	2	0	0	1	0	0	0	0	0	1	3	0	5	2	0	2	0	0	-	0	2	0	0	0	0	0	1		
11	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5	0	2	2	0	1	0	0	-	0	5	0	0	0	0	0		
12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	-	0	3	0	0	0	0	3	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	-	0	4	0	0	0	3	1	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	-	0	14	0	0	0	22	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	-	0	21	0	0	0	19	1	0	
16	0	0	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	0	0	1	5	0	-	0	37	0	0	0	0	15	2	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	7	0	0	0	1	4	8	2	-	0	20	3	0	0	19	2	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	16	1	0	0	1	14	6	-	0	20	3	0	0	5	6	0		
19	0	0	0	0	0	0	0	0	0	0	0	2	0	3	1	0	23	0	0	0	2	2	10	4	-	0	23	1	0	0	11	9	1	
20	0	0	0	0	0	3	0	0	0	2	0	1	6	3	0	19	0	0	1	4	10	6	4	-	0	14	1	0	0	5	6	0		
21	0	0	0	0	0	1	0	0	0	1	0	1	4	1	0	17	0	0	1	3	4	9	4	-	0	9	1	2	0	2	2	2		
22	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	5	0	0	0	1	4	3	-	0	3	8	1	0	0	3	0		
23	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	1	0	0	2	0	-	0	6	11	2	0	1	6	2		
24	0	0	2	0	0	0	0	0	0	1	0	0	3	0	0	2	0	0	0	0	0	0	0	-	0	0	12	1	0	0	10	4		
25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	-	0	0	14	1	0	1	5	3		
26	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	-	1	0	18	2	0	1	9	2		
27	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	2	-	1	1	15	3	3	5	8	3		
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	2	0	-	1	2	13	10	2	2	7	12		
29	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0	1	1	2	0	1	0	-	2	1	8	13	2	6	3	14		
30	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	0	1	0	-	5	1	8	10	1	3	3	14		
31	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	1	1	0	0	0	2	1	0	-	4	1	4	21	4	2	4	17		
32	0	0	2	0	0	0	0	0	0	0	0	1	0	2	3	2	0	0	0	0	2	0	0	-	1	0	4	14	5	0	0	15		
33	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	2	0	0	0	2	0	0	0	-	1	1	4	23	3	1	0	8		
34	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	0	1	1	0	-	1	1	0	21	9	4	0	8	
35	0	0	1	0	0	0	0	0	0	0	0	1	0	0	3	2	1	1	0	0	0	1	1	-	2	1	1	27	11	3	0	12		
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	-	0	1	2	20	8	3	1	11		
37	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	9	2	0	0	0	1	1	0	-	3	1	3	12	6	2	2	2		
38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	3	0	0	1	0	1	0	-	1	1	6	11	5	6	0	3		
39	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	2	0	1	-	2	2	1	7	8	7	2	0		
40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	2	0	1	0	0	1	0	-	1	3	7	8	13	7	2	0		
41	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	0	0	1	0	2	0	-	3	2	2	4	4	10	3	0		
42	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	2	0	0	0	-	3	4	3	2	5	7	6	0		
43	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	1	0	0	-	0	3	5	3	4	4	2	1		
44	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	3	1	0	0	0	0	0	0	-	1	3	2	0	2	5	4	2		
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	-	0	0	3	1	1	0	2	2		
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-	0	1	1	0	1	3	5	0		
47	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	-	0	1	0	1	0	5	3	1		
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	-	0	2	2	0	0	2	5	3		
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	0	0	6	3	2		
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	1	0	-	0	0	1	2	0	2	6	2		
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	0	1	0		
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	1	1	0	0	0	1		
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0	
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	-	0	1	1	0	0	0	0	0	1	
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0	
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	1	
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	1	0	0	0	0
Total	0	3	9	1	8	22	2	8	12	1	6	4	10	33	22	66	155	11	75	23	12	53	77	38	0	45	224	185	239	104	207	151	166	



**Table 5.38. Blueback herring length frequencies, spring and fall, 1 cm intervals, 1989-2018.**

*From 1989 - 1990, lengths were recorded from the first three tows of each day; since 1991, lengths have been recorded from every tow.*

length	Spring																														
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
6	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	
7	0	0	2	0	2	7	2	0	0	2	0	4	1	0	3	2	1	0	0	1	0	4	0	0	5	1	17	3	0	0	
8	0	0	3	0	2	76	20	4	0	5	0	10	7	12	7	9	8	1	0	8	0	1	0	9	8	30	13	0	0		
9	0	0	2	0	3	114	11	5	21	15	0	14	5	9	23	23	14	8	1	11	7	4	3	3	9	3	24	45	0	9	
10	0	0	5	10	7	74	9	19	45	45	0	18	2	9	26	47	6	23	9	14	19	5	18	5	1	32	52	0	22		
11	0	0	3	4	9	41	9	10	258	48	0	28	1	6	11	39	10	2	3	12	25	38	9	12	8	2	29	40	0	37	
12	3	0	5	0	2	9	5	3	4	16	0	18	2	3	4	20	12	0	5	2	27	8	3	5	1	2	10	23	0	4	
13	0	0	0	4	0	13	5	2	0	2	0	12	1	1	1	12	3	1	3	4	17	10	6	1	1	0	3	5	0	3	
14	0	0	0	15	0	5	3	1	1	1	0	3	0	0	0	7	0	1	1	5	4	2	0	0	0	0	1	0	6	0	
15	0	0	1	27	1	3	4	7	0	0	1	2	0	4	0	0	8	1	2	2	9	1	0	0	0	0	1	0	24	0	
16	0	0	0	65	0	8	3	7	0	3	5	1	1	1	4	4	13	2	23	1	30	4	2	2	7	0	0	0	78	0	
17	0	0	1	11	3	9	1	10	4	0	5	3	10	7	4	4	11	2	37	7	64	2	12	2	5	6	0	1	162	0	
18	0	1	0	2	0	3	0	4	2	0	0	5	15	2	3	3	1	2	7	3	49	1	3	2	3	11	1	2	143	0	
19	0	0	0	0	1	2	4	3	2	0	0	0	3	0	0	3	2	1	3	2	17	2	1	0	1	4	0	0	42	0	
20	0	0	0	4	0	1	1	0	0	0	0	2	1	1	0	0	5	2	0	1	2	0	1	0	1	3	0	0	23	0	
21	2	1	2	0	0	1	1	3	0	0	0	1	3	0	0	3	2	3	2	0	1	1	0	0	7	2	1	0	15	0	
22	1	0	0	1	0	3	0	4	0	1	0	3	0	0	1	0	1	0	1	1	0	1	0	0	5	2	0	1	6	0	
23	0	0	3	2	0	3	2	3	1	0	0	5	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0
24	0	1	2	0	0	0	0	2	0	0	0	3	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	
25	0	0	0	1	0	1	1	1	0	0	0	1	0	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	3	29	147	30	373	83	90	338	140	11	136	52	56	89	173	104	49	101	71	272	102	47	45	68	47	153	187	0	574	

length	Fall																															
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	4		
5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	2		
6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	5	0	2	0	0	0	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	33	0	2	0	0	0	0	0	0	0	0	0	1	0	0	-	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	21	3	2	2	1	0	0	0	0	0	0	0	1	0	2	-	0	0	0	0	0	0	1	0	0	
10	0	0	0	0	0	1	3	0	8	1	0	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	1	0	0	
11	0	0	0	0	3	13	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0	
12	0	0	3	9	8	227	14	0	12	1	1	0	7	0	0	2	0	0	0	0	0	-	0	0	0	1	0	0	3	0	0	
13	38	1	4	11	24	225	48	0	117	18	0	36	2	0	15	2	2	0	0	0	-	0	1	0	1	0	17	0	0	0		
14	77	0	1	6	18	247	40	1	111	28	1	0	117	7	0	17	3	8	1	1	3	-	4	0	0	2	26	151	31	0		
15	24	0	0	1	20	94	3	34	16	0	3	52	3	4	6	2	4	14	2	5	-	9	0	0	3	60	92	37	0	0		
16	0	0	0	0	2	14	0	0	5	2	1	10	0	4	0	0	0	31	0	2	-	9	0	0	1	6	1	14	0	0		
17	0	0	0	0	0	2	0	0	0	1	1	2	2	0	1	0	0	7	0	1	-	3	0	0	2	0	0	1	0	0	0	
18	1	0	0	0	0	1	0	0	0	0	0	1	3	0	0	0	0	0	0	0	5	-	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	-	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0
24	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0
25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0
Total	140	2	9	27	76	827	172	7	292	72	8	8	227	12	9	42	8	14	55	3	18	-	25	1	0	10	94	261	88	6		



**Table 5.40. Bluefish length frequencies, fall, 1 cm intervals, 1984-2018.**

*Bluefish lengths were recorded from every tow.*

length	Fall																																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	1	0	0	0	0	0	0	2	33	0	1	0	0	3	12	2	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1	5	0	2	0	0	0	0	14	96	1	11	1	0	13	85	40	0	15	1	0	3	1	3	1	0	1	0	0	0	0	4	0	0	0	0
9	1	6	0	3	3	0	3	38	228	4	71	0	0	135	344	252	2	25	8	8	15	76	8	30	0	28	0	0	1	0	2	2	1	0	0	
10	0	4	7	16	39	3	21	115	184	27	183	6	4	941	647	720	14	89	56	33	342	308	76	86	2	93	0	4	0	2	42	13	16	12	4	
11	38	13	13	79	76	76	53	200	290	56	1266	156	3	2006	1127	484	50	213	96	70	730	421	239	41	19	317	0	2	10	12	167	110	93	75	9	
12	350	92	45	108	270	249	57	280	269	171	2842	397	10	2905	2008	338	42	136	149	77	748	451	349	157	120	442	0	15	36	122	363	170	268	191	27	
13	958	96	45	322	332	494	49	260	123	432	2880	428	54	1258	1558	316	168	122	250	33	420	459	64	379	301	324	0	40	90	71	495	229	334	323	56	
14	1483	556	138	500	183	596	99	202	96	283	2023	154	93	518	834	337	284	122	216	12	299	273	131	231	483	136	0	132	157	250	576	373	182	273	24	
15	1076	1232	376	482	151	903	409	241	401	149	1763	61	510	351	433	300	126	336	126	32	129	117	110	134	225	120	0	196	501	486	305	484	121	214	17	
16	1028	1284	533	399	307	1187	540	405	566	146	1033	145	1399	469	160	503	155	679	70	200	113	231	172	328	45	475	0	476	871	363	181	439	111	62	26	
17	770	783	399	147	472	1155	643	681	495	552	829	497	1924	536	127	361	216	568	36	460	161	389	229	821	22	630	0	603	761	204	404	217	106	156	23	
18	246	351	258	92	458	1380	729	589	498	1177	512	902	1227	407	97	190	476	363	33	697	241	668	181	1664	49	350	0	491	523	126	638	155	116	297	14	
19	180	204	128	26	322	1057	493	574	340	1268	529	995	618	363	114	244	724	307	116	790	315	859	106	1733	40	116	0	278	272	53	466	138	198	323	48	
20	182	64	125	6	360	499	280	383	208	854	482	602	329	188	117	446	1270	228	247	681	348	751	79	1379	49	63	0	168	185	37	330	46	229	226	49	
21	64	32	44	13	172	404	227	245	56	320	321	333	158	144	82	467	976	164	370	330	328	437	29	772	20	20	0	72	127	14	156	50	172	108	82	
22	38	12	48	7	171	149	102	270	25	119	336	148	17	98	115	490	491	90	407	97	293	268	43	518	7	7	0	34	75	9	115	51	159	46	101	
23	30	9	38	2	22	49	48	128	3	95	133	54	15	56	100	606	350	71	316	7	257	161	21	335	1	4	0	18	36	6	43	68	103	27	48	
24	19	15	9	3	12	11	49	119	1	33	184	7	3	16	181	515	230	49	236	2	214	119	22	151	2	1	0	18	30	1	25	27	76	12	34	
25	0	5	6	2	6	7	14	92	0	33	81	7	4	9	189	517	107	27	120	0	126	59	6	69	0	1	0	3	18	0	17	18	24	8	19	
26	0	5	0	0	1	0	5	27	0	8	54	1	0	3	108	311	9	14	29	0	42	25	6	16	1	0	0	1	5	0	9	6	26	4	5	
27	2	0	0	0	0	5	4	5	0	2	8	2	0	0	59	165	0	4	21	0	11	7	8	2	9	0	0	0	0	2	0	0	1	1	2	7
28	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	4	44	0	5	1	0	8	0	2	1	0	0	0	1	2	0	0	0	1	0	2
29	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	10	0	0	0	2	0	0	3	2	0	0	0	1	1	0	1	0	1	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	1	1	2	0	2	
31	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
32	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	2	0	0	0	0	2	0	1	0	3	0	2	
33	0	0	0	2	0	0	4	0	0	0	0	0	2	0	1	0	0	0	2	0	10	0	2	1	0	1	0	0	2	0	4	0	4	0	6	
34	0	0	0	1	0	0	8	0	1	0	0	5	0	0	1	0	0	0	7	0	39	0	3	0	0	0	0	1	3	0	5	0	3	0	8	
35	0	0	0	3	1	0	9	0	2	0	0	17	0	1	0	0	0	0	6	1	41	0	1	3	0	1	0	0	1	0	4	0	10	2	11	
36	1	2	0	3	1	1	11	1	2	0	6	31	0	1	1	0	0	3	12	2	58	0	12	0	2	9	0	2	2	1	3	0	3	0	15	
37	3	6	1	13	1	0	29	0	19	0	4	61	0	1	1	2	15	4	129	0	15	5	3	26	0	3	0	5	11	2	12	1	19	2	22	
38	11	16	5	18	1	1	70	6	44	0	7	81	2	18	8	2	13	21	24	7	197	0	32	11	17	59	0	5	11	2	12	1	19	2	22	
39	14	50	30	38	5	9	75	12	74	4	23	111	0	34	20	5	18	31	44	13	231	0	18	34	25	52	0	13	7	1	7	1	23	1	10	
40	40	72	57	48	12	22	127	38	85	7	57	80	11	60	31	3	46	55	82	9	159	8	17	43	24	55	0	13	11	1	2	2	42	2	2	
41	24	61	62	36	12	50	118	92	84	12	58	45	7	49	15	12	83	35	70	6	53	7	8	35	11	29	0	10	9	2	0	5	27	2	0	
42	18	39	81	25	16	51	101	110	55	16	75	25	12	37	15	5	50	18	57	6	22	22	9	37	6	25	0	19	4	3	2	4	14	0	0	
43	14	24	20	16	15	50	55	118	22	26	50	12	10	15	13	6	23	13	29	7	11	21	2	31	7	10	0	16	6	1	4	3	2	1	0	
44	5	8	12	13	22	24	20	82	17	36	20	7	10	12	12	0	11	6	8	3	7	31	0	24	5	8	0	6	3	2	2	1	0	0	0	
45	1	6	8	8	18	10	5	55	18	44	12	3	13	8	18	1	5	9	2	3	8	26	2	16	5	2	0	6	4	4	0	1	2	0	0	
46	8	3	27	5	9	13	8	35	21	38	3	6	18	2	16	2	2	11	2	8	12	21	0	12	6	0	0	7	3	2	0	1	2	0	0	
47	5	8	36	4	16	6	17	34	51	37	4	13	43	4	13	5	7	4	6	6	16	17	1	13	5	3	0	4	1	4	5	0	1	5	1	1
48	3	28	24	5	11	10	5	44	72	35	1	8	45	16	15	5	5	8	10	21	14	3	15	9	3	0	4	1	9	3	0	1	1	0	0	
49	18	27	28	6	8	11	12	44	107	46	8	12	29	11	18	4	9	17	6	9	26	20	3	16	11	7	0	10	2	22	0	0	3	1	0	
50	13	27	25	9	11	9	17	43	112	26	5	12	26	6	10	0	15	17	6	9	33	31	3	12	15	10	0	3	3	13	0	1	8	1	1	
51	12	31	18	5	5	10	19	30	98	24	8	9	12	10	14	7	17	9	7	9	26	26	1	14	14	11	0	9	4	6	1	2	11	0	0	
52	16	27	14	2	9	18	10	11	101	22	17	18	10	4	5	4	26	8	13	4	10	13	7	11	14	5	0	5	5	6						



**Table 5.42. Clearnose skate length frequencies, spring, 1 cm intervals, 1993-2018.**

length	Spring																											
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
47	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	
50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
52	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0	
53	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	1	
54	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	4	2	0	0	0	0	
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
56	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	1	2	0	1	0	0	0	
57	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	
58	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	2	0	0	0	
59	0	0	0	0	0	0	0	0	0	4	1	0	0	1	2	0	0	0	1	0	0	1	0	3	0	0	0	
60	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	8	0	1	0	2	1	0	0	
61	0	0	1	0	0	0	1	0	0	2	0	0	0	0	1	0	0	0	7	0	2	2	5	1	1	1	1	
62	0	0	0	0	0	0	2	0	0	1	0	0	0	2	0	2	2	0	0	5	1	1	2	4	2	1	1	
63	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	1	0	0	1	3	1	1	1	3	1	2	2	
64	0	0	0	0	0	0	0	1	0	3	0	1	0	0	1	0	1	0	1	9	0	3	2	3	0	1	1	
65	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	2	1	0	1	4	0	2	1	2	0	2	2	
66	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3	0	1	0	4	4	2	3	1	1	2	0	0	
67	0	0	0	0	0	0	0	0	1	2	0	0	0	1	1	1	2	0	1	9	4	1	1	4	1	1	1	
68	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	2	1	0	1	6	2	3	2	4	0	1	1	
69	0	0	0	0	0	0	0	0	1	4	0	1	1	0	4	0	2	0	0	7	2	4	2	5	1	1	1	
70	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	4	0	3	5	3	4	1	3	2	2	2	
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	1	1	5	2	3	3	3	
72	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	3	1	2	1	2	2	0	0	
73	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	5	0	0	1	4	0	0	0	
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	1	1	0	1	0	
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	2	1	1	1	1	
76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	0	0	
77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	0	0	2	
79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
80	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	1	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
83	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1
86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>6</b>	<b>31</b>	<b>8</b>	<b>5</b>	<b>2</b>	<b>9</b>	<b>22</b>	<b>12</b>	<b>21</b>	<b>1</b>	<b>13</b>	<b>95</b>	<b>24</b>	<b>42</b>	<b>35</b>	<b>64</b>	<b>19</b>	<b>23</b>		

Table 5.43. Clearnose skate length frequencies, fall, 1 cm intervals, 1993-2018.

length	Fall																											
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
43	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0		
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0		
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0		
47	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0		
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0		
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0		
51	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0		
52	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1		
53	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0		
54	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	3	2	0	3	3	1		
55	0	0	0	0	0	0	0	0	1	0	0	0	3	2	1	1	0	0	0	1	2	0	3	1	0	0		
56	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	0	0	0	3	2	0	5	2	1	1		
57	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	1	0	1	4	1	0	4	0	0	0		
58	0	0	0	0	0	1	0	2	2	3	0	0	4	1	1	0	0	0	1	5	3	0	3	0	0	3		
59	2	0	0	0	0	1	0	1	3	0	0	0	1	2	0	0	0	0	3	1	4	2	8	0	0	1		
60	0	0	0	0	0	0	0	1	2	0	0	0	7	3	1	0	1	0	1	4	2	1	4	4	1	0		
61	0	0	0	0	0	0	1	0	4	1	2	1	7	3	1	0	1	0	3	9	4	0	6	1	3	3		
62	0	0	0	0	1	0	1	0	4	0	1	0	7	1	2	1	2	0	0	8	7	2	3	5	2	2		
63	0	0	0	0	0	2	3	1	0	2	0	0	2	2	1	2	1	0	3	9	12	0	2	1	2	4		
64	0	0	0	0	0	0	3	1	5	5	2	0	3	0	3	0	1	0	2	9	16	2	8	6	5	4		
65	0	0	0	0	0	3	1	2	1	1	2	1	7	1	6	1	6	0	1	14	12	3	2	1	3	1		
66	0	0	1	0	1	4	0	0	5	2	9	3	4	0	5	3	3	0	5	12	12	3	8	2	3	1		
67	0	0	0	1	0	1	2	1	3	2	5	4	6	2	3	2	4	0	1	17	17	4	2	6	0	3		
68	0	0	0	0	0	1	1	0	3	0	4	0	5	1	8	3	2	0	5	11	17	4	5	6	2	1		
69	0	0	0	0	0	0	0	3	3	0	3	1	11	2	6	0	1	0	3	11	19	8	3	6	6	1		
70	0	0	0	0	0	0	0	0	5	0	2	1	6	2	2	1	3	0	1	12	18	7	6	3	4	1		
71	0	0	0	0	0	0	0	0	4	0	5	1	2	1	5	2	1	0	1	9	10	3	5	3	1	6		
72	0	0	0	0	0	0	0	1	1	0	3	1	6	0	3	2	5	0	2	5	6	2	2	2	1	2		
73	0	0	0	0	0	0	0	0	3	3	1	0	1	1	3	1	2	0	0	3	10	3	3	5	2	3		
74	0	0	0	0	0	0	0	0	1	1	4	0	1	0	5	0	2	0	4	5	2	2	1	2	1	2		
75	0	0	0	0	0	1	0	1	1	2	0	0	2	0	4	1	2	0	1	4	4	1	2	2	2	3		
76	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	1	2	0	2	1	1	2	1		
77	0	0	2	0	0	0	0	0	1	4	0	0	0	0	3	1	0	0	0	4	1	1	0	1	0	3		
78	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	3	1	3	0	1	0	0	0		
79	0	0	0	0	0	0	1	0	0	0	1	2	1	0	4	1	0	0	3	0	2	0	1	0	0	0		
80	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	0	0	1	1	1	1	1	0	3	1	
81	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	1	0	0	1	0	0	2	0	0	1		
82	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	1	0	0	0	
83	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	0	0	2	1	0	1		
84	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1		
85	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	1	1	0	0	0	2	0		
86	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	0	1	0	0	0	0		
87	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1		
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0		
89	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	2	0		
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0		
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
92	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0		
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0		
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0		
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0		
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
98	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
99	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
Total	2	0	3	1	4	20	17	15	59	29	47	17	100	27	75	25	46	0	44	185	193	62	96	69	53	57		

**Table 5.44. Fourspot flounder length frequencies, spring and fall, 2 cm intervals (midpoint given), 1989, 1990, 1996-2018.**  
*Prior to 2014, Fourspot flounder lengths were recorded from the first three tows of each day; since 2014, lengths have been recorded from every tow.*

length	Spring																								
	1989	1990	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
13	2	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
15	5	2	0	0	5	5	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	21	8	1	3	8	12	1	2	17	2	13	0	0	6	0	0	6	2	5	1	1	0	3	0	0
19	19	19	8	16	14	61	22	5	89	8	8	0	6	7	7	4	2	1	24	2	6	3	12	2	0
21	17	42	31	60	13	28	26	4	99	6	4	1	18	11	9	10	3	10	42	11	5	1	51	6	0
23	11	341	198	161	16	32	239	42	33	8	4	14	24	9	17	6	5	45	56	20	9	1	79	10	7
25	56	528	279	353	105	72	422	181	84	124	26	71	29	44	39	37	33	157	258	185	64	19	211	53	37
27	103	225	208	456	209	97	256	300	199	228	82	75	33	105	81	91	55	150	441	209	172	52	235	105	137
29	120	139	193	392	233	81	201	245	191	187	129	64	44	170	108	127	55	107	461	189	179	87	185	104	188
31	89	60	117	192	137	66	139	153	175	163	178	68	61	121	94	90	69	93	303	139	107	77	111	48	146
33	51	27	54	76	60	60	81	45	89	88	113	52	36	52	70	51	36	49	92	100	78	41	69	15	65
35	8	33	15	22	16	25	39	11	26	47	35	31	13	43	34	31	24	27	31	27	29	26	39	9	13
37	2	12	6	3	4	7	12	8	7	12	5	11	4	9	11	7	9	9	4	16	8	6	10	6	6
39	0	4	3	0	2	1	1	2	3	6	2	3	1	7	2	0	4	5	0	0	0	3	2	0	1
41	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	1	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>504</b>	<b>1,440</b>	<b>1,113</b>	<b>1,734</b>	<b>822</b>	<b>548</b>	<b>1,439</b>	<b>999</b>	<b>1,015</b>	<b>879</b>	<b>602</b>	<b>394</b>	<b>271</b>	<b>585</b>	<b>472</b>	<b>455</b>	<b>302</b>	<b>655</b>	<b>1,719</b>	<b>899</b>	<b>659</b>	<b>316</b>	<b>1,007</b>	<b>358</b>	<b>600</b>

length	Fall																								
	1989	1990	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
5	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	1	-	0	0	0	0	0	0	0	0
7	0	1	0	1	4	0	0	1	0	0	1	0	2	0	0	1	-	1	0	1	1	0	0	0	0
9	5	0	0	23	19	0	2	2	0	4	1	0	2	1	1	7	-	4	0	0	3	1	0	0	0
11	9	4	2	46	27	5	4	17	5	2	12	4	5	0	7	16	-	17	3	1	11	3	0	0	1
13	10	15	5	68	22	24	6	25	3	3	9	9	13	2	8	59	-	28	4	11	26	20	3	0	5
15	6	17	35	55	21	42	5	15	9	0	13	17	4	5	11	45	-	22	13	10	47	23	9	0	4
17	0	0	42	16	3	16	1	0	3	0	1	26	3	2	16	20	-	4	12	2	49	11	8	0	3
19	0	0	22	0	0	4	1	0	1	0	0	2	0	0	7	6	-	0	0	4	5	1	2	0	0
21	0	0	0	2	2	3	2	0	2	0	1	0	0	1	0	0	-	0	0	1	0	0	0	0	0
23	1	2	9	2	5	0	17	1	5	0	0	0	1	1	0	1	-	0	0	0	1	0	3	0	1
25	0	3	42	7	16	5	58	3	7	3	4	1	0	6	1	2	-	2	3	0	1	0	1	0	5
27	0	7	41	10	22	4	77	5	13	7	6	5	0	7	1	6	-	1	9	2	4	1	4	1	19
29	0	3	24	5	22	5	54	10	18	11	13	5	0	20	6	8	-	1	11	2	4	4	9	3	32
31	0	1	20	3	6	3	25	1	18	4	30	6	0	12	5	6	-	1	6	2	8	2	6	0	25
33	0	0	6	1	1	1	7	1	13	7	19	2	1	3	1	11	-	3	6	0	0	5	1	2	10
35	0	0	4	0	1	0	5	0	6	5	6	7	0	4	4	1	-	2	2	2	1	0	2	1	3
37	0	0	0	0	0	0	2	1	3	0	2	0	0	0	0	1	-	1	0	0	0	0	1	0	2
39	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	-	0	0	0	0	0	0	0	0
<b>Total</b>	<b>31</b>	<b>53</b>	<b>252</b>	<b>239</b>	<b>171</b>	<b>112</b>	<b>266</b>	<b>83</b>	<b>106</b>	<b>46</b>	<b>118</b>	<b>85</b>	<b>33</b>	<b>64</b>	<b>68</b>	<b>192</b>	<b>-</b>	<b>87</b>	<b>69</b>	<b>38</b>	<b>161</b>	<b>71</b>	<b>49</b>	<b>7</b>	<b>110</b>

**Table 5.45. Hickory shad length frequencies, spring and fall, 1 cm intervals, 1991-2018.**

*Hickory shad were measured from every tow, with the exception of one fish in each of fall 1996, fall 1997, and fall 1998.*

length	Spring																				2017	2018						
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			2011	2012	2013	2014	2015	2016
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	1	0	0	0	0	
18	0	0	0	1	0	1	0	0	2	0	0	0	0	0	1	7	1	2	1	0	0	0	0	0	0	0	0	
19	0	0	0	1	0	0	1	0	0	0	0	0	0	3	5	6	0	1	1	0	0	0	0	0	0	0		
20	0	0	0	0	0	2	0	2	0	0	0	0	0	2	4	2	0	0	0	0	1	2	0	0	0	2		
21	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	1	1	0	0	1	0	1	0	1	0	1		
22	0	0	0	0	0	0	0	0	1	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3		
23	0	0	1	0	0	0	0	0	1	0	0	0	1	2	0	2	1	0	0	0	0	0	0	0	0	0		
24	1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	0	0	1	0	0	1		
25	0	0	0	0	0	0	0	2	0	0	0	0	0	1	6	5	0	0	0	0	0	0	0	1	1	0		
26	0	0	0	0	0	0	0	1	0	0	0	2	0	0	6	5	2	0	0	0	0	0	2	0	3	0		
27	0	0	0	0	0	1	0	1	0	0	1	0	0	18	3	5	0	1	0	0	0	3	0	2	0	1		
28	0	0	0	1	0	1	1	2	2	0	4	1	0	14	3	3	0	1	1	0	1	3	4	1	1	0		
29	0	0	0	0	0	2	4	1	7	0	5	0	2	5	2	1	0	1	0	0	1	0	1	1	1	1		
30	0	0	1	1	1	0	1	5	1	5	0	5	3	1	6	5	2	0	0	0	0	1	0	4	0	0		
31	0	0	0	0	1	1	1	2	1	4	0	2	0	0	1	0	2	0	1	0	0	0	0	1	0	0		
32	0	2	0	0	0	3	0	6	6	2	1	2	1	1	0	5	1	0	0	0	0	0	1	1	0	0		
33	0	0	0	0	0	2	1	2	3	1	0	3	2	0	0	0	1	0	0	0	0	0	0	1	0	0		
34	0	0	0	0	0	0	1	3	1	2	2	1	3	1	2	1	1	0	0	0	0	0	1	2	1	0		
35	0	0	1	0	0	1	0	2	2	0	4	2	2	2	2	0	0	0	0	0	0	0	0	1	0	0		
36	0	0	0	0	0	0	0	2	1	1	0	4	1	0	1	0	0	0	0	0	0	0	0	2	0	0		
37	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0		
38	0	0	0	0	0	0	0	1	0	0	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0		
39	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0		
40	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
41	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0		
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
46	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<b>Total</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>12</b>	<b>9</b>	<b>34</b>	<b>24</b>	<b>26</b>	<b>10</b>	<b>40</b>	<b>16</b>	<b>20</b>	<b>75</b>	<b>53</b>	<b>27</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>14</b>	<b>5</b>	<b>20</b>	<b>9</b>	<b>16</b>	<b>2</b>	<b>2</b>

length	Fall																				2017	2018						
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			2011	2012	2013	2014	2015	2016
19	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	-	0	0	0	0	0	0	0	
23	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	-	2	1	0	0	0	0	0	
24	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	-	2	1	0	0	0	0	0	
25	0	0	0	6	0	1	1	0	2	0	0	0	0	0	2	1	2	0	0	-	0	2	0	0	0	1	0	
26	0	1	2	8	0	3	1	0	5	0	0	0	0	4	3	0	0	0	0	-	3	1	0	0	0	0	0	
27	0	0	0	3	0	2	0	0	5	2	0	1	0	3	0	1	0	0	0	-	0	0	0	0	0	0	0	
28	0	1	0	1	0	3	0	0	2	0	0	1	0	1	1	1	0	0	2	-	0	1	3	0	0	0	0	
29	0	0	0	2	0	0	0	0	0	2	0	0	0	1	2	3	0	0	0	-	0	4	7	0	1	1	1	
30	0	1	0	1	1	0	1	0	0	0	0	0	0	8	7	2	0	3	-	0	3	7	2	0	0	0	1	
31	0	0	1	0	1	0	2	1	2	0	0	0	1	0	15	1	2	0	2	-	0	7	5	1	0	0	0	2
32	0	1	0	0	1	2	2	1	7	3	1	0	2	0	12	1	1	0	0	-	0	3	1	0	1	0	1	0
33	0	2	1	2	0	1	3	2	2	2	3	1	2	1	5	0	1	2	0	-	0	1	1	1	0	0	0	1
34	0	2	0	0	1	4	2	0	3	4	0	1	1	0	5	1	0	0	0	-	0	4	1	1	1	0	0	0
35	0	0	2	0	0	0	0	0	0	0	2	0	0	2	1	1	0	0	0	-	0	0	1	0	0	0	0	0
36	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2	1	0	0	0	-	0	1	1	1	0	0	0	0
37	0	1	1	0	0	0	1	0	2	1	0	0	0	1	2	0	0	0	0	-	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	1	0	0	0	-	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	-	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>10</b>	<b>7</b>	<b>27</b>	<b>4</b>	<b>16</b>	<b>15</b>	<b>5</b>	<b>32</b>	<b>16</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>18</b>	<b>60</b>	<b>22</b>	<b>10</b>	<b>2</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>29</b>	<b>27</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>





**Table 5.47. Horseshoe crab length frequencies by sex, fall, 1 cm intervals, 1998-2018.**

*Horseshoe crabs were measured (prosomal width) from every tow.*

Sex	length	Fall																				
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
F	13	0	0	2	0	0	0	3	0	1	0	0	-	0	0	0	0	0	2	0	0	0
F	14	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
F	15	0	0	0	0	2	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	1
F	16	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	1
F	17	1	1	0	0	2	1	0	1	1	0	1	0	-	0	0	0	0	1	0	0	0
F	18	0	2	0	1	0	1	1	1	0	0	0	0	-	0	0	0	0	1	1	1	0
F	19	3	2	2	2	0	1	0	0	1	0	1	1	-	0	0	0	2	1	0	0	2
F	20	5	1	1	4	4	2	3	0	2	0	0	2	-	0	0	0	0	1	1	1	0
F	21	3	2	2	3	1	4	6	3	1	1	1	0	-	0	0	0	1	2	1	0	1
F	22	3	8	13	13	10	3	9	4	1	2	6	6	-	6	0	2	2	0	1	1	1
F	23	8	15	15	12	8	8	13	10	7	7	6	14	-	6	2	3	4	6	9	6	5
F	24	7	19	30	27	21	9	24	10	6	17	14	22	-	18	10	12	8	10	14	4	13
F	25	17	12	20	31	33	13	19	6	12	26	17	17	-	19	9	11	11	7	17	13	23
F	26	19	23	33	31	18	9	29	12	10	22	15	24	-	25	16	27	10	9	12	12	26
F	27	14	7	21	22	18	7	22	8	3	17	11	28	-	16	5	15	10	3	9	12	19
F	28	2	4	10	8	13	6	15	5	4	8	11	22	-	11	3	10	6	5	6	9	13
F	29	2	3	2	5	2	3	8	2	0	4	1	5	-	2	4	2	3	1	2	2	2
F	30	0	1	1	2	0	2	1	2	0	2	0	2	-	0	1	2	0	0	1	2	1
F	31	0	1	0	0	1	0	0	2	0	0	0	1	-	0	0	0	1	0	1	0	0
F	32	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
F	33	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
F	34	0	0	0	0	0	1	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	11	0	0	0	1	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	12	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	13	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	14	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	15	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	16	0	0	2	1	5	3	0	0	0	1	1	0	-	1	0	0	0	0	0	0	0
M	17	6	5	7	6	3	5	11	0	1	3	1	2	-	3	0	1	1	1	1	1	3
M	18	12	14	28	18	14	15	21	3	9	3	9	18	-	13	4	2	5	1	7	2	2
M	19	10	20	39	27	31	11	39	13	4	12	21	14	-	9	4	6	13	3	5	6	8
M	20	20	23	35	32	22	8	30	12	9	19	23	31	-	10	1	17	4	9	7	8	18
M	21	6	11	18	15	9	4	15	4	2	10	6	13	-	7	1	7	6	4	8	8	10
M	22	5	3	8	4	6	0	10	2	5	6	2	5	-	6	0	5	0	1	3	4	6
M	23	0	0	3	2	6	1	1	0	2	3	1	3	-	0	1	2	0	0	1	1	0
M	24	0	0	1	3	0	0	1	0	1	2	0	2	-	0	0	0	0	0	0	1	0
M	25	0	0	2	0	0	0	0	0	0	0	0	1	-	0	0	1	0	0	0	0	0
M	26	2	0	0	3	0	0	0	0	1	0	0	1	-	0	0	0	0	0	0	0	0
M	27	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
M	28	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0
M	29	0	0	0	1	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
<b>Total</b>		<b>145</b>	<b>177</b>	<b>295</b>	<b>274</b>	<b>229</b>	<b>117</b>	<b>281</b>	<b>101</b>	<b>83</b>	<b>165</b>	<b>148</b>	<b>234</b>	-	<b>152</b>	<b>61</b>	<b>125</b>	<b>87</b>	<b>66</b>	<b>109</b>	<b>94</b>	<b>155</b>

**Table 5.48. Long-finned squid length frequencies, spring, 1 cm intervals, 1986-1990, 1992-2018.**

*From 1986 – 1990, and 1992-2013, Length frequencies of squid taken from the first three tows of each day; since 2014, lengths have been recorded from every tow.*

length	Spring																																
	1986	1987	1988	1989	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	14	0	0	0	0	1	0	0	0	2	2	
3	0	0	0	0	0	0	0	0	1	5	1	18	4	11	0	6	0	6	0	1	2	111	17	1	0	5	4	5	2	4	17	33	
4	0	0	3	0	0	3	9	31	48	23	11	103	10	32	5	44	11	51	1	12	8	220	66	1	6	28	17	35	36	29	35	65	
5	0	1	35	0	1	7	64	137	87	39	35	323	32	36	12	48	16	70	11	18	36	220	128	5	17	45	46	63	111	70	59	123	
6	0	6	53	0	0	8	99	117	175	23	46	444	20	31	15	36	6	88	20	13	35	148	141	2	45	64	31	62	117	63	45	86	
7	2	2	60	0	0	17	96	108	178	33	45	324	18	20	24	27	9	65	4	9	21	66	74	9	42	40	22	41	58	52	33	89	
8	3	10	30	0	3	20	49	63	141	34	42	290	18	13	26	36	12	51	7	8	19	55	30	7	15	31	22	38	52	48	26	52	
9	2	2	40	2	0	20	42	83	170	40	45	159	43	24	41	18	26	24	6	12	30	54	63	4	23	59	31	44	45	39	27	58	
10	2	9	53	1	9	17	47	71	248	55	51	135	47	18	52	41	24	59	10	30	50	106	67	40	38	130	57	32	83	70	38	61	
11	1	23	76	4	4	28	60	141	367	75	69	67	82	39	74	49	33	84	28	61	53	173	163	72	39	155	75	40	125	144	49	86	
12	19	103	152	6	11	70	133	125	367	78	98	33	88	92	90	75	53	198	51	123	60	220	317	132	77	108	78	70	213	229	61	89	
13	24	232	202	12	24	58	163	133	258	95	125	50	106	111	87	72	88	321	146	163	64	112	367	171	75	60	34	99	155	313	75	95	
14	22	243	294	36	43	91	163	108	146	81	180	18	99	96	52	86	74	448	208	119	58	105	209	167	65	44	26	136	166	251	92	109	
15	22	368	300	48	83	87	210	79	132	77	213	13	94	101	39	62	63	414	234	137	37	75	177	133	65	37	16	146	95	160	65	78	
16	14	343	271	111	146	67	289	80	80	43	166	5	71	76	34	47	41	475	227	138	36	76	114	78	50	63	16	195	70	90	54	85	
17	7	479	252	81	142	53	218	67	98	42	174	14	39	59	31	46	42	352	180	102	13	61	126	73	41	24	4	113	86	90	32	54	
18	36	208	223	92	145	59	195	28	66	44	105	10	41	58	16	22	27	200	134	77	21	48	99	50	41	16	18	71	54	88	22	47	
19	23	361	222	95	128	30	150	24	53	24	83	5	20	32	26	12	11	144	64	40	19	20	54	60	28	21	9	65	45	70	14	39	
20	24	328	143	62	90	52	80	18	65	19	78	9	22	35	22	14	15	124	81	57	11	25	42	21	44	19	8	77	45	67	21	26	
21	27	214	102	30	67	45	90	13	30	15	39	1	16	24	16	18	14	136	53	33	5	34	21	35	21	36	4	46	36	26	13	24	
22	13	238	100	42	53	46	43	16	17	12	51	8	12	19	17	6	12	115	53	26	9	14	22	28	16	24	3	61	26	42	7	15	
23	13	160	46	40	54	22	28	7	9	4	55	3	9	18	3	9	13	49	36	32	3	7	9	14	21	13	7	53	10	32	12	21	
24	13	174	33	35	48	11	23	7	5	9	61	0	16	11	10	6	14	64	41	21	6	10	16	14	23	3	4	28	5	16	7	13	
25	6	195	65	28	63	9	21	9	12	0	33	3	10	14	9	2	7	40	23	22	4	3	9	9	6	6	1	30	1	14	5	10	
26	6	242	37	58	32	21	37	5	26	2	36	4	3	12	9	6	5	28	28	8	4	5	12	7	2	2	0	29	1	8	0	8	
27	7	197	41	27	53	13	10	4	14	2	7	1	4	6	0	1	2	17	9	9	1	2	5	0	7	4	0	12	0	4	5	6	
28	2	133	19	32	51	11	27	3	0	1	10	0	2	1	4	2	0	15	9	6	1	1	4	1	0	5	0	14	1	0	1	6	
29	2	86	10	8	30	15	7	2	7	3	1	3	5	0	2	3	2	5	3	4	1	1	2	0	0	2	0	9	0	0	0	0	
30	5	121	24	12	31	3	1	2	9	1	14	1	0	0	1	8	2	11	0	6	1	0	3	0	3	2	0	6	0	0	0	2	
31	3	78	14	11	5	4	8	1	3	0	0	0	1	1	1	0	0	3	2	2	1	0	1	0	0	0	0	1	0	1	0	0	0
32	0	61	7	6	9	1	7	0	0	1	0	0	0	0	1	3	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0
33	0	25	7	7	6	9	0	1	5	0	5	0	1	1	0	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	9	2	2	1	8	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0
35	1	38	0	0	2	0	0	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	38	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	2	0	0	5	2	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>301</b>	<b>4,719</b>	<b>2,918</b>	<b>896</b>	<b>1,347</b>	<b>900</b>	<b>2,371</b>	<b>1,485</b>	<b>2,825</b>	<b>880</b>	<b>1,883</b>	<b>2,044</b>	<b>933</b>	<b>993</b>	<b>721</b>	<b>809</b>	<b>622</b>	<b>3,658</b>	<b>1,670</b>	<b>1,290</b>	<b>609</b>	<b>1,986</b>	<b>2,361</b>	<b>1,134</b>	<b>812</b>	<b>1,047</b>	<b>534</b>	<b>1,625</b>	<b>1,638</b>	<b>2,020</b>	<b>817</b>	<b>1,382</b>	

**Table 5.49. Long-finned squid length frequencies, fall, 1 cm intervals, 1986-1990, 1992-2018.**

*From 1986 – 1990, and 1992-2013, Length frequencies of squid taken from the first three tows of each day; since 2014, lengths have been recorded from every tow.*

length	Fall																																	
	1986	1987	1988	1989	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1	0	13	0	12	0	0	0	0	0	0	0	0	0	0	0	4	0	0	3	12	0	0	14	-	0	0	11	0	2	60	68	30		
2	0	31	0	1	0	49	0	9	25	24	6	20	29	2	0	11	0	1	10	74	9	33	90	-	12	10	67	6	30	95	175	83		
3	0	126	59	112	74	266	914	80	156	57	125	115	104	53	36	80	90	170	91	107	20	87	343	-	80	101	51	25	85	91	108	293		
4	0	320	212	468	278	1,507	2,336	477	460	598	491	642	362	384	230	261	886	693	763	249	420	294	939	-	618	469	127	517	208	322	279	1222		
5	0	892	826	743	830	2,906	3,502	1,332	1,223	1,371	1,091	1,888	1,214	1,215	663	695	2,225	1,757	1,539	587	1,367	417	2,332	-	1,417	705	273	1,443	634	1,066	838	2328		
6	3	1,019	1,165	677	836	5,015	4,358	1,803	1,896	1,869	1,278	2,737	1,782	1,842	923	1,067	3,185	2,705	2,337	913	2,780	604	2,894	-	1,405	731	426	1,814	1,818	1,475	1,650	2342		
7	13	817	722	446	469	5,210	4,331	2,152	2,254	2,751	1,169	3,412	2,390	2,204	996	1,193	2,566	2,759	2,552	917	3,822	780	2,746	-	1,315	698	550	1,560	2,753	1,566	1,854	1701		
8	135	654	333	283	220	3,110	3,811	2,225	2,080	2,224	935	2,939	1,808	1,797	839	929	1,885	1,787	2,006	611	3,549	908	1,791	-	840	638	570	1,394	3,618	1,633	1,805	1041		
9	16	692	146	108	129	1,594	2,913	2,486	2,124	1,853	570	1,993	1,829	1,081	616	488	1,785	907	1,283	385	2,119	777	1,131	-	670	584	418	1,366	3,465	1,327	1,465	712		
10	13	503	65	58	42	894	1,772	2,055	1,540	1,264	446	1,216	1,332	695	528	354	861	626	970	204	1,974	480	808	-	637	399	306	1,198	3,348	1,015	1,234	536		
11	0	310	62	70	39	737	1,178	1,607	905	698	291	675	780	556	264	214	215	392	541	183	1,379	332	326	-	343	359	178	862	3,227	611	1,092	424		
12	0	165	21	38	24	284	737	843	387	579	153	368	423	380	154	145	58	144	307	85	728	193	222	-	211	232	123	574	2,233	545	780	313		
13	0	82	24	34	17	242	408	415	159	297	126	328	277	247	132	87	2	96	194	31	447	103	108	-	139	148	62	315	1,698	240	548	209		
14	0	77	9	17	6	40	278	329	110	160	44	199	235	204	68	53	1	103	64	26	253	47	41	-	40	97	53	253	1,340	132	427	194		
15	0	31	11	17	3	18	185	181	77	83	31	103	133	128	66	13	2	48	44	9	150	18	27	-	86	64	14	213	767	88	279	105		
16	0	4	11	13	2	0	53	99	33	46	15	90	111	73	32	10	0	43	30	8	159	7	14	-	18	35	2	106	489	42	257	79		
17	0	14	0	10	4	0	73	75	15	16	13	23	120	101	8	6	0	1	24	17	103	5	2	-	7	8	6	50	266	64	216	72		
18	0	1	23	6	1	0	20	31	2	6	10	16	82	34	3	0	0	8	2	11	74	0	1	-	25	12	4	53	282	14	119	35		
19	0	1	0	0	0	0	0	3	12	0	1	0	1	34	9	2	4	0	1	11	2	0	0	-	0	7	0	37	93	7	69	17		
20	0	13	0	5	1	0	2	7	0	0	1	1	22	3	2	1	0	4	2	1	3	0	0	-	0	1	0	21	156	9	60	12		
21	0	15	0	4	0	0	0	3	0	0	0	0	22	9	1	0	0	0	0	0	1	0	0	-	0	5	2	6	42	0	26	1		
22	0	2	0	3	1	0	0	11	0	6	0	1	17	0	0	0	0	0	1	0	0	0	0	-	0	2	1	0	4	0	14	7		
23	0	0	0	3	0	0	2	1	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	-	1	0	0	0	28	0	4	1		
24	0	1	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	-	0	0	0	0	1	0	3	0		
25	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-	0	0	0	0	4	0	0	2		
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	1		
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0		
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0		
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	0	0	0	0	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	2
<b>Total</b>	<b>180</b>	<b>5,783</b>	<b>3,689</b>	<b>3,136</b>	<b>2,976</b>	<b>21,872</b>	<b>26,877</b>	<b>16,233</b>	<b>13,446</b>	<b>13,903</b>	<b>6,795</b>	<b>16,767</b>	<b>13,111</b>	<b>11,018</b>	<b>5,563</b>	<b>5,615</b>	<b>13,761</b>	<b>12,245</b>	<b>12,765</b>	<b>4,441</b>	<b>19,364</b>	<b>5,085</b>	<b>13,829</b>	-	<b>7,864</b>	<b>5,306</b>	<b>3,244</b>	<b>11,813</b>	<b>26,594</b>	<b>10,402</b>	<b>13,370</b>	<b>11,762</b>		

**Table 5.50. Scup spring length frequencies, 1 cm intervals, 1984-2018.**  
*Lengths were recorded from every tow.*

length	Spring																																				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	13	0	0	0	0	0	0	0	0	0	72	8	0
8	0	0	0	6	3	84	0	12	0	0	0	11	0	0	10	24	61	0	16	0	0	4	56	4	145	3	0	0	35	0	15	32	2,674	27	15		
9	4	30	50	33	46	1,049	11	80	9	0	11	408	152	10	163	128	976	98	400	0	0	77	322	145	606	148	0	19	435	60	77	435	15,025	475	340		
10	8	138	377	46	160	2,523	270	514	49	3	48	1,202	537	145	1,381	355	5,293	405	2,303	4	1	169	1,151	926	1,700	1,966	14	115	3,169	338	455	2,585	27,025	1,615	1,191		
11	10	362	724	38	144	2,075	493	1,365	67	4	92	1,437	1,055	311	1,617	313	10,571	645	3,389	19	1	136	1,259	1,033	2,055	3,476	22	203	3,888	460	1,007	3,918	23,949	1,143	796		
12	5	194	427	9	31	312	280	576	57	3	67	809	826	151	712	131	8,815	586	1,706	33	1	62	1,263	486	950	3,418	7	178	2,589	300	1,402	2,111	12,415	644	241		
13	2	51	122	4	9	87	56	122	18	4	23	108	397	36	359	51	4,041	265	722	25	2	19	888	78	586	1,141	1	77	1,241	93	623	785	6,004	622	60		
14	0	7	64	2	0	72	22	0	11	5	2	20	29	25	154	16	1,043	104	498	7	1	8	626	76	357	561	3	16	262	74	123	86	2,758	2,738	314		
15	2	4	4	11	4	137	40	3	3	77	7	3	11	66	1	201	220	247	7	42	56	251	298	426	593	40	19	62	98	108	60	556	8,588	1,836			
16	9	47	26	65	19	121	202	8	4	217	48	6	61	49	24	13	48	1,349	1,035	121	327	129	722	1,177	1,971	1,430	222	100	52	504	226	229	3,003	7,944	3,322		
17	37	91	91	119	40	105	310	63	49	339	142	11	264	123	57	75	229	4,517	2,943	415	485	129	1,670	1,607	3,916	2,151	614	215	206	1,343	669	784	9,775	3,796	5,607		
18	22	204	208	174	34	95	231	182	135	286	194	28	545	216	89	161	1,034	8,611	4,097	733	403	140	2,254	1,444	3,722	1,953	780	312	642	2,764	755	1,319	10,201	1,916	10,492		
19	28	130	182	100	16	50	121	347	258	159	203	30	390	136	66	172	1,451	6,452	3,619	720	261	114	1,607	918	1,978	1,078	527	270	1,123	3,058	520	1,196	5,162	1,282	9,542		
20	11	71	131	33	25	33	30	256	136	35	99	22	153	81	21	130	1,106	1,840	3,679	390	381	29	934	390	1,315	798	424	257	909	1,402	718	593	1,389	3,012	3,119		
21	3	15	36	15	44	13	26	223	65	27	95	19	34	62	11	78	513	518	6,253	427	584	42	559	266	2,149	1,320	599	655	377	271	1,539	371	618	3,939	3,119		
22	7	7	6	4	49	7	18	292	11	17	56	17	10	96	8	29	173	292	8,129	660	1,077	111	416	458	2,835	1,941	723	1,260	200	296	2,305	510	1,214	3,105	3,055		
23	6	22	103	3	33	12	12	225	10	25	44	19	1	86	17	25	240	755	5,618	931	982	174	427	603	2,340	1,522	641	1,387	313	665	1,674	699	1,311	1,618	2,679		
24	4	38	124	5	14	9	6	103	21	14	23	24	8	46	18	26	282	833	2,385	977	745	161	361	558	1,351	1,149	580	1,123	568	738	711	802	1,012	917	1,699		
25	3	28	77	2	4	5	7	33	15	8	10	15	2	20	12	13	199	278	1,292	1,025	844	216	234	272	854	909	573	930	816	591	326	896	1,010	612	1,030		
26	0	11	73	2	3	3	3	15	10	1	8	5	1	5	10	10	154	132	1,266	741	1,215	332	262	128	642	793	523	658	1,000	312	379	847	1,220	564	664		
27	2	3	35	3	1	4	1	5	4	4	6	8	2	3	7	7	50	93	491	363	1,200	353	283	91	382	504	350	651	931	461	338	426	1,367	590	431		
28	0	12	4	5	4	3	3	1	6	2	2	0	1	3	3	2	13	88	282	201	730	379	427	109	230	267	243	637	721	689	316	243	1,206	722	439		
29	1	14	6	3	2	0	0	2	2	0	0	0	1	0	1	6	19	36	147	81	331	332	622	115	198	234	153	468	565	753	346	155	741	530	472		
30	0	11	3	1	0	1	0	2	1	1	1	1	1	3	0	0	8	8	71	33	116	171	618	156	64	90	41	321	467	627	299	158	435	390	278		
31	0	1	0	1	2	0	0	1	0	0	1	0	1	4	0	1	6	3	35	23	37	101	441	167	54	42	34	235	307	496	227	118	324	195	200		
32	0	2	1	0	1	1	1	1	0	0	1	0	1	0	0	3	3	2	10	11	28	41	317	126	68	32	15	123	174	310	174	148	262	154	132		
33	0	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4	2	11	4	11	16	266	65	57	57	14	78	105	152	100	102	166	99	72		
34	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3	1	4	2	8	1	30	37	47	16	4	44	63	106	61	63	127	60	43		
35	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	3	0	1	2	17	18	26	10	4	32	31	36	20	31	109	55	26		
36	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	4	9	11	11	2	28	17	23	8	34	48	14	12		
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	4	8	1	15	6	8	1	8	41	8	4	
38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	5	4	10	3	10	28	8	3		
39	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	2	3	0	3	3	2	0	0	
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	3	0	1	3	0	0	0	0	
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Total	166	1,497	2,877	684	689	6,801	2,143	4,430	942	1,232	1,183	4,204	4,474	1,624	4,806	1,771	36,537	28,134	50,654	7,955	9,817	3,506	18,292	11,764	31,052	27,623	7,155	10,435	21,283	17,042	15,528	19,760	131,250	47,392	53,127		

**Table 5.51. Scup fall length frequencies, 1 cm intervals, 1984-2018.**

*Lengths were recorded from every tow.*

length	Fall																																				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-	0	0	0	0	0	0	0	0		
3	0	8	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	13	4	9	0	0	-	4	0	0	0	0	2	0	24		
4	1	61	0	0	17	1	3	14	196	0	6	0	0	18	4	1	1	28	117	19	143	363	11	74	0	34	-	21	29	4	11	21	4	40	317		
5	16	90	313	213	103	128	57	120	483	28	312	1	13	70	224	21	168	317	603	214	1,302	850	129	381	0	234	-	131	119	7	204	799	55	136	691		
6	295	249	626	1,193	625	612	340	1,805	1,516	554	931	41	185	338	1,246	1,041	991	1,891	2,132	573	4,723	4,122	389	1,303	4	1,106	-	705	567	116	1,033	3,154	370	622	1,756		
7	627	588	753	491	1,782	1,367	640	4,923	1,554	4,383	5,217	219	788	1,020	2,354	4,570	4,228	5,003	5,571	1,589	8,721	9,683	942	4,516	871	2,923	-	1,769	1,849	180	4,259	8,512	1,759	2,740	2,464		
8	345	1,827	507	499	2,264	1,765	2,152	11,168	2,595	9,063	11,585	602	2,048	1,318	4,330	9,886	7,464	7,327	9,315	701	10,637	11,328	1,442	10,576	3,092	3,078	-	3,977	4,036	563	7,657	15,560	3,354	4,964	4,353		
9	719	2,637	210	434	2,050	1,500	3,806	13,883	936	9,169	13,327	1,867	3,502	1,479	4,515	18,224	9,302	5,369	10,102	205	10,751	8,808	1,517	13,782	6,383	1,316	-	4,882	5,961	1275	6,878	11,241	1,747	5,374	4,135		
10	262	2,025	84	77	656	798	2,728	5,539	250	5,754	4,712	1,916	2,667	1,184	3,126	29,863	6,831	2,837	6,754	33	5,987	5,295	459	10,376	7,196	610	-	2,365	5,770	701	3,654	5,762	697	2,624	1,109		
11	8	1,064	19	12	81	95	601	1,191	78	814	432	606	525	499	728	20,073	1,806	888	2,020	3	1,896	1,973	126	2,547	1,733	75	-	632	2,695	375	1,526	2,094	1,073	676	373		
12	0	9	4	22	17	124	28	88	40	12	46	103	31	191	94	6,931	467	312	488	6	344	734	256	1,316	84	10	-	112	726	118	362	532	3,881	456	60		
13	14	59	41	144	53	670	51	2	304	13	4	46	39	44	56	1,190	428	229	197	87	77	680	606	1,645	27	81	-	42	154	70	205	281	6,261	1,054	206		
14	30	265	322	288	274	1,449	13	46	860	70	22	403	161	130	180	198	2,744	309	276	249	159	1,158	1,101	3,269	193	598	-	248	482	288	230	1,335	5,499	1,202	592		
15	86	339	603	277	649	1,102	171	305	1,393	176	68	1,283	459	517	504	459	6,889	690	854	325	268	784	1,210	4,216	367	1,890	-	883	1,483	454	537	2,361	3,665	1,117	556		
16	91	473	452	149	313	487	373	910	942	251	117	1,478	491	588	738	742	10,695	762	1,403	201	130	555	801	3,003	493	2,445	-	1,425	2,233	331	589	2,667	1,753	744	338		
17	46	299	361	61	111	213	362	683	465	168	103	869	299	289	446	1,583	7,208	593	1,642	92	75	359	338	1,468	330	1,777	-	1,138	2,015	203	416	1,813	575	1,039	334		
18	27	170	188	29	81	87	415	242	110	70	87	262	111	101	193	1,548	3,508	225	1,370	43	37	261	179	555	110	830	-	613	1,332	83	271	735	799	1,329	941		
19	8	44	55	20	85	42	309	39	28	56	57	47	51	21	72	1,196	771	294	733	175	78	234	113	676	88	320	-	293	455	176	143	218	1,942	1,027	1,849		
20	21	15	36	52	93	43	266	13	145	95	34	18	75	32	33	436	396	769	621	586	189	308	147	1,121	185	343	-	110	199	505	190	241	3,058	435	2,377		
21	47	8	44	87	87	34	424	56	254	111	41	9	70	34	33	289	337	967	797	693	339	194	158	1,179	228	336	-	186	212	640	151	397	1,819	451	1,885		
22	59	38	116	88	96	34	333	64	265	88	56	4	58	39	27	460	216	655	1,214	500	447	147	128	655	238	226	-	288	388	478	201	479	802	513	1,251		
23	75	77	133	61	18	14	101	86	181	44	38	4	23	17	16	329	189	328	1,185	315	544	88	134	365	150	190	-	408	319	164	335	337	667	409	816		
24	93	64	84	33	17	9	34	98	27	16	33	3	7	10	7	173	124	195	1,071	506	744	104	90	189	94	170	-	649	184	179	358	248	722	250	550		
25	46	49	38	27	4	6	21	47	23	12	17	1	1	12	5	66	49	96	769	726	1,072	146	59	181	123	170	-	822	112	238	277	313	576	196	380		
26	38	53	13	28	10	3	10	19	17	10	11	0	0	4	2	13	35	55	271	720	878	173	42	170	147	167	-	643	106	162	190	516	672	173	211		
27	38	64	9	36	7	1	2	13	22	10	7	0	2	1	2	19	42	27	184	558	790	212	23	91	99	128	-	502	122	129	100	400	798	133	129		
28	31	18	12	11	3	1	3	6	13	7	6	0	2	1	1	4	20	11	67	261	731	214	15	78	85	107	-	383	116	108	100	232	615	198	152		
29	9	21	4	7	0	0	1	1	6	4	2	0	0	0	3	2	13	14	32	101	433	174	23	32	59	86	-	341	59	135	57	145	564	159	97		
30	8	16	2	1	0	0	0	0	0	3	0	0	0	0	0	0	3	4	22	75	122	101	36	27	51	35	-	196	63	116	88	95	299	91	70		
31	7	7	1	1	0	0	1	2	1	0	0	0	1	0	0	1	2	3	14	23	45	46	26	43	22	28	-	111	26	47	64	98	157	91	33		
32	2	1	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	14	25	18	20	37	20	21	-	76	17	36	49	76	47	17
33	1	2	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	5	10	3	6	27	14	13	-	31	11	24	22	67	58	33	8	
34	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5	2	10	11	13	-	16	1	9	7	18	40	31	5	
35	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	6	7	-	10	0	7	4	12	9	13	3	
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	1	4	2	-	7	1	2	3	5	2	3	1	
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	-	2	0	1	0	5	0	0	0		
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	0	3	0	0	0		
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	0	0	0	0	
<b>Total</b>	<b>3,050</b>	<b>10,641</b>	<b>5,030</b>	<b>4,344</b>	<b>9,496</b>	<b>10,592</b>	<b>13,249</b>	<b>41,363</b>	<b>12,705</b>	<b>30,983</b>	<b>37,272</b>	<b>9,782</b>	<b>11,609</b>	<b>7,957</b>	<b>18,939</b>	<b>99,319</b>	<b>64,927</b>	<b>30,198</b>	<b>49,829</b>	<b>9,602</b>	<b>51,706</b>	<b>49,133</b>	<b>10,533</b>	<b>63,921</b>	<b>22,507</b>	<b>19,371</b>	-	<b>24,021</b>	<b>31,842</b>	<b>7,925</b>	<b>30,172</b>	<b>60,772</b>	<b>44,388</b>	<b>28,370</b>	<b>28,083</b>		

**Table 5.52. Striped bass spring length frequencies, 2 cm intervals (midpoint given), 1984–2018.**

*All striped bass taken in the Survey were measured, with the exception of one fish taken in 1984, one in 1988, and two in 1990.*

length	Spring																																				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
11	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0			
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0		
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	8	0	0	0	1	0	0	0	0	0	0		
17	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	2	0	2	0	0	3	0	0	0	1	0	0		
19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5	0	0	5	0	0	0	1	0	0		
21	0	0	0	0	0	2	3	0	0	0	0	4	1	0	2	1	3	0	8	0	0	1	0	0	0	21	0	0	5	3	0	0	3	0	0		
23	0	0	0	0	0	1	1	0	1	0	0	9	0	0	11	1	8	1	22	0	0	23	0	7	1	24	1	0	10	11	0	1	10	0	0		
25	0	0	0	1	0	1	4	2	0	0	0	18	0	2	28	1	18	7	32	4	2	57	0	9	4	24	1	2	8	9	1	0	15	2	1		
27	0	0	0	0	0	0	5	1	2	0	2	28	2	5	30	2	24	15	38	4	1	67	1	12	4	7	1	0	8	11	0	0	9	1	1		
29	0	0	0	0	1	0	9	2	0	1	1	24	4	12	21	14	28	16	27	11	4	50	1	10	6	5	0	0	8	7	2	0	21	1	1		
31	0	0	0	0	0	1	6	2	1	2	2	12	4	14	20	10	29	5	17	7	5	19	1	4	4	1	0	0	5	4	1	1	9	0	3		
33	0	0	0	1	0	0	0	6	1	0	3	7	8	5	20	24	7	6	12	10	10	6	2	5	4	6	0	0	2	7	1	0	3	0	7		
35	0	0	0	0	1	0	3	2	1	1	0	8	20	2	19	16	3	4	7	7	13	7	6	6	1	2	1	1	2	7	5	2	1	1	6		
37	0	0	0	0	0	0	3	1	0	0	1	8	26	25	25	15	2	11	12	11	11	4	5	16	2	5	2	1	3	10	12	2	3	2	13		
39	0	0	0	0	0	1	0	0	0	0	3	3	19	42	23	13	2	14	14	7	4	7	6	35	2	10	3	0	3	9	33	0	1	2	13		
41	0	0	0	0	0	2	2	1	3	1	3	4	17	30	25	19	6	7	20	3	2	20	2	26	2	19	1	0	1	2	31	5	0	3	14		
43	0	0	0	0	0	0	1	3	5	1	0	7	16	17	11	3	2	17	5	1	13	4	25	6	14	0	0	4	2	12	4	0	2	10			
45	0	0	0	1	0	0	0	0	5	2	2	3	12	6	19	9	4	1	17	2	3	12	2	11	7	21	0	0	5	4	12	1	3	2	13		
47	0	0	0	0	2	0	0	0	3	6	0	7	10	15	10	5	6	9	3	2	17	0	7	10	30	2	6	1	4	22	6	3	5	7			
49	0	0	0	0	2	0	2	1	2	3	4	1	5	13	14	6	4	3	8	5	6	17	1	12	9	28	7	4	1	6	19	6	1	1	9		
51	0	0	0	0	0	1	0	1	4	3	4	2	7	7	12	6	4	3	9	7	1	4	6	5	10	32	2	8	5	3	13	4	6	4	6		
53	0	0	0	1	0	0	0	1	2	5	4	2	7	4	8	11	5	2	5	6	6	9	6	8	12	19	5	11	1	4	6	6	6	1	6		
55	0	0	0	0	0	0	1	1	4	2	2	5	3	13	13	7	3	8	9	3	7	6	4	12	9	7	11	5	3	10	7	8	1	0			
57	0	0	0	0	0	0	0	2	2	2	8	1	2	3	6	21	4	5	9	9	6	13	3	15	12	13	8	13	6	0	2	1	6	2	0		
59	0	0	0	2	0	1	0	0	0	4	2	2	2	7	7	22	4	5	10	11	4	5	5	5	8	17	6	5	6	6	3	5	3	3	2		
61	0	0	0	0	0	0	0	2	1	2	5	2	3	3	2	26	4	10	17	7	6	6	4	12	5	17	3	13	1	2	4	4	6	1	0		
63	0	0	0	1	1	0	0	0	1	5	1	0	2	3	2	21	8	13	6	9	7	7	4	15	5	15	2	12	1	3	2	1	1	1	3		
65	0	0	0	0	0	0	0	0	0	1	4	0	3	5	10	15	10	4	13	9	4	8	6	4	1	12	4	8	2	6	2	0	1	1	0		
67	0	0	0	0	0	1	0	0	1	1	0	1	3	4	6	10	9	6	19	14	6	4	3	8	4	8	1	15	4	3	1	0	0	0	1		
69	0	0	0	0	0	0	2	0	0	3	3	1	3	1	10	3	13	15	10	5	7	2	5	3	3	2	9	4	4	2	0	0	1	2	0		
71	0	0	0	1	0	0	1	0	0	1	2	1	3	1	10	5	6	6	5	3	9	1	4	5	7	2	12	3	3	1	0	1	1	1	5		
73	0	0	0	0	0	0	0	2	0	3	0	0	7	6	2	5	8	5	12	10	2	6	3	3	3	2	7	1	4	0	1	0	0	3			
75	0	0	0	0	0	0	0	0	0	3	1	0	0	0	6	1	2	4	10	5	5	1	3	0	3	4	8	3	2	1	0	1	0	1	2	2	
77	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	3	5	2	0	6	1	5	2	1	1	0	9	0	2	0	0	1	1	2	0	0	
79	0	0	0	0	0	0	0	1	1	0	0	3	2	3	0	1	2	1	7	1	1	4	2	0	1	1	5	1	7	5	0	0	0	0	0		
81	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2	0	4	0	2	4	1	2	2	0	1	1	2	5	0	0	0	1	2	0		
83	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	4	0	1	1	1	1	0	0	0	1	0	3	0	1	0	2	3		
85	0	0	0	0	0	0	0	2	0	0	0	0	2	1	0	0	0	1	3	2	0	1	0	0	0	0	1	1	0	1	0	0	1	0	0		
87	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	4	2	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
89	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	0	0	0	0	1	1	0	0	3	0	0	0	0	
91	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	1	0	0	0	0	0	0	1	0	0	0	0	
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	
97	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	8	7	11	43	32	34	59	65	151	184	239	361	335	229	184	413	208	135	422	97	287	160	382	69	165	125	160	205	59	128	46	137		

**Table 5.53. Striped bass fall length frequencies, 2 cm intervals (midpoint given), 1984–2018.**

*All striped bass taken in the Survey were measured on each tow.*

length	Fall																																					
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018			
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
41	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	12	
43	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	1	0	1	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
45	0	0	1	0	0	0	0	0	0	0	0	0	4	3	2	2	0	0	1	0	18	1	1	2	0	0	0	0	0	0	0	0	0	1	0	1	21	
47	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	11	0	0	1	1	18	1	1	10	0	2	0	5	6	5	6	0	4	25	0	0		
49	0	0	0	0	0	0	0	0	0	0	1	0	0	9	9	2	9	1	0	0	14	2	4	22	1	1	0	6	5	3	5	0	1	17	0	0		
51	0	0	0	0	0	0	0	0	0	0	4	2	0	8	4	1	9	0	0	3	0	29	2	5	18	2	4	0	2	2	2	4	16	0	2	10		
53	1	0	0	0	0	0	0	0	0	2	2	1	5	14	7	5	5	0	3	0	27	7	7	16	7	7	0	2	2	4	7	18	1	4	11			
55	0	0	0	0	0	0	0	0	1	0	1	0	2	10	5	5	2	0	4	1	26	1	2	10	4	10	0	3	3	2	6	26	3	1	6			
57	0	0	0	1	1	0	0	1	1	5	0	2	3	11	5	5	5	2	7	1	11	6	3	6	3	8	0	0	3	8	15	4	2	2	2			
59	0	0	0	0	0	0	0	0	1	0	0	0	0	7	3	0	8	0	2	0	13	6	3	5	3	8	0	6	1	4	14	5	0	1	0			
61	0	0	0	0	3	0	0	1	0	1	0	2	2	3	1	2	4	2	2	0	12	1	6	4	3	4	0	2	1	2	4	10	10	1	3	0		
63	0	0	0	0	2	0	0	1	1	1	1	0	0	3	2	3	6	7	3	1	9	5	2	5	1	6	0	3	0	5	2	1	4	1	1	0		
65	0	0	0	0	1	0	0	0	2	1	1	0	0	2	0	4	6	5	3	0	7	2	2	7	1	6	0	6	0	2	1	4	4	1	0	0		
67	0	0	0	0	1	0	0	1	0	1	2	2	1	1	0	1	6	1	6	0	8	4	3	4	0	5	0	3	0	0	0	5	2	3	0	0		
69	0	0	0	0	1	0	0	0	0	1	1	0	2	2	0	0	4	3	4	0	6	0	3	6	2	6	0	2	0	2	1	1	2	1	0	0		
71	0	0	0	0	1	0	0	0	1	0	0	1	1	1	2	0	3	3	5	0	3	3	0	0	0	1	0	1	2	0	1	1	1	1	0	0	0	
73	0	0	0	0	0	0	0	0	0	2	1	4	0	2	3	1	2	2	0	1	3	0	0	0	4	1	0	5	1	1	0	0	0	2	1	0	0	
75	0	0	0	0	0	0	0	1	0	0	1	2	1	1	0	1	3	2	1	1	1	2	0	1	0	0	0	1	1	0	1	1	0	0	0	2	0	
77	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	4	0	4	0	1	0	0	0	2	3	0	0	5	1	0	1	0	0	1	1	0	
79	0	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	1	1	2	1	1	0	1	0	1	0	3	1	0	0	0	0	0	0	0	0	0	
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
83	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	
85	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	2	1	0	1	0	3	0	1	0	0	0	1	0	0	1	0	0	
87	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
89	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	
91	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	5	0	0	0	0	0	0	0	0	0	0	0	
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	1	1	10	0	0	6	8	22	16	15	48	80	37	62	64	28	56	8	243	47	47	131	39	83	-	77	46	40	49	128	36	27	132			



**Table 5.54. Summer flounder length frequencies, spring, 2 cm intervals (midpoint given), 1984–2018.**

*All summer flounder taken in the Survey were measured, with the exception of one fish in 1990.*

length	Spring																																				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		
13	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		
15	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	15	0	0	1	0	0	0	1	0	0	0	0		
17	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	28	1	1	7	0	0	1	0	0	0	0	1		
19	0	0	0	36	0	0	1	0	0	0	0	1	1	0	0	2	0	0	2	1	0	0	37	1	3	10	0	0	0	1	5	1	0	1			
21	0	0	11	39	0	0	0	0	0	3	2	2	1	0	0	2	1	1	3	0	0	0	46	5	16	21	1	0	15	5	19	0	0	15			
23	0	0	10	31	1	0	1	3	2	0	9	1	2	2	0	0	0	6	1	13	1	2	1	37	3	21	38	4	2	21	15	35	0	0	18		
25	1	0	22	33	2	0	2	6	1	9	20	1	2	10	1	2	6	5	2	27	3	3	0	21	7	43	86	21	4	41	29	67	3	6	60		
27	8	0	43	25	20	0	7	12	6	22	32	3	11	10	2	14	7	26	13	79	8	14	0	11	13	55	94	50	22	58	61	87	7	18	86		
29	7	0	39	6	18	0	15	17	14	15	10	9	45	22	5	32	21	60	50	135	25	10	2	19	34	53	78	90	56	56	92	56	14	32	78		
31	9	1	17	3	18	0	19	23	12	12	19	12	44	27	4	42	23	53	89	104	14	19	5	19	28	24	37	92	51	33	74	49	25	11	56		
33	0	7	13	5	12	1	12	9	8	7	22	2	14	25	7	22	28	16	57	54	18	15	21	6	25	26	10	70	44	36	65	25	20	11	15		
35	2	8	4	2	13	3	1	5	6	7	16	2	12	11	11	22	22	10	41	49	13	12	17	9	14	20	7	81	58	35	50	21	23	18	20		
37	1	3	4	5	8	2	1	6	2	6	20	1	10	20	28	26	34	20	57	75	34	8	14	12	10	28	16	69	60	64	48	30	25	11	16		
39	3	3	3	4	5	1	2	5	2	7	7	0	12	16	38	18	36	12	61	71	51	9	10	22	14	36	20	55	66	62	33	27	17	15	26		
41	1	3	7	1	8	2	1	6	5	4	6	3	5	10	35	14	33	19	51	77	49	13	5	26	17	35	12	38	34	68	33	22	17	9	15		
43	0	1	3	0	2	2	0	0	2	4	6	7	6	6	22	16	22	24	28	58	48	10	5	30	13	28	13	25	43	46	29	20	14	7	20		
45	0	0	1	1	3	0	0	8	4	0	4	0	5	4	15	11	29	16	21	33	18	5	4	26	6	30	7	19	23	39	23	17	13	4	2		
47	0	0	3	3	3	1	1	4	2	1	3	0	1	6	9	10	18	14	20	43	28	12	3	25	14	14	16	26	24	28	16	12	14	9	9		
49	1	0	1	1	1	2	0	2	1	0	2	1	3	2	12	17	7	10	14	32	26	6	3	35	9	13	10	20	23	20	17	10	9	10	8		
51	0	0	5	0	1	0	0	1	1	0	1	0	1	3	15	9	8	12	19	19	13	8	7	26	15	16	9	15	15	18	16	8	8	4	7		
53	0	0	1	0	1	0	2	1	0	1	1	2	3	5	5	9	5	8	10	21	16	6	4	10	15	8	2	18	8	13	18	8	3	4	5		
55	0	2	1	0	1	1	0	0	1	2	1	0	3	2	6	8	8	8	14	10	13	5	2	11	18	14	2	15	8	12	17	4	5	4	5		
57	0	0	0	0	0	1	1	0	0	1	0	0	0	1	5	4	5	8	12	9	3	2	1	13	14	16	2	14	3	6	14	7	3	3	9		
59	0	0	0	0	1	1	0	0	0	2	0	0	2	3	3	8	8	2	6	12	8	4	1	5	5	17	3	7	8	9	3	7	5	5	7		
61	0	2	0	0	0	0	0	0	0	1	2	1	1	0	1	3	4	4	6	5	5	3	0	2	4	7	3	7	1	3	4	0	1	1	1		
63	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	2	1	7	10	9	0	4	6	5	8	2	8	6	3	3	1	4	1	2		
65	0	1	0	0	0	0	0	1	1	0	1	0	0	0	1	1	2	4	2	8	2	1	0	7	3	4	6	4	5	5	1	2	1	0	2		
67	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2	3	5	4	0	1	1	1	1	1	6	0	1	1	1	1	0	0		
69	0	0	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	0	0	4	2	0	0	3	0	1	1	0	1	0	2	1	1	0	0		
71	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	2	0	3	4	0	0	0	0	0	0	1	3	0	1	1	1	1		
73	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	2	2	0	1	0	0	0	0		
75	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	2	0	1	1	0	0	0	0	1	0	1	0	1	
77	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>33</b>	<b>32</b>	<b>189</b>	<b>203</b>	<b>118</b>	<b>18</b>	<b>67</b>	<b>109</b>	<b>72</b>	<b>101</b>	<b>188</b>	<b>51</b>	<b>186</b>	<b>188</b>	<b>230</b>	<b>289</b>	<b>334</b>	<b>342</b>	<b>588</b>	<b>962</b>	<b>416</b>	<b>172</b>	<b>110</b>	<b>512</b>	<b>297</b>	<b>538</b>	<b>516</b>	<b>758</b>	<b>569</b>	<b>696</b>	<b>675</b>	<b>541</b>	<b>236</b>	<b>184</b>	<b>486</b>		

**Table 5.55. Summer flounder length frequencies, fall, 2 cm intervals (midpoint given), 1984–2018.**

*All summer flounder taken in the Survey were measured, with the exception of two fish in 1985.*

length	Fall																																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	-	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	-	0	0	0	0	0	0	0	0	0
15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	1	-	0	0	0	0	0	0	0	0	1
17	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2	0	0	0	0	2	-	0	0	0	0	0	0	0	1	3
19	0	3	3	0	0	0	0	0	0	2	0	0	1	0	0	0	1	0	0	0	0	0	2	1	1	5	-	0	0	0	0	0	0	0	0	0
21	0	7	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	1	4	8	-	0	0	2	0	0	1	1	4	
23	0	4	3	0	0	0	0	0	1	2	0	1	3	0	0	0	1	7	0	3	2	0	0	11	6	-	0	2	6	4	0	5	2	5	6	
25	0	6	0	0	0	0	0	2	0	4	0	0	2	0	0	1	1	0	5	0	5	0	0	3	5	7	-	3	1	5	3	0	2	2	6	
27	0	6	3	1	0	0	1	1	0	1	0	0	0	0	0	3	11	1	17	0	5	2	0	4	17	14	-	4	3	4	1	1	3	8	11	
29	0	2	2	7	0	0	0	1	0	1	1	0	1	0	0	1	2	1	19	0	10	1	0	6	8	6	-	5	5	13	5	5	1	13	10	
31	0	3	6	9	3	0	0	1	1	0	1	0	4	3	0	4	2	14	13	0	5	5	0	18	5	5	-	11	7	26	7	8	1	11	18	
33	10	0	10	30	10	0	3	3	3	8	8	8	12	17	1	16	3	28	14	3	6	33	5	14	3	8	-	29	34	45	10	27	8	15	28	
35	22	4	33	35	20	0	10	11	14	29	7	13	33	37	11	18	8	104	70	15	3	55	2	19	1	34	-	35	42	33	12	24	21	22	32	
37	21	17	44	28	41	0	14	21	19	31	10	6	33	44	10	39	23	109	106	29	6	37	6	15	8	34	-	38	58	37	27	40	23	20	46	
39	20	10	35	21	37	0	11	28	15	29	25	6	38	72	17	50	33	81	158	28	18	32	9	9	29	40	-	54	73	25	29	40	24	15	28	
41	16	11	26	16	36	1	18	30	12	37	10	16	49	54	21	52	31	61	119	16	21	57	10	20	36	34	-	41	55	46	23	43	23	10	19	
43	11	24	26	5	21	1	18	13	13	16	4	9	23	27	34	43	31	28	61	22	25	30	16	17	27	29	-	27	37	27	13	21	32	8	11	
45	3	16	9	3	18	1	15	13	9	6	5	2	15	10	32	22	13	16	77	21	32	25	13	14	9	20	-	17	23	33	14	15	21	5	5	
47	2	11	6	6	8	3	3	5	6	11	7	2	13	11	36	8	8	15	35	18	29	15	4	8	5	27	-	6	15	16	8	15	16	8	11	
49	3	12	1	2	3	3	3	3	8	3	7	1	8	7	15	4	18	23	24	10	26	15	8	13	5	20	-	9	11	19	4	6	17	9	4	
51	3	1	4	1	1	2	0	8	4	6	0	3	8	4	9	7	11	20	14	8	9	7	1	15	2	7	-	2	15	11	4	7	5	5	6	
53	1	1	2	2	1	4	1	7	4	3	1	0	3	5	7	12	7	8	5	5	7	8	4	16	1	10	-	1	11	8	6	3	6	5	6	
55	1	2	1	2	1	0	2	4	2	1	0	2	0	3	4	3	5	9	1	2	4	3	2	7	0	8	-	4	14	8	3	6	5	3	4	
57	2	0	1	2	1	0	1	0	1	2	1	1	1	2	2	2	5	10	2	4	1	2	3	1	2	-	1	0	4	3	2	3	1	4	4	
59	0	0	1	0	1	0	1	0	0	1	3	0	0	2	1	6	3	4	7	4	3	1	0	8	0	4	-	1	2	3	3	4	1	1	2	
61	0	0	0	1	0	0	1	0	0	1	0	0	0	1	2	1	2	0	1	2	0	1	0	2	0	4	-	4	1	2	2	0	2	3	0	
63	1	1	0	0	1	0	0	1	1	0	0	0	0	0	2	0	2	1	2	2	1	0	1	1	0	3	-	1	0	1	0	0	2	0	2	
65	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	1	1	1	1	0	1	1	1	0	0	-	0	0	2	0	1	1	0	2	
67	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	1	0	1	-	1	0	1	0	0	0	0	0	
69	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	2	-	0	0	0	2	0	1	1	0	
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	-	0	0	0	1	0	0	0	0	
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
Total	117	141	225	171	203	16	102	153	114	194	93	70	248	299	206	293	220	531	770	189	228	331	95	219	178	343	-	294	409	377	184	268	224	169	268	

**Table 5.56. Tautog length frequencies, spring, 1 cm intervals, 1984-2018.**

*All tautog taken in the Survey were measured.*

length	Spring																																				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	
12	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	2	2	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	
13	0	0	0	1	1	0	4	1	0	1	0	0	2	1	0	0	0	2	0	0	0	3	0	0	0	1	0	1	4	2	1	1	2	0	1	0	
14	0	0	0	1	0	4	3	0	2	3	2	0	0	1	0	0	4	2	1	0	1	1	0	0	1	1	2	0	2	0	1	0	6	0	1	0	
15	0	0	2	2	1	4	7	1	1	0	2	0	1	2	0	0	2	2	0	0	0	0	0	1	0	2	0	2	0	0	1	0	5	0	2	0	
16	0	0	0	3	1	3	6	1	0	0	2	0	3	3	0	0	1	1	0	1	1	0	1	1	2	1	0	0	2	2	0	1	3	0	0	0	
17	2	1	2	3	2	3	8	3	3	1	2	0	0	2	0	0	5	2	2	1	0	2	3	0	0	0	0	4	1	3	3	1	3	1	0	2	
18	2	2	0	3	4	3	14	7	4	4	1	1	0	4	1	0	4	2	2	0	0	0	0	0	1	1	1	1	3	2	1	0	5	0	0	0	
19	2	0	2	3	4	11	11	6	2	1	1	0	2	1	0	3	0	6	2	2	0	0	0	2	1	0	0	0	2	0	0	1	9	0	2	0	
20	5	2	2	0	3	7	15	7	2	1	2	1	0	2	1	0	1	3	1	1	0	2	0	0	2	0	0	1	3	9	6	2	3	0	4	0	
21	3	1	5	2	5	7	12	4	1	5	2	0	0	5	0	3	3	2	4	0	1	2	1	0	0	0	2	3	3	2	5	3	6	2	3	0	
22	2	5	0	1	7	11	13	11	2	2	1	1	0	5	2	0	2	6	0	1	0	3	3	1	1	0	1	2	3	4	1	6	9	2	1	0	
23	7	0	6	4	4	12	15	9	2	2	5	1	0	2	2	1	4	7	5	0	1	2	2	2	2	0	0	3	6	1	8	1	8	1	2	3	
24	5	1	3	1	4	8	8	3	0	3	5	1	1	0	2	1	1	6	6	2	2	2	2	5	1	0	3	1	1	5	6	1	3	1	2	0	
25	6	8	2	4	4	7	7	5	4	1	2	1	1	7	1	2	4	5	6	2	1	2	2	1	2	1	2	1	2	3	4	4	6	2	1	7	0
26	6	4	7	0	2	4	15	6	0	3	1	0	0	2	2	1	2	7	3	0	3	1	2	1	2	0	0	1	8	3	8	2	8	2	10	0	
27	5	3	8	3	2	9	5	6	1	1	3	1	1	3	6	2	6	1	8	3	1	0	0	3	1	0	0	5	0	2	3	7	8	3	4	0	
28	3	8	5	2	3	11	12	6	3	3	9	1	0	2	0	1	4	4	5	1	1	4	1	2	2	0	1	1	1	7	5	1	4	2	3	0	
29	7	7	3	3	4	7	4	2	3	7	1	2	3	7	2	1	3	0	4	3	4	3	1	4	6	0	0	0	4	4	2	6	5	0	3	0	
30	6	4	9	3	2	15	10	6	1	3	1	1	1	4	2	1	2	3	12	3	6	1	5	2	1	0	0	1	1	4	5	6	5	1	12	0	
31	9	3	6	2	8	5	12	1	1	3	4	0	1	5	1	0	1	6	9	3	4	2	4	1	1	2	1	2	4	3	4	11	9	0	4	0	
32	8	3	6	6	4	6	6	5	2	0	2	1	3	7	9	3	2	3	13	10	9	4	3	5	2	2	2	1	6	3	2	8	8	0	5	0	
33	5	4	7	8	4	6	7	7	3	1	4	0	2	4	0	6	6	18	8	3	4	4	3	2	4	0	0	3	2	5	13	7	4	9	0	0	
34	5	7	12	4	5	11	6	6	2	0	2	0	2	9	3	3	6	5	13	5	1	5	3	4	3	1	2	1	6	6	12	7	2	9	0	0	
35	10	4	6	3	10	5	9	10	7	0	3	0	3	0	3	3	5	15	4	6	1	4	6	4	1	0	3	2	2	6	13	16	3	8	0	0	
36	7	1	17	13	13	11	7	7	2	2	4	1	1	4	4	2	11	14	17	7	7	5	7	3	3	5	2	1	2	3	5	10	13	1	7	0	
37	8	8	22	13	12	8	6	11	2	1	5	1	4	4	1	7	9	6	23	12	14	8	5	4	6	4	2	2	0	5	11	16	8	2	9	0	
38	9	10	17	11	14	5	14	18	10	3	4	1	2	1	3	5	11	7	22	8	10	4	5	2	4	6	3	2	9	5	12	19	9	3	4	0	
39	8	5	18	7	6	14	7	7	3	2	8	2	9	5	5	8	10	25	7	15	9	9	3	17	6	6	3	2	9	6	14	12	3	12	0	0	
40	8	8	38	8	14	22	10	17	8	2	7	2	4	2	7	4	10	11	27	10	9	8	9	9	2	5	1	5	4	5	1	8	11	4	7	0	
41	11	6	27	12	12	16	9	10	6	2	5	2	9	3	9	3	18	16	28	5	12	10	7	7	6	16	1	5	2	5	8	21	16	0	6	0	
42	11	14	22	10	19	21	12	17	6	3	7	1	6	7	7	10	16	12	24	15	9	6	3	13	6	12	1	4	3	6	8	13	10	1	5	0	
43	13	9	28	9	18	24	6	8	10	7	5	1	5	8	6	9	11	17	24	9	12	5	8	14	3	9	2	4	4	5	5	12	8	3	7	0	
44	15	6	31	12	20	27	17	13	11	1	9	1	1	7	8	5	17	12	37	3	19	5	6	15	8	11	2	4	1	3	4	14	8	3	5	0	
45	20	21	23	12	15	25	32	18	10	10	6	1	6	5	9	12	11	11	33	13	10	5	9	10	7	5	2	3	2	6	2	10	6	3	1	0	
46	15	9	22	10	17	31	20	18	10	1	8	1	2	6	3	5	8	10	28	11	8	7	7	15	10	8	0	3	4	1	4	7	3	2	3	0	
47	16	9	37	11	23	22	14	23	15	7	10	3	6	5	7	7	9	10	18	7	1	7	10	17	4	3	4	2	2	2	4	10	0	1	1	0	
48	15	13	25	8	21	31	21	18	7	5	1	1	3	7	6	8	5	7	20	3	6	10	7	13	0	4	1	2	1	3	1	2	3	2	3	0	
49	17	11	12	9	19	29	17	20	7	6	12	0	2	3	4	3	5	8	9	4	3	5	11	14	3	7	1	4	5	0	3	2	7	4	1	0	
50	13	5	10	5	16	27	12	16	9	6	7	1	2	2	7	7	3	10	8	7	5	4	4	17	7	10	2	5	2	2	1	5	3	0	1	0	
51	9	12	21	5	19	12	26	13	11	3	6	2	6	1	7	2	4	7	10	1	6	4	5	10	3	2	1	2	2	0	5	2	0	1	2	0	0
52	10	8	5	7	14	10	20	10	8	6	7	0	2	3	7	3	5	4	8	3	2	1	8	5	5	2	2	3	1	1	2	2	2	2	0	0	
53	8	4	11	3	11	17	17	6	8	2	2	1	4	4	2	0	1	5	8	1	0	1	2	5	3	5	0	2	2	1	0	1	0	1	0	1	0
54	3	3	6	6	12	8	14	11	6	6	3	1	7	4	5	2	2	1	5	1	5	2	3	6	5	4	2	2	0	0	1	0	2	1	1	0	
55	9	0	5	5	11	13	10	5	7	2	3	2	1	3	2	2	6	4	5	1	0	0	4	8	3	2	1	0	1	0	0	0	0	0	0	1	0
56	2	0	7	8	7	9	11	8	3	3	1	3	1	1	3	1	0	2	1	3	1	0	0	3	3	2	0	1	0	0	1	0	0	0	0	2	0
57	2	0	11	2	1	5	5	5	7	1	1	0	3	2	1	3	7	0	3	1	0	1	0	1	0	1	2	1	0	0	0	2	0</				



**Table 5.58. Weakfish length frequencies, spring, 2 cm intervals (midpoint given), 1984-2018.**

*Weakfish were measured from every tow.*

length	Spring																																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	1	3	0	1	11	2	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	1	3	0	3	10	4	0	3	93	6	0	
23	0	0	0	0	0	0	0	0	1	0	0	3	0	0	1	0	0	1	2	1	9	3	6	1	0	1	0	2	5	8	1	0	73	6	0	
25	0	0	0	0	1	0	1	0	0	0	2	3	1	0	1	2	3	4	1	2	9	10	3	0	2	0	0	0	0	6	0	0	15	9	1	
27	0	0	0	0	0	0	2	4	0	0	3	5	3	5	4	1	2	13	3	0	3	27	4	4	0	0	0	2	4	10	5	0	4	7	0	
29	0	0	0	0	0	0	2	4	1	3	3	7	12	12	16	5	1	20	0	0	2	22	2	4	1	1	0	0	5	12	1	0	5	7	0	
31	0	0	0	0	1	0	1	6	3	3	3	7	15	21	21	8	5	9	1	0	2	20	1	0	0	0	0	0	11	8	4	0	4	4	1	
33	0	0	0	0	0	0	0	12	0	3	2	1	5	19	10	10	1	5	0	0	0	11	0	3	0	0	0	0	17	1	0	0	10	13	1	
35	0	0	0	0	0	1	1	13	0	0	0	0	4	11	4	3	1	2	1	0	0	0	0	1	0	0	0	1	28	2	1	0	9	12	0	
37	0	0	0	1	0	0	2	5	0	0	0	1	2	2	3	1	0	0	1	0	0	1	0	2	1	0	0	2	31	3	1	0	13	8	2	
39	0	0	0	0	1	0	0	4	0	0	0	0	1	1	0	2	0	0	2	0	0	0	0	1	0	0	0	3	26	6	2	0	15	6	0	
41	0	0	0	0	0	0	0	0	0	0	0	0	0	4	7	3	0	2	1	0	0	0	1	6	0	0	0	1	15	3	0	0	5	2	1	
43	0	0	0	1	0	0	0	1	1	0	0	0	0	2	3	6	0	0	1	0	0	0	1	0	0	0	0	0	8	1	0	0	1	0	0	
45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	1	0	0	0	0	0	0	0	0	0	0	0	3	1	4	0	0	0	0	
47	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	2	1	0	1	0	0	0	0	2	0	0	1	0	2	1	0	1	1	1	0	
49	0	0	1	0	0	0	0	0	0	0	0	1	0	1	5	3	1	0	1	0	0	0	4	1	0	0	0	0	1	4	0	0	0	0	0	
51	0	0	0	0	0	1	0	1	2	0	0	0	0	0	6	3	2	0	1	0	0	0	2	0	0	0	0	0	1	3	0	0	0	3	0	
53	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	1	0	0	0	7	3	0	0	0	1	0	
55	0	0	0	0	0	0	0	0	4	0	0	0	0	1	1	3	1	0	2	0	0	0	0	0	0	0	0	6	4	0	1	0	0	0		
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	
59	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	
61	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	2	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	
65	0	0	0	0	0	3	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	1	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0
75	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
79	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	9	2	6	5	9	51	18	11	13	28	43	81	92	85	29	59	28	5	28	96	26	31	6	10	1	16	187	86	24	5	261	88	7	

**Table 5.59. Weakfish length frequencies, fall, 2 cm intervals (midpoint given), 1984-2018.**

*Weakfish were measured from every tow, with the exceptions of 968 juveniles in 1988 and 863 juveniles in 1989 that were not measured.*

length	Fall																																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	2	1	0	0	0	1	0	2	0	3	0	0	24	13	0	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	3	51	0	13	46	2	0	48	22	16	34	34	92	0	0	1,065	89	2	357	30	8	3	101	9	9	-	9	81	23	24	10	16	1	60	
9	15	70	448	15	37	247	39	11	218	76	127	74	110	431	27	53	5,951	1,054	253	1,026	1,263	11	6	904	18	117	-	83	519	127	671	177	190	58	853	
11	24	168	1,625	84	63	566	130	423	233	222	413	33	366	749	110	976	7,488	3,672	1,009	1,186	4,329	197	26	2,578	70	528	-	302	1,475	276	1418	305	457	588	1237	
13	69	187	2,191	98	60	1,152	207	522	289	340	1,586	137	713	598	589	1,748	3,650	4,135	2,455	1,108	5,940	1,246	41	4,876	492	938	-	455	1,246	379	2,358	1,071	802	1,419	2,160	
15	54	474	894	22	31	1,699	519	831	292	550	2,561	566	1,529	214	788	2,802	1,641	2,124	3,740	1,153	3,909	2,538	37	4,570	931	692	-	620	1,606	485	3,602	2,305	1,785	2,110	1,556	
17	17	1,196	107	3	17	750	629	949	120	503	2,538	957	2,084	356	1,160	2,889	1,821	764	1,875	590	1,168	2,739	36	2,084	594	212	-	665	1,017	239	1,586	3,109	607	1,057	702	
19	5	379	50	2	3	162	312	741	35	235	665	748	1,165	651	497	2,007	1,169	366	851	132	471	1,798	27	991	253	43	-	225	332	125	396	1,780	215	281	415	
21	2	92	4	4	0	1	57	347	22	63	146	141	187	417	104	1,147	565	250	345	29	235	413	9	645	129	2	-	82	140	78	273	793	124	121	292	
23	1	14	10	1	0	1	6	267	9	6	71	11	8	106	50	357	100	84	94	0	74	89	1	352	15	1	-	8	50	24	101	374	1	10	123	
25	1	13	1	0	0	1	0	65	2	0	0	3	0	5	0	234	22	5	13	0	31	26	0	173	6	0	-	1	8	2	14	53	1	0	23	
27	0	14	0	0	0	0	0	0	2	0	0	0	0	0	0	38	0	2	13	0	0	1	0	70	0	1	-	0	1	0	3	1	7	3	3	
29	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	11	0	0	0	0	1	0	0	-	9	0	1	0	0	22	18	4	
31	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	1	0	0	3	0	0	7	-	10	6	5	1	14	47	37	28	
33	0	0	0	0	0	0	0	0	2	0	0	3	3	0	1	0	3	0	0	1	2	0	2	0	0	12	-	16	7	3	1	20	44	29	33	
35	2	1	0	0	0	0	0	1	1	1	0	6	12	8	3	1	12	0	1	0	4	0	4	0	0	14	-	21	18	22	0	16	45	12	21	
37	5	0	2	1	0	0	1	0	2	0	0	13	19	18	10	0	9	3	1	0	1	2	6	0	0	9	-	9	18	11	1	15	22	10	11	
39	3	0	2	0	0	0	1	2	8	2	2	16	21	31	10	3	13	7	3	1	4	4	1	2	2	6	-	8	7	24	2	16	9	10	7	
41	4	2	4	1	0	0	2	1	1	3	5	23	41	37	13	5	9	18	3	0	6	6	2	3	1	1	-	2	7	13	3	6	6	8	2	
43	5	1	4	4	0	0	0	9	0	8	4	38	18	43	11	14	6	24	3	0	1	6	4	3	1	0	-	1	5	12	0	2	5	11	0	
45	7	4	0	3	1	0	1	9	0	8	1	27	11	28	10	15	1	22	1	0	6	2	1	1	1	0	-	4	12	6	1	1	6	6	3	
47	3	6	0	5	1	0	0	20	0	3	2	9	6	15	8	8	0	34	1	1	3	3	1	0	1	0	-	6	6	4	0	0	4	4	1	
49	0	1	1	0	0	0	1	22	0	1	4	5	1	10	2	9	1	8	0	0	3	0	1	0	1	0	-	10	10	4	0	0	5	7	1	
51	4	1	1	1	0	0	0	26	1	0	0	4	3	2	1	5	0	5	4	0	0	0	1	0	0	0	-	11	8	3	0	0	3	8	1	
53	1	0	0	0	1	0	0	19	2	2	0	0	0	2	1	0	0	2	0	0	0	0	0	0	1	0	-	6	7	2	0	1	5	3	0	
55	0	1	1	0	0	0	1	4	1	0	0	0	0	4	2	3	0	2	1	0	0	0	2	0	0	0	-	2	4	1	0	0	1	0	1	
57	1	2	0	0	2	0	0	0	3	0	0	0	0	2	4	2	0	1	0	0	0	1	0	0	0	0	-	2	1	1	0	0	0	0	0	
59	1	1	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0	-	0	2	5	0	0	0	1	1	
61	0	1	0	0	0	0	0	1	3	0	0	0	0	0	0	0	2	0	3	0	0	0	1	0	0	0	-	0	0	2	0	0	0	0	0	
63	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	-	0	0	1	0	0	0	0	0	
65	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	5	0	0	0	0	0	0	0	1	0	-	0	0	0	0	0	0	1	0	
67	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
69	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
71	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
73	7	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
75	10	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
77	5	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
79	2	2	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
81	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
83	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
85	1	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
87	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
91	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	
Total	259	2,650	5,415	246	234	4,628	1,911	4,270	1,299	2,047	8,141	2,850	6,332	3,823	3,404	12,331	23,561	12,683	10,686	5,592	17,478	9,092	216	17,355	2,524	2,594	-	2,567	6,599	1,878	10,455	10,070	4,429	5,813	7,538	

**Table 5.60. Windowpane flounder length frequencies, spring, 1 cm intervals, 1989, 1990, 1994-2018.**

*Prior to 2014, lengths were recorded from the first three tows of each day; since 2014, lengths have been recorded from every tow.*

length	Spring																											
	1989	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
4	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
5	4	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2	0	0	2	3	1	0	2	
6	0	0	0	0	0	2	0	2	5	1	1	10	2	0	0	1	0	4	4	9	0	0	10	2	8	1	8	
7	0	0	0	0	1	4	2	4	17	2	7	22	3	0	0	7	3	8	9	9	5	0	7	0	26	5	10	
8	0	2	4	1	3	5	4	3	27	7	6	23	6	0	0	31	5	17	10	20	19	10	41	2	47	26	15	
9	0	40	16	3	2	9	5	2	11	10	21	20	11	0	0	18	6	10	13	24	16	4	31	1	133	34	31	
10	25	66	67	12	34	15	7	8	17	13	12	11	19	7	2	4	11	23	8	10	10	16	24	3	168	56	24	
11	69	96	169	86	79	37	19	20	5	29	8	3	24	12	1	4	11	8	7	11	10	20	8	3	105	42	24	
12	89	74	305	148	162	76	60	40	3	23	10	7	25	16	7	8	17	4	20	2	0	16	10	3	77	16	6	
13	337	53	362	259	288	136	131	37	10	29	5	9	58	25	12	22	13	6	72	9	3	8	15	9	35	11	5	
14	430	66	232	189	381	309	200	45	11	26	8	13	100	22	34	28	44	17	93	7	7	10	18	4	17	8	10	
15	414	124	152	180	487	362	211	96	24	43	15	13	101	23	42	60	51	37	107	15	32	19	15	11	9	0	5	
16	305	180	126	89	310	606	177	123	27	55	12	15	72	37	36	107	119	62	117	19	64	16	21	25	2	1	9	
17	174	212	209	70	331	754	130	165	23	73	9	15	65	22	48	129	137	97	166	23	81	17	26	36	4	0	5	
18	78	178	372	99	339	588	165	160	32	94	24	23	56	4	45	132	116	90	104	58	133	20	37	32	4	4	12	
19	65	132	357	139	548	440	260	194	26	78	19	26	45	16	20	110	101	75	124	58	155	30	37	46	7	9	19	
20	174	144	289	143	604	366	362	386	75	89	15	31	60	13	24	130	76	51	76	47	135	40	71	27	16	8	23	
21	216	116	217	85	567	429	461	357	136	95	22	45	32	22	24	186	122	50	88	66	97	62	75	26	16	10	59	
22	299	143	139	82	401	438	311	301	166	232	45	50	42	29	27	246	155	63	172	75	97	121	102	49	30	23	70	
23	319	108	163	57	409	368	229	217	138	290	110	92	39	42	28	181	216	92	198	107	117	140	170	57	49	33	85	
24	270	103	147	54	280	323	227	217	125	245	141	123	66	36	41	158	132	84	199	122	128	166	229	95	79	31	80	
25	177	87	183	54	236	231	188	206	121	208	133	111	109	47	31	162	118	82	155	134	121	142	228	96	83	52	79	
26	189	103	184	70	235	191	178	136	106	126	114	76	100	52	52	186	103	67	161	120	118	138	175	108	87	59	75	
27	138	79	138	56	187	222	162	161	91	88	69	88	86	49	37	104	100	60	148	103	102	86	145	89	68	41	54	
28	148	38	70	44	117	145	138	97	56	83	62	68	71	29	38	100	111	45	103	69	100	55	111	50	36	24	41	
29	78	26	68	24	97	98	67	53	47	59	41	37	48	24	24	65	52	30	146	42	70	41	56	42	14	25	31	
30	99	35	42	27	66	75	58	42	37	39	42	35	51	20	14	33	46	24	51	24	45	27	27	21	10	9	11	
31	50	20	25	12	31	23	34	39	12	25	19	22	32	13	8	14	22	11	67	25	33	12	21	13	5	9	8	
32	8	15	13	4	25	12	13	26	16	21	17	9	16	5	2	23	19	6	21	7	7	6	11	4	2	2	3	
33	16	3	2	9	5	8	6	3	8	15	7	2	10	1	3	2	5	1	33	14	13	8	5	3	2	2	3	
34	0	5	5	0	4	1	1	1	2	5	4	4	9	3	0	4	5	2	20	11	11	4	9	0	4	0	1	
35	0	4	5	1	3	0	3	4	5	10	2	4	5	0	0	3	3	3	11	1	4	2	5	3	1	1	1	
36	0	4	2	2	1	1	0	0	1	2	0	5	0	2	0	0	1	0	0	0	1	0	1	0	0	0	0	0
37	0	0	0	1	0	0	3	1	1	2	2	1	1	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>4,171</b>	<b>2,256</b>	<b>4,064</b>	<b>2,001</b>	<b>6,234</b>	<b>6,274</b>	<b>3,812</b>	<b>3,147</b>	<b>1,381</b>	<b>2,118</b>	<b>1,002</b>	<b>1,015</b>	<b>1,365</b>	<b>571</b>	<b>600</b>	<b>2,258</b>	<b>1,920</b>	<b>1,129</b>	<b>2,511</b>	<b>1,244</b>	<b>1,734</b>	<b>1,236</b>	<b>1,744</b>	<b>863</b>	<b>1,146</b>	<b>542</b>	<b>810</b>	

**Table 5.61. Windowpane flounder length frequencies, fall, 1 cm intervals, 1989, 1990, 1994-2018.**

*Prior to 2014, lengths were recorded from the first three tows of each day; since 2014, lengths have been recorded from every tow.*

length	Fall																										
	1989	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
6	1	0	1	0	0	0	0	0	3	1	0	0	3	0	0	0	0	1	-	0	0	0	0	0	0	0	0
7	5	0	5	0	6	0	1	0	0	0	0	2	0	0	0	0	0	4	-	1	0	0	0	0	0	0	0
8	8	3	18	5	24	15	1	0	6	9	0	5	11	14	5	4	0	15	-	4	2	2	1	0	0	0	0
9	25	2	28	6	70	17	2	2	2	2	0	21	15	49	2	6	2	15	-	2	3	1	4	3	0	0	0
10	18	11	78	10	165	50	2	4	3	9	1	20	22	67	1	14	5	17	-	9	6	7	9	1	0	0	2
11	15	9	60	22	227	75	31	11	7	14	0	13	27	111	5	18	3	24	-	19	1	7	13	1	2	0	2
12	16	12	50	15	270	107	33	6	9	9	1	6	16	155	2	26	15	29	-	31	5	6	7	0	1	0	0
13	23	6	30	10	285	173	47	3	11	9	6	0	14	145	8	44	43	19	-	19	10	10	14	0	5	0	4
14	33	14	11	13	306	154	48	5	23	6	0	4	8	109	3	36	58	27	-	36	14	10	14	4	9	3	5
15	58	23	23	9	250	110	39	6	18	3	5	8	3	62	2	37	38	25	-	43	18	11	10	12	15	3	19
16	140	38	15	16	181	60	34	3	11	3	5	9	3	33	0	30	28	31	-	41	19	13	24	8	24	5	24
17	188	44	35	26	112	78	33	11	30	7	14	4	9	12	7	21	20	35	-	72	37	13	19	11	66	16	45
18	91	53	47	48	101	119	54	11	15	12	8	11	2	8	19	19	16	47	-	70	19	19	28	16	63	34	57
19	46	46	49	47	145	179	95	44	29	6	10	7	11	20	32	26	10	45	-	52	44	31	12	19	86	48	39
20	49	28	39	48	131	213	96	67	30	13	9	6	18	30	39	39	31	24	-	41	50	29	18	18	62	93	29
21	21	11	23	24	125	165	69	38	52	18	9	11	35	50	25	36	40	28	-	35	87	23	27	21	20	86	23
22	14	14	16	19	65	123	37	18	28	22	21	2	25	48	25	42	25	26	-	51	58	28	34	23	8	51	20
23	3	10	20	6	67	63	32	12	37	30	39	6	10	14	12	32	27	20	-	47	79	30	43	29	13	24	34
24	9	4	7	9	25	49	13	11	33	19	39	11	15	13	9	19	32	23	-	40	45	15	55	24	9	8	43
25	4	3	6	3	22	28	9	6	18	19	25	14	8	10	10	6	9	9	-	16	24	29	50	28	14	13	43
26	2	0	8	3	19	29	9	4	16	9	10	18	4	3	4	8	16	6	-	18	22	17	29	25	15	15	29
27	6	2	3	1	11	17	8	3	5	11	12	17	4	5	3	4	5	4	-	7	14	16	21	24	21	8	19
28	2	1	4	1	3	12	1	1	4	5	6	9	2	3	3	3	2	7	-	9	1	13	7	5	5	12	8
29	2	2	0	1	2	17	0	1	6	3	1	4	2	3	1	3	2	1	-	2	0	2	4	9	5	5	4
30	2	1	2	1	0	5	0	0	1	2	2	2	0	1	1	0	0	0	-	3	1	2	2	2	2	6	3
31	0	0	0	0	0	0	0	0	0	1	0	3	1	2	0	0	2	1	-	0	0	1	1	3	0	0	1
32	1	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0	0	1	-	0	1	0	0	0	0	0	1
33	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
<b>Total</b>	<b>782</b>	<b>337</b>	<b>578</b>	<b>344</b>	<b>2,613</b>	<b>1,858</b>	<b>694</b>	<b>267</b>	<b>397</b>	<b>242</b>	<b>223</b>	<b>215</b>	<b>268</b>	<b>968</b>	<b>218</b>	<b>473</b>	<b>429</b>	<b>484</b>	<b>-</b>	<b>668</b>	<b>560</b>	<b>335</b>	<b>446</b>	<b>286</b>	<b>445</b>	<b>430</b>	<b>454</b>





**Table 5.63. Winter flounder length frequencies, fall, 1 cm intervals, 1984-2018.**

*Winter flounder were measured from every tow.*

length	Fall																																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0	0	0	0	0	0	0	
7	0	0	0	0	1	0	1	1	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	
8	0	0	0	1	7	0	0	1	5	43	0	1	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	-	0	0	0	0	0	1	0	
9	0	0	0	0	3	4	0	1	8	83	3	0	3	4	2	0	0	0	0	0	0	1	0	0	0	3	-	0	0	0	0	0	0	0	0	
10	0	2	0	0	10	3	2	1	9	39	6	3	11	5	3	0	0	2	0	0	2	1	2	0	0	0	-	1	0	0	0	0	0	0	0	
11	1	3	2	2	8	6	4	9	6	42	10	16	16	6	3	0	0	6	0	0	9	0	0	0	1	1	-	0	2	0	0	0	0	0	0	
12	9	16	16	8	34	38	6	34	18	159	63	28	54	23	20	3	5	13	0	1	21	4	1	3	2	11	-	2	4	0	1	3	0	0	0	
13	18	37	43	47	97	127	34	72	72	331	149	67	157	77	68	44	20	62	6	1	41	28	6	9	10	21	-	5	14	0	3	8	0	0	0	
14	25	57	82	54	243	343	130	139	85	409	230	87	218	113	137	128	53	123	24	5	65	77	8	10	23	36	-	7	38	1	3	12	6	0	0	
15	31	63	116	67	295	367	260	144	149	435	219	96	255	165	190	194	111	122	37	10	61	98	17	9	45	51	-	19	59	3	7	12	11	0	2	
16	60	55	104	72	302	293	345	91	182	377	187	77	225	176	192	243	156	116	40	9	48	99	23	9	60	48	-	28	62	3	12	21	5	1	0	
17	65	49	118	53	207	315	327	110	140	247	146	61	173	175	160	268	170	80	43	11	37	66	11	6	43	50	-	22	61	5	9	10	1	0	0	
18	89	53	86	72	167	213	319	99	111	151	142	64	132	116	87	225	169	66	33	10	19	52	5	10	49	35	-	25	50	6	12	9	5	1	0	
19	111	41	50	79	212	199	326	108	99	85	141	41	119	126	60	158	148	32	31	8	21	33	5	7	25	31	-	18	26	4	10	9	7	0	1	
20	97	36	45	83	184	146	310	95	97	68	124	32	136	78	46	108	107	28	35	9	7	24	7	16	17	14	-	11	25	3	8	4	4	1	0	
21	100	37	27	53	184	121	245	96	84	51	111	23	96	65	25	86	89	25	23	10	8	14	4	19	6	10	-	11	16	0	8	9	4	0	1	
22	67	33	22	54	138	105	176	79	68	39	56	19	97	38	28	52	62	20	38	10	4	9	7	15	6	4	-	5	15	3	3	10	6	1	0	
23	63	22	17	44	104	107	146	73	42	39	38	13	65	55	24	29	41	16	28	17	2	6	3	17	4	5	-	7	22	2	2	3	1	0	2	
24	38	17	13	25	77	68	91	40	37	38	24	10	58	32	15	27	47	33	31	15	1	1	3	18	4	2	-	4	20	4	4	10	6	0	0	
25	34	14	9	21	40	85	53	48	28	29	26	5	47	23	14	29	35	24	28	10	0	7	2	9	9	6	-	4	30	2	5	5	3	1	0	
26	36	10	7	14	32	39	49	20	17	30	28	2	25	26	11	19	30	31	27	18	5	6	2	12	10	0	-	2	20	5	2	2	1	1	1	
27	16	10	1	5	32	43	38	13	8	22	13	3	27	20	13	17	21	15	20	21	3	5	0	8	9	3	-	7	20	3	9	2	5	1	1	
28	34	6	2	11	12	33	16	17	13	10	8	3	14	14	8	13	25	20	9	11	4	5	0	4	6	0	-	6	16	2	3	1	4	2	0	
29	13	3	1	5	9	30	12	7	7	12	10	1	17	7	7	17	15	22	10	10	6	1	0	4	7	3	-	5	7	3	4	4	2	1	1	
30	14	6	2	3	13	10	14	5	7	7	7	0	10	7	3	8	13	17	8	10	2	1	1	9	13	1	-	3	5	4	5	3	5	1	1	
31	8	1	2	2	4	12	1	8	3	8	8	2	13	5	11	7	8	4	4	16	2	1	0	7	8	1	-	2	7	1	2	5	5	1	1	
32	6	0	1	2	6	4	3	2	1	4	3	1	4	2	4	5	6	4	6	11	3	1	0	6	3	4	-	2	7	3	1	3	0	0	0	
33	5	1	2	0	1	1	4	6	0	3	2	1	3	4	5	9	9	6	10	12	2	1	1	0	4	1	-	2	4	1	2	5	2	0	1	
34	1	2	0	0	0	1	0	1	1	2	2	0	3	3	5	1	10	2	7	10	3	0	0	0	5	2	-	3	4	1	1	1	1	0	1	
35	4	0	0	4	0	3	1	0	0	0	1	1	1	1	3	4	6	3	4	4	3	1	0	2	3	0	-	1	5	1	2	2	2	0	1	
36	1	0	1	0	0	0	1	0	0	0	1	0	2	0	0	2	4	3	4	4	2	1	0	2	3	2	-	4	0	1	2	0	2	1	1	
37	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	1	1	3	1	2	2	0	1	3	2	-	2	2	0	2	3	5	0	1	
38	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	2	1	5	4	2	2	0	0	4	2	-	1	4	0	1	8	3	0	0	
39	2	0	0	0	0	0	0	0	0	3	0	0	0	1	0	1	1	3	5	0	2	2	0	0	2	0	-	0	1	0	1	1	0	0	0	
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	2	2	0	1	3	2	-	0	0	0	0	1	0	0	0	
41	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	3	0	0	2	0	0	0	0	-	1	1	0	2	1	0	0	0	
42	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	-	0	0	0	1	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	-	0	0	0	0	3	0	0	0	
44	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	0	0	1	
45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	-	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	-	1	0	0	0	0	0	0	0	0
Total	949	575	769	781	2,422	2,717	2,914	1,321	1,300	2,771	1,765	657	1,984	1,370	1,146	1,699	1,364	907	527	262	392	557	108	213	387	351	-	211	547	61	128	170	97	13	17	

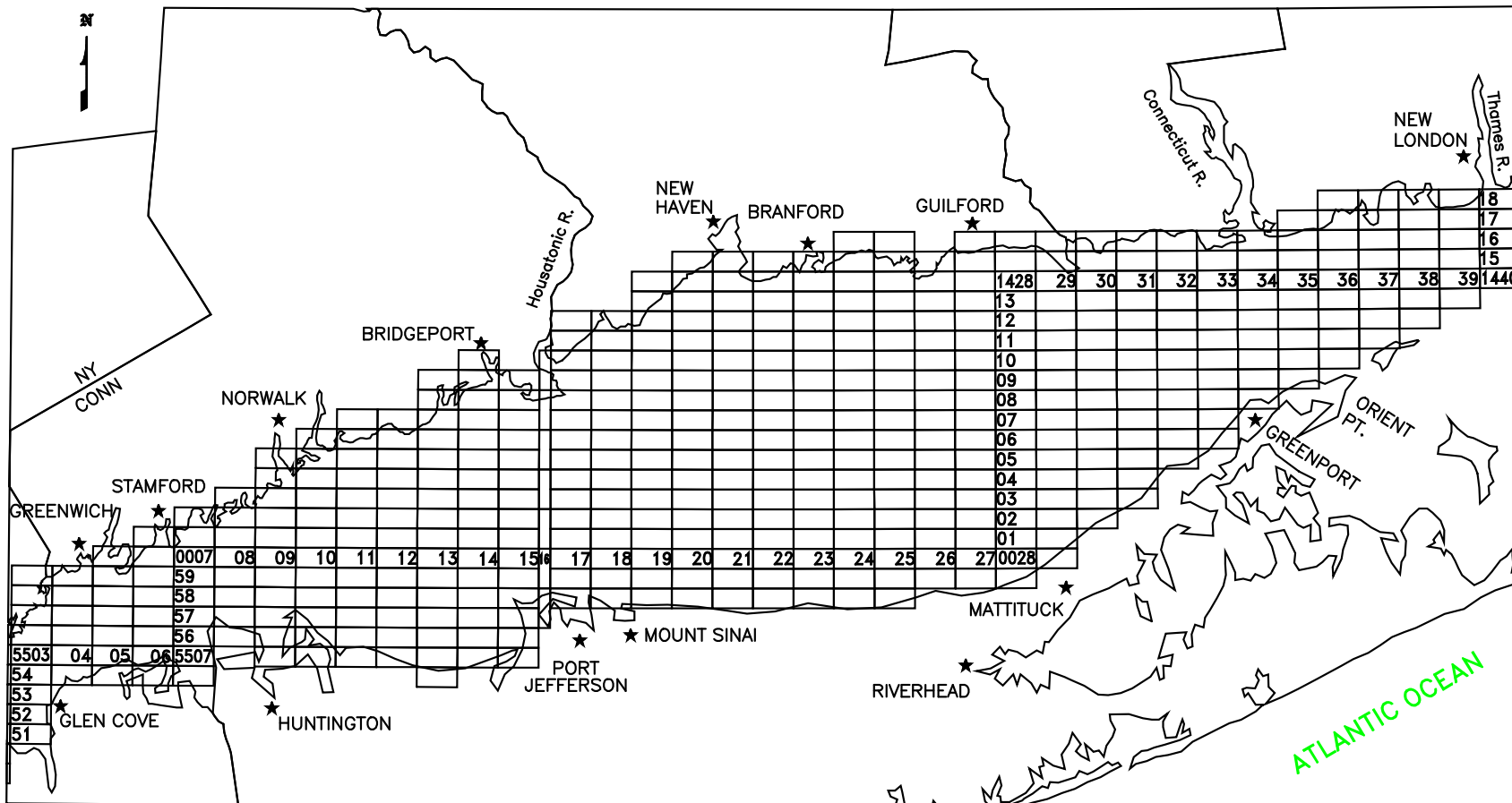
**Table 5.64. Winter skate length frequencies, spring and fall, 2 cm intervals (midpoint given), 1995-2018.**

Winter skate were scheduled to be measured from every tow. However, the following numbers of skate were not measured: 4 in 1995, 10 in 1996, and 2 in 1997.

length	Spring																							
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
27	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	1	0	0	0	1
37	0	0	0	0	0	0	1	0	0	3	0	0	1	1	1	1	1	7	7	2	0	0	1	0
39	0	0	0	0	0	0	0	1	2	2	0	0	1	0	1	0	1	5	3	3	2	1	2	0
41	0	0	0	0	0	0	0	1	1	2	0	0	1	1	1	2	0	4	3	5	1	0	0	1
43	0	0	0	0	0	3	0	1	2	4	1	0	0	1	2	1	0	0	9	3	0	0	0	0
45	0	0	0	0	1	3	0	0	0	6	0	0	2	1	1	2	0	7	5	4	0	0	0	0
47	0	0	0	0	0	2	0	0	0	4	3	0	3	0	0	0	1	1	3	5	0	1	0	0
49	0	0	0	0	0	2	0	0	1	2	1	1	2	2	2	0	0	3	2	7	1	0	0	0
51	0	1	0	1	0	0	0	1	1	0	1	0	0	0	1	0	0	3	3	2	1	2	0	0
53	0	0	0	0	1	3	1	0	1	0	0	1	1	0	1	0	0	1	3	6	2	1	0	0
55	0	0	2	3	1	1	0	0	1	1	4	3	0	1	0	0	2	5	5	4	1	0	0	0
57	1	2	4	3	2	0	0	0	6	0	0	1	2	1	3	0	2	2	4	2	3	1	1	0
59	5	4	1	5	3	2	0	1	1	2	0	1	0	0	2	1	0	2	2	3	2	2	0	0
61	1	5	2	1	0	0	3	1	1	1	3	1	1	3	2	0	1	2	4	1	1	1	0	0
63	2	2	2	4	1	0	0	1	2	3	2	2	0	1	1	0	2	1	3	1	1	0	0	0
65	4	2	4	7	0	0	0	0	0	0	1	1	1	2	0	0	2	3	2	0	0	1	0	0
67	1	1	2	2	1	1	0	1	1	1	3	3	0	1	1	1	2	3	2	2	0	0	0	0
69	2	0	1	4	2	0	0	1	4	1	0	1	2	3	2	0	3	1	2	4	0	1	1	0
71	1	3	2	3	1	2	2	1	2	2	0	1	2	3	0	0	0	4	1	1	2	0	0	0
73	0	3	0	0	0	1	2	4	0	2	1	4	3	1	1	1	3	5	2	3	0	3	0	0
75	4	4	1	5	3	1	2	1	3	1	0	1	4	3	3	4	3	5	0	0	1	0	0	1
77	0	2	3	6	7	2	1	1	1	1	0	0	2	4	0	1	2	0	1	3	1	0	0	0
79	1	2	1	4	1	1	2	3	1	1	1	0	4	3	2	1	4	2	0	0	1	0	1	0
81	0	4	0	3	2	1	1	2	3	3	0	1	1	1	1	0	2	3	0	1	0	0	0	0
83	0	3	0	2	0	0	1	0	1	1	0	0	1	0	3	1	1	4	0	2	1	0	0	0
85	0	2	1	1	0	3	1	2	1	0	0	0	0	0	0	0	0	3	1	0	1	0	0	0
87	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0
89	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Total	22	40	27	55	26	29	18	26	37	45	18	23	37	35	32	16	30	77	72	67	25	15	6	3

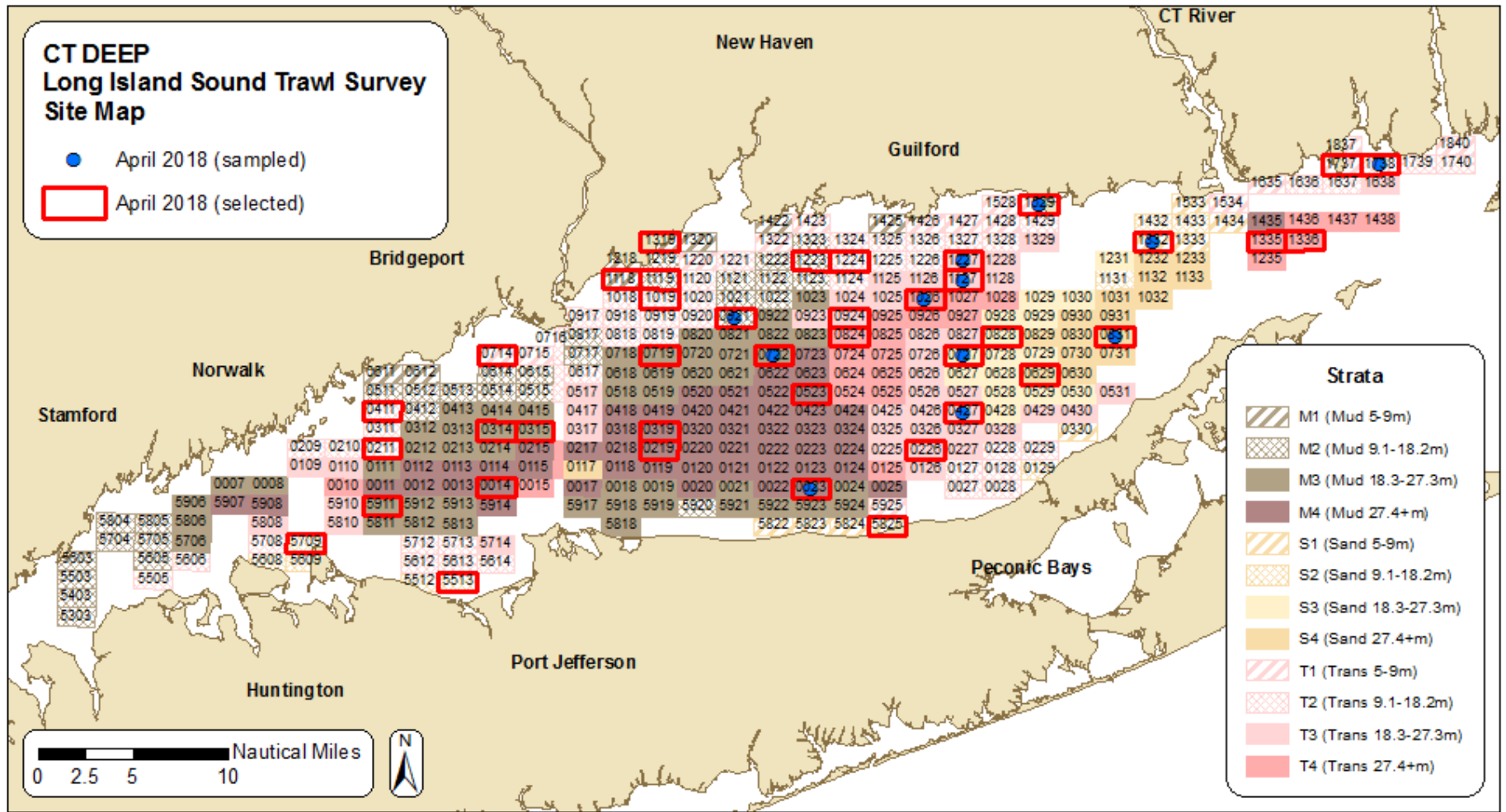
length	Fall																							
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0
39	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	-	0	2	0	0	0	0	0	0
41	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	0	1	0
43	0	0	2	0	0	0	0	2	0	0	0	0	0	1	0	-	2	1	1	0	1	0	0	0
45	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	-	0	4	3	2	1	0	1	0
47	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	-	0	1	0	1	0	0	1	0
49	1	5	1	0	0	0	0	0	0	0	1	0	0	0	0	-	0	1	4	1	0	0	0	0
51	0	0	1	0	2	0	2	0	0	0	0	0	1	0	0	-	0	2	1	0	0	0	0	0
53	2	0	2	1	0	0	1	1	0	0	1	0	0	0	0	-	0	2	0	1	0	0	0	0
55	1	2	1	0	1	0	4	0	0	0	0	0	0	1	0	-	0	0	1	2	0	1	0	0
57	2	6	2	0	0	0	0	3	0	0	2	0	0	1	1	-	3	0	0	0	0	0	1	0
59	2	2	2	1	0	0	1	1	0	0	0	0	0	0	1	-	0	1	0	0	1	1	0	0
61	0	5	0	0	0	0	3	0	0	0	0	0	1	0	0	-	0	0	1	1	1	0	1	0
63	1	4	1	0	0	0	1	0	0	0	2	0	0	0	0	-	0	0	1	1	0	0	0	0
65	2	3	0	1	1	0	0	1	0	3	0	0	0	1	1	-	1	0	0	0	0	0	1	0
67	1	2	2	1	0	0	2	0	0	0	3	0	1	1	1	-	0	0	1	2	1	0	1	0
69	0	2	1	1	0	0	0	1	0	0	0	0	1	1	1	-	0	1	3	0	0	0	2	0
71	0	0	0	0	0	0	0	1	0	2	0	0	2	1	1	-	0	0	1	2	0	0	2	0
73	0	2	1	1	1	0	0	2	0	1	1	0	0	0	0	-	1	1	0	1	0	0	0	0
75	1	3	1	0	1	0	1	1	0	1	1	0	1	1	1	-	0	1	0	0	0	0	2	0
77	0	1	0	0	0	0	1	2	0	1	0	0	0	2	0	-	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	-	0	0	0	0	0	0	0	0
81	0	0	0	1	0	0	1	1	0	0	1	0	1	1	1	-	0	1	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	-	0	1	0	0	0	0	0	0
85	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	-	0	0	0	0	0	0	0	0
Total	15	37	19	7	7	1	20	19	0	9	13	0	7	16	11	-	7	20	17	14	5	2	13	0

**FIGURES 5.1 - 5.18  
LISTS**



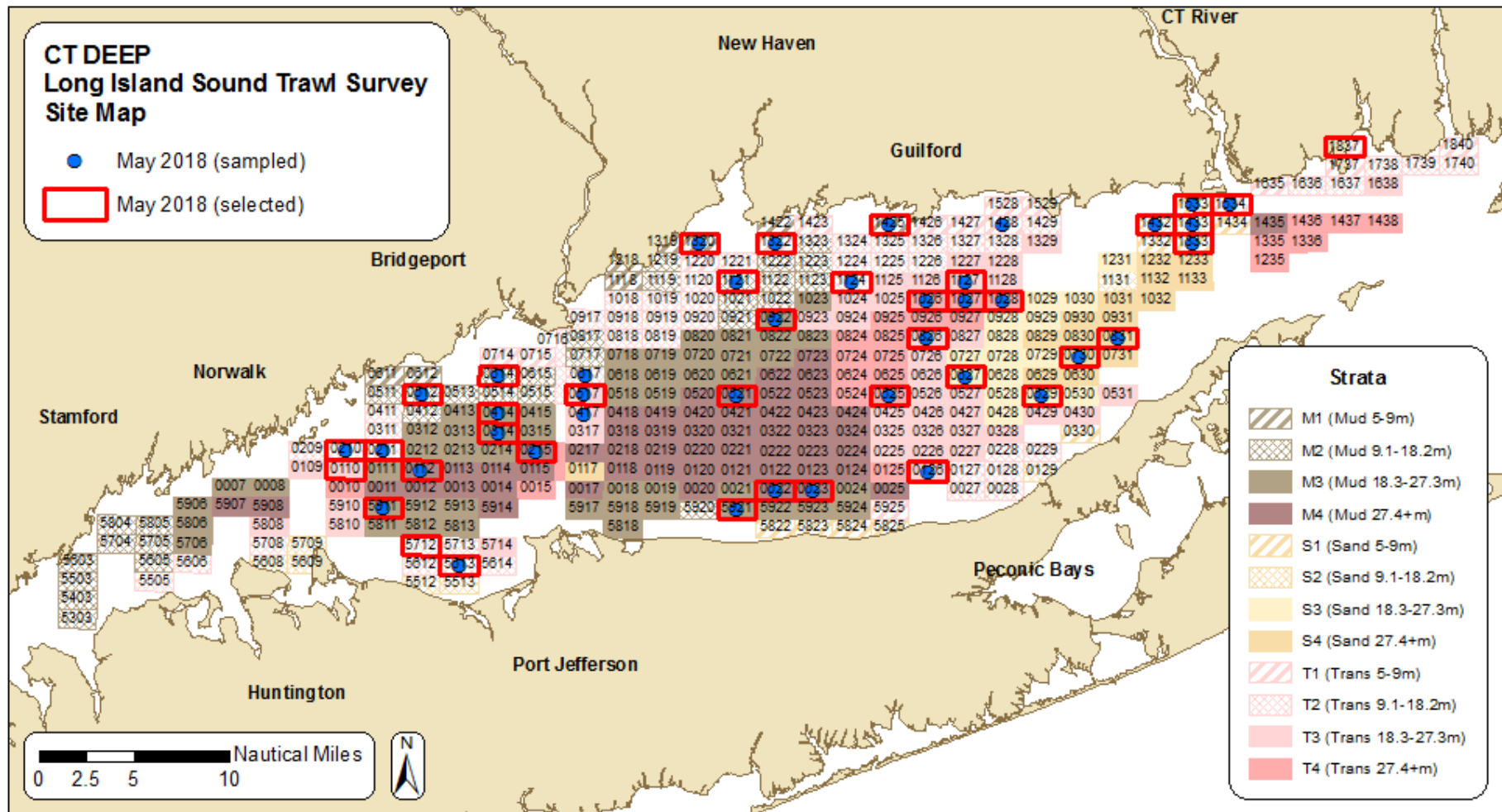
**Figure 5.1. Trawl Survey site grid.** Each sampling site is 1x2 nmi (nautical miles). A four-digit number identifies the site: the first two digits are the row numbers (corresponding to minutes of latitude) and the last two digits are the column numbers (corresponding to two nautical miles in length on the longitudinal axis). Examples: site 1428 near Guilford and 0028 near Mattituck. (Note: The sites in column 16 are approximately 2x1 nmi. The grid was drawn on the Eastern and Western Long Island Sound 80,000:1 nautical charts, which overlap by the area in column 16.)

**Figure 5.2. April 2018 sites selected and sampled.** The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the “Notice to Fishermen” are noted in table below map.



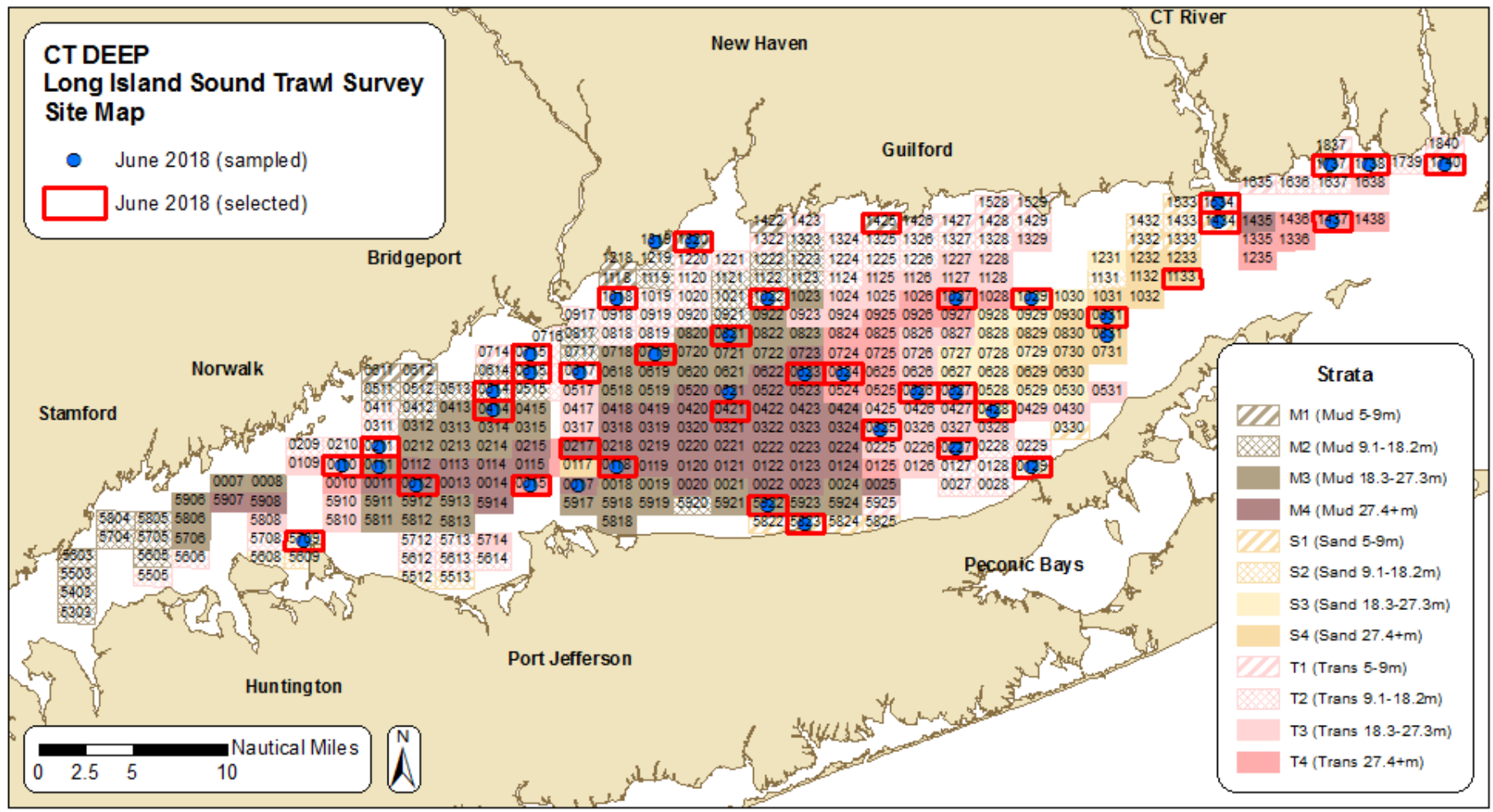
Month	Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
						No sites were moved during this cruise, although only 12 of the 40 were sampled this month due to R/V being unavailable until late in April

**Figure 5.3. May 2018 sites selected and sampled.** The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the “Notice to Fishermen” are noted in table below map.



Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
SP2018040	0417	T3	0110	T3	time constraints
SP2018041	0617	T2	5712	T2	time constraints
SP2018047	1428	T1	1837	T1	time constraints

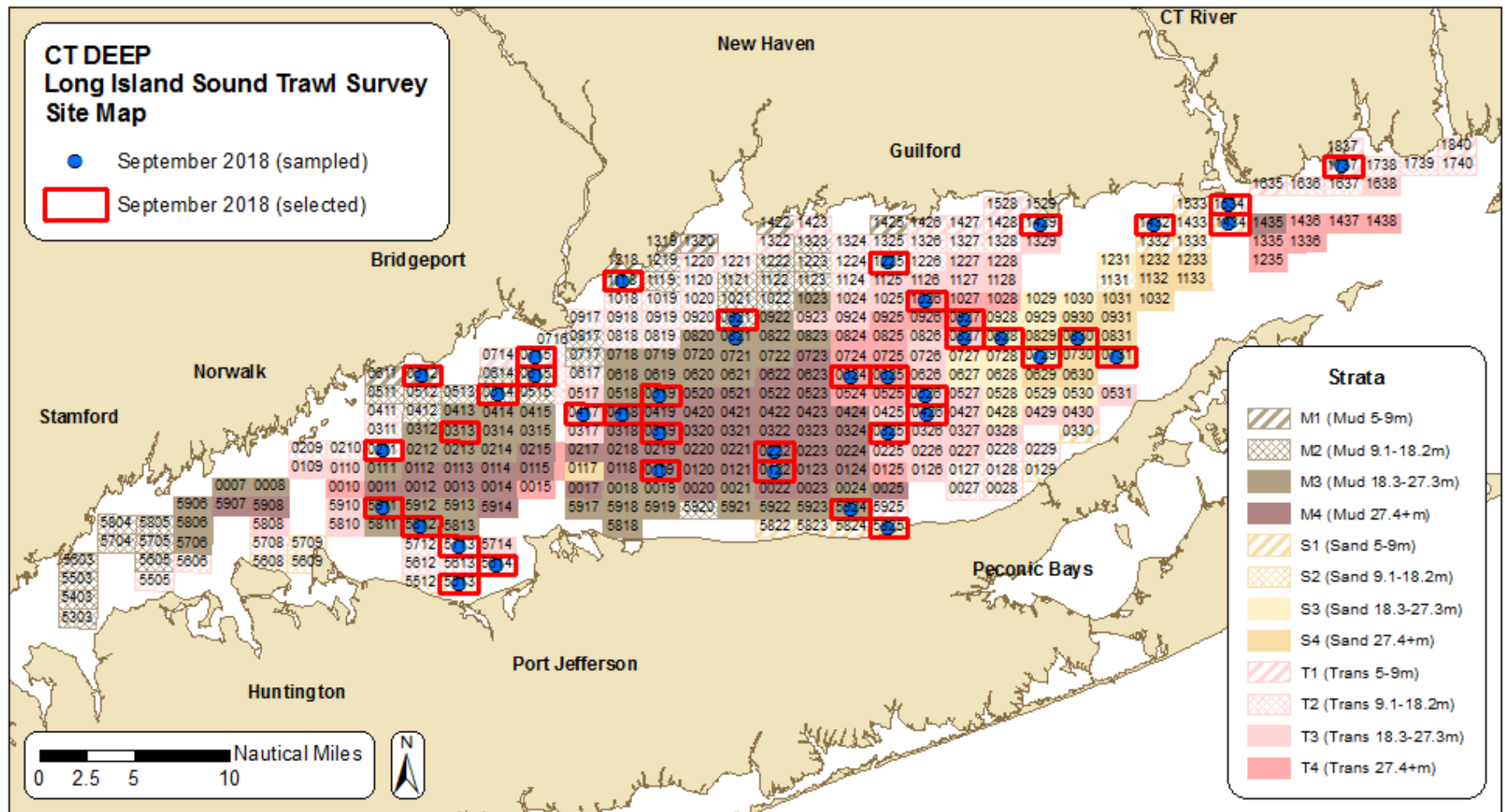
**Figure 5.4. June 2018 sites selected and sampled.** The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the “Notice to Fishermen” are noted in table below map.



Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
SP2018063	0831	S4	1133	S4	attempted 1133 unsuccessfully then moved site
SP2018073	0521	M4	0421	M4	trouble with pot gear in the past
SP2018087	0017	M4	0217	M4	trouble with pot gear in the past
SP2018091	1319	M1	1425	M1	time constraints

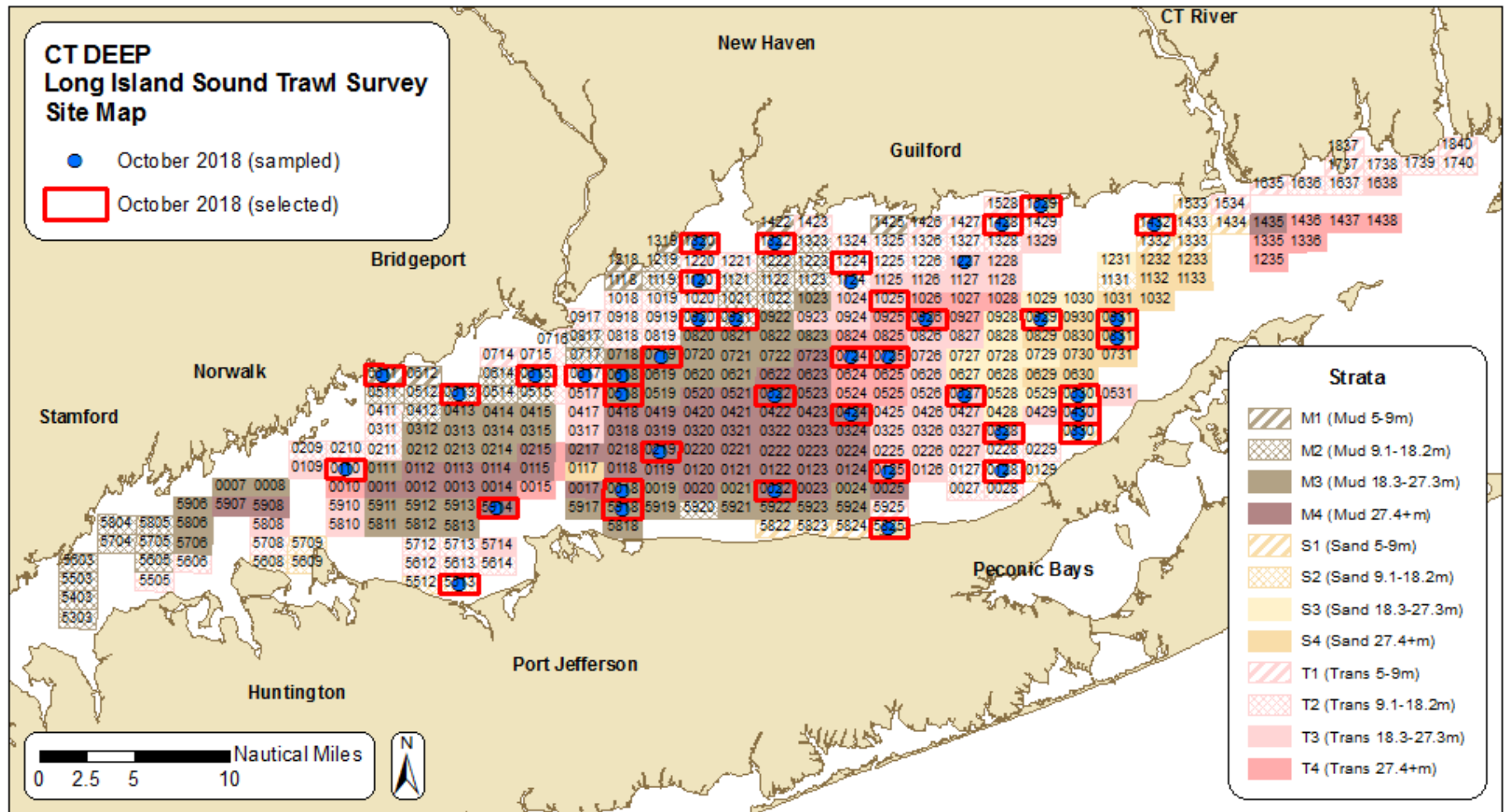


**Figure 5.5. September 2018 sites selected and sampled.** The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the “Notice to Fishermen” are noted in table below map.



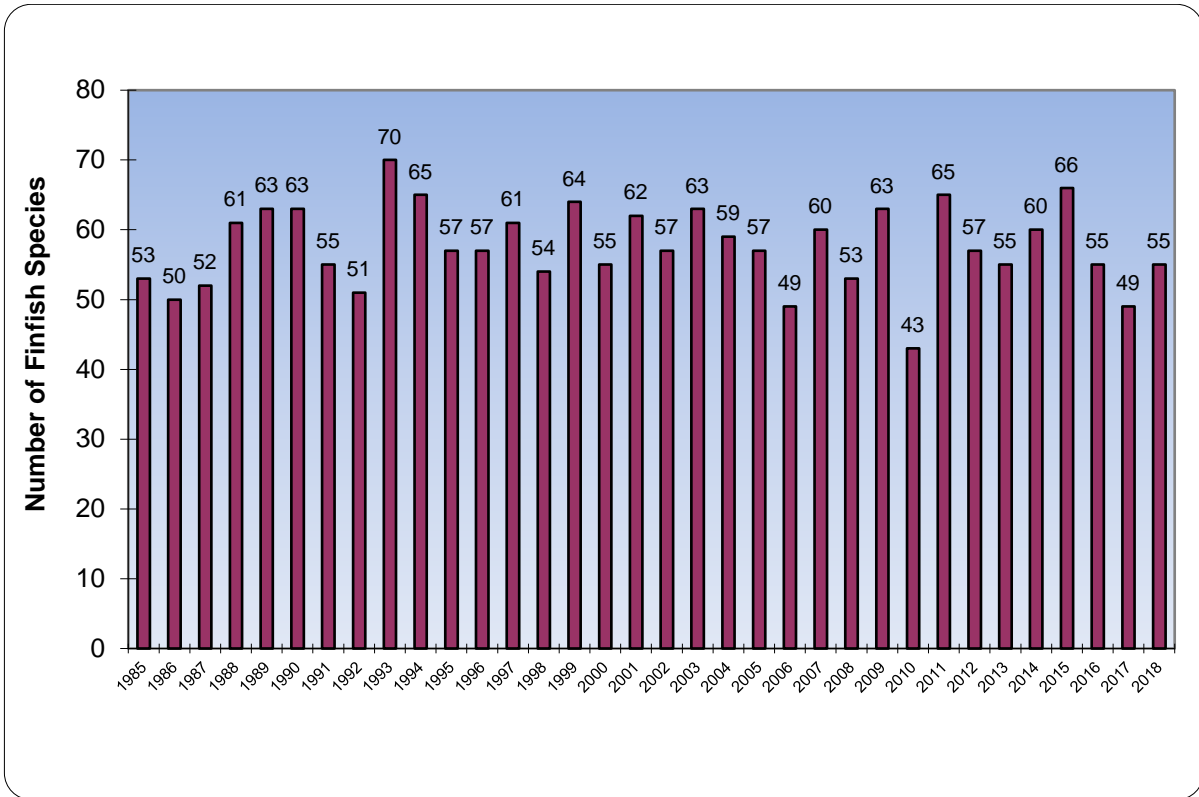
Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
FA2018036	0821	M3	0313	M3	time constraints

**Figure 5.6. October 2018 sites selected and sampled.** The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the “Notice to Fishermen” are noted in table below map.

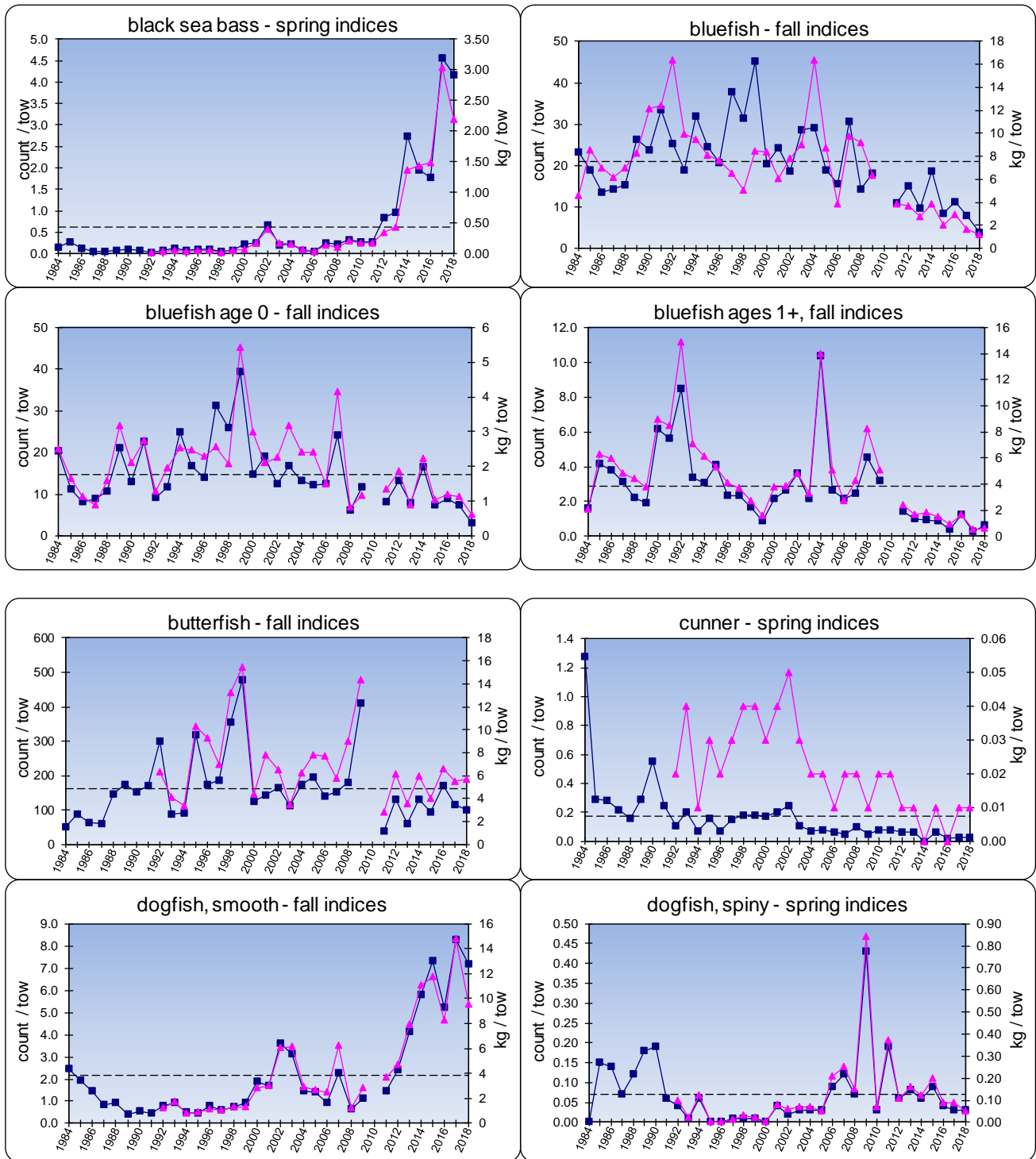


Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
FA2018051	1227	T3	1025	T3	time constraints
FA2018056	1124	T2	1224	T2	trouble with pot gear in the past

**Figure 5.7. Number of finfish species observed annually, 1984-2018.** *Note: not all years have the same number of tows. See Table 5.4 for details on number of tows completed each year. Average number of finfish species caught per year is 57.5 for the time-series*

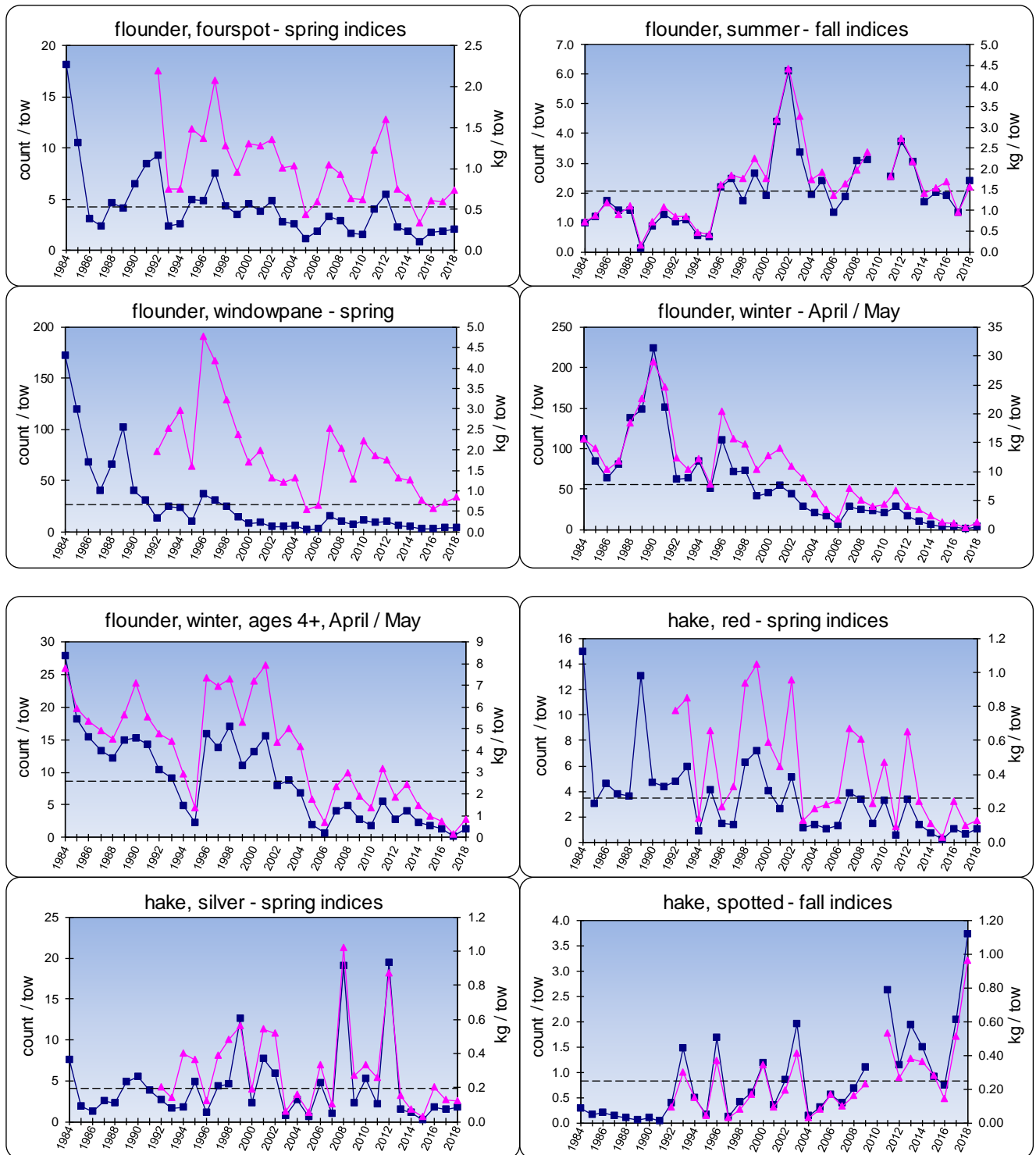


**Figure 5.8. Plots of abundance indices for: black sea bass, bluefish (total, age 0, and ages 1+), butterfish, cunner, and dogfish (smooth and spiny).**



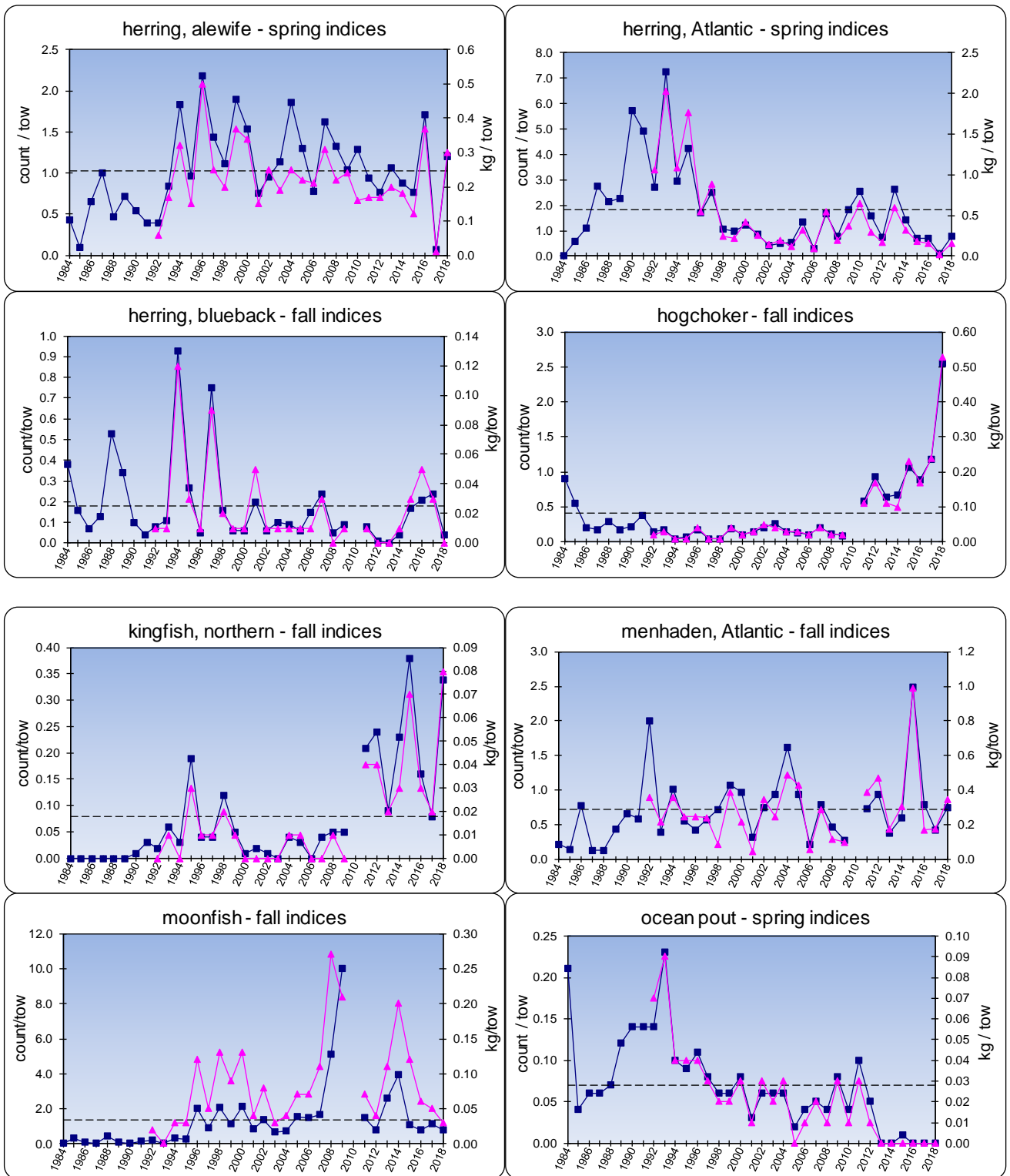
Legend:  
 ■ = count / tow  
 ▲ = kg / tow  
 --- = mean count / tow

**Figure 5.9. Plots of abundance indices for: flounders (fourspot, summer, windowpane, winter, and winter ages 4+) and hakes (red, silver, and spotted).**



Legend:  
 ■ = count / tow  
 ▲ = kg / tow  
 --- = mean count / tow

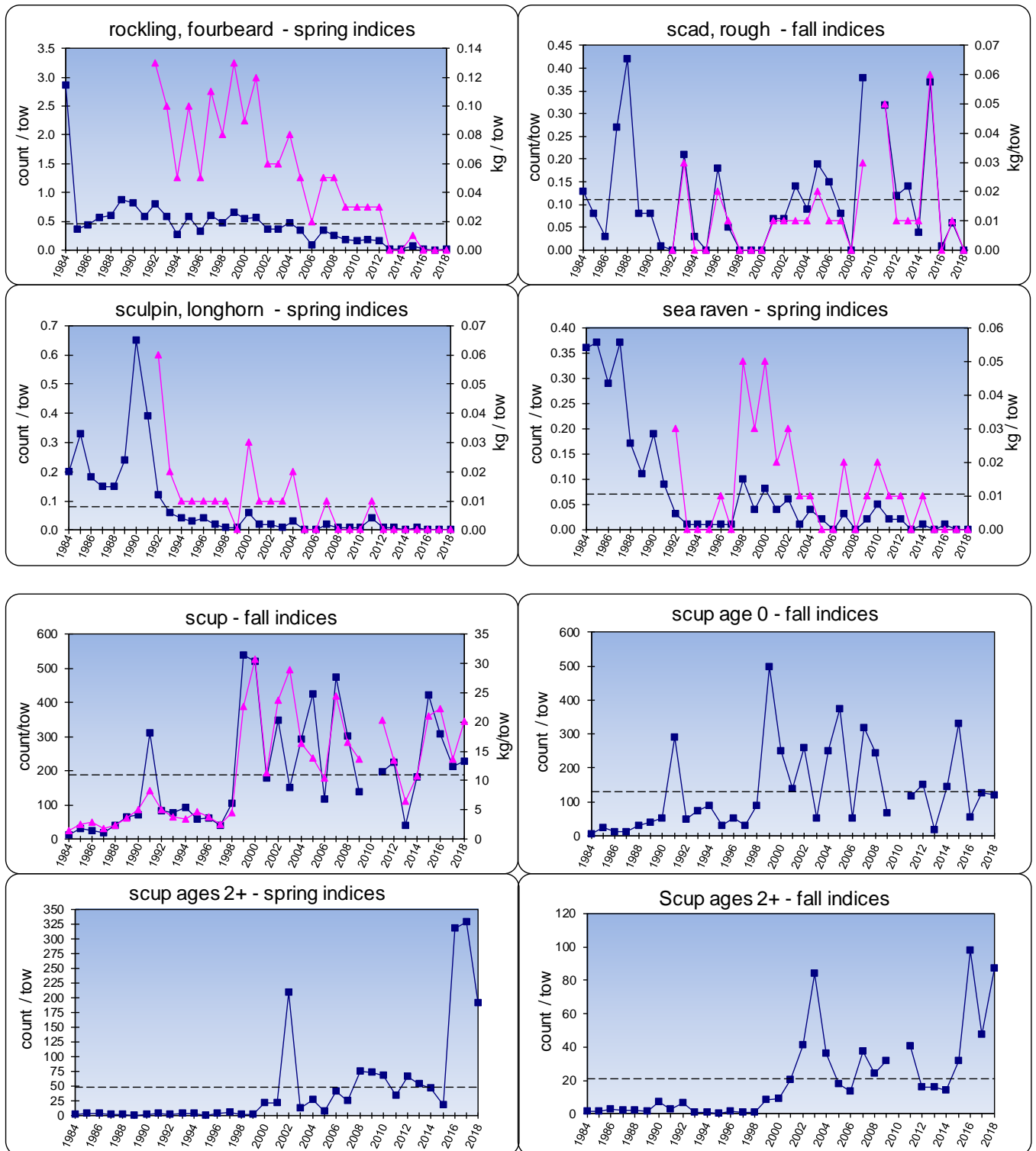
**Figure 5.10. Plots of abundance indices for: herrings (alewife, Atlantic, and blueback), hogchoker, Northern kingfish, Atlantic menhaden, moonfish, and ocean pout.**



Legend:  
■ = count / tow  
▲ = kg / tow  
 ---- = mean count / tow

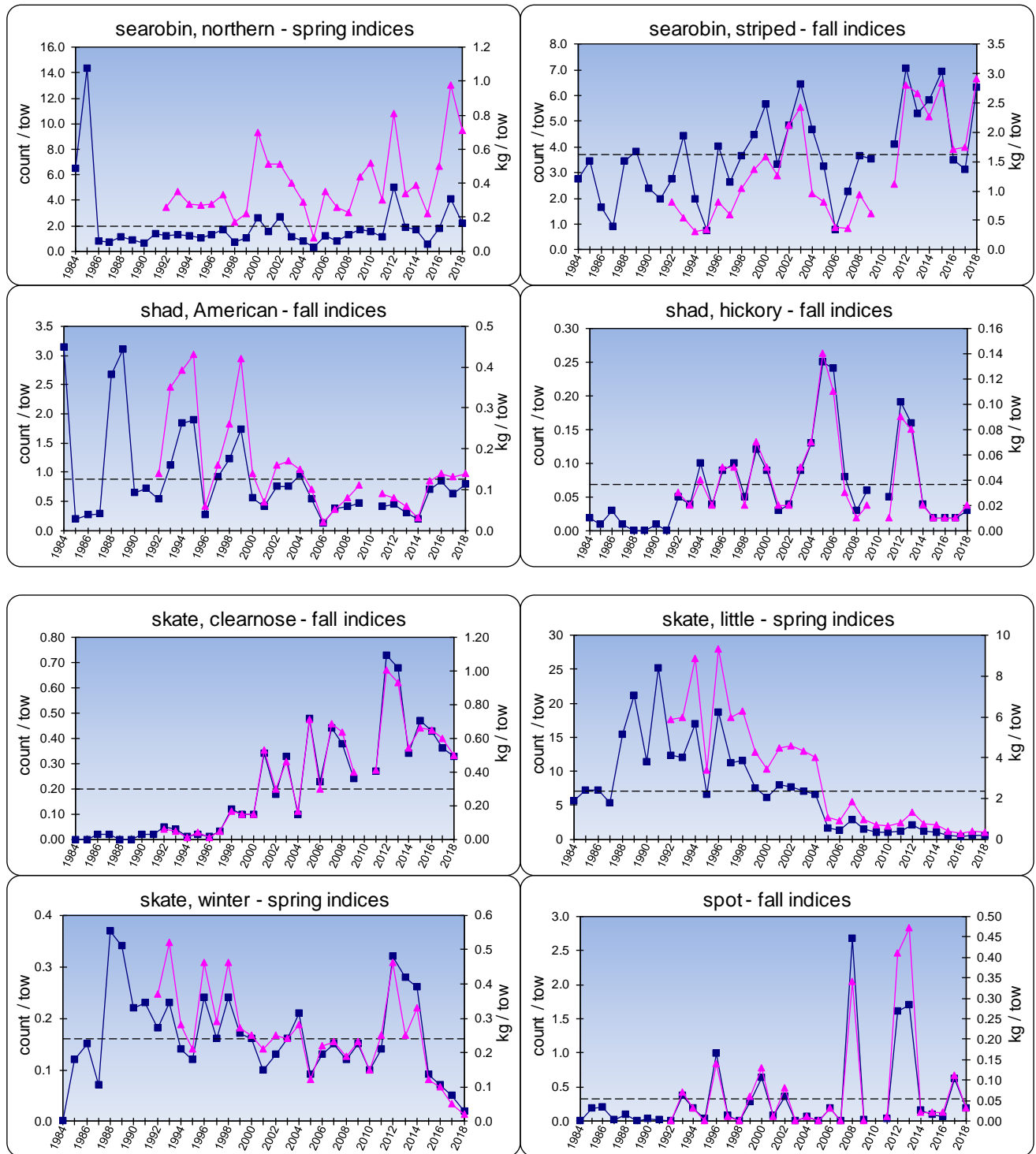


**Figure 5.11. Plots of abundance indices for: fourbeard rockling, rough scad, longhorn sculpin, sea raven, and scup (all ages, age 0, and ages 2+).**



Legend:  
■ = count / tow  
▲ = kg / tow  
 ---- = mean count / tow

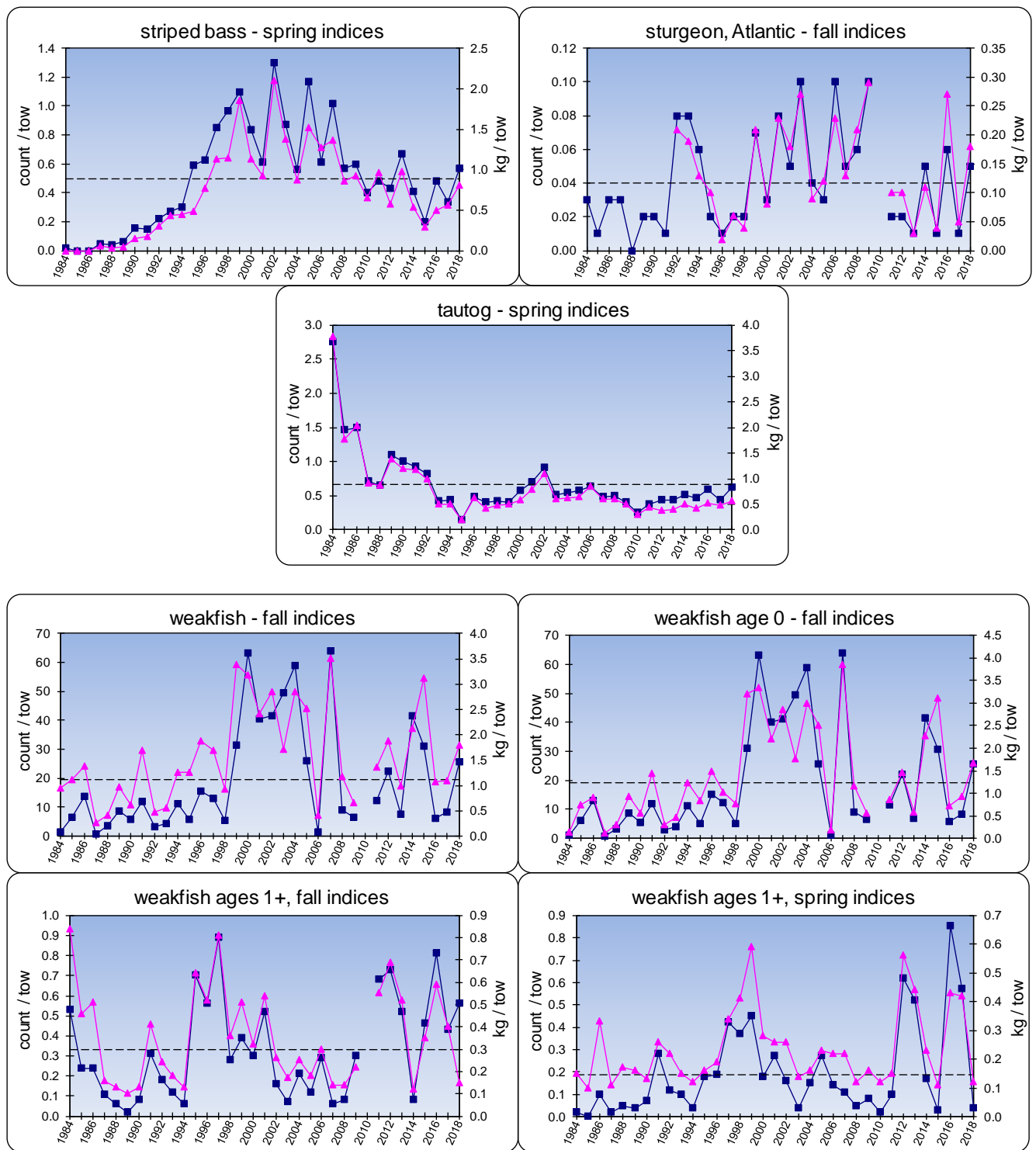
**Figure 5.12. Plots of abundance indices for: searobins (striped and northern), shad (American and hickory), skates (clearnose, little, and winter), and spot.**



Legend:  
■ = count / tow  
▲ = kg / tow  
 --- = mean count / tow



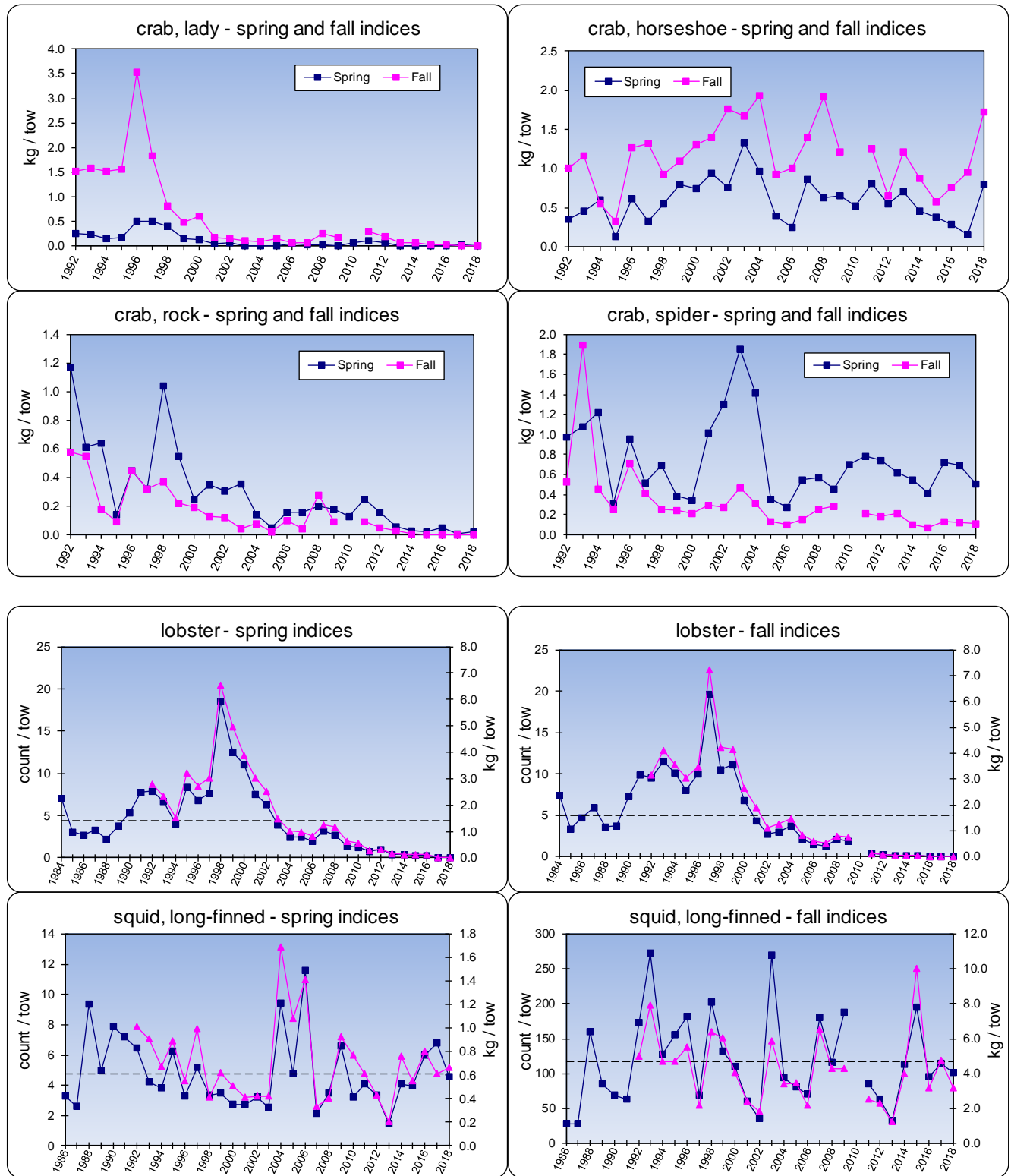
**Figure 5.13. Plots of abundance indices for: striped bass, Atlantic sturgeon, tautog, and weakfish (all ages, age 0, and ages 1+).**



Legend:

- = count / tow
- ▲ = kg / tow
- = mean count / tow

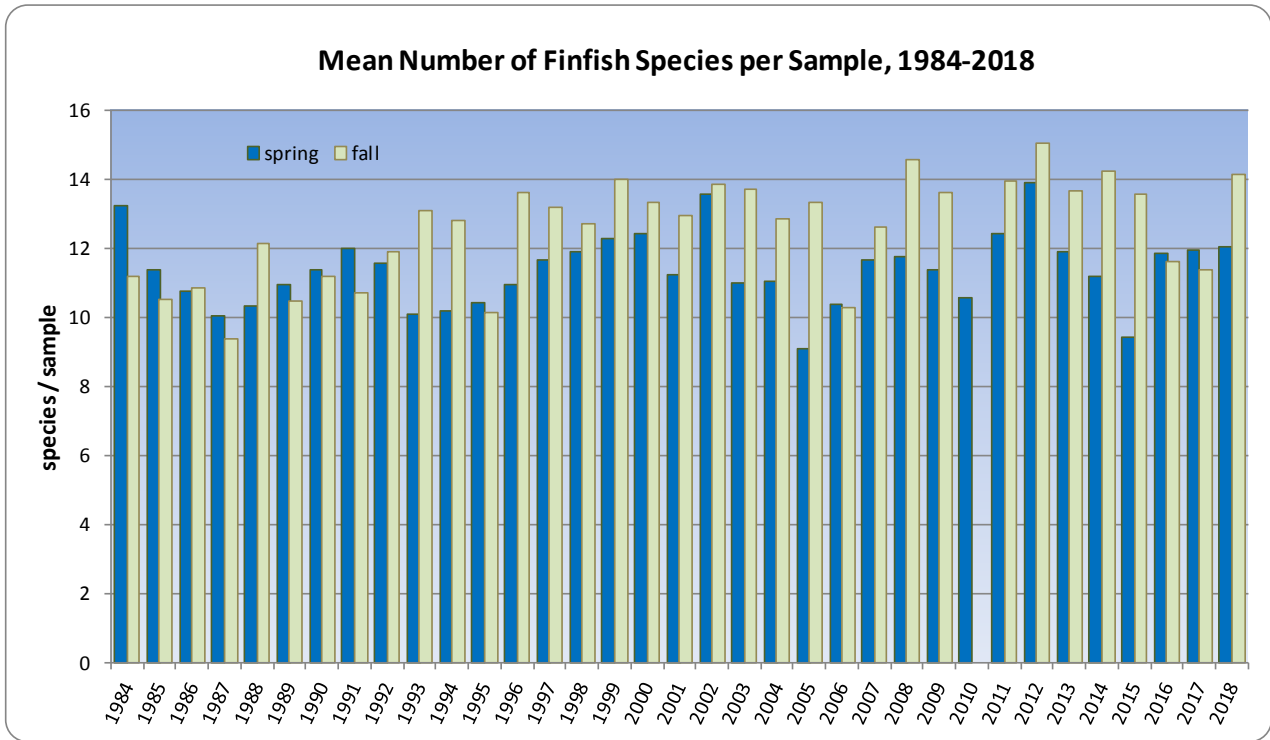
**Figure 5.14. Plots of abundance and biomass indices for: crabs (lady, rock, and spider), horseshoe crab, American lobster, and long-finned squid.**



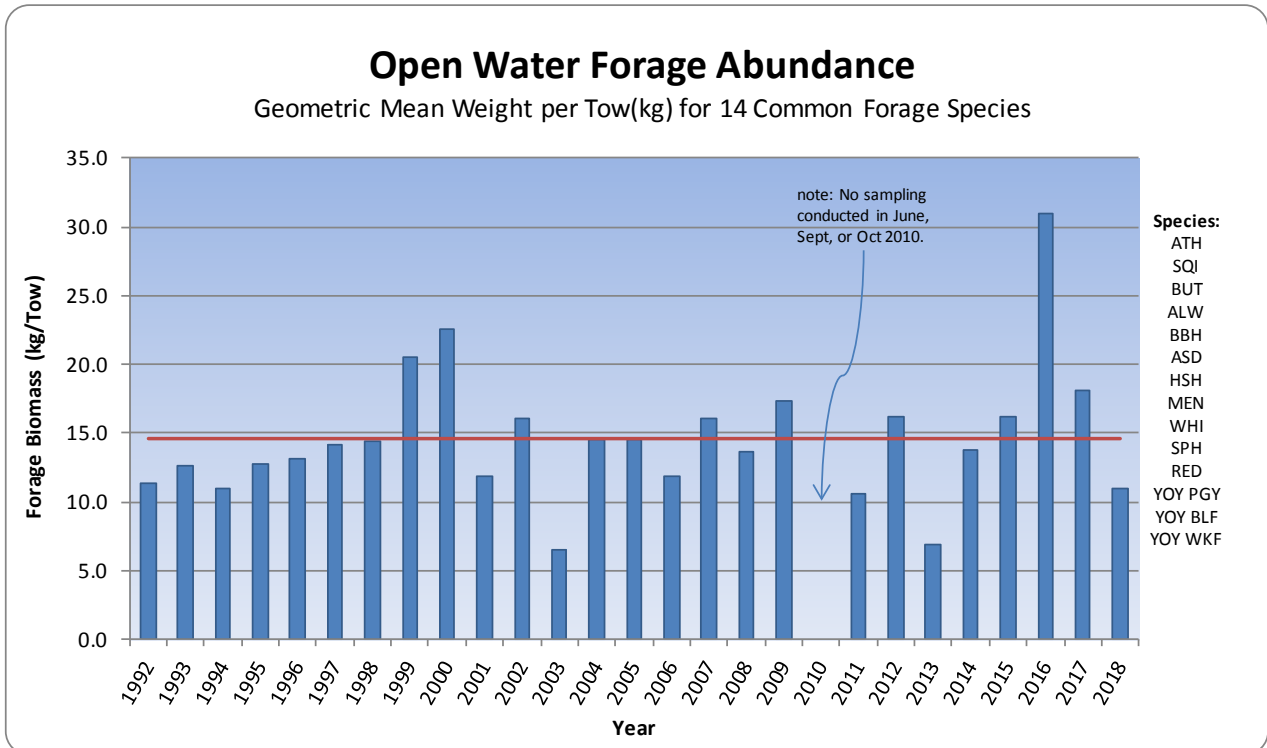
Legend for bottom four graphs:

- = count / tow
- ▲ = kg / tow
- = mean count / tow

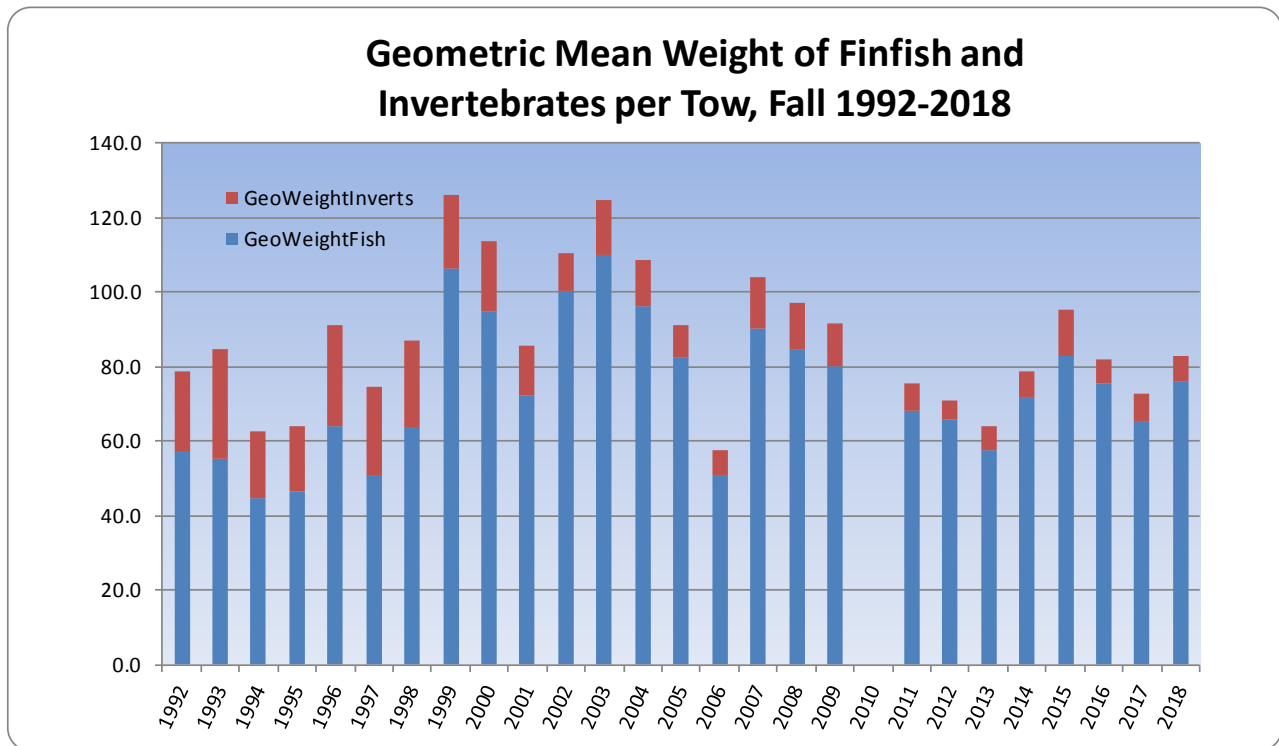
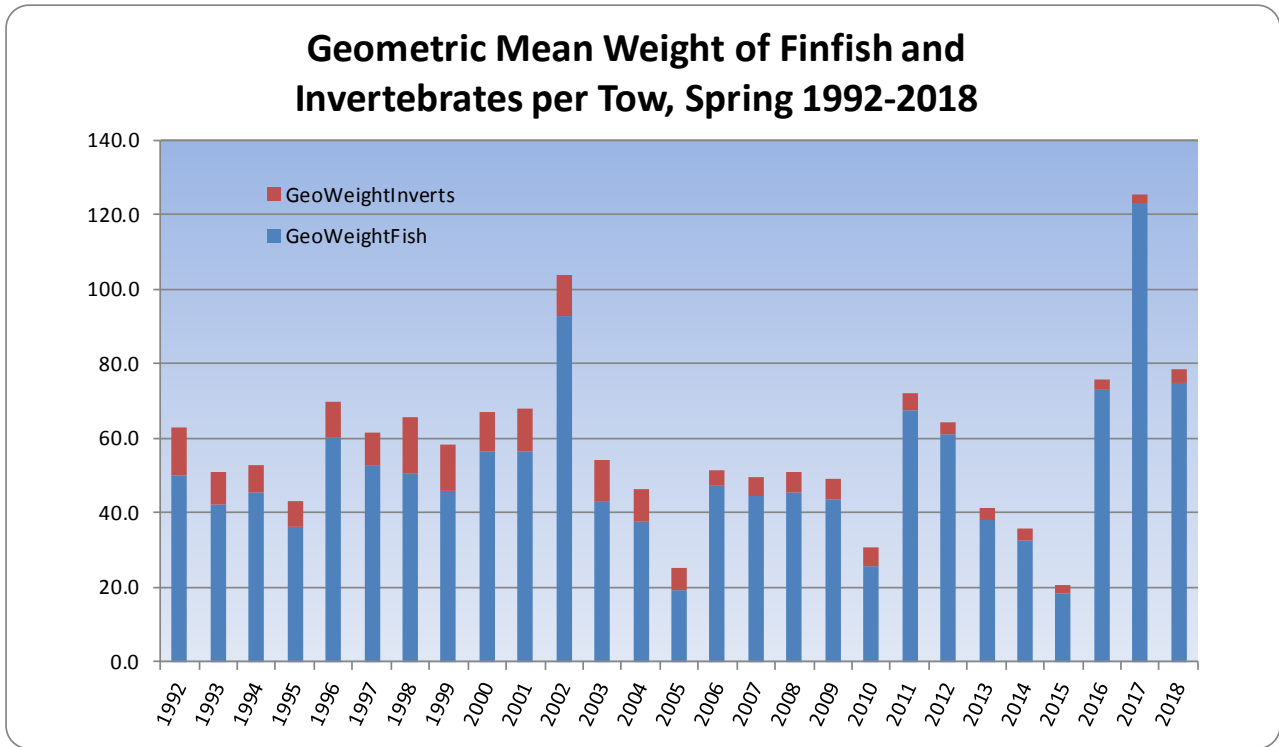
**Figure 5.15. Mean number of finfish species per sample, spring and fall, 1984-2018.** This index measures the diversity of species supported within the Sound's various habitats.



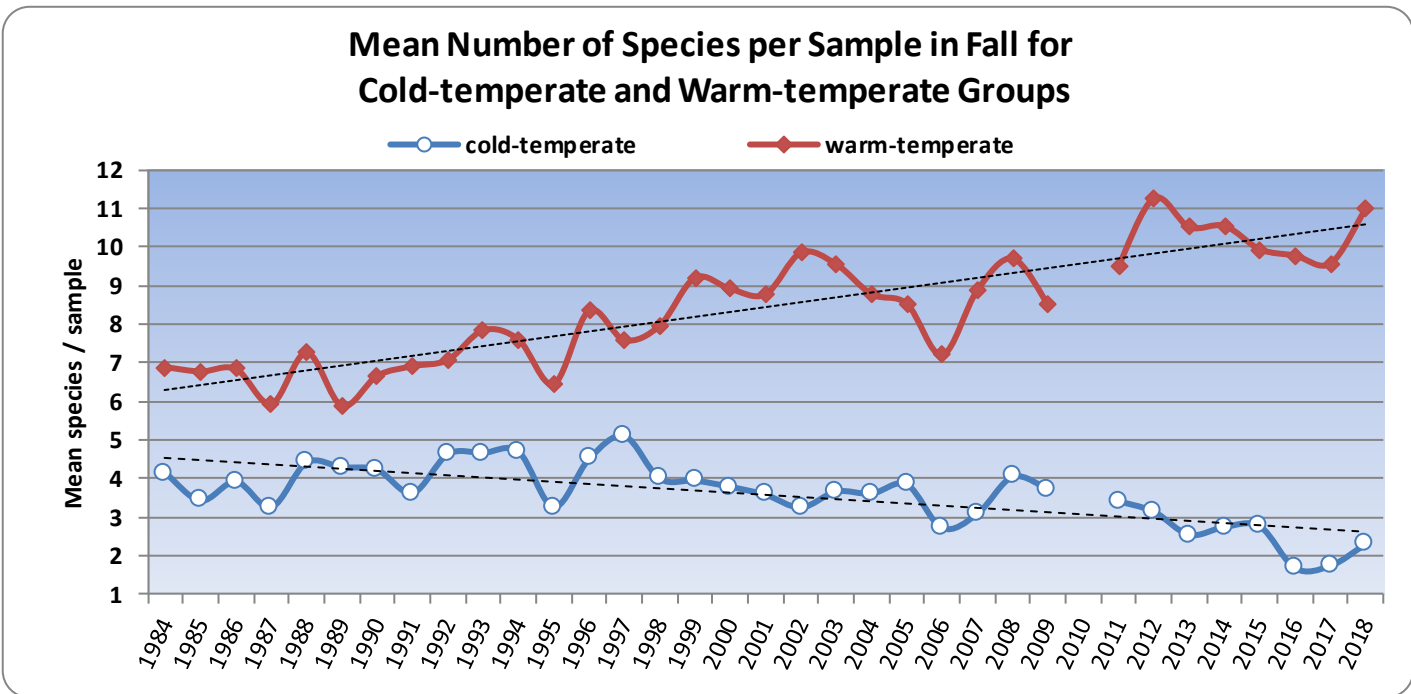
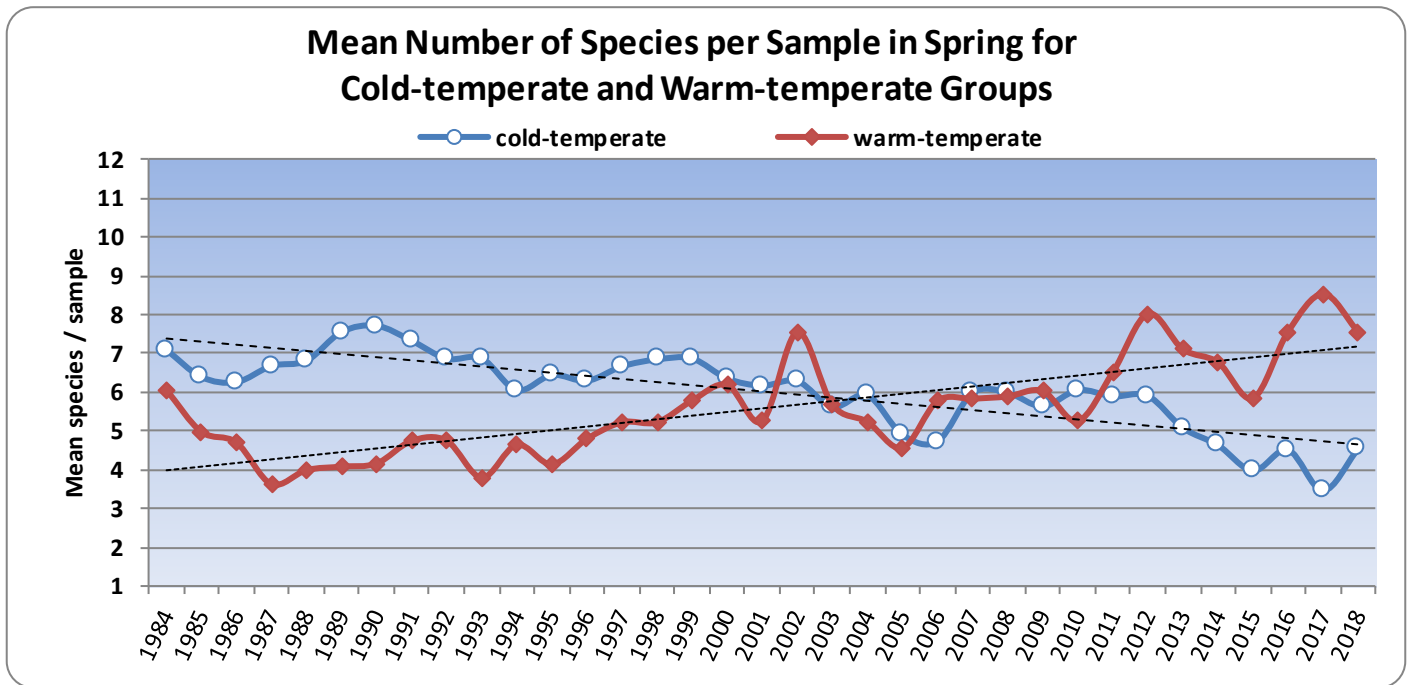
**Figure 5.16. Open water forage abundance, 1992-2018.** The geometric mean is calculated as the aggregate sample biomass per tow of 14 of the most common forage species sampled in the survey. This index measures the available food base which supports both resident and migratory species. The average since 1992 is 14.56 kg/tow (red line).



**Figure 5.17. Geometric mean biomass of finfish and invertebrates per sample, spring and fall, 1992-2018.**  
 This index measures the diversity of species supported within the Sound's various habitats.



**Figure 5.18. Trends in the number of cold temperate versus warm temperate species per sample captured in spring and fall LIS Trawl Surveys.** See Appendix 2.5 for list of species included in analysis.



**APPENDICES  
LISTS**

**Appendix 5.1. List of finfish species identified by A Study of Marine Recreational Fisheries in Connecticut (F54R) and other CT DEEP Marine Fisheries programs.** LISTS has collected one hundred-eleven (111) finfish species from 1984-2018.

This appendix contains a list of 156 species identified from all sampling programs conducted since 1984 **except** Marine Angler Surveys (Jobs 1-3). Species are listed alphabetically by common name (Nelson et al. 2004). Sampling program abbreviations, survey time periods and gear type are as follows:

Survey Abbreviation	Survey Description	Time Period	Gear Type
CTR	CT River Creel Survey	1997-1998	bus stop creel survey mainstem of CT River
EPA	cooperative sampling in western LIS with EPA	1986-1990	used LISTS net
ESS (F54R)	Estuarine Seine Survey	1988 to present	7.6m (25 ft) beach seine
IS (F54R)	Inshore Survey of Juvenile Winter Flounder	1990-1994	beam trawls (also a little data from 1995-1996)
ISS (non-F54R & F54R)	Inshore Seine Surveys in CT and/or TH rivers	1979 to present	15.2m (50 ft) bag seine set by boat
LISTS (F54R)	Long Island Sound Trawl Survey	1984 to present	14m (50 ft) trawls with 2" codend mesh
MISC	misc sampling conducted on R/V Dempsey	various	various
NCA	"inshore" EPA NCA C2K sampling	2000	skiff trawls
NRRWS	sampling in western end of LIS, the "Narrows"	2000-2007	14m (50 ft) trawls with 2" codend mesh
SNFH (F54R)	Study of Nearshore Finfish Habitat	1995-1996	plankton net
SS (F54R)	Summer Survey	1991-1993, 1996	14m (50 ft) trawls with codend liner in LIS
TN	Trap Net Survey	1997-1998	trap nets in rivers

Common Name	Scientific Name	Survey
anchovy, bay	<i>Anchoa mitchilli</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC
anchovy, striped	<i>Anchoa hepsetus</i>	LISTS;ESS;IS;SS
banded rudderfish	<i>Seriola zonata</i>	LISTS;ESS
bass, largemouth	<i>Micropterus salmoides</i>	ISS;ESS;TN;CTR
bass, rock	<i>Ambloplites rupestris</i>	ISS; TN;CTR
bass, smallmouth	<i>Micropterus dolomieu</i>	ISS; TN;CTR
bass, striped	<i>Morone saxatilis</i>	LISTS;NRRWS;ESS;ISS; SS;NCA;MISC;EPA;TN;CTR
bigeye	<i>Priacanthus arenatus</i>	LISTS;IS
bigeye, short	<i>Pristigenys alta</i>	LISTS
black sea bass	<i>Centropristis striata</i>	LISTS;NRRWS;ESS;IS; SS;NCA;MISC;EPA
blenny, feather	<i>Hypsoblennius hentz</i>	LISTS;ESS
bluefish	<i>Pomatomus saltatrix</i>	LISTS;NRRWS;ESS;ISS;SS;MISC;EPA;CTR
bluegill	<i>Lepomis macrochirus</i>	TN;CTR
bonefish	<i>Albula vulpes</i>	ISS
bonito, Atlantic	<i>Sarda sarda</i>	LISTS;EPA
bullhead, brown	<i>Ameiurus nebulosus</i>	ISS;NCA;TN;CTR
burrfish, striped	<i>Chilomycterus schoepfi</i>	LISTS;ESS
burrfish, web	<i>Chilomycterus antillarum</i>	ESS
butterfish	<i>Peprilus triacanthus</i>	LISTS;NRRWS;ESS;ISS;IS; SS;NCA;MISC;EPA
butterfly fish, banded	<i>Chaetodon striatus</i>	ESS
carp	<i>Cyprinus carpio</i>	ISS;NCA;TN;CTR
catfish, channel	<i>Ictalurus punctatus</i>	ISS;NCA;TN;CTR
catfish, white	<i>Ameiurus catus</i>	NCA;TN;CTR
cod, Atlantic	<i>Gadus morhua</i>	LISTS;SS
cornetfish, bluespotted	<i>Fistularia tabacaria</i>	LISTS;ESS;IS
cornetfish, red	<i>Fistularia petimba</i>	LISTS;IS
crappie, black	<i>Pomoxis nigromaculatus</i>	ISS;NCA;TN;CTR
crappie, white	<i>Pomoxis annularis</i>	TN;CTR
croaker, Atlantic	<i>Micropogonias undulates</i>	LISTS;ISS;IS
cunner	<i>Tautoglabrus adspersus</i>	LISTS;NRRWS;ESS;ISS;IS; SS;MISC;EPA
cusck-eel, fawn	<i>Lepophidium profundorum</i>	LISTS
cusck-eel, striped	<i>Ophidion marginatum</i>	LISTS;SS
dace	<i>Rhinichthys spp.</i>	ISS
darter, tessellated	<i>Etheostoma olmstedii</i>	ISS
dogfish, smooth	<i>Mustelus canis</i>	LISTS;NRRWS;ESS;IS;SS;MISC;EPA
dogfish, spiny	<i>Squalus acanthias</i>	LISTS;NRRWS;MISC
drum, black	<i>Pogonias cromis</i>	LISTS
eel, American	<i>Anguilla rostrata</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;NCA;EPA;TN;CTR
eel, conger	<i>Conger oceanicus</i>	LISTS;IS;SS;ESS
fallfish	<i>Semotilus corporalis</i>	ISS
filefish, orange	<i>Aluterus schoepfi</i>	LISTS;IS;SS
filefish, planehead	<i>Stephanolepis hispidus</i>	LISTS;EPA
filefish, scrawled	<i>Aluterus scriptus</i>	IS

Appendix 5.1 cont.

Common Name	Scientific Name	Survey
flounder, American plaice	<i>Hippoglossoides platessoides</i>	LISTS
flounder, fourspot	<i>Paralichthys oblongus</i>	LISTS;NRRWS;IS;SS;MISC;EPA
flounder, smallmouth	<i>Etropus microstomus</i>	LISTS;NRRWS;ESS;IS;SS;NCA;MISC
flounder, summer	<i>Paralichthys dentatus</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA;TN;CTR
flounder, windowpane	<i>Scophthalmus aquosus</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA;TN;CTR
flounder, winter	<i>Pseudopleuronectes americanus</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;NCA;MISC;EPA;TN;CTR
flounder, yellowtail	<i>Limanda ferruginea</i>	LISTS;IS
goatfish, dwarf	<i>Upeneus parvus</i>	LISTS
goatfish, red	<i>Mullus auratus</i>	LISTS
goby, code	<i>Gobiosoma robustum</i>	IS
goby, naked	<i>Gobiosoma bosc</i>	LISTS;ESS;ISS;IS
goldfish	<i>Carassius auratus</i>	CTR
goosefish	<i>Lophius americanus</i>	LISTS;IS;SS;MISC
grubby	<i>Myoxocephalus aeneus</i>	LISTS;ESS;ISS;IS;SNFH;SS;EPA
gunnel, banded	<i>Pholis fasciata</i>	ESS;IS
gunnel, rock	<i>Pholis gunnellus</i>	LISTS;ESS;ISS;IS;SNFH;SS
gurnard, flying	<i>Dactylopterus volitans</i>	ESS
haddock	<i>Melanogrammus aeglefinus</i>	LISTS;SS
hake, red	<i>Urophycis chuss</i>	LISTS;NRRWS;IS;SS;MISC;EPA
hake, silver	<i>Merluccius bilinearis</i>	LISTS;NRRWS;SS;MISC;EPA
hake, spotted	<i>Urophycis regia</i>	LISTS;NRRWS;ESS;IS;SS;MISC;EPA
harvestfish	<i>Peprilus paru</i>	LISTS
herring, Atlantic	<i>Clupea harengus</i>	LISTS;NRRWS;ISS;IS;SNFH;SS;MISC;EPA
herring, Atlantic thread	<i>Opisthonema oglinum</i>	LISTS
herring, alewife	<i>Alosa pseudoharengus</i>	LISTS;NRRWS;ESS;ISS;SNFH;SS;MISC;EPA;TN;CTR
herring, blueback	<i>Alosa aestivalis</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;EPA;TN;CTR
herring, round	<i>Etrumeus teres</i>	LISTS;EPA
hogchoker	<i>Trinectes maculatus</i>	LISTS;NRRWS;ESS;ISS;IS;SS;MISC;EPA;TN
jack, blue runner	<i>Caranx crysos</i>	LISTS;EPA;ESS;ISS
jack, crevalle	<i>Caranx hippos</i>	LISTS;NRRWS;ESS;ISS;EPA
jack, yellow	<i>Caranx bartholomaei</i>	LISTS;NRRWS;ESS;IS;MISC;EPA
killifish, rainwater	<i>Lucania parva</i>	ESS
killifish, striped	<i>Fundulus majalis</i>	ESS;IS
kingfish, northern	<i>Menticirrhus saxatilis</i>	LISTS;NRRWS;ESS;ISS;IS;SS;EPA
lamprey, sea	<i>Petromyzon marinus</i>	LISTS;IS;TN
lizardfish, inshore	<i>Synodus foetens</i>	LISTS;NRRWS;ESS;ISS;IS;SS;MISC
lookdown	<i>Selene vomer</i>	LISTS;ISS
lumpfish	<i>Cyclopterus lumpus</i>	LISTS;IS;SNFH
mackerel, Atlantic	<i>Scomber scombrus</i>	LISTS;ISS;SS;EPA
mackerel, Spanish	<i>Scomberomorus maculatus</i>	LISTS;SS;EPA
menhaden, Atlantic	<i>Brevoortia tyrannus</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;NCA;MISC;EPA
minnow, sheepshead	<i>Cyprinodon variegatus</i>	ESS;ISS
moonfish	<i>Selene setapinnis</i>	LISTS;NRRWS;ESS;SS;MISC;EPA
mullet, striped	<i>Mugil cephalus</i>	ISS
mullet, white	<i>Mugil curema</i>	LISTS;ESS;ISS
mummichog	<i>Fundulus heteroclitus</i>	ESS;ISS;IS
needlefish, Atlantic	<i>Strongylura marina</i>	ESS;ISS
ocean pout	<i>Zoarces americanus</i>	LISTS;NRRWS;MISC;EPA
oyster toadfish	<i>Opsanus tau</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;EPA
perch, white	<i>Morone americana</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;NCA;TN;CTR
perch, yellow	<i>Perca flavescens</i>	ISS;SNFH;TN;CTR
perch, silver	<i>Bairdiella chrysoura</i>	LISTS;ESS
pickerel, chain	<i>Esox niger</i>	ISS;TN
pike, northern	<i>Esox lucius</i>	ISS;TN;CTR
pinfish	<i>Lagodon rhomboides</i>	LISTS
pipefish, northern	<i>Syngnathus fuscus</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;NCA;EPA
pollock	<i>Pollachius virens</i>	LISTS;NRRWS;SNFH;SS;EPA
pompano, African	<i>Alectis ciliaris</i>	LISTS;ISS
puffer, northern	<i>Sphoeroides maculatus</i>	LISTS;NRRWS;ESS;ISS;IS;SS



**Appendix 5.1 cont.**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Survey</b>
pumpkinseed	<i>Lepomis gibbosus</i>	ESS;ISS;NCA;TN;CTR
radiated shanny	<i>Ulvaria subbifurcata</i>	SNFH
ray, bluntmose stingray	<i>Dasyatis say</i>	LISTS
ray, bullnose	<i>Myliobatis freminvillei</i>	LISTS
ray, roughtail stingray	<i>Dasyatis centroura</i>	LISTS
rockling, fourbeard	<i>Enchelyopus cimbrius</i>	LISTS;NRRWS;ESS;IS;SNFH;SS;MISC;EPA
salmon, Atlantic	<i>Salmo salar</i>	LISTS;TN
sand lance, American	<i>Ammodytes americanus</i>	LISTS;ESS;IS;SNFH;SS
scad, bigeye	<i>Selar crumenophthalmus</i>	LISTS;SS;MISC
scad, mackerel	<i>Decapterus macarellus</i>	LISTS;SS
scad, rough	<i>Trachurus lathami</i>	LISTS;NRRWS;SS;MISC;EPA
scad, round	<i>Decapterus punctatus</i>	LISTS;NRRWS;ESS
sculpin, longhorn	<i>Myoxocephalus octodecemspinosus</i>	LISTS;NRRWS;ISS;SNFH;MISC
scup	<i>Stenotomus chrysops</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA
sea raven	<i>Hemirhamphus intermedius</i>	LISTS;SNFH;MISC;EPA
seahorse, lined	<i>Hippocampus erectus</i>	LISTS;ESS;IS
searobin, northern	<i>Prionotus carolinus</i>	LISTS;NRRWS;ESS;IS;SNFH;SS;MISC;EPA
searobin, striped	<i>Prionotus evolans</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA
seasnail	<i>Liparis atlanticus</i>	LISTS;SNFH
sennet, northern	<i>Sphyræna borealis</i>	LISTS;ESS
shad, American	<i>Alosa sapidissima</i>	LISTS;NRRWS;ESS;ISS;SS;MISC;EPA;TN;CTR
shad, gizzard	<i>Dorosoma cepedianum</i>	LISTS;NRRWS;ESS;ISS;TN
shad, hickory	<i>Alosa mediocris</i>	LISTS;NRRWS;ISS;SS;MISC;EPA;CTR
shark, sand tiger shark	<i>Carcharias taurus</i>	LISTS
shark, sandbar (brown) shark	<i>Carcharhinus plumbeus</i>	LISTS
sharksucker	<i>Echeneis naucrates</i>	LISTS
shiner, golden	<i>Notemigonus crysoleucas</i>	ISS;TN
shiner, spottail	<i>Notropis hudsonius</i>	ISS;NCA;TN;CTR
silverside, Atlantic	<i>Menidia menidia</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;MISC;EPA
silverside, inland	<i>Menidia beryllina</i>	SNFH
skate, barndoor	<i>Dipturus laevis</i>	LISTS
skate, clearnose	<i>Raja eglanteria</i>	LISTS;NRRWS;IS
skate, little	<i>Leucoraja erinacea</i>	LISTS;NRRWS;ESS;IS;SS;NCA;MISC;EPA;CTR
skate, winter	<i>Leucoraja ocellata</i>	LISTS;NRRWS;SS;MISC
skilletfish	<i>Gobiesox strumosus</i>	ESS
smelt, rainbow	<i>Osmerus mordax</i>	LISTS;ESS;IS;SNFH;SS;TN;CTR
snapper, glasseye	<i>Heteropriacanthus cruentatus</i>	LISTS
snapper, grey	<i>Lutjanus griseus</i>	ESS;IS
snapper, mahogany	<i>Lutjanus mahogoni</i>	LISTS
spot	<i>Leiostomus xanthurus</i>	LISTS;NRRWS;ESS;ISS;IS;SS;MISC;EPA
stargazer, northern	<i>Astroscopus guttatus</i>	LISTS;ESS
stickleback, blackspotted	<i>Gasterosteus wheatlandi</i>	ESS
stickleback, four-spine	<i>Apeltes quadracus</i>	ESS;IS
stickleback, nine-spine	<i>Pungitius pungitius</i>	ESS;IS
stickleback, three-spine	<i>Gasterosteus aculeatus</i>	ESS;IS;TN
sturgeon, Atlantic	<i>Acipenser oxyrinchus</i>	LISTS
sucker, white	<i>Catostomus commersonii</i>	ISS;NCA;TN;CTR
tautog	<i>Tautoga onitis</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA
tomcod, Atlantic	<i>Microgadus tomcod</i>	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;EPA;CTR
triggerfish, gray	<i>Balistes capriscus</i>	LISTS
trout, brook	<i>Salvelinus fontinalis</i>	TN;CTR
trout, brown	<i>Salmo trutta</i>	CTR;ISS
walleye	<i>Sander vitreus</i>	ISS;ESS;TN
weakfish	<i>Cynoscion regalis</i>	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA





Appendix 5.2 cont.

Total count of finfish, lobster, horseshoe crab and squid taken in the LISTS, 1984-2018.

Year	Tows	Total Count
1984	200	122,527
1985	246	152,574
1986	316	153,383
1987	320	136,139
1988	320	216,479
1989	320	294,026
1990	297	277,183
1991	200	174,235
1992	160	186,975
1993	240	230,301
1994	240	204,795
1995	200	163,532
1996	200	165,756
1997	200	170,761
1998	200	258,082
1999	200	392,831
2000	200	271,608
2001	200	172,622
2002	200	229,284
2003	200	131,812
2004	199	250,439
2005	200	200,991
2006	120	109,330
2007	200	215,638
2008	160	164,948
2009	200	239,154
2010	78	39,340
2011	172	146,254
2012	200	170,798
2013	200	102,413
2014	199	177,250
2015	200	211,566
2016	196	293,181
2017	144	162,833
2018	172	169,361
	7,299	6,758,401

**Appendix 5.3. Annual total weight (kg) of finfish, lobster, horseshoe crab and squid taken in LISTS, 1992-2017.**

*Weights include all tows – number of tows shown in second row. Refer to Appendix 5.4 for details on number of tows conducted per month. Note: nw = not weighed.*

Common name (number of tows)	1992 160	1993 240	1994 240	1995 200	1996 200	1997 200	1998 200	1999 200	2000 200	2001 200	2002 200	2003 200	2004 199	2005 200	2006 120	2007 200	2008 160	2009 200	2010 78	2011 172	2012 200	2013 200	2014 199	2015 200	2016 196	2017 144	2018 172	Total 5,080	
anchovy, bay	nw	nw	nw	nw	nw	nw	nw	5.6	12.2	3.6	6.6	13.3	10.3	5.8	8.3	14.5	7.7	35.3	2.8	10.5	8.6	6.8	9.4	3.1	8.7	7.7	3.3	184.1	
anchovy, striped	nw	nw	nw	nw	0.2	0.0	0.0	6.1	0.0	1.2	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.0	0.1	0.2	0.1	0.0	0.1	0.5	0.0	4.1	13.3	
Anchovy, spp (yo-y-est)	nw	nw	nw	nw	nw	nw	nw	0.5	4.5	0.8	1.5	2.0	3.0	1.5	0.6	0.8	5.1	0.7	0.0	1.0	0.4	1.3	2.6	3.3	3.1	7.9	1.7	42.3	
bigeye	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.6	
bigeye, short	0.0	0.1	0.1	0.0	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	1.1	
black sea bass	1.8	6.4	11.0	4.7	12.1	10.5	10.6	17.2	22.6	74.8	188.3	49.6	40.5	26.4	9.3	46.8	29.8	59.5	20.1	54.2	141.0	181.2	543.3	678.0	823.4	714.8	690.7	4,468.6	
blenny, leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
blue runner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	2.3	0.0	1.7	2.7	0.0	0.9	6.7	1.5	0.1	19.9	36.2	
bluefish	2,462.9	2,226.1	2,341.7	1,156.1	1,118.2	977.6	899.0	1,218.0	1,408.0	751.2	1,099.7	791.6	2,140.6	1,333.8	358.6	1,801.3	641.4	1,157.4	6.1	584.7	532.7	517.7	522.7	324.4	1,118.7	263.6	161.4	27,915.2	
bonito, Atlantic	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	
burrfish, striped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	
butterfish	1,357.3	1,450.1	1,202.2	1,664.5	1,844.7	2,017.2	3,661.1	4,171.6	1,458.3	1,834.0	1,924.2	682.8	1,842.7	2,097.3	1,631.4	1,446.2	1,442.0	3,186.9	166.9	1,600.8	1,891.3	1,252.5	1,707.6	1,011.2	2,036.1	1,426.0	1,412.7	47,419.6	
cod, Atlantic	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.1	0.0	0.0	2.8	4.7	0.9	0.0	0.0	0.0	1.0	2.1	9.2	0.0	0.0	0.3	4.7	4.9	0.1	3.2	34.4	
Gadus spp. (yo-y/larvae)	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	1.5	0.0	0.0	0.0	1.8	0.3	0.4	0.0	0.4	1.1	0.2	0.0	0.4	6.1	6.1	
cometfish, red	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.8	
cometfish, blue spotted	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.1	
crab, horseshoe	514.1	807.9	463.1	116.8	717	472.4	489.4	634.1	689.4	870.7	862.9	751	873.4	304.2	205.8	596.4	496.8	645.8	112.2	505.2	385.8	531.8	497.3	288.3	315.5	224.4	512.3	13,884.0	
croaker, Atlantic	0.0	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.2	1.5	0.0	0.0	0.1	0.0	5.0	
cunner	3.7	6.2	2.1	4.4	2.6	4.1	8.1	5.9	5.3	5.9	7.2	6.7	3.7	4.1	1.3	3.0	3.6	1.8	1.3	1.9	2.8	1.8	0.2	1.8	0.5	0.5	0.5	91.0	
coisk-eel, fawn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
coisk-eel, striped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.6	0.0	0.1	0.0	0.1	1.2	
dogfish, smooth	863.2	1,339.1	934.6	566.8	862.8	527.3	989.8	923.0	1,038.5	1,407.6	2,814.3	1,527.4	1,435.3	1,421.7	1,176.6	2,110.2	1,134.2	2,213.3	34.4	2,031.7	1,833.3	2,162.3	2,799.2	2,804.1	2,785.6	3,391.3	3,024.9	44,152.5	
dogfish, spiny	30.7	58.4	199.6	0.0	2.1	13.7	44.5	51.1	9.9	128.6	48.0	239.5	104.7	102.0	47.0	122.3	127.7	545.7	16.2	203.5	62.8	91.5	62.2	80.8	43.6	15.6	16.7	2,468.4	
drum, black	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.0	
eel, American	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
eel, American (yo-y)	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
eel, conger	0.1	0.2	0.0	1.2	0.1	0.0	0.0	0.5	0.0	0.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	1.2	0.0	0.2	0.0	0.0	0.0	6.4	
eel, conger (yo-y)	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
filefish, orange	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
filefish, planehead	0.0	0.8	0.1	0.0	0.3	0.0	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.4	0.2	0.0	0.0	0.1	2.7	
flounder, American plaice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
flounder, fourspot	382.4	193.6	202.4	402.9	407.2	615.3	306.0	203.9	398.6	362.7	326.9	350.1	309.3	125.9	88.1	224.9	186.3	169.8	92.0	224.2	454.5	203.4	145.0	76.3	175.3	67.9	147.6	6,842.5	
flounder, smallmouth	0.6	2.6	1.5	1.2	2.3	2.4	6.4	5.2	2.7	3.8	4.9	3.0	2.8	2.4	0.6	2.6	3.2	4.7	1.4	3.5	7.5	5.2	6.0	3.6	4.2	2.0	2.9	89.2	
flounder, summer	142.1	193.1	173.0	79.6	266.4	326.0	431.3	459.8	471.3	628.1	989.3	845.7	627.2	406.1	180.5	590.9	398.0	694.4	229.6	713.0	718.5	726.6	567.4	449.3	386.4	244.0	397.0	12,334.6	
flounder, windowpane	286.1	578.9	597.2	356.2	1,223.6	986.1	741.1	594.2	368.8	475.5	343.3	378.8	333.7	177.5	128.9	510.8	524.0	342.8	449.3	395.9	501.1	326.6	365.6	191.1	154.7	127.1	189.6	11,648.5	
flounder, winter	1,344.8	1,898.0	2,060.9	1,614.7	3,335.0	2,439.4	2,450.3	2,011.7	1,921.4	1,993.6	1,584.1	1,421.9	839.9	566.1	271.2	951.3	751.9	524.0	450.5	613.8	604.9	576.8	459.7	319.7	261.0	27.7	132.2	31,426.5	
flounder, yellowtail	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.4	1.0	0.4	0.2	0.0	0.3	0.0	0.0	0.0	0.7	0.0	0.0	0.0	3.7	
glasseye snapper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.7	0.1	0.6	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	2.0	
goatfish, red	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.9	
goby, naked	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	
goosefish	2.5	0.5	2.0	3.3	0.1	1.6	3.2	0.3	0.2	0.4	0.6	0.0	0.1	0.7	1.2	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.1	23.3	0.0	0.9	41.8		
grubby	0.0	0.0	0.3	0.1	0.2	0.7	0.3	0.2	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	
gunnel, rock	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.2	0.6	0.1	0.1	0.2	0.2	0.5	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	3.4	
haddock	0.0	0.0	0.0	0.2	0.0	0.1	0.5	0.1	0.0	0.0	0.0	1.3	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.6	5.1	
hake, red	127.7	254.4	63.9	145.6	95.5	80.5	217.5	226.5	162.6	109.7	206.6	73.4	51.6	56.0	37.4	200.4	141.3	59.5	64.3	25.1	148.6	61.1	33.5	44.5	50.3	11.9	25.8	2,775.2	
hake, silver	22.0	21.9	127.6	61.6	20.0	70.8	88.3	99.6	28.8	152.2	89.6	13.9	7.1	37.7	14.6	208.5	50.0	35.4	40.3	171.0	23.6	10.6	6.5	32.9	12.3	18.3	1,492.4		
hake, spotted	10.3	55.9	32.4	6.5	42.6	19.0	12.2	38.8	92.3	34.9	48.2	70.4	37.8	17.															

Appendix 5.3 cont.

Common name (number of tows)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
mackerel, Spanish	1.5	5.3	6.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	15.7	
menhaden, Atlantic	60.6	103.9	87.8	41.9	40.5	38.5	9.2	90.9	31.8	4.7	96.3	344.9	110.7	77.9	5.5	63.9	10.4	18.0	2.7	69.8	144.6	87.5	267.8	361.2	69.4	72.2	80.5	2,393.1
moonfish	1.5	0.6	4.1	2.1	11.6	4.6	13.4	9.6	15.0	3.8	7.4	2.3	3.4	6.0	3.5	12.0	13.4	19.5	0.0	6.3	3.6	10.0	23.2	14.6	5.2	4.2	2.6	203.5
mullet, white	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
ocean pout	7.7	16.4	9.1	6.5	7.2	4.8	2.7	3.9	4.9	2.3	4.3	2.9	5.4	0.7	0.9	3.2	2.1	4.8	1.4	4.5	2.0	0.0	0.0	0.5	0.0	0.0	0.0	98.2
perch, silver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3
perch, white	0.0	0.3	0.3	0.0	0.1	0.9	0.0	0.4	0.2	0.0	0.0	1.4	0.5	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	4.8
pinfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.3
pipefish, northern	0.4	0.6	0.2	0.1	0.0	0.1	0.0	0.1	0.2	0.3	0.2	0.4	0.2	0.3	0.2	0.2	0.0	0.2	0.3	0.3	0.1	0.2	0.1	0.2	0.0	0.0	0.2	5.1
pollock	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.5	0.0	0.1	0.0	0.0	0.1	0.0	0.0	2.1
pompano, African	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
puffer, northern	0.1	0.9	0.4	0.1	0.3	0.1	0.5	1.1	0.4	0.7	0.3	0.3	0.4	0.3	0.0	0.5	0.0	0.4	0.0	0.9	3.1	0.3	1.3	0.8	0.9	0.7	0.3	15.1
ray, bluntnose stingray	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.6
ray, bullnose ray	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	5.7
ray, roughtail stingray	0.0	0.0	0.0	0.0	0.0	50.6	3.4	0.0	0.0	2.5	24.4	0.0	4.1	0.0	0.0	0.0	3.0	0.0	0.0	13.0	5.0	0.0	0.0	7.8	45.4	0.0	18.9	178.1
rocking, fourbeard	12.8	15.7	8.5	14.7	8.6	17.3	11.6	28.8	14.7	21.5	9.7	9.2	13.0	6.8	1.5	7.6	7.1	3.9	2.9	4.0	3.5	0.2	0.4	2.0	0.3	0.0	0.1	226.4
rudderfish, banded	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.4
salmon, Atlantic	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
sand lance, American	nw	0.3	0.6	0.4	0.0	0.1	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.0	0.3	7.2	2.0	5.2	7.5	0.2	0.1	0.2	0.1	0.0	0.1	0.0	26.2
sand lance, (yoy - est)	nw	0.0	0.8	0.1	0.0	0.0	0.1	0.4	0.0	0.6	0.0	0.0	0.0	0.0	2.9	0.1	0.2	2.3	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3
scad, bigeye	0.0	0.0	0.3	0.0	0.1	0.1	0.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	2.3
scad, mackerel	0.2	0.0	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.1
scad, rough	0.0	4.4	0.2	0.0	1.5	2.0	0.0	0.0	0.0	0.7	0.7	0.5	0.7	1.9	0.5	0.7	0.0	2.8	0.0	6.8	1.1	1.3	0.5	7.1	0.1	0.6	0.0	34.1
scad, round	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.2	0.0	0.0	0.3	0.3	0.3	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	2.5
sculpin, longhorn	9.0	3.2	1.6	1.3	2.1	0.8	1.0	0.3	5.0	1.5	0.9	2.0	3.4	0.0	0.0	0.8	0.3	0.3	0.4	2.0	0.2	0.4	0.0	0.7	0.0	0.0	0.0	37.2
scup	837.7	867.9	878.1	770.5	739.4	530.5	740.5	3,641.3	6,679.0	5,828.4	13,814.0	5,221.9	6,801.1	3,080.7	4,636.1	5,333.5	6,509.9	6,332.1	1,971.6	6,759.5	6,170.2	5,945.6	5,161.4	6,045.5	16,006.0	9,616.8	12,947.0	143,866.2
sea raven	3.9	0.6	0.2	0.7	1.5	0.4	11.3	4.9	9.2	4.1	4.1	1.6	2.4	0.5	0.0	3.6	0.0	1.7	1.6	0.9	1.1	0.0	1.5	0.0	0.2	0.0	0.0	56.0
sea turtle, Kemp's ridley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	3.8
seahorse, lined	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
searobin, northern	35.6	97.9	66.7	166.9	57.4	60.4	39.4	52.0	251.2	222.7	267.3	252.2	112.0	21.3	74.5	74.2	58.8	194.3	149.5	85.5	405.2	161.7	225.9	133.2	452.1	196.2	460.8	4,374.9
searobin, striped	305.1	260.0	208.6	277.5	278.7	230.5	509.7	497.0	1,036.1	861.0	1,065.0	805.1	465.4	183.7	113.5	217.0	263.0	471.8	66.4	558.7	1,086.4	1,112.5	1,020.8	1,058.2	1,964.4	1,400.0	1,582.6	17,998.7
seasnail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
sennet, northern	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.2	0.0	0.0	0.7	0.0	0.2	0.0	0.4	0.0	0.1	0.3	0.0	0.0	0.0	0.2	0.0	0.0	2.9
shad, American	63.3	138.9	165.8	81.4	36.2	66.8	60.2	117.3	25.8	9.6	40.3	40.8	24.2	18.2	6.1	15.8	20.2	28.9	8.6	17.5	25.3	15.3	12.3	24.7	46.2	21.0	17.6	1,148.3
shad, gizzard	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9
shad, hickory	4.9	4.4	7.6	2.5	10.2	9.1	15.9	19.4	17.1	6.7	19.6	20.1	14.2	43.1	19.1	10.4	1.1	3.6	0.4	1.5	14.1	10.8	10.5	5.5	4.2	1.3	2.2	279.5
shark, sand tiger	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.8	0.0	21.8
sharksucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
silverside, Atlantic	0.1	1.0	0.3	0.9	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.1	0.0	0.3	0.1	0.4	0.3	0.0	0.0	0.0	4.6
skate, barndoor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
skate, clearnose	10.3	11.3	1.8	11.0	1.7	7.4	36.8	39.4	37.9	132.4	107.3	130.8	48.2	187.1	52.4	193.3	78.1	148.5	4.5	109.8	491.7	387.0	207.7	225.0	228.7	147.1	149.8	3,187.0
skate, little	1,389.0	2,534.8	3,091.5	1,055.3	2,801.8	1,945.8	2,085.5	1,829.6	1,604.7	2,022.6	2,121.9	2,187.3	1,689.8	682.5	310.6	697.0	327.4	390.0	148.3	359.4	657.9	317.8	428.2	192.0	193.1	63.0	82.4	31,209.2
skate, winter	105.3	220.9	139.2	89.2	212.7	109.7	180.7	89.8	66.5	112.2	133.5	162.1	100.3	59.9	60.0	117.8	140.8	108.5	37.7	101.2	179.8	111.2	133.8	51.8	31.6	34.1	4.1	2,894.4
smelt, rainbow	0.0	0.6	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
snapper, mahogany	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
spot	0.0	10.6	4.3	0.3	14.1	1.1	0.0	5.7	17.8	1.3	7.2	0.1	0.9	0.0	1.2	0.0	21.3	0.2	0.0	0.7	107.5	195.4	1.8	1.7	1.7	10.5	3.8	409.2
squid, long-finned	844.9	1,629.1	965.4	796.4	720.4	515.2	767.0	826.4	582.3	346.2	279.9	573.2	953.4	683.5	326.0	773.6	330.1	648.4	161.4	370.7	333.9	170.8	582.3	1,366.2	464.4	584.5	408.8	17,004.4
stargazer, northern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.			

**Appendix 5.4. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1984.**

*Finfish species are in order of descending count. Number of tows (sample size)=102.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
butterfish	18,700	31.0	.	.	Atlantic mackerel	48	0.1	.	.
windowpane flounder	13,746	22.8	.	.	spotted hake	46	0.1	.	.
winter flounder	6,847	11.4	.	.	sea raven	32	0.1	.	.
bluefish	6,738	11.2	.	.	ocean pout	25	0	.	.
scup	3,225	5.4	.	.	rough scad	22	0	.	.
fourspot flounder	1,868	3.1	.	.	longhorn sculpin	12	0	.	.
little skate	1,491	2.5	.	.	black sea bass	11	0	.	.
red hake	1,323	2.2	.	.	moonfish	7	0	.	.
American shad	982	1.6	.	.	Atlantic sturgeon	6	0	.	.
blueback herring	925	1.5	.	.	round herring	5	0	.	.
striped searobin	697	1.2	.	.	spiny dogfish	4	0	.	.
silver hake	575	1.0	.	.	American eel	2	0	.	.
smooth dogfish	534	0.9	.	.	striped bass	2	0	.	.
tautog	472	0.8	.	.	oyster toadfish	2	0	.	.
northern searobin	448	0.7	.	.	goosefish	1	0	.	.
fourbeard rockling	303	0.5	.	.	northern sennet	1	0	.	.
weakfish	260	0.4	.	.	northern puffer	1	0	.	.
hogchoker	252	0.4	.	.	red goatfish	1	0	.	.
cunner	220	0.4	.	.	<b>Total</b>	<b>60,230</b>			
summer flounder	150	0.2	.	.					
alewife	108	0.2	.	.	<b><u>Invertebrates</u></b>				
hickory shad	71	0.1	.	.	American lobster	2865	100	.	.
Atlantic menhaden	67	0.1	.	.	<b>Total</b>	<b>2,865</b>			

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1985.**  
*Finfish species are in order of descending count. Number of tows (sample size)=126.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	34,512	41.4	.	.	spot	26	0	.	.
scup	12,155	14.6	.	.	round herring	15	0	.	.
windowpane flounder	11,194	13.4	.	.	rough scad	14	0	.	.
winter flounder	7,980	9.6	.	.	Atlantic mackerel	13	0	.	.
bluefish	5,302	6.4	.	.	spiny dogfish	13	0	.	.
weakfish	2,650	3.2	.	.	winter skate	13	0	.	.
northern searobin	2,098	2.5	.	.	alewife	9	0	.	.
little skate	1,705	2.0	.	.	planehead filefish	7	0	.	.
fourspot flounder	1,289	1.5	.	.	rock gunnel	4	0	.	.
striped searobin	1,078	1.3	.	.	oyster toadfish	4	0	.	.
red hake	573	0.7	.	.	goosefish	3	0	.	.
Atlantic herring	504	0.6	.	.	ocean pout	3	0	.	.
smooth dogfish	405	0.5	.	.	Atlantic bonito	2	0	.	.
tautog	323	0.4	.	.	crevalle jack	1	0	.	.
American shad	280	0.3	.	.	grubby	1	0	.	.
silver hake	250	0.3	.	.	gray triggerfish	1	0	.	.
summer flounder	175	0.2	.	.	hickory shad	1	0	.	.
hogchoker	163	0.2	.	.	orange filefish	1	0	.	.
moonfish	142	0.2	.	.	northern puffer	1	0	.	.
blueback herring	100	0.1	.	.	Atlantic sturgeon	1	0	.	.
longhorn sculpin	80	0.1	.	.	Atlantic tomcod	1	0	.	.
cunner	51	0.1	.	.	<b>Total</b>	<b>83,395</b>		-	
sea raven	50	0.1	.	.					
fourbeard rockling	44	0.1	.	.					
Atlantic menhaden	38	0	.	.	<b><u>Invertebrates</u></b>				
black sea bass	35	0	.	.	American lobster	1589	100	.	.
spotted hake	27	0	.	.	<b>Total</b>	<b>1,589</b>		-	



**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1986.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=196.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
butterfish	25,192	28.0	.	.	winter skate	32	0	.	.
windowpane flounder	18,848	20.9	.	.	spotted hake	30	0	.	.
winter flounder	15,341	17.0	.	.	black sea bass	28	0	.	.
scup	7,910	8.8	.	.	spot	25	0	.	.
weakfish	5,427	6.0	.	.	Atlantic mackerel	19	0	.	.
little skate	3,210	3.6	.	.	moonfish	14	0	.	.
bluefish	2,789	3.1	.	.	ocean pout	14	0	.	.
red hake	2,657	3.0	.	.	oyster toadfish	9	0	.	.
Atlantic herring	1,999	2.2	.	.	hickory shad	6	0	.	.
fourspot flounder	1,487	1.7	.	.	rough scad	5	0	.	.
striped searobin	886	1.0	.	.	Atlantic sturgeon	4	0	.	.
silver hake	723	0.8	.	.	clearnose skate	2	0	.	.
tautog	566	0.6	.	.	American eel	1	0	.	.
smooth dogfish	430	0.5	.	.	goosefish	1	0	.	.
summer flounder	414	0.5	.	.	grubby	1	0	.	.
northern searobin	396	0.4	.	.	northern pipefish	1	0	.	.
American shad	344	0.4	.	.	northern puffer	1	0	.	.
Atlantic menhaden	318	0.4	.	.	smallmouth flounder	1	0	.	.
blueback herring	256	0.3	.	.	striped bass	1	0	.	.
alewife	216	0.2	.	.	<b>Total</b>	<b>90,031</b>		-	
fourbeard rockling	123	0.1	.	.					
cunner	76	0.1	.	.					
sea raven	70	0.1	.	.	<b><u>Invertebrates</u></b>				
hogchoker	60	0.1	.	.	American lobster	2,553	28.1	.	.
longhorn sculpin	51	0.1	.	.	long-finned squid	6,537	71.9	.	.
spiny dogfish	47	0.1	.	.	<b>Total</b>	<b>9,090</b>		-	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1987.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
winter flounder	15,600	25.6	.	.	longhorn sculpin	32	0.1	.	.
butterfish	14,674	24.1	.	.	spotted hake	22	0	.	.
windowpane flounder	11,031	18.1	.	.	spiny dogfish	19	0	.	.
scup	5,029	8.3	.	.	ocean pout	14	0	.	.
bluefish	2,611	4.3	.	.	black sea bass	13	0	.	.
little skate	2,140	3.5	.	.	winter skate	13	0	.	.
red hake	1,729	2.8	.	.	striped bass	10	0	.	.
Atlantic herring	1,628	2.7	.	.	Atlantic tomcod	8	0	.	.
fourspot flounder	1,298	2.1	.	.	smallmouth flounder	7	0	.	.
silver hake	906	1.5	.	.	moonfish	6	0	.	.
alewife	754	1.2	.	.	rock gunnel	4	0	.	.
striped searobin	543	0.9	.	.	Atlantic sturgeon	4	0	.	.
summer flounder	374	0.6	.	.	spot	3	0	.	.
American shad	371	0.6	.	.	clearnose skate	2	0	.	.
tautog	363	0.6	.	.	hickory shad	2	0	.	.
Atlantic menhaden	329	0.5	.	.	Atlantic bonito	1	0	.	.
smooth dogfish	257	0.4	.	.	Atlantic mackerel	1	0	.	.
weakfish	248	0.4	.	.	round herring	1	0	.	.
fourbeard rockling	241	0.4	.	.	sea lamprey	1	0	.	.
northern searobin	220	0.4	.	.	<b>Total</b>	<b>60,862</b>		-	
sea raven	86	0.1	.	.					
blueback herring	79	0.1	.	.	<b>Invertebrates</b>				
cunner	79	0.1	.	.	American lobster	3,544	25.1	.	.
hogchoker	61	0.1	.	.	long-finned squid	10,552	74.9	.	.
rough scad	48	0.1	.	.	<b>Total</b>	<b>14,096</b>		-	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1988.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	45,983	36.7	.	.	ocean pout	30	0	.	.
winter flounder	25,695	20.5	.	.	Atlantic mackerel	24	0	.	.
windowpane flounder	19,497	15.6	.	.	spot	18	0	.	.
scup	10,184	8.1	.	.	black sea bass	17	0	.	.
little skate	6,539	5.2	.	.	striped bass	17	0	.	.
bluefish	3,688	2.9	.	.	yellowtail flounder	6	0	.	.
fourspot flounder	2,478	2.0	.	.	grubby	5	0	.	.
red hake	1,933	1.5	.	.	rock gunnel	5	0	.	.
weakfish	1,287	1.0	.	.	rainbow smelt	5	0	.	.
silver hake	1,210	1.0	.	.	crevalle jack	4	0	.	.
striped searobin	1,194	1.0	.	.	bigeye scad	2	0	.	.
Atlantic herring	1,193	1.0	.	.	bigeye	2	0	.	.
American shad	1,187	0.9	.	.	planehead filefish	2	0	.	.
northern searobin	474	0.4	.	.	hickory shad	2	0	.	.
tautog	455	0.4	.	.	northern puffer	2	0	.	.
smooth dogfish	385	0.3	.	.	Atlantic sturgeon	2	0	.	.
summer flounder	320	0.3	.	.	Atlantic tomcod	2	0	.	.
fourbeard rockling	302	0.2	.	.	Atlantic bonito	1	0	.	.
blueback herring	164	0.1	.	.	dwarf goatfish	1	0	.	.
alewife	153	0.1	.	.	goosefish	1	0	.	.
moonfish	137	0.1	.	.	northern pipefish	1	0	.	.
rough scad	128	0.1	.	.	short bigeye	1	0	.	.
longhorn sculpin	103	0.1	.	.	striped cusk-eel	1	0	.	.
winter skate	101	0.1	.	.	sea lamprey	1	0	.	.
spotted hake	87	0.1	.	.	<b>Total</b>	<b>125,344</b>		-	
hogchoker	75	0.1	.	.					
Atlantic menhaden	69	0.1	.	.					
sea raven	50	0	.	.	<b>Invertebrates</b>				
cunner	48	0	.	.	American lobster	2,114	8.5	.	.
spiny dogfish	39	0	.	.	long-finned squid	22,769	91.5	.	.
smallmouth flounder	34	0	.	.	<b>Total</b>	<b>24,883</b>		-	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1989.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	47,089	29.3	.	.	sea raven	34	0	.	.
winter flounder	32,361	20.2	.	.	black sea bass	15	0	.	.
windowpane flounder	25,109	15.6	.	.	rough scad	11	0	.	.
scup	17,391	10.8	.	.	striped bass	11	0	.	.
bluefish	8,649	5.4	.	.	yellow jack	11	0	.	.
little skate	7,079	4.4	.	.	goosefish	9	0	.	.
red hake	5,689	3.5	.	.	smallmouth flounder	9	0	.	.
weakfish	5,496	3.4	.	.	rock gunnel	8	0	.	.
American shad	1,977	1.2	.	.	grubby	7	0	.	.
fourspot flounder	1,877	1.2	.	.	spotted hake	7	0	.	.
striped searobin	1,763	1.1	.	.	rainbow smelt	4	0	.	.
silver hake	1,697	1.1	.	.	planehead filefish	3	0	.	.
Atlantic herring	1,154	0.7	.	.	Atlantic sturgeon	3	0	.	.
tautog	600	0.4	.	.	Atlantic tomcod	3	0	.	.
fourbeard rockling	397	0.2	.	.	bigeye	2	0	.	.
blueback herring	307	0.2	.	.	American eel	2	0	.	.
northern searobin	297	0.2	.	.	short bigeye	2	0	.	.
Atlantic mackerel	237	0.1	.	.	oyster toadfish	2	0	.	.
Atlantic menhaden	230	0.1	.	.	white perch	2	0	.	.
smooth dogfish	202	0.1	.	.	northern sennet	1	0	.	.
alewife	190	0.1	.	.	northern puffer	1	0	.	.
longhorn sculpin	107	0.1	.	.	banded rudderfish	1	0	.	.
cunner	106	0.1	.	.	Spanish mackerel	1	0	.	.
hogchoker	91	0.1	.	.	<b>Total</b>	<b>160,581</b>			<b>-</b>
winter skate	91	0.1	.	.					
spiny dogfish	66	0	.	.					
ocean pout	58	0	.	.	<b>Invertebrates</b>				
bigeye scad	45	0	.	.	American lobster	3,447	19.9	.	.
moonfish	42	0	.	.	long-finned squid	13,883	80.1	.	.
summer flounder	35	0	.	.	<b>Total</b>	<b>17,330</b>			<b>-</b>

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1990.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
winter flounder	47,184	31.1	.	.	seasnail	8	0	.	.
butterfish	45,373	29.9	.	.	planehead filefish	7	0	.	.
scup	15,393	10.2	.	.	moonfish	7	0	.	.
windowpane flounder	9,825	6.5	.	.	rock gunnel	7	0	.	.
Atlantic herring	8,779	5.8	.	.	yellow jack	7	0	.	.
little skate	6,456	4.3	.	.	grubby	4	0	.	.
bluefish	4,688	3.1	.	.	spot	4	0	.	.
fourspot flounder	3,270	2.2	.	.	Atlantic sturgeon	4	0	.	.
silver hake	2,334	1.5	.	.	oyster toadfish	4	0	.	.
red hake	2,237	1.5	.	.	goosefish	3	0	.	.
weakfish	1,921	1.3	.	.	smallmouth flounder	3	0	.	.
striped searobin	866	0.6	.	.	Atlantic tomcod	3	0	.	.
tautog	554	0.4	.	.	clearnose skate	2	0	.	.
American shad	406	0.3	.	.	lookdown	2	0	.	.
fourbeard rockling	299	0.2	.	.	red goatfish	2	0	.	.
longhorn sculpin	243	0.2	.	.	rainbow smelt	2	0	.	.
northern searobin	232	0.2	.	.	bigeye scad	1	0	.	.
Atlantic menhaden	219	0.1	.	.	bigeye	1	0	.	.
smooth dogfish	209	0.1	.	.	hickory shad	1	0	.	.
summer flounder	170	0.1	.	.	mackerel scad	1	0	.	.
cunner	168	0.1	.	.	northern kingfish	1	0	.	.
alewife	160	0.1	.	.	northern puffer	1	0	.	.
spiny dogfish	150	0.1	.	.	red cornetfish	1	0	.	.
hogchoker	84	0.1	.	.	sandbar shark	1	0	.	.
winter skate	61	0	.	.	sea lamprey	1	0	.	.
blueback herring	46	0	.	.	yellowtail flounder	1	0	.	.
striped bass	45	0	.	.	<b>Total</b>	<b>151,600</b>			<b>-</b>
sea raven	42	0	.	.					
ocean pout	39	0	.	.					
black sea bass	27	0	.	.	<b>Invertebrates</b>				
spotted hake	21	0	.	.	American lobster	5,369	27.0.	.	.
Atlantic mackerel	10	0	.	.	long-finned squid	14,538	73.0.	.	.
rough scad	10	0	.	.	<b>Total</b>	<b>19,907</b>			<b>-</b>

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1991.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
scup	45,790	29.9	.	.	moonfish	24	0	.	.
butterfish	40,537	26.4	.	.	smallmouth flounder	20	0	.	.
winter flounder	26,623	17.4	.	.	sea raven	19	0	.	.
windowpane flounder	8,482	5.5	.	.	spiny dogfish	14	0	.	.
little skate	6,479	4.2	.	.	yellow jack	11	0	.	.
bluefish	5,845	3.8	.	.	goosefish	8	0	.	.
weakfish	4,320	2.8	.	.	northern puffer	5	0	.	.
Atlantic herring	4,003	2.6	.	.	northern kingfish	4	0	.	.
fourspot flounder	3,553	2.3	.	.	Atlantic tomcod	4	0	.	.
red hake	2,085	1.4	.	.	Atlantic sturgeon	3	0	.	.
silver hake	1,537	1.0	.	.	clearnose skate	2	0	.	.
striped searobin	865	0.6	.	.	Atlantic mackerel	2	0	.	.
northern searobin	609	0.4	.	.	mackerel scad	2	0	.	.
tautog	501	0.3	.	.	rainbow smelt	2	0	.	.
American shad	361	0.2	.	.	Spanish mackerel	2	0	.	.
Atlantic menhaden	348	0.2	.	.	spot	2	0	.	.
summer flounder	263	0.2	.	.	bigeye scad	1	0	.	.
smooth dogfish	193	0.1	.	.	planehead filefish	1	0	.	.
fourbeard rockling	163	0.1	.	.	hickory shad	1	0	.	.
longhorn sculpin	139	0.1	.	.	red goatfish	1	0	.	.
hogchoker	104	0.1	.	.	rough scad	1	0	.	.
alewife	103	0.1	.	.	sea lamprey	1	0	.	.
cunner	75	0	.	.	oyster toadfish	1	0	.	.
spotted hake	73	0	.	.	<b>Total</b>	<b>153,389</b>			-
winter skate	50	0	.	.					
ocean pout	42	0	.	.	<b>Invertebrates</b>				
black sea bass	39	0	.	.	American lobster	8,524	40.9	.	.
blueback herring	38	0	.	.	long-finned squid	12,322	59.1	.	.
striped bass	38	0	.	.	<b>Total</b>	<b>20,846</b>			-

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1992.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=160.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	95,961	65.7	1,357.3	11.7	black sea bass	5	0	1.8	0
scup	13,646	9.3	837.7	7.2	northern pipefish	5	0	0.4	0
winter flounder	9,548	6.5	1,344.8	11.5	Atlantic mackerel	4	0	1.0	0
bluefish	5,269	3.6	2,462.9	21.1	sea raven	4	0	3.9	0
Atlantic herring	4,565	3.1	797.5	6.8	northern kingfish	2	0	0.2	0
little skate	3,495	2.4	1,389.0	11.9	round herring	2	0	0.2	0
windowpane flounder	2,980	2.0	286.1	2.5	yellow jack	2	0	0.2	0
fourspot flounder	2,774	1.9	382.4	3.3	Atlantic silverside	1	0	0.1	0
red hake	1,606	1.1	127.7	1.1	conger eel	1	0	0.1	0
weakfish	1,317	0.9	94.8	0.8	northern puffer	1	0	0.1	0
Atlantic menhaden	1,115	0.8	60.6	0.5	Spanish mackerel	1	0	1.5	0
striped searobin	857	0.6	305.1	2.6	<b>Total</b>	<b>146,035</b>		<b>11,648.2</b>	
silver hake	544	0.4	22.0	0.2					
American shad	380	0.3	63.3	0.5	<b>Invertebrates</b>				
northern searobin	313	0.2	35.6	0.3	American lobster	8,160	19.9	1,537.9	28.6
smooth dogfish	304	0.2	863.2	7.4	blue mussel	nc	nc	1,157.1	21.5
tautog	265	0.2	508.3	4.4	long-finned squid	32,780	80.1	844.9	15.7
summer flounder	186	0.1	142.1	1.2	horseshoe crab	nc	nc	514.1	9.6
blueback herring	175	0.1	8.5	0.1	lady crab	nc	nc	375.4	7.0
fourbeard rockling	150	0.1	12.8	0.1	rock crab	nc	nc	239.1	4.5
alewife	122	0.1	9.2	0.1	boring sponge	nc	nc	225.5	4.2
spotted hake	68	0	10.3	0.1	spider crab	nc	nc	186.0	3.5
moonfish	62	0	1.5	0	starfish spp.	nc	nc	148.6	2.8
hogchoker	61	0	5.6	0	whelks	nc	nc	57.5	1.1
striped bass	42	0	89.4	0.8	flat claw hermit crab	nc	nc	34.7	0.6
longhorn sculpin	31	0	9.0	0.1	bluecrab	nc	nc	18.1	0.3
winter skate	31	0	105.3	0.9	mantis shrimp	nc	nc	10.3	0.2
cunner	30	0	3.7	0	northern moon snail	nc	nc	8.6	0.2
Atlantic sturgeon	30	0	244.8	2.1	common oyster	nc	nc	7.3	0.1
ocean pout	18	0	7.7	0.1	lion's mane jellyfish	nc	nc	2.4	0
hickory shad	12	0	4.9	0	surf clam	nc	nc	1.7	0
smallmouth flounder	12	0	0.6	0	hard clams	nc	nc	1.2	0
goosefish	10	0	2.5	0	bushy bryozoan	nc	nc	1.0	0
clearnose skate	8	0	10.3	0.1	purple sea urchin	nc	nc	0.4	0
Atlantic tomcod	8	0	1.3	0	mud crabs	nc	nc	0.3	0
mackerel scad	6	0	0.2	0	star coral	nc	nc	0.1	0
spiny dogfish	6	0	30.7	0.3	<b>Total</b>	<b>40,940</b>		<b>5,372</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1993.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	35,361	33.0	847.8	7.1	goosefish	3	0	0.3	0
scup	18,785	17.6	581.4	4.8	American sand lance	3	0	0.3	0
winter flounder	16,090	15.0	1,855.7	15.4	Atlantic bonito	2	0	6.4	0.1
windowpane flounder	7,953	7.4	547.6	4.6	lumpfish	2	0	0.2	0
Atlantic herring	6,269	5.9	1,119.8	9.3	moonfish	2	0	0.2	0
little skate	5,186	4.8	2,172.3	18.1	sea lamprey	2	0	1.0	0
bluefish	4,402	4.1	1,343.2	11.2	Atlantic salmon	1	0	0.1	0
red hake	3,963	3.7	232.0	1.9	American eel	1	0	1.6	0
fourspot flounder	1,262	1.2	182.3	1.5	northern sennet	1	0	0.1	0
weakfish	1,142	1.1	60.3	0.5	orange filefish	1	0	0.1	0
striped searobin	1,079	1.0	165.4	1.4	round herring	1	0	0.1	0
northern searobin	935	0.9	96.8	0.8	red cornetfish	1	0	0.1	0
American shad	791	0.7	101.1	0.8	red goatfish	1	0	0.1	0
alewife	788	0.7	48.2	0.4	short bigeye	1	0	0.1	0
silver hake	500	0.5	21.1	0.2	sea raven	1	0	0.6	0
spotted hake	331	0.3	36.7	0.3	yellow jack	1	0	0.1	0
smooth dogfish	283	0.3	857.6	7.1	<b>Total</b>	<b>107,035</b>		<b>12,012.4</b>	
Atlantic menhaden	271	0.3	94.1	0.8					
fourbeard rockling	241	0.2	15.6	0.1	<b>Invertebrates</b>				
summer flounder	224	0.2	137.9	1.1	American lobster	10,306	20.6	2,173.5	34.4
tautog	157	0.1	308.2	2.6	long-finned squid	39,723	79.4	1,176.5	18.6
Spanish mackerel	136	0.1	2.2	0	blue mussel	nc	nc	945.1	15.0
blueback herring	96	0.1	4.3	0	horseshoe crab	nc	nc	673.8	10.7
rough scad	92	0.1	3.8	0	spider crab	nc	nc	511.2	8.1
striped bass	78	0.1	198.7	1.7	lady crab	nc	nc	428.0	6.8
ocean pout	66	0.1	16.4	0.1	rock crab	nc	nc	155.9	2.5
cunner	64	0.1	6.1	0.1	flat claw hermit crab	nc	nc	45.7	0.7
Atlantic sturgeon	60	0.1	633.6	5.3	starfish spp.	nc	nc	37.4	0.6
winter skate	59	0.1	213.2	1.8	boring sponge	nc	nc	36.6	0.6
spot	57	0.1	4.5	0	whelks	nc	nc	34.0	0.5
hogchoker	56	0.1	5.2	0	mantis shrimp	nc	nc	31.6	0.5
Atlantic silverside	54	0.1	1.0	0	lion's mane jellyfish	nc	nc	27.6	0.4
northern puffer	23	0	0.4	0	bluecrab	nc	nc	20.0	0.3
smallmouth flounder	23	0	2.1	0	northern moon snail	nc	nc	8.9	0.1
Atlantic croaker	20	0	1.1	0	common oyster	nc	nc	2.0	0
black sea bass	16	0	5.0	0	surf clam	nc	nc	1.0	0
spiny dogfish	14	0	58.4	0.5	hard clams	nc	nc	0.9	0
Atlantic mackerel	11	0	0.9	0	purple sea urchin	nc	nc	0.7	0
longhorn sculpin	11	0	3.2	0	arks	nc	nc	0.7	0
planehead filefish	9	0	0.7	0	mud crabs	nc	nc	0.4	0
hickory shad	9	0	4.1	0	star coral	nc	nc	0.3	0
northern pipefish	9	0	0.4	0	blood star	nc	nc	0.2	0
rainbow smelt	9	0	0.6	0	common slipper shell	nc	nc	0.2	0
crevalle jack	5	0	0.4	0	sand shrimp	nc	nc	0.1	0
northern kingfish	5	0	0.6	0	sand dollar	nc	nc	0.1	0
Atlantic tomcod	5	0	0.8	0	northern red shrimp	nc	nc	0.1	0
clearnose skate	4	0	7.7	0.1	polychaetes	nc	nc	0.1	0
white perch	4	0	0.3	0					
conger eel	3	0	0.2	0	<b>Total</b>	<b>50,029</b>		<b>6,313</b>	



**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1994.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	33,538	28.7	776.8	6.3	longhorn sculpin	7	0	1.6	0
scup	25,451	21.8	660.8	5.4	grubby	5	0	0.3	0
winter flounder	20,615	17.6	1,992.2	16.2	mackerel scad	4	0	0.4	0
bluefish	7,703	6.6	1,159.8	9.4	Atlantic silverside	3	0	0.3	0
windowpane flounder	6,062	5.2	574.5	4.7	bigeye scad	2	0	0.2	0
little skate	5,604	4.8	2,565.3	20.9	lookdown	2	0	0.2	0
Atlantic herring	3,836	3.3	768.6	6.3	northern puffer	2	0	0.2	0
weakfish	3,320	2.8	160.0	1.3	Atlantic tomcod	2	0	0.3	0
silver hake	1,703	1.5	112.9	0.9	bigeye	1	0	0.1	0
fourspot flounder	1,494	1.3	195.6	1.6	clearnose skate	1	0	1.8	0
American shad	1,289	1.1	133.2	1.1	inshore lizardfish	1	0	0.1	0
alewife	1,211	1.0	75.0	0.6	northern pipefish	1	0	0.1	0
blueback herring	1,052	0.9	26.6	0.2	rock gunnel	1	0	0.1	0
striped searobin	927	0.8	183.6	1.5	sea raven	1	0	0.2	0
northern searobin	800	0.7	63.7	0.5	white perch	1	0	0.3	0
red hake	490	0.4	54.0	0.4	yellow jack	1	0	0.1	0
smooth dogfish	310	0.3	816.3	6.6	<b>Total</b>	<b>117,002</b>		<b>12,284.5</b>	
Atlantic menhaden	276	0.2	61.4	0.5	<b>Invertebrates</b>				
summer flounder	242	0.2	141.6	1.2	American lobster	7,057	31.6	1,533.9	38.6
tautog	207	0.2	346.5	2.8	long-finned squid	15,299	68.4	594.8	15.0
spotted hake	148	0.1	25.7	0.2	horseshoe crab	nc	nc	386.7	9.7
moonfish	93	0.1	2.6	0	blue mussel	nc	nc	377.5	9.5
fourbeard rockling	92	0.1	8.4	0.1	lady crab	nc	nc	338.5	8.5
striped bass	81	0.1	198.6	1.6	spider crab	nc	nc	335.0	8.4
Atlantic sturgeon	60	0.1	848.6	6.9	rock crab	nc	nc	136.8	3.4
spiny dogfish	55	0	186.2	1.5	starfish spp.	nc	nc	124.6	3.1
ocean pout	42	0	9.1	0.1	flat claw hermit crab	nc	nc	51.4	1.3
hogchoker	36	0	3.8	0	northern moon snail	nc	nc	34.6	0.9
black sea bass	33	0	10.9	0.1	common oyster	nc	nc	18.4	0.5
winter skate	33	0	101.5	0.8	whelks	nc	nc	14.1	0.4
American sand lance	25	0	0.6	0	mantis shrimp	nc	nc	9.8	0.2
Spanish mackerel	25	0	1.7	0	lion's mane jellyfish	nc	nc	4.2	0.1
cunner	18	0	1.3	0	bluecrab	nc	nc	3.7	0.1
smallmouth flounder	15	0	1.3	0	arks	nc	nc	3.0	0.1
hickory shad	14	0	3.7	0	boring sponge	nc	nc	1.9	0
rough scad	13	0	0.2	0	hard clams	nc	nc	1.3	0
Atlantic mackerel	11	0	0.9	0	bushy bryozoan	nc	nc	0.6	0
spot	11	0	1.1	0	mud crabs	nc	nc	0.3	0
rainbow smelt	9	0	0.6	0	surf clam	nc	nc	0.3	0
crevalle jack	8	0	0.5	0	purple sea urchin	nc	nc	0.1	0
goosefish	8	0	2.0	0	<b>Total</b>	<b>22,356</b>		<b>3,972</b>	
northern kingfish	7	0	0.5	0					

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1995.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	64,930	50.1	1,664.5	15.2	spot	3	0	0.3	0
winter flounder	15,558	12.0	1,614.7	14.7	Atlantic cod	2	0	0.1	0
scup	13,985	10.8	770.5	7.0	conger eel	2	0	1.2	0
Atlantic herring	9,135	7.0	1,631.7	14.9	haddock	2	0	0.2	0
bluefish	5,524	4.3	1,156.1	10.5	northern pipefish	2	0	0.1	0
windowpane flounder	3,815	2.9	356.2	3.2	sea raven	2	0	0.7	0
weakfish	2,881	2.2	275.7	2.5	African pompano	1	0	0.1	0
fourspot flounder	2,584	2.0	402.9	3.7	crevalle jack	1	0	0.1	0
little skate	2,372	1.8	1,055.3	9.6	grubby	1	0	0.1	0
red hake	1,977	1.5	145.6	1.3	Atlantic mackerel	1	0	0.1	0
silver hake	1,941	1.5	61.6	0.6	mackerel scad	1	0	0.1	0
northern searobin	1,317	1.0	166.9	1.5	northern puffer	1	0	0.1	0
American shad	755	0.6	81.4	0.7	oyster toadfish	1	0	0.5	0
striped searobin	682	0.5	277.5	2.5	yellowtail flounder	1	0	0.1	0
alewife	386	0.3	24.6	0.2	<b>Total</b>	<b>129,609</b>		<b>10,966.8</b>	
Atlantic menhaden	318	0.2	41.9	0.4	<b>Invertebrates</b>				
blueback herring	255	0.2	7.5	0.1	American lobster	9,944	29.3	2,141.9	55.1
fourbeard rockling	169	0.1	14.7	0.1	long-finned squid	23,974	70.7	796.4	20.5
smooth dogfish	168	0.1	566.8	5.2	lady crab	nc	nc	535.0	13.8
striped bass	165	0.1	185.3	1.7	horseshoe crab	nc	nc	116.8	3
summer flounder	121	0.1	79.6	0.7	spider crab	nc	nc	95.4	2.5
American sand lance	95	0.1	0.4	0	lion's mane jellyfish	nc	nc	78.3	2
spotted hake	72	0.1	6.5	0.1	rock crab	nc	nc	47.0	1.2
tautog	61	0	95.1	0.9	blue mussel	nc	nc	14.0	0.4
cunner	41	0	4.4	0	flat claw hermit crab	nc	nc	12.8	0.3
winter skate	41	0	89.2	0.8	boring sponge	nc	nc	11.2	0.3
Atlantic silverside	39	0	0.9	0	whelks	nc	nc	10.8	0.3
moonfish	33	0	2.1	0	mantis shrimp	nc	nc	8.1	0.2
yellow jack	32	0	2.1	0	bluecrab	nc	nc	6.0	0.2
ocean pout	30	0	6.5	0.1	northern moon snail	nc	nc	5.8	0.1
northern kingfish	25	0	2.5	0	starfish spp.	nc	nc	4.7	0.1
smallmouth flounder	19	0	1.2	0	arks	nc	nc	1.4	0
hogchoker	17	0	1.7	0	hard clams	nc	nc	0.7	0
black sea bass	12	0	4.7	0	purple sea urchin	nc	nc	0.7	0
hickory shad	6	0	2.5	0	sand shrimp	nc	nc	0.4	0
Atlantic sturgeon	6	0	145.5	1.3	ghost shrimp	nc	nc	0.3	0
longhorn sculpin	5	0	1.3	0	mud crabs	nc	nc	0.2	0
clearnose skate	4	0	11.0	0.1	common razor clam	nc	nc	0.1	0
goosefish	4	0	3.3	0	shore shrimp	nc	nc	0.1	0
rainbow smelt	4	0	0.3	0	<b>Total</b>	<b>33,918</b>		<b>3,888</b>	
Atlantic tomcod	4	0	0.8	0					

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1996.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	49,360	37.0	1,844.7	12.4	northern puffer	3	0	0.3	0
winter flounder	22,722	17.0	3,335.0	22.5	rock gunnel	3	0	0.2	0
scup	16,087	12.0	739.4	5.0	short bigeye	3	0	0.3	0
windowpane flounder	14,116	10.6	1,223.6	8.2	Atlantic sturgeon	3	0	19.9	0.1
bluefish	6,705	5.0	1,118.2	7.5	bigeye scad	2	0	0.1	0
weakfish	6,375	4.8	414.9	2.8	grubby	2	0	0.2	0
little skate	6,203	4.6	2,801.8	18.9	sea raven	2	0	1.5	0
fourspot flounder	2,815	2.1	407.2	2.7	Atlantic tomcod	2	0	0.3	0
alewife	1,402	1.0	134.6	0.9	clearnose skate	1	0	1.7	0
striped searobin	1,008	0.8	278.7	1.9	conger eel	1	0	0.1	0
Atlantic herring	972	0.7	189.8	1.3	gizzard shad	1	0	0.1	0
moonfish	921	0.7	11.6	0.1	goosefish	1	0	0.1	0
red hake	872	0.7	95.5	0.6	sea lamprey	1	0	0.7	0
northern searobin	672	0.5	57.4	0.4	spiny dogfish	1	0	2.1	0
American shad	501	0.4	36.2	0.2	white perch	1	0	0.1	0
silver hake	489	0.4	20.0	0.1	<b>Total</b>	<b>133,546</b>		<b>14,835.2</b>	
summer flounder	434	0.3	266.4	1.8					
spotted hake	384	0.3	42.6	0.3	<b>Invertebrates</b>				
smooth dogfish	275	0.2	862.8	5.8	American lobster	9,490	29.5	2,113.5	39.1
striped bass	232	0.2	373.5	2.5	lady crab	nc	nc	1,160.4	21.5
spot	195	0.1	14.1	0.1	long-finned squid	22,720	70.5	720.4	13.3
tautog	136	0.1	225.9	1.5	horseshoe crab	nc	nc	717.0	13.3
fourbeard rockling	109	0.1	8.6	0.1	spider crab	nc	nc	293.9	5.4
blueback herring	97	0.1	6.2	0	rock crab	nc	nc	162.7	3.0
Atlantic menhaden	88	0.1	40.5	0.3	lion's mane jellyfish	nc	nc	42.7	0.8
winter skate	88	0.1	212.7	1.4	blue mussel	nc	nc	42.5	0.8
hogchoker	45	0	5.4	0	flat claw hermit crab	nc	nc	39.4	0.7
smallmouth flounder	41	0	2.3	0	whelks	nc	nc	33.0	0.6
rough scad	35	0	1.5	0	mantis shrimp	nc	nc	20.9	0.4
hickory shad	29	0	10.2	0.1	boring sponge	nc	nc	19.2	0.4
black sea bass	27	0	12.1	0.1	bushy bryozoan	nc	nc	15.2	0.3
ocean pout	26	0	7.2	0	starfish spp.	nc	nc	6.2	0.1
cunner	17	0	2.6	0	arks	nc	nc	4.3	0.1
striped anchovy	11	0	0.2	0	northern moon snail	nc	nc	4.3	0.1
longhorn sculpin	7	0	2.1	0	bluecrab	nc	nc	4.0	0.1
northern kingfish	6	0	0.6	0	hard clams	nc	nc	3.2	0.1
yellow jack	6	0	0.5	0	surf clam	nc	nc	1.4	0
Atlantic mackerel	5	0	0.5	0	mud crabs	nc	nc	0.3	0
planehead filefish	3	0	0.3	0	purple sea urchin	nc	nc	0.1	0
mackerel scad	3	0	0.1	0	<b>Total</b>	<b>32,210</b>		<b>5,405</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1997.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	70,985	50.3	2,017.2	15.5	American sand lance	2	0	0.1	0
winter flounder	14,701	10.4	2,439.4	18.8	short bigeye	2	0	0.2	0
bluefish	10,815	7.7	977.6	7.5	yellow jack	2	0	0.2	0
windowpane flounder	10,324	7.3	986.1	7.6	bigeye scad	1	0	0.1	0
scup	9,582	6.8	530.5	4.1	Atlantic cod	1	0	0.3	0
fourspot flounder	4,122	2.9	615.3	4.7	haddock	1	0	0.1	0
little skate	4,068	2.9	1,945.8	15.0	northern pipefish	1	0	0.1	0
weakfish	3,904	2.8	362.0	2.8	northern puffer	1	0	0.1	0
Atlantic herring	3,455	2.4	515.1	4.0	rougthead stingray	1	0	50.6	0.4
silver hake	1,973	1.4	70.8	0.5	sea lamprey	1	0	0.1	0
alewife	1,194	0.8	81.3	0.6	Atlantic tomcod	1	0	0.1	0
American shad	922	0.7	66.8	0.5	yellowtail flounder	1	0	0.3	0
striped searobin	819	0.6	230.5	1.8	<b>Total</b>	<b>141,040</b>		<b>12,974.6</b>	
red hake	748	0.5	80.5	0.6					
blueback herring	630	0.4	16.5	0.1	<b><u>Invertebrates</u></b>				
northern searobin	579	0.4	60.4	0.5	American lobster	16,467	55.3	3,800.9	64.6
summer flounder	486	0.3	326.0	2.5	lady crab	nc	nc	592.5	10.1
striped bass	319	0.2	509.9	3.9	long-finned squid	13,048	43.8	515.2	8.8
moonfish	287	0.2	4.6	0	horseshoe crab	204	0.7	472.4	8.0
fourbeard rockling	199	0.1	17.3	0.1	spider crab	nc	nc	188.3	3.2
tautog	190	0.1	271.8	2.1	rock crab	nc	nc	94.1	1.6
smooth dogfish	167	0.1	527.3	4.1	lion's mane jellyfish	nc	nc	88.0	1.5
Atlantic menhaden	116	0.1	38.5	0.3	bushy bryozoan	nc	nc	28.0	0.5
spotted hake	77	0.1	19.0	0.1	flat claw hermit crab	nc	nc	21.7	0.4
rough scad	65	0	2.0	0	boring sponge	nc	nc	16.5	0.3
smallmouth flounder	58	0	2.4	0	whelks	22	0.1	14.8	0.3
winter skate	48	0	109.7	0.8	bluecrab	33	0.1	13.6	0.2
cunner	43	0	4.1	0	mantis shrimp	nc	nc	9.3	0.2
hickory shad	25	0	9.1	0.1	starfish spp.	nc	nc	7.3	0.1
black sea bass	22	0	10.5	0.1	hard clams	nc	nc	3.8	0.1
hogchoker	15	0	1.8	0	blue mussel	nc	nc	3.5	0.1
ocean pout	15	0	4.8	0	northern moon snail	nc	nc	3.3	0.1
grubby	11	0	0.7	0	northern comb jelly	nc	nc	2.0	0
spot	10	0	1.1	0	arks	nc	nc	1.8	0
Atlantic mackerel	8	0	1.7	0	common oyster	nc	nc	1.8	0
northern kingfish	7	0	0.9	0	surf clam	nc	nc	0.9	0
spiny dogfish	7	0	13.7	0.1	common slipper shell	nc	nc	0.7	0
Atlantic sturgeon	5	0	37.8	0.3	mud crabs	nc	nc	0.6	0
clearnose skate	4	0	7.4	0.1	sand shrimp	nc	nc	0.2	0
longhorn sculpin	4	0	0.8	0	common razor clam	nc	nc	0.2	0
white perch	4	0	0.9	0	blood star	nc	nc	0.1	0
crevalle jack	3	0	0.6	0	star coral	nc	nc	0.1	0
sea raven	3	0	0.4	0	northern red shrimp	nc	nc	0.1	0
Atlantic silverside	2	0	0.1	0	shore shrimp	nc	nc	0.1	0
goosefish	2	0	1.6	0	purple sea urchin	nc	nc	0.1	0
inshore lizardfish	2	0	0.2	0	<b>Total</b>	<b>29,774</b>		<b>5,882</b>	
round scad	2	0	0.2	0					

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1998.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	136,926	64.0	3,661.1	24.4	goosefish	3	0	3.2	0
scup	23,742	11.1	740.5	4.9	oyster toadfish	3	0	0.9	0
winter flounder	15,697	7.3	2,450.3	16.3	gray triggerfish	2	0	2.3	0
bluefish	8,814	4.1	899.0	6.0	longhorn sculpin	2	0	1.0	0
windowpane flounder	6,483	3.0	741.1	4.9	bigeye scad	1	0	0.1	0
little skate	4,305	2.0	2,085.5	13.9	inshore lizardfish	1	0	0.1	0
weakfish	3,495	1.6	268.2	1.8	mackerel scad	1	0	0.1	0
red hake	3,015	1.4	217.5	1.4	rougtail stingray	1	0	3.4	0
fourspot flounder	1,908	0.9	306.0	2.0	<b>Total</b>	<b>214,025</b>		<b>15,005.7</b>	
silver hake	1,870	0.9	88.3	0.6					
striped searobin	1,321	0.6	509.7	3.4	<b>Invertebrates</b>				
moonfish	1,188	0.6	13.4	0.1	American lobster	16,211	36.7	3,873.9	60.2
American shad	901	0.4	60.2	0.4	long-finned squid	27,443	62.1	767.0	11.9
Atlantic herring	893	0.4	74.6	0.5	horseshoe crab	303	0.7	489.4	7.6
alewife	456	0.2	35.1	0.2	blue mussel	nc	nc	309.0	4.8
summer flounder	436	0.2	431.3	2.9	lady crab	nc	nc	291.2	4.5
striped bass	400	0.2	484.2	3.2	rock crab	nc	nc	241.4	3.8
northern searobin	360	0.2	39.4	0.3	spider crab	nc	nc	157.2	2.4
smooth dogfish	310	0.1	989.8	6.6	lion's mane jellyfish	nc	nc	63.1	1.0
Atlantic menhaden	306	0.1	9.2	0.1	flat claw hermit crab	nc	nc	56.0	0.9
blueback herring	211	0.1	5.1	0	bushy bryozoan	nc	nc	55.6	0.9
tautog	194	0.1	347.1	2.3	boring sponge	nc	nc	24.9	0.4
spotted hake	142	0.1	12.2	0.1	knobbed whelk	51	0.1	22.5	0.3
fourbeard rockling	133	0.1	11.6	0.1	starfish spp.	nc	nc	18.2	0.3
smallmouth flounder	97	0	6.4	0	bluecrab	49	0.1	12.8	0.2
cunner	65	0	8.1	0.1	channeled whelk	40	0.1	10.1	0.2
winter skate	62	0	180.7	1.2	whelks	52	0.1	9.8	0.2
hickory shad	40	0	15.9	0.1	northern moon snail	nc	nc	8.6	0.1
round herring	31	0	0.6	0	mantis shrimp	nc	nc	5.6	0.1
sea raven	30	0	11.3	0.1	common oyster	nc	nc	5.4	0.1
northern puffer	28	0	0.5	0	hard clams	nc	nc	3.7	0.1
clearnose skate	20	0	36.8	0.2	arks	nc	nc	2.0	0
black sea bass	18	0	10.6	0.1	red bearded sponge	nc	nc	1.4	0
spiny dogfish	18	0	44.5	0.3	surf clam	nc	nc	1.1	0
Atlantic sturgeon	17	0	189.7	1.3	sea grape	nc	nc	0.8	0
northern kingfish	15	0	1.3	0	mud crabs	nc	nc	0.7	0
Atlantic mackerel	13	0	1.1	0	boreal squid	18	0	0.7	0
ocean pout	13	0	2.7	0	purple sea urchin	nc	nc	0.6	0
hogchoker	12	0	1.9	0	common slipper shell	nc	nc	0.5	0
haddock	7	0	0.5	0	star coral	nc	nc	0.4	0
yellow jack	6	0	0.7	0	moon jelly	nc	nc	0.2	0
grubby	5	0	0.3	0	ghost shrimp	nc	nc	0.1	0
round scad	4	0	0.3	0	<b>Total</b>	<b>44,167</b>		<b>6,434</b>	
American sand lance	4	0	0.3	0					

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1999.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
butterfish	191,100	54.1	4,171.6	21.9	goosefish	2	0	0.3	0
scup	101,095	28.6	3,641.3	19.1	grubby	2	0	0.2	0
weakfish	12,416	3.5	771.3	4.0	northern pipefish	2	0	0.1	0
winter flounder	10,288	2.9	2,011.7	10.6	longhorn sculpin	2	0	0.3	0
bluefish	7,843	2.2	1,218.0	6.4	oyster toadfish	2	0	1.8	0
silver hake	5,126	1.5	99.6	0.5	Atlantic silverside	1	0	0.1	0
windowpane flounder	4,643	1.3	594.2	3.1	gizzard shad	1	0	0.1	0
little skate	3,686	1.0	1,829.6	9.6	haddock	1	0	0.1	0
red hake	2,973	0.8	226.5	1.2	round scad	1	0	0.1	0
Atlantic herring	2,511	0.7	45.4	0.2	striped cusk-eel	1	0	0.1	0
striped searobin	1,690	0.5	497.0	2.6	sharksucker	1	0	0.3	0
alewife	1,393	0.4	107.6	0.6	Spanish mackerel	1	0	0.2	0
fourspot flounder	1,393	0.4	203.9	1.1	Atlantic tomcod	1	0	0.7	0
Atlantic menhaden	1,187	0.3	90.9	0.5	white perch	1	0	0.4	0
American shad	987	0.3	117.3	0.6	<b>Total</b>	<b>353,203</b>		<b>19,054.7</b>	
moonfish	645	0.2	9.6	0.1					
summer flounder	582	0.2	459.8	2.4					
bay anchovy	548	0.2	5.6	0	<b>Invertebrates</b>				
northern searobin	547	0.2	52.0	0.3	American lobster	13,922	38.1	3,397.9	61.6
striped bass	397	0.1	815.4	4.3	long-finned squid	21,580	59.0	826.4	15.0
spotted hake	381	0.1	38.8	0.2	horseshoe crab	384	1.1	634.1	11.5
smooth dogfish	305	0.1	923.0	4.8	lady crab	nc	nc	159.7	2.9
fourbeard rockling	233	0.1	28.8	0.2	rock crab	nc	nc	118.6	2.2
tautog	217	0.1	326.6	1.7	spider crab	nc	nc	95.4	1.7
striped anchovy	216	0.1	6.1	0	bushy bryozoan	nc	nc	78.0	1.4
American sand lance	178	0.1	0.3	0	flat claw hermit crab	nc	nc	32.5	0.6
smallmouth flounder	96	0	5.2	0	knobbed whelk	61	0.2	24.8	0.4
hickory shad	56	0	19.4	0.1	bluecrab	89	0.2	21.3	0.4
cunner	51	0	5.9	0	channeled whelk	81	0.2	21.1	0.4
black sea bass	50	0	17.2	0.1	mantis shrimp	376	1.0	19.3	0.4
spot	45	0	5.7	0	boring sponge	nc	nc	19.3	0.4
winter skate	41	0	89.8	0.5	lion's mane jellyfish	61	0.2	16.7	0.3
hogchoker	39	0	5.0	0	blue mussel	nc	nc	14.1	0.3
Atlantic sturgeon	39	0	498.6	2.6	northern moon snail	nc	nc	9.1	0.2
clearnose skate	22	0	39.4	0.2	starfish spp.	nc	nc	8.8	0.2
bigeye scad	21	0	1.4	0	common oyster	nc	nc	4.7	0.1
Atlantic mackerel	21	0	3.1	0	arks	nc	nc	2.8	0.1
yellow jack	20	0	1.9	0	common slipper shell	nc	nc	1.8	0
blueback herring	19	0	1.1	0	mud crabs	nc	nc	1.7	0
ocean pout	17	0	3.9	0	hard clams	nc	nc	1.5	0
northern puffer	14	0	1.1	0	sand shrimp	nc	nc	1.0	0
spiny dogfish	10	0	51.1	0.3	purple sea urchin	nc	nc	1.0	0
sea raven	9	0	4.9	0	northern red shrimp	nc	nc	0.9	0
crevalle jack	8	0	0.7	0	surf clam	nc	nc	0.4	0
inshore lizardfish	7	0	0.5	0	sea grape	nc	nc	0.2	0
northern kingfish	6	0	0.6	0	star coral	nc	nc	0.1	0
northern sennet	6	0	0.5	0	common razor clam	nc	nc	0.1	0
planehead filefish	3	0	0.3	0	moon jelly	nc	nc	0.1	0
bigeye	2	0	0.2	0	nemerteans	nc	nc	0.1	0
conger eel	2	0	0.5	0	<b>Total</b>	<b>36,554</b>		<b>5,514</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2000.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
scup	101,464	44.4	6,679.0	34.9	northern kingfish	2	0	0.3	0
butterfish	60,490	26.5	1,458.3	7.6	round scad	2	0	0.2	0
weakfish	23,595	10.3	554.5	2.9	bigeye	1	0	0.1	0
winter flounder	8,867	3.9	1,921.4	10.0	Atlantic cod	1	0	0.1	0
bluefish	6,135	2.7	1,408.0	7.3	goosefish	1	0	0.2	0
little skate	3,340	1.5	1,604.7	8.4	inshore lizardfish	1	0	0.1	0
striped searobin	3,129	1.4	1,036.1	5.4	lined seahorse	1	0	0.1	0
fourspot flounder	2,590	1.1	398.6	2.1	white perch	1	0	0.2	0
windowpane flounder	2,488	1.1	368.8	1.9	yellowtail flounder	1	0	0.1	0
red hake	2,393	1.0	162.6	0.8	<b>Total</b>	<b>228,425</b>		<b>19,156.5</b>	
bay anchovy	2,303	1.0	12.2	0.1					
northern searobin	2,014	0.9	251.2	1.3	<b>Invertebrates</b>				
moonfish	1,817	0.8	15.0	0.1	American lobster	10,481	36.0	2,184.5	49.9
alewife	1,572	0.7	96.0	0.5	horseshoe crab	420	1.4	689.4	15.8
spotted hake	1,425	0.6	92.3	0.5	long-finned squid	16,585	57.0	582.3	13.3
Atlantic herring	770	0.3	124.1	0.6	lady crab	nc	nc	308.4	7.1
silver hake	679	0.3	28.8	0.2	spider crab	nc	nc	99.4	2.3
summer flounder	555	0.2	471.3	2.5	bushy bryozoan	nc	nc	95.2	2.2
Atlantic menhaden	492	0.2	31.8	0.2	rock crab	nc	nc	60.4	1.4
smooth dogfish	467	0.2	1,038.5	5.4	boring sponge	nc	nc	58.6	1.3
American shad	316	0.1	25.8	0.1	mantis shrimp	1,086	3.7	49.0	1.1
striped bass	293	0.1	602.6	3.1	blue mussel	nc	nc	36.8	0.8
tautog	287	0.1	463.5	2.4	lion's mane jellyfish	223	0.8	36.4	0.8
spot	204	0.1	17.8	0.1	channeled whelk	138	0.5	32.0	0.7
fourbeard rockling	185	0.1	14.7	0.1	knobbed whelk	76	0.3	29.9	0.7
blueback herring	143	0.1	6.8	0	starfish spp.	nc	nc	29.0	0.7
black sea bass	69	0	22.6	0.1	flat claw hermit crab	nc	nc	26.0	0.6
smallmouth flounder	61	0	2.7	0	bluecrab	104	0.4	19.3	0.4
cunner	50	0	5.3	0	northern moon snail	nc	nc	9.7	0.2
hickory shad	42	0	17.1	0.1	hydroid spp.	nc	nc	4.8	0.1
hogchoker	40	0	5.9	0	fan worm tubes	nc	nc	3.4	0.1
winter skate	31	0	66.5	0.3	hard clams	nc	nc	3.3	0.1
sea raven	19	0	9.2	0	arks	nc	nc	3.1	0.1
clearnose skate	18	0	37.9	0.2	mud crabs	nc	nc	2.8	0.1
ocean pout	18	0	4.9	0	sand shrimp	nc	nc	2.7	0.1
longhorn sculpin	14	0	5.0	0	common slipper shell	nc	nc	2.4	0.1
Atlantic sturgeon	7	0	79.0	0.4	purple sea urchin	nc	nc	2.3	0.1
oyster toadfish	6	0	2.5	0	common oyster	nc	nc	1.4	0
northern pipefish	4	0	0.2	0	sea grape	nc	nc	1.1	0
northern puffer	4	0	0.4	0	blood star	nc	nc	0.2	0
American sand lance	4	0	0.3	0	northern comb jelly	nc	nc	0.1	0
spiny dogfish	4	0	9.9	0.1	common razor clam	nc	nc	0.1	0
rock gunnel	3	0	0.2	0	northern cyclocardia	nc	nc	0.1	0
yellow jack	3	0	0.2	0	northern red shrimp	nc	nc	0.1	0
Atlantic silverside	2	0	0.1	0	surf clam	nc	nc	0.1	0
Atlantic mackerel	2	0	0.8	0	<b>Total</b>	<b>29,113</b>		<b>4,374</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2001.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay anchovy, striped anchovy, and American sand lance and Atlantic herring are not quantified. Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
scup	58,325	37.7	5,828.4	30.7	American eel	1	0	0.6	0
butterfish	45,264	29.3	1,834.0	9.7	planehead filefish	1	0	0.1	0
weakfish	12,739	8.2	415.0	2.2	goosefish	1	0	0.4	0
winter flounder	9,826	6.4	1,993.6	10.5	naked goby	1	0	0.1	0
little skate	4,311	2.8	2,022.6	10.6	northern sennet	1	0	0.1	0
bluefish	3,986	2.6	751.2	4.0	rock gunnel	1	0	0.1	0
silver hake	3,945	2.6	152.2	0.8	red goatfish	1	0	0.1	0
windowpane flounder	3,065	2.0	475.5	2.5	rougtail stingray	1	0	2.5	0
fourspot flounder	2,167	1.4	362.7	1.9	short bigeye	1	0	0.1	0
striped searobin	2,061	1.3	861.0	4.5	yellowtail flounder	1	0	0.2	0
northern searobin	1,594	1.0	222.7	1.2	<b>Total</b>	<b>154,514</b>		<b>18,997.8</b>	
red hake	1,382	0.9	109.7	0.6					
summer flounder	875	0.6	628.1	3.3	<b><u>Finfish not ranked</u></b>				
alewife	638	0.4	41.7	0.2	American sand lance, yoy				
spotted hake	606	0.4	34.9	0.2	anchovy spp, yoy				
smooth dogfish	598	0.4	1,407.6	7.4	Atlantic herring, yoy				
Atlantic herring	497	0.3	72.6	0.4					
bay anchovy	443	0.3	3.6	0	<b><u>Invertebrates</u></b>				
tautog	319	0.2	491.2	2.6	American lobster	5,626	35.1	1,531.2	39.2
blueback herring	279	0.2	11.1	0.1	horseshoe crab	503	3.1	870.7	22.3
fourbeard rockling	251	0.2	21.5	0.1	long-finned squid	9,080	56.6	346.2	8.9
moonfish	225	0.1	3.8	0	spider crab	nc	nc	302.5	7.7
striped bass	214	0.1	472.5	2.5	bushy bryozoan	nc	nc	162.9	4.2
black sea bass	134	0.1	74.8	0.4	starfish spp.	nc	nc	154.7	4.0
American shad	109	0.1	9.6	0.1	rock crab	nc	nc	86.3	2.2
smallmouth flounder	98	0.1	3.8	0	blue mussel	nc	nc	84.7	2.2
Atlantic menhaden	86	0.1	4.7	0	lady crab	nc	nc	79.0	2.0
hogchoker	85	0.1	10.5	0.1	flat claw hermit crab	nc	nc	57.6	1.5
clearnose skate	65	0	132.4	0.7	knobbed whelk	118	0.7	53.3	1.4
cunner	51	0	5.9	0	channeled whelk	190	1.2	48.0	1.2
spiny dogfish	48	0	128.6	0.7	boring sponge	nc	nc	30.0	0.8
striped anchovy	47	0	1.2	0	lion's mane jellyfish	182	1.1	25.9	0.7
winter skate	38	0	112.2	0.6	northern moon snail	nc	nc	17.5	0.4
inshore lizardfish	21	0	2.2	0	mantis shrimp	304	1.9	16.5	0.4
Atlantic sturgeon	18	0	270.6	1.4	bluecrab	38	0.2	6.2	0.2
hickory shad	14	0	6.7	0	sea grape	nc	nc	6.1	0.2
spot	13	0	1.3	0	common slipper shell	nc	nc	5.3	0.1
rough scad	10	0	0.7	0	hydroid spp.	nc	nc	5.0	0.1
northern puffer	8	0	0.7	0	arks	nc	nc	4.0	0.1
sea raven	7	0	4.1	0	mud crabs	nc	nc	3.6	0.1
ocean pout	6	0	2.3	0	hard clams	nc	nc	3.0	0.1
round herring	5	0	0.1	0	sand shrimp	nc	nc	2.8	0.1
longhorn sculpin	5	0	1.5	0	common oyster	1	0	1.2	0
fawn cusk-eel	4	0	0.2	0	fan worm tubes	nc	nc	1.0	0
northern pipefish	4	0	0.3	0	purple sea urchin	nc	nc	0.8	0
American sand lance	4	0	0.3	0	moon jelly	nc	nc	0.4	0
seasnail	4	0	0.3	0	ghost shrimp	nc	nc	0.3	0
yellow jack	3	0	0.3	0	bobtail squid	1	0	0.1	0
conger eel	2	0	0.3	0	common razor clam	nc	nc	0.1	0
northern kingfish	2	0	0.2	0	northern red shrimp	nc	nc	0.1	0
oyster toadfish	2	0	0.4	0	surf clam	nc	nc	0.1	0
Atlantic silverside	1	0	0.1	0	<b>Total</b>	<b>16,043</b>		<b>3,907</b>	



**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2002.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring are not quantified. Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
scup	100,481	47.0	13,814.1	46.0	inshore lizardfish	1	0	0.1	0
butterfish	66,550	31.1	1,924.2	6.4	northern kingfish	1	0	0.2	0
weakfish	10,713	5.0	442.0	1.5	rock gunnel	1	0	0.1	0
winter flounder	6,884	3.2	1,584.1	5.3	rainbow smelt	1	0	0.1	0
little skate	4,242	2.0	2,121.9	7.1	rougtail stingray	1	0	24.4	0.1
bluefish	3,450	1.6	1,099.7	3.7	<b>Total</b>	<b>213,796</b>		<b>30,062.0</b>	
striped searobin	2,394	1.1	1,065.0	3.5					
northern searobin	2,123	1.0	267.3	0.9					
red hake	2,103	1.0	206.6	0.7	<b>Finfish not ranked</b>				
silver hake	2,013	0.9	89.6	0.3	anchovy spp, yoy				
windowpane flounder	1,991	0.9	343.3	1.1	Atlantic herring, yoy				
fourspot flounder	1,859	0.9	326.9	1.1					
summer flounder	1,356	0.6	989.3	3.3					
smooth dogfish	1,019	0.5	2,814.3	9.4	<b>Invertebrates</b>				
bay anchovy	992	0.5	6.6	0	blue mussel	nc	nc	2,497.8	43.9
alewife	855	0.4	70.2	0.2	American lobster	3,880	29.7	1,005.7	17.7
spotted hake	798	0.4	48.2	0.2	horseshoe crab	517	4.0	862.9	15.2
American shad	593	0.3	40.3	0.1	spider crab	nc	nc	348.4	6.1
tautog	565	0.3	921.1	3.1	long-finned squid	8,034	61.5	279.9	4.9
striped bass	469	0.2	855.2	2.8	lady crab	nc	nc	117.0	2.1
moonfish	424	0.2	7.4	0	starfish spp.	nc	nc	91.8	1.6
black sea bass	394	0.2	188.3	0.6	bushy bryozoan	nc	nc	85.0	1.5
Atlantic menhaden	366	0.2	96.3	0.3	boring sponge	nc	nc	83.9	1.5
Atlantic herring	365	0.2	63.9	0.2	rock crab	nc	nc	74.6	1.3
smallmouth flounder	139	0.1	4.9	0	flat claw hermit crab	36	0.3	55.8	1.0
fourbeard rockling	106	0	9.7	0	channeled whelk	174	1.3	43.6	0.8
hogchoker	100	0	13.3	0	northern moon snail	nc	nc	40.3	0.7
blueback herring	68	0	2.4	0	knobbed whelk	40	0.3	19.1	0.3
clearnose skate	59	0	107.3	0.4	bluecrab	84	0.6	16.1	0.3
cunner	55	0	7.2	0	lion's mane jellyfish	71	0.5	12.3	0.2
spot	52	0	7.2	0	mantis shrimp	226	1.7	11.2	0.2
hickory shad	45	0	19.6	0.1	arks	nc	nc	7.8	0.1
winter skate	45	0	133.5	0.4	common slipper shell	nc	nc	7.3	0.1
Atlantic sturgeon	18	0	275.3	0.9	hydroid spp.	nc	nc	7.3	0.1
spiny dogfish	17	0	48.0	0.2	sea grape	nc	nc	5.3	0.1
ocean pout	13	0	4.3	0	hard clams	3	0	5.2	0.1
yellow jack	13	0	1.4	0	mud crabs	nc	nc	4.7	0.1
sea raven	11	0	4.1	0	purple sea urchin	nc	nc	2.3	0
rough scad	10	0	0.7	0	sand shrimp	nc	nc	1.6	0
oyster toadfish	8	0	4.7	0	rubbery bryozoan	nc	nc	1.0	0
northern puffer	6	0	0.3	0	surf clam	nc	nc	1.0	0
Atlantic mackerel	5	0	2.5	0	deadman's fingers sponge	nc	nc	0.5	0
short bigeye	5	0	0.2	0	blood star	nc	nc	0.4	0
goosefish	3	0	0.6	0	common oyster	nc	nc	0.4	0
American sand lance	3	0	0.1	0	mixed sponge species	nc	nc	0.4	0
longhorn sculpin	3	0	0.9	0	northern red shrimp	nc	nc	0.3	0
northern sennet	2	0	0.2	0	anemones	nc	nc	0.1	0
northern pipefish	2	0	0.2	0	bobtail squid	1	0	0.1	0
Atlantic bonito	1	0	2.4	0	ghost shrimp	nc	nc	0.1	0
crevalle jack	1	0	0.1	0	ribbed mussel	nc	nc	0.1	0
gizzard shad	1	0	0.1	0	sea cucumber	1	0	0.1	0
grubby	1	0	0.1	0	<b>Total</b>	<b>13,067</b>		<b>5,691</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2003.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring are not quantified. Number of tows (sample size)=160.*

species	count	%	weight	%	Species	count	%	weight	%
butterfish	25,483	34.4	524.6	3.7	barndoor skate	1	0	0.4	0
scup	17,552	23.7	4,389.3	30.6	Planehead filefish	1	0	0.1	0
weakfish	5,596	7.6	131.9	0.9	rainbow smelt	1	0	0.1	0
winter flounder	4,245	5.7	1,276.5	8.9	sea lamprey	1	0	1.3	0
bluefish	3,717	5.0	655.0	4.6	Spanish mackerel	1	0	2.1	0
little skate	2,867	3.9	1,554.1	10.8	<b>Total</b>	<b>74,107</b>		<b>14,323.6</b>	
bay anchovy	2,254	3.0	12.5	0.1					
windowpane flounder	1,858	2.5	333.9	2.3	<b>Finfish not ranked</b>				
fourspot flounder	1,658	2.2	327.7	2.3	anchovy spp, yoy				
striped searobin	1,529	2.1	687.0	4.8	Atlantic herring, yoy				
northern searobin	1,468	2.0	240.7	1.7					
summer flounder	1,151	1.6	825.0	5.8	<b>Invertebrates</b>				
red hake	681	0.9	31.1	0.2	Horseshoe crab	399	1.7	670.5	23.2
alewife	608	0.8	49.4	0.3	spider crab	nc	nc	640.6	22.2
smooth dogfish	552	0.7	1,508.8	10.5	American lobster	1,958	8.3	479.7	16.6
spotted hake	527	0.7	41.6	0.3	long-finned squid	19,231	81.9	421.3	14.6
Atlantic herring	448	0.6	87.8	0.6	boring sponge	nc	nc	107.5	3.7
American shad	305	0.4	23.5	0.2	rock crab	nc	nc	80.9	2.8
silver hake	217	0.3	8.3	0.1	starfish spp.	nc	nc	73.7	2.6
striped bass	215	0.3	542.1	3.8	flat claw hermit crab	nc	nc	61.3	2.1
tautog	210	0.3	325.4	2.3	channeled whelk	334	1.4	58.8	2.0
Atlantic menhaden	121	0.2	16.1	0.1	bushy bryozoan	nc	nc	54.3	1.9
fourbeard rockling	111	0.1	9.0	0.1	lion's mane jellyfish	1,307	5.6	40.6	1.4
blueback herring	98	0.1	3.4	0	knobbed whelk	96	0.4	35.1	1.2
moonfish	97	0.1	1.3	0	sea grape	nc	nc	31.1	1.1
hogchoker	89	0.1	8.3	0.1	northern moon snail	nc	nc	20.9	0.7
black sea bass	57	0.1	45.7	0.3	blue mussel	nc	nc	19.7	0.7
Atlantic cod	57	0.1	2.7	0	common slipper shell	nc	nc	16.8	0.6
clearnose skate	55	0.1	105.9	0.7	lady crab	nc	nc	12.0	0.4
smallmouth flounder	38	0.1	2.4	0	hydroid spp.	nc	nc	9.6	0.3
winter skate	38	0.1	90.6	0.6	ribbed mussel	nc	nc	8.8	0.3
cunner	36	0	5.9	0	sand shrimp	nc	nc	6.8	0.2
haddock	26	0	1.3	0	arks	nc	nc	6.5	0.2
Atlantic sturgeon	23	0	391.9	2.7	mud crabs	nc	nc	6.5	0.2
hickory shad	22	0	10.3	0.1	rubbery bryozoan	nc	nc	6.0	0.2
American sand lance	19	0	0.2	0	mantis shrimp	110	0.5	4.9	0.2
ocean pout	14	0	2.9	0	bluecrab	24	0.1	4.3	0.1
rough scad	12	0	0.5	0	hard clams	nc	nc	3.9	0.1
oyster toadfish	9	0	5.0	0	star coral	nc	nc	1.9	0.1
spiny dogfish	7	0	34.8	0.2	coastal mud shrimp	4	0	0.7	0
rock gunnel	6	0	0.4	0	purple sea urchin	nc	nc	0.6	0
round scad	4	0	0.3	0	blood star	nc	nc	0.4	0
glasseye snapper	3	0	0.1	0	northern red shrimp	2	0	0.4	0
conger eel	3	0	1.1	0	Japanese shore crab	4	0	0.3	0
Atlantic mackerel	3	0	0.3	0	anemones	nc	nc	0.1	0
crevalle jack	2	0	0.2	0	sand dollar	1	0	0.1	0
northern pipefish	2	0	0.2	0	common razor clam	1	0	0.1	0
northern puffer	2	0	0.2	0	moon jelly	nc	nc	0.1	0
longhorn sculpin	2	0	0.9	0	northern cyclocardia	nc	nc	0.1	0
sea raven	2	0	1.3	0	mixed sponge species	nc	nc	0.1	0
striped anchovy	2	0	0.1	0	<b>Total</b>	<b>23,471</b>		<b>2,887</b>	
Atlantic silverside	1	0	0.1	0					

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2004.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring are not quantified. Number of tows (sample size)=199.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	94,735	46.7	1,842.7	9.7	American plaice	1	0	0.1	0
scup	61,521	30.3	6,801.1	35.7	conger eel	1	0	0.1	0
weakfish	17,505	8.6	426.9	2.2	gizzard shad	1	0	0.1	0
bluefish	6,504	3.2	2,140.6	11.2	goosefish	1	0	0.1	0
winter flounder	4,021	2.0	839.9	4.4	pollock	1	0	0.1	0
little skate	3,044	1.5	1,689.8	8.9	rougtail stingray	1	0	4.1	0
windowpane flounder	2,275	1.1	333.7	1.8	oyster toadfish	1	0	0.8	0
bay anchovy	1,523	0.8	10.3	0.1	yellow jack	1	0	0.1	0
silver hake	1,417	0.7	27.3	0.1	<b>Total</b>	<b>202,887</b>		<b>19,056.6</b>	
fourspot flounder	1,406	0.7	309.3	1.6					
striped searobin	1,308	0.6	465.4	2.4	<b><u>Finfish not ranked</u></b>				
alewife	859	0.4	56.1	0.3	anchovy spp, yoy				
Atlantic herring	851	0.4	58.3	0.3	Atlantic herring, yoy				
red hake	829	0.4	51.6	0.3					
northern searobin	784	0.4	112.0	0.6	<b><u>Invertebrates</u></b>				
Atlantic menhaden	746	0.4	110.7	0.6	long-finned squid	23,022	86.5	953.4	28.8
summer flounder	644	0.3	627.2	3.3	horseshoe crab	534	2.0	873.4	26.4
smooth dogfish	503	0.2	1,435.3	7.5	American lobster	1,843	6.9	481.5	14.5
striped bass	378	0.2	811.8	4.3	spider crab	nc	nc	355.5	10.7
American shad	356	0.2	24.2	0.1	blue mussel	nc	nc	250.2	7.6
tautog	232	0.1	353.7	1.9	bushy bryozoan	nc	nc	50.9	1.5
spotted hake	230	0.1	37.8	0.2	flat claw hermit crab	nc	nc	42.4	1.3
blueback herring	218	0.1	6.5	0	channeled whelk	199	0.7	42.3	1.3
moonfish	182	0.1	3.4	0	starfish spp.	nc	nc	41.7	1.3
fourbeard rockling	173	0.1	13.0	0.1	boring sponge	nc	nc	41.7	1.3
black sea bass	124	0.1	40.5	0.2	rock crab	1	0.0	35.2	1.1
hogchoker	83	0	9.5	0	lion's mane jellyfish	803	3.0	34.0	1.0
American sand lance	70	0	0.2	0	common slipper shell	nc	nc	22.9	0.7
winter skate	53	0	100.3	0.5	sea grape	nc	nc	16.4	0.5
smallmouth flounder	50	0	2.8	0	lady crab	nc	nc	14.5	0.4
hickory shad	39	0	14.2	0.1	northern moon snail	nc	nc	11.5	0.3
spiny dogfish	38	0	104.7	0.5	knobbed whelk	21	0.1	7.7	0.2
Atlantic cod	33	0	4.7	0	mantis shrimp	159	0.6	7.0	0.2
clearnose skate	22	0	48.2	0.3	arks	nc	nc	7.0	0.2
cunner	21	0	3.7	0	mud crabs	nc	nc	5.4	0.2
ocean pout	18	0	5.4	0	sand shrimp	nc	nc	4.7	0.1
rough scad	14	0	0.7	0	bluecrab	13	0	2.8	0.1
round scad	11	0	0.3	0	hard clams	nc	nc	2.3	0.1
spot	8	0	0.9	0	surf clam	5	0	1.0	0
Atlantic sturgeon	8	0	117.6	0.6	purple sea urchin	nc	nc	0.8	0
haddock	7	0	0.6	0	mixed sponge species	nc	nc	0.6	0
sea raven	7	0	2.4	0	hydroid spp.	nc	nc	0.6	0
northern kingfish	5	0	0.5	0	deadman's fingers sponge	nc	nc	0.5	0
northern puffer	5	0	0.4	0	rubbery bryzoan	nc	nc	0.4	0
longhorn sculpin	5	0	3.4	0	star coral	nc	nc	0.3	0
seasnail	4	0	0.2	0	northern red shrimp	nc	nc	0.3	0
crevalle jack	2	0	0.2	0	northern cyclocardia	nc	nc	0.2	0
northern pipefish	2	0	0.2	0	blood star	nc	nc	0.1	0
rock gunnel	2	0	0.2	0	coastal mud shrimp	1	0	0.1	0
Atlantic tomcod	2	0	0.2	0	sea cucumber	2	0	0.1	0
white perch	2	0	0.5	0	<b>Total</b>	<b>26,603</b>		<b>3,309.4</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2005.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring are not quantified. Number of tows (sample size)=200.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
butterfish	92,996	52.2	2,097.3	16.8	haddock	2	0	0.2	0
scup	52,642	29.6	3,080.7	24.7	seasnail	2	0	0.2	0
weakfish	9,191	5.2	449.9	3.6	glasseye snapper	1	0	0.1	0
bluefish	6,532	3.7	1,333.8	10.7	inshore lizardfish	1	0	0.1	0
winter flounder	4,692	2.6	566.1	4.5	lookdown	1	0	0.1	0
windowpane flounder	1,982	1.1	177.5	1.4	pollock	1	0	0.1	0
little skate	1,317	0.7	682.5	5.5	<b>Total</b>	<b>178,073</b>		<b>12,474.3</b>	
Atlantic herring	1,168	0.7	131.1	1.1					
bay anchovy	814	0.5	5.8	0	<b>Finfish not ranked</b>				
striped searobin	757	0.4	183.7	1.5	anchovy spp, yoy				
alewife	742	0.4	47.6	0.4	Atlantic herring, yoy				
fourspot flounder	688	0.4	125.9	1					
red hake	585	0.3	56.0	0.4	<b>Invertebrates</b>				
summer flounder	506	0.3	406.1	3.3	blue mussel	nc	nc	971.0	32.6
striped bass	469	0.3	675.1	5.4	long-finned squid	17,542	83.2	683.5	22.9
smooth dogfish	467	0.3	1,421.7	11.4	American lobster	1,389	6.6	364.3	12.2
moonfish	356	0.2	6.0	0	horseshoe crab	161	0.8	304.2	10.2
northern searobin	265	0.1	21.3	0.2	starfish spp.	nc	nc	198.4	6.7
Atlantic menhaden	235	0.1	77.9	0.6	lion's mane jellyfish	1,806	8.6	97.3	3.3
spotted hake	234	0.1	17.4	0.1	spider crab	nc	nc	92.0	3.1
tautog	179	0.1	269.2	2.2	bushy bryozoan	nc	nc	64.6	2.2
American shad	177	0.1	18.2	0.1	lady crab	nc	nc	48.8	1.6
silver hake	165	0.1	7.1	0.1	boring sponge	nc	nc	26.1	0.9
hickory shad	136	0.1	43.1	0.3	flat claw hermit crab	nc	nc	23.1	0.8
blueback herring	111	0.1	5.4	0	channeled whelk	101	0.5	23.0	0.8
fourbeard rockling	106	0.1	6.8	0.1	common slipper shell	nc	nc	12.2	0.4
clearnose skate	102	0.1	187.1	1.5	rubbery bryozoan	nc	nc	11.0	0.4
rough scad	62	0	1.9	0	knobbed whelk	23	0.1	9.7	0.3
hogchoker	61	0	8.7	0.1	rock crab	nc	nc	9.3	0.3
smallmouth flounder	44	0	2.4	0	ribbed mussel	nc	nc	7.6	0.3
black sea bass	42	0	26.4	0.2	hard clams	nc	nc	7.2	0.2
spiny dogfish	41	0	102.0	0.8	northern moon snail	nc	nc	4.7	0.2
Atlantic mackerel	37	0	5.7	0	sea grape	nc	nc	4.5	0.2
winter skate	31	0	59.9	0.5	mantis shrimp	64	0.3	3.8	0.1
yellow jack	28	0	3.0	0	arks	nc	nc	3.5	0.1
cunner	24	0	4.1	0	hydroid spp.	nc	nc	3.4	0.1
round scad	12	0	0.3	0	mud crabs	nc	nc	2.5	0.1
Atlantic cod	10	0	0.9	0	sand shrimp	nc	nc	2.1	0.1
rock gunnel	9	0	0.6	0	deadman's fingers sponge	nc	nc	1.1	0
Atlantic sturgeon	9	0	152.7	1.2	purple sea urchin	nc	nc	0.7	0
northern sennet	8	0	0.7	0	bluecrab	3	0	0.6	0
American sand lance	6	0	0.2	0	mixed sponge species	nc	nc	0.4	0
northern puffer	5	0	0.3	0	surf clam	nc	nc	0.4	0
northern kingfish	4	0	0.6	0	star coral	nc	nc	0.3	0
northern pipefish	4	0	0.3	0	sand dollar	1	0	0.2	0
ocean pout	3	0	0.7	0	northern red shrimp	nc	nc	0.2	0
sea raven	3	0	0.5	0	boreal squid	1	0	0.1	0
crevalle jack	2	0	0.2	0	Japanese shore crab	5	0	0.1	0
gizzard shad	2	0	0.2	0	northern cyclocardia	nc	nc	0.1	0
goosefish	2	0	0.7	0	common oyster	nc	nc	0.1	0
grubby	2	0	0.2	0	<b>Total</b>	<b>21,096</b>		<b>2,982.1</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 2006.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=120.*

<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>	<b>species</b>	<b>count</b>	<b>%</b>	<b>weight</b>	<b>%</b>
butterfish	50,022	54.3	1,631.4	15.5					
scup	28,829	31.3	4,636.1	44.2					
bluefish	2,100	2.3	358.6	3.4	<b><u>Finfish not ranked</u></b>				
winter flounder	1,699	1.8	271.2	2.6	anchovy spp. yoy				
bay anchovy	1,492	1.6	8.3	0.1	Atlantic herring, yoy				
silver hake	1,267	1.4	37.7	0.4	American sand lance (yoy)				
windowpane flounder	1,077	1.2	128.9	1.2					
northern searobin	630	0.7	74.5	0.7					
red hake	625	0.7	37.4	0.4					
little skate	593	0.6	310.6	3	<b><u>Invertebrates</u></b>				
alewife	573	0.6	49.5	0.5	long-finned squid	7,802	83.4	326	32.5
fourspot flounder	466	0.5	88.1	0.8	horseshoe crab	109	1.2	205.8	20.5
striped searobin	366	0.4	113.5	1.1	American lobster	748	8	197.9	19.7
moonfish	361	0.4	3.5	0	boring sponge	nc	nc	51.3	5.1
smooth dogfish	332	0.4	1,176.6	11.2	spider crab	nc	nc	50.6	5
spotted hake	321	0.3	24.3	0.2	lion's mane jellyfish	558	6	45.4	4.5
weakfish	241	0.3	52.2	0.5	rock crab	nc	nc	40.4	4
summer flounder	203	0.2	180.5	1.7	bushy bryozoan	nc	nc	17.8	1.8
tautog	186	0.2	301.4	2.9	blue mussel	nc	nc	7.6	0.8
striped bass	144	0.2	418.7	4	channeled whelk	41	0.4	7.6	0.8
hickory shad	75	0.1	19.1	0.2	lady crab	nc	nc	7.5	0.7
American shad	68	0.1	6.1	0.1	deadman's fingers sponge	nc	nc	6.8	0.7
Atlantic herring	66	0.1	10.3	0.1	hydroid spp.	nc	nc	5.9	0.6
blueback herring	63	0.1	2.5	0	flat claw hermit crab	nc	nc	5.7	0.6
clearnose skate	36	0	52.4	0.5	starfish spp.	nc	nc	4.8	0.5
Atlantic menhaden	28	0	5.5	0.1	rubbery bryozoan	nc	nc	4	0.4
winter skate	23	0	60	0.6	common slipper shell	nc	nc	3.9	0.4
hogchoker	22	0	3.2	0	mantis shrimp	70	0.7	3.4	0.3
Atlantic sturgeon	21	0	368.7	3.5	mud crabs	nc	nc	2.1	0.2
black sea bass	19	0	9.3	0.1	blue crab	11	0.1	1.8	0.2
fourbeard rockling	14	0	1.5	0	knobbed whelk	5	0.1	1.2	0.1
rough scad	14	0	0.5	0	sand shrimp	nc	nc	0.6	0.1
spot	14	0	1.2	0	mixed sponge species	nc	nc	0.6	0.1
spiny dogfish	11	0	47	0.4	moon jelly	2	0	0.5	0
cunner	8	0	1.3	0	sea grape	nc	nc	0.5	0
smallmouth flounder	7	0	0.6	0	arks	nc	nc	0.4	0
ocean pout	5	0	0.9	0	purple sea urchin	2	0	0.4	0
glasseye snapper	4	0	0.1	0	star coral	nc	nc	0.3	0
inshore lizardfish	4	0	0.4	0	hard clams	1	0	0.3	0
northern pipefish	3	0	0.2	0	northern red shrimp	1	0	0.3	0
rock gunnel	2	0	0.1	0	red bearded sponge	nc	nc	0.2	0
yellow jack	2	0	0.1	0	fan worm tubes	nc	nc	0.2	0
Atlantic bonito	1	0	3.2	0	northern moon snail	nc	nc	0.2	0
planehead filefish	1	0	0.1	0	surf clam	1	0	0.2	0
goosefish	1	0	1.2	0	brown shrimp	1	0	0.1	0
pollock	1	0	0.1	0	ghost shrimp	nc	nc	0.1	0
oyster toadfish	1	0	1.2	0	Japanese shore crab	nc	nc	0.1	0
yellowtail flounder	1	0	0.4	0	northern cyclocardia	nc	nc	0.1	0
<b>Total</b>	<b>92,042</b>		<b>10,500.2</b>		<b>Total</b>	<b>9,352</b>		<b>1,002.6</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2007.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
scup	75,681	42.6	5,333.5	30.4	grubby	1	0	0.1	0
butterfish	49,137	27.6	1,446.2	8.2	pollock	1	0	0.1	0
weakfish	17,386	9.8	584.8	3.3	rock gunnel	1	0	0.1	0
bluefish	9,378	5.3	1,801.3	10.3	striped burrfish	1	0	0.5	0
winter flounder	4,550	2.6	951.3	5.4	sea lamprey	1	0	0.1	0
windowpane flounder	4,051	2.3	510.8	2.9	yellowtail flounder	1	0	1.0	0
red hake	2,788	1.6	200.4	1.1					
bay anchovy	2,440	1.4	14.5	0.1	<b><u>Finfish not ranked</u></b>				
Atlantic herring	1,932	1.1	234.2	1.3	anchovy spp. yoy				
alewife	1,537	0.9	101.3	0.6	Atlantic herring, yoy				
little skate	1,277	0.7	697.0	4.0	American sand lance (yoy)				
fourspot flounder	1,094	0.6	224.9	1.3					
moonfish	979	0.6	12.0	0.1	<b><u>Invertebrates</u></b>				
striped searobin	755	0.4	217.0	1.2	long-finned squid	24,212	88.2	773.6	30.8
summer flounder	733	0.4	590.9	3.4	horseshoe crab	333	1.2	596.4	23.7
northern searobin	691	0.4	74.2	0.4	American lobster	1,648	6.0	396.5	15.8
smooth dogfish	580	0.3	2,110.2	12.0	spider crab	nc	nc	165.5	6.6
Atlantic menhaden	426	0.2	63.9	0.4	lion's mane jellyfish	660	2.4	129.8	5.2
striped bass	422	0.2	888.0	5.1	bushy bryozoan	nc	nc	107.4	4.3
spotted hake	340	0.2	23.9	0.1	mixed sponge species	nc	nc	84.5	3.4
silver hake	290	0.2	14.6	0.1	rock crab	nc	nc	41.4	1.6
tautog	280	0.2	551.4	3.1	channeled whelk	196	0.7	33.4	1.3
American shad	236	0.1	15.8	0.1	flat claw hermit crab	nc	nc	27.5	1.1
blueback herring	156	0.1	9.1	0.1	blue mussel	nc	nc	20.4	0.8
black sea bass	116	0.1	46.8	0.3	starfish spp.	nc	nc	20.3	0.8
clearnose skate	97	0.1	193.3	1.1	boring sponge	nc	nc	17.7	0.7
fourbeard rockling	87	0	7.6	0	blue crab	68	0.2	13.0	0.5
hogchoker	78	0	11.4	0.1	mantis shrimp	264	1.0	12.1	0.5
smallmouth flounder	48	0	2.6	0	deadman's fingers sponge	nc	nc	11.5	0.5
winter skate	44	0	117.8	0.7	lady crab	nc	nc	11.5	0.5
hickory shad	37	0	10.4	0.1	knobbed whelk	23	0.1	11.1	0.4
spiny dogfish	32	0	122.3	0.7	common slipper shell	nc	nc	9.3	0.4
American sand lance	30	0	0.3	0	mud crabs	nc	nc	4.3	0.2
Atlantic sturgeon	18	0	336.4	1.9	northern moon snail	nc	nc	4.3	0.2
cunner	16	0	3.0	0	sand shrimp	nc	nc	3.5	0.1
rough scad	13	0	0.7	0	sea grape	nc	nc	3.5	0.1
ocean pout	12	0	3.2	0	arks	2	0	2.7	0.1
Atlantic mackerel	9	0	0.8	0	hydroid spp.	nc	nc	2.5	0.1
glasseye snapper	8	0	0.7	0	hard clams	1	0	2.2	0.1
northern puffer	8	0	0.5	0	rubbery bryozoan	nc	nc	1.4	0.1
striped anchovy	6	0	0.1	0	common oyster	nc	nc	1.1	0
sea raven	5	0	3.6	0	surf clam	10	0	1.0	0
oyster toadfish	5	0	2.0	0	anemones	16	0.1	0.6	0
yellow jack	5	0	0.4	0	purple sea urchin	2	0	0.6	0
northern kingfish	4	0	0.4	0	red bearded sponge	nc	nc	0.5	0
round scad	3	0	0.3	0	star coral	nc	nc	0.4	0
longhorn sculpin	3	0	0.8	0	water jelly	1	0	0.3	0
American eel	2	0	0.9	0	jonah crab	1	0	0.2	0
inshore lizardfish	2	0	0.2	0	northern red shrimp	1	0	0.2	0
mackerel scad	2	0	0.1	0	blood star	nc	nc	0.1	0
northern sennet	2	0	0.2	0	coastal mud shrimp	1	0	0.1	0
northern pipefish	2	0	0.2	0	green sea urchin	1	0	0.1	0
Atlantic silverside	1	0	0.1	0	Japanese shore crab	nc	nc	0.1	0
gizzard shad	1	0	0.1	0	tunicates, misc	1	0	0.1	0
<b>Total</b>	<b>177,841</b>		<b>17,540.3</b>		<b>Total</b>	<b>27,441</b>		<b>2,512.7</b>	

Note: nc= not counted

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2008.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=120.*

species	count	%	weight	%	species	count	%	weight	%
scup	53,560	38	6,509.9	45.7	sea lamprey	1	0	0.8	0
butterfish	48,766	34.6	1,442.0	10.1	striped anchovy	1	0	0.1	0
American sand lance	7,495	5.3	7.2	0.1	<b>Total</b>	<b>140,777</b>		<b>14,239.8</b>	
silver hake	6,587	4.7	208.5	1.5					
winter flounder	4,973	3.5	751.9	5.3	<b>Finfish not ranked</b>				
windowpane flounder	3,511	2.5	524.0	3.7	anchovy spp. yoy				
weakfish	2,531	1.8	116.1	0.8	Atlantic herring, yoy				
red hake	1,723	1.2	141.3	1.0	American sand lance (yoy)				
bluefish	1,699	1.2	641.4	4.5					
spotted hake	1,267	0.9	65.8	0.5	<b>Invertebrates</b>				
bay anchovy	1,128	0.8	7.7	0.1	horseshoe crab	289	2.2	496.8	29.2
alewife	931	0.7	51.1	0.4	long-finned squid	10,490	80.5	330.1	19.4
fourspot flounder	902	0.6	186.3	1.3	American lobster	1,096	8.4	314.1	18.5
northern searobin	809	0.6	58.8	0.4	spider crab	nc	nc	145.8	8.6
moonfish	689	0.5	13.4	0.1	rock crab	nc	nc	64.0	3.8
little skate	682	0.5	327.4	2.3	bushy bryozoan	nc	nc	54.2	3.2
striped searobin	612	0.4	263.0	1.8	lady crab	nc	nc	36.3	2.1
summer flounder	477	0.3	398.0	2.8	starfish spp.	nc	nc	32.1	1.9
American shad	405	0.3	20.2	0.1	boring sponge	nc	nc	30.1	1.8
Atlantic herring	356	0.3	52.1	0.4	channeled whelk	177	1.4	29.3	1.7
smooth dogfish	328	0.2	1,134.2	8.0	mixed sponge species	nc	nc	27.8	1.6
spot	308	0.2	21.3	0.1	hydroid spp.	nc	nc	24.6	1.4
striped bass	199	0.1	456.3	3.2	flat claw hermit crab	nc	nc	22.8	1.3
tautog	179	0.1	309.4	2.2	common slipper shell	nc	nc	15.7	0.9
black sea bass	122	0.1	29.8	0.2	lion's mane jellyfish	520	4	14.3	0.8
smallmouth flounder	89	0.1	3.2	0	mantis shrimp	244	1.9	9.1	0.5
fourbeard rockling	81	0.1	7.1	0	sea grape	nc	nc	6.6	0.4
blueback herring	74	0.1	3.2	0	arks	124	1	6.1	0.4
winter skate	51	0	140.8	1.0	knobbed whelk	17	0.1	5.9	0.3
Atlantic menhaden	47	0	10.4	0.1	blue mussel	nc	nc	5.8	0.3
hogchoker	38	0	5.6	0	northern moon snail	1	0	5.6	0.3
clearnose skate	37	0	78.1	0.5	sand shrimp	nc	nc	4.0	0.2
spiny dogfish	35	0	127.7	0.9	blue crab	16	0.1	3.8	0.2
cunner	26	0	3.6	0	mud crabs	nc	nc	3.5	0.2
inshore lizardfish	10	0	0.5	0	rubbery bryozoan	nc	nc	3.1	0.2
ocean pout	9	0	2.1	0	common oyster	1	0	2.1	0.1
Atlantic sturgeon	7	0	111.3	0.8	hard clams	8	0.1	1.4	0.1
hickory shad	5	0	1.1	0	purple sea urchin	15	0.1	0.9	0.1
feather blenny	4	0	0.2	0	northern red shrimp	21	0.2	0.7	0
white perch	4	0	0.1	0	deadman's fingers sponge	nc	nc	0.6	0
northern kingfish	3	0	0.4	0	surf clam	9	0.1	0.6	0
oyster toadfish	3	0	1.9	0	red bearded sponge	nc	nc	0.4	0
Atlantic silverside	2	0	0.2	0	Jonah crab	2	0	0.4	0
rock gunnel	2	0	0.2	0	star coral	nc	nc	0.3	0
longhorn sculpin	2	0	0.3	0	sea cucumber	2	0	0.3	0
yellowtail flounder	2	0	0.4	0	tunicates, misc	nc	nc	0.3	0
Atlantic croaker	1	0	0.1	0	anemones	nc	nc	0.2	0
planehead filefish	1	0	0.1	0	coastal mud shrimp	1	0	0.1	0
glasseye snapper	1	0	0.1	0	green crab	1	0	0.1	0
pollock	1	0	0.1	0	moon jelly	1	0	0.1	0
rougtail stingray	1	0	3.0	0	northern cyclocardia	1	0	0.1	0
					<b>Total</b>	<b>13,036</b>		<b>1,700.1</b>	

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2009.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=200.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	108,087	53.6	3,186.9	17	striped cusk-eel	1	0	0.1	0
scup	46,991	23.3	6,332.1	33.8	spot	1	0	0.2	0
bay anchovy	11,128	5.5	35.3	0.2	northern stargazer	1	0	0.1	0
Atlantic herring	6,330	3.1	239.2	1.3	Atlantic tomcod	1	0	0.1	0
winter flounder	4,068	2	524.0	2.8	white perch	1	0	0.1	0
bluefish	3,657	1.8	1,157.4	6.2	yellow jack	1	0	0.1	0
weakfish	2,604	1.3	108.7	0.6	yellowtail flounder	1	0	0.2	0
moonfish	2,575	1.3	19.5	0.1	<b>Total</b>	<b>201,476</b>		<b>18,750</b>	
windowpane flounder	2,496	1.2	342.8	1.8					
northern searobin	2,012	1	194.3	1	<b>Finfish not ranked</b>				
striped searobin	1,507	0.7	471.8	2.5	anchovy spp, yoy				
American sand lance	1,227	0.6	2.0	0	Atlantic herring, yoy				
alewife	1,175	0.6	96.0	0.5	American sand lance (yoy)				
fourspot flounder	1,036	0.5	169.8	0.9					
silver hake	947	0.5	50.0	0.3	<b>Invertebrates</b>				
red hake	897	0.4	59.5	0.3	long-finned squid	24,130	91.4	648.4	30.2
summer flounder	881	0.4	694.4	3.7	horseshoe crab	340	1.3	645.8	30
little skate	709	0.4	390.0	2.1	American lobster	853	3.2	244	11.3
smooth dogfish	588	0.3	2,213.3	11.8	spider crab	.	.	144.1	6.7
striped bass	466	0.2	897.4	4.8	lion's mane jellyfish	641	2.4	89.3	4.2
American shad	422	0.2	28.9	0.2	lady crab	.	.	63.6	3
spotted hake	327	0.2	32.1	0.2	rock crab	.	.	42.4	2
blueback herring	291	0.1	14.6	0.1	common slipper shell	.	.	37	1.7
tautog	163	0.1	285.4	1.5	flat claw hermit crab	.	.	33.8	1.6
spiny dogfish	148	0.1	545.7	2.9	bushy bryozoan	.	.	33.3	1.5
black sea bass	121	0.1	59.5	0.3	starfish spp.	.	.	26.6	1.2
smallmouth flounder	96	0	4.7	0	channeled whelk	127	0.5	26	1.2
clearnose skate	69	0	148.5	0.8	hydroid spp.	.	.	25.7	1.2
Atlantic menhaden	69	0	18.0	0.1	knobbed whelk	39	0.1	11.6	0.5
rough scad	59	0	2.8	0	mantis shrimp	215	0.8	10.7	0.5
fourbeard rockling	47	0	3.9	0	Tubularia, spp.	.	.	9	0.4
winter skate	44	0	108.5	0.6	northern moon snail	.	.	7.2	0.3
hogchoker	39	0	4.5	0	anemones	.	.	5.6	0.3
blue runner	34	0	2.3	0	mixed sponge species	.	.	5.4	0.3
ocean pout	22	0	4.8	0	sea grape	.	.	5.0	0.2
Atlantic sturgeon	18	0	286.6	1.5	boring sponge	.	.	4.2	0.2
cunner	18	0	1.8	0	blue crab	19	0.1	4.1	0.2
pollock	18	0	0.8	0	sand shrimp	.	.	3.8	0.2
Atlantic cod	15	0	1.0	0	deadman's fingers sponge	.	.	3.5	0.2
hickory shad	13	0	3.6	0	blue mussel	8	0	3.5	0.2
northern kingfish	7	0	0.4	0	mud crabs	.	.	3.1	0.1
glasseye snapper	6	0	0.6	0	common oyster	1	0	3.1	0.1
Atlantic mackerel	5	0	0.4	0	arks	2	0	2.5	0.1
northern sennet	5	0	0.4	0	surf clam	18	0.1	1.7	0.1
northern puffer	5	0	0.4	0	hard clams	4	0	1.1	0.1
sea raven	5	0	1.7	0	red bearded sponge	.	.	0.8	0
striped anchovy	5	0	0.4	0	purple sea urchin	4	0	0.8	0
Atlantic silverside	3	0	0.3	0	rubbery bryozoan	.	.	0.6	0
oyster toadfish	3	0	0.8	0	star coral	.	.	0.2	0
inshore lizardfish	2	0	0.2	0	ghost shrimp	2	0	0.2	0
northern pipefish	2	0	0.2	0	coastal mud shrimp	2	0	0.1	0
rock gunnel	2	0	0.2	0	northern cyclocardia	1	0	0.1	0
longhorn sculpin	2	0	0.3	0	northern red shrimp	1	0	0.1	0
crevalle jack	1	0	0.1	0	sea cucumber	1	0	0.1	0
planehead filefish	1	0	0.1	0	tunicates, misc	1	0	0.1	0
round scad	1	0	0.1	0	<b>Total</b>	<b>26,409</b>		<b>2,148.2</b>	

Note: nc= not counted



**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2010.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=78.*

species	count	%	weight	%	species	count	%	weight	%
American sand lance	13,061	35.3	5.2	0.1	<b><u>Invertebrates</u></b>				
scup	7,157	19.3	1,971.6	44.3	long-finned squid	1,906	62.9	161.4	28.4
butterfish	2,894	7.8	166.9	3.7	horseshoe crab	58	1.9	112.2	19.8
windowpane flounder	2,850	7.7	449.3	10.1	American lobster	293	9.7	83.6	14.7
winter flounder	2,579	7.0	450.5	10.1	spider crab	.	.	81.6	14.4
silver hake	1,747	4.7	35.4	0.8	bushy bryozoan	.	.	23.1	4.1
Atlantic herring	1,318	3.6	179.0	4	rock crab	.	.	16.7	2.9
northern searobin	1,128	3	149.5	3.4	starfish spp.	.	.	15.1	2.7
red hake	990	2.7	64.3	1.4	common slipper shell	.	.	11.2	2
spotted hake	665	1.8	15.8	0.4	lion's mane jellyfish	401	13.2	7.8	1.4
summer flounder	517	1.4	229.6	5.2	lady crab	.	.	7.7	1.4
bay anchovy	475	1.3	2.8	0.1	flat claw hermit crab	.	.	6.8	1.2
fourspot flounder	402	1.1	92.0	2.1	hydroid spp.	.	.	6.7	1.2
little skate	281	0.8	148.3	3.3	channeled whelk	33	1.1	4.5	0.8
alewife	172	0.5	14.3	0.3	northern moon snail	.	.	4.1	0.7
American shad	165	0.4	8.6	0.2	blue mussel	.	.	3.1	0.5
striped searobin	141	0.4	66.4	1.5	common oyster	.	.	2.9	0.5
blueback herring	101	0.3	3.4	0.1	sea grape	.	.	2.7	0.5
striped bass	71	0.2	173.2	3.9	sand shrimp	.	.	2.3	0.4
tautog	53	0.1	83.1	1.9	deadman's fingers sponge	.	.	2.3	0.4
black sea bass	37	0.1	20.1	0.5	blue crab	10	0.3	2.0	0.4
fourbeard rockling	35	0.1	2.9	0.1	arks	.	.	1.6	0.3
hogchoker	34	0.1	4.4	0.1	mud crabs	.	.	1.6	0.3
smallmouth flounder	31	0.1	1.4	0	rubbery bryozoan	.	.	1.2	0.2
rock gunnel	29	0.1	0.5	0	mantis shrimp	19	0.6	1.1	0.2
Atlantic cod	21	0.1	2.1	0	Unknown Jellyfish	300	9.9	0.8	0.1
winter skate	16	0	37.7	0.8	Tubularia, spp.	.	.	0.5	0.1
cunner	11	0	1.3	0	anemones	5	0.1	0.4	0.1
smooth dogfish	10	0	34.4	0.8	surf clam	2	0.1	0.4	0.1
Atlantic menhaden	7	0	2.7	0.1	knobbed whelk	1	0	0.3	0.1
ocean pout	6	0	1.4	0	mixed sponge species	.	.	0.3	0.1
sea raven	6	0	1.6	0	northern comb jelly	1	0	0.2	0
northern pipefish	4	0	0.3	0	purple sea urchin	4	0.1	0.2	0
spiny dogfish	3	0	16.2	0.4	boring sponge	.	.	0.1	0
bluefish	2	0	6.1	0.1	red bearded sponge	.	.	0.1	0
hickory shad	2	0	0.4	0	coastal mud shrimp	.	.	0.1	0
pollock	2	0	0.1	0	star coral	.	.	0.1	0
American plaice	1	0	0.1	0	hard clams	.	.	0.1	0
Atlantic silverside	1	0	0.1	0	sea cucumber	.	.	0.1	0
Atlantic sturgeon	1	0	5.6	0.1	<b>Total</b>	<b>3,033</b>		<b>567.0</b>	
clearnose skate	1	0	4.5	0.1	Note: nc= not counted				
longhorn sculpin	1	0	0.4	0					
weakfish	1	0	1.0	0					
<b>Total</b>	<b>37,029</b>		<b>4,455</b>						

**Finfish not ranked**

- anchovy spp, yoy
- Atlantic herring, yoy
- American sand lance (yoy)

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2011.**

*Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=172.*

species	count	%	weight	%	species	count	%	weight	%
butterfish	42,141	36.7	1,600.8	9.9	striped burrfish	1	0	0.5	0
scup	34,458	30.0	6,759.0	41.7	striped anchovy	1	0	0.1	0
American sand lance	9,535	8.3	7.5	0.0	silver perch	1	0	0.1	0
bay anchovy	4,693	4.1	10.5	0.1	oyster toadfish	1	0	0.2	0
winter flounder	3,092	2.7	613.8	3.8	white perch	1	0	0.1	0
windowpane flounder	2,831	2.5	395.9	2.4	white mullet	1	0	0.1	0
bluefish	2,765	2.4	584.7	3.6	yellowtail flounder	1	0	0.3	0
weakfish	2,583	2.3	192.6	1.2	<b>Total</b>	<b>114,706</b>		<b>16,210.3</b>	
striped searobin	1,630	1.4	558.7	3.4					
Atlantic herring	1,482	1.3	199.4	1.2	<b><u>Finfish not ranked</u></b>				
fourspot flounder	1,400	1.2	224.2	1.4	anchovy spp. yoy				
summer flounder	1,051	0.9	713.0	4.4	Atlantic herring, yoy				
silver hake	948	0.8	40.3	0.2	American sand lance (yoy)				
northern searobin	803	0.7	85.5	0.5					
spotted hake	725	0.6	76.8	0.5	<b><u>Invertebrates</u></b>				
little skate	674	0.6	359.4	2.2	horseshoe crab	257	1.7	505.2	33.5
moonfish	640	0.6	6.3	0	long-finned squid	13,020	86.4	370.7	24.6
smooth dogfish	613	0.5	2,031.7	12.5	spider crab	.	.	151.8	10.1
alewife	512	0.4	29.8	0.2	lady crab	.	.	132.4	8.8
red hake	278	0.2	25.1	0.2	American lobster	230	1.5	52.0	3.4
American shad	271	0.2	17.5	0.1	rock crab	.	.	45.5	3.0
striped bass	243	0.2	721.9	4.5	hydroid spp.	.	.	30.5	2.0
Atlantic menhaden	181	0.2	69.8	0.4	mantis shrimp	971	6.4	29.6	2.0
rough scad	150	0.1	6.8	0	bushy bryozoan	.	.	24.9	1.7
hogchoker	147	0.1	16.8	0.1	knobbed whelk	62	0.4	23.8	1.6
Atlantic cod	109	0.1	9.2	0.1	flat claw hermit crab	.	.	22.1	1.5
tautog	106	0.1	151.7	0.9	channeled whelk	99	0.7	19.0	1.3
black sea bass	91	0.1	54.2	0.3	starfish spp.	.	.	14.4	1.0
blueback herring	72	0.1	3.2	0	blue crab	69	0.5	12.4	0.8
smallmouth flounder	67	0.1	3.5	0	lion's mane jellyfish	345	2.3	11.3	0.7
spiny dogfish	58	0.1	203.5	1.3	mixed sponge species	.	.	11.0	0.7
clearnose skate	56	0	109.8	0.7	blue mussel	1	0	6.7	0.4
inshore lizardfish	43	0	4.6	0	northern moon snail	.	.	5.6	0.4
fourbeard rockling	43	0	4.0	0	boring sponge	.	.	5.5	0.4
winter skate	37	0	101.2	0.6	hard clams	.	.	5.3	0.4
northern kingfish	34	0	3.7	0	common slipper shell	.	.	5.2	0.3
ocean pout	27	0	4.5	0	sand shrimp	.	.	4.5	0.3
blue runner	24	0	1.7	0	Tubularia, spp.	.	.	3.5	0.2
cunner	14	0	1.9	0	mud crabs	.	.	2.6	0.2
northern puffer	9	0	0.9	0	rubbery bryozoan	.	.	1.7	0.1
longhorn sculpin	9	0	2.0	0	common oyster	1	0	1.6	0.1
hickory shad	8	0	1.5	0	sea grape	.	.	1.5	0.1
Atlantic sturgeon	5	0	181.9	1.1	arks	.	.	1.4	0.1
pollock	5	0	0.5	0	surf clam	7	0	1.0	0.1
spot	5	0	0.7	0	purple sea urchin	3	0	0.6	0
crevalle jack	4	0	0.4	0	red bearded sponge	.	.	0.3	0
grubby	4	0	0.1	0	northern comb jelly	.	.	0.3	0
northern pipefish	4	0	0.3	0	anemones	6	0	0.2	0
rock gunnel	4	0	0.2	0	star coral	.	.	0.2	0
conger eel	3	0	1.1	0	coastal mud shrimp	1	0	0.1	0
sea raven	3	0	0.9	0	common razor clam	1	0	0.1	0
striped cusk-eel	2	0	0.2	0	ghost shrimp	1	0	0.1	0
Atlantic tomcod	2	0	0.2	0	northern red shrimp	1	0	0.1	0
American plaice	1	0	0.1	0	polychaetes	.	.	0.1	0
Atlantic croaker	1	0	0.2	0	tunicates, misc	.	.	0.1	0
northern sennet	1	0	0.1	0	water jelly	1	0	0.1	0
round scad	1	0	0.1	0	<b>Total</b>	<b>15,076</b>		<b>1,505.0</b>	
rougtail stingray	1	0	13.0	0.1					

Note: nc= not counted

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2012.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=200.

species	count	%	weight	%	species	count	%	weight	%
butterfish	60,539	37.9	1,891.3	10.8	longhorn sculpin	1	0	0.2	0
scup	53,119	33.2	6,170.2	35.1	white perch	1	0	0.2	0
silver hake	7,519	4.7	171.0	1.0	white mullet	1	0	0.1	0
weakfish	6,785	4.2	409.2	2.3	<b>Total</b>	<b>159,770</b>		<b>17,570.3</b>	
bluefish	3,851	2.4	532.7	3.0					
northern searobin	3,642	2.3	405.2	2.3	<b>Finfish not ranked</b>				
windowpane flounder	3,536	2.2	501.1	2.9	anchovy spp. yoy				
winter flounder	3,365	2.1	604.9	3.4	Atlantic herring, yoy				
striped searobin	2,973	1.9	1,086.4	6.2	American sand lance (yoy)				
fourspot flounder	2,597	1.6	454.5	2.6					
red hake	1,720	1.1	148.6	0.8	<b>Invertebrates</b>				
little skate	1,406	0.9	657.9	3.7	horseshoe crab	199	1.7	385.8	30.6
bay anchovy	1,296	0.8	8.6	0.0	long-finned squid	9,767	84.5	333.9	26.5
summer flounder	980	0.6	718.5	4.1	spider crab	.	.	162.4	12.9
spot	858	0.5	107.5	0.6	American lobster	349	3.0	70.0	5.6
alewife	708	0.4	47.0	0.3	boring sponge	.	.	47.9	3.8
spotted hake	626	0.4	64.2	0	lady crab	.	.	45.3	3.6
smooth dogfish	610	0.4	1,833.3	10.4	rock crab	.	.	40.7	3.2
Atlantic herring	571	0.4	61.5	0.4	mantis shrimp	846	7.3	26.6	2.1
Atlantic menhaden	426	0.3	144.6	0.8	bushy bryozoan	.	.	20.4	1.6
black sea bass	410	0.3	141.0	0.8	flat claw hermit crab	.	.	18.3	1.5
hogchoker	340	0.2	30.7	0.2	blue crab	72	0.6	14.5	1.2
American shad	321	0.2	25.3	0.1	knobbed whelk	36	0.3	13.8	1.1
clearnose skate	280	0.2	491.7	3	channeled whelk	76	0.7	13.7	1.1
moonfish	262	0.2	3.6	0.0	blue mussel	1	0.0	9.4	0.7
smallmouth flounder	258	0.2	7.5	0.0	common slipper shell	.	.	9.4	0.7
striped bass	170	0.1	278.0	1.6	mixed sponge species	.	.	7.4	0.6
tautog	135	0.1	128.9	0.7	Tubularia, spp.	.	.	5.0	0.4
winter skate	97	0.1	179.8	1	hydroid spp.	.	.	4.8	0.4
northern kingfish	59	0.0	8.4	0	lion's mane jellyfish	50	0.4	4.4	0.3
northern puffer	47	0.0	3.1	0.0	mud crabs	.	.	3.9	0.3
blueback herring	46	0	1.6	0.0	starfish spp.	.	.	3.3	0.3
fourbeard rockling	43	0	3.5	0	northern red shrimp	118	1.0	3.0	0.2
hickory shad	42	0	14.1	0	northern moon snail	.	.	1.8	0.1
blue runner	27	0	2.7	0.0	sand shrimp	.	.	1.7	0.1
cunner	20	0	2.8	0	arks	.	.	1.4	0.1
rough scad	19	0	1.1	0	hard clams	3	0	1.3	0.1
spiny dogfish	16	0	62.8	0	red bearded sponge	.	.	1.2	0.1
ocean pout	14	0	2.0	0	sea grape	.	.	1.1	0.1
Atlantic sturgeon	7	0	154.2	1	deadman's fingers sponge	.	.	0.8	0.1
sea raven	5	0	1.1	0	purple sea urchin	7	0	0.8	0
northern sennet	3	0	0.3	0	common oyster	.	.	0.8	0
striped anchovy	3	0	0.2	0.0	surf clam	10	0.1	0.8	0
crevalle jack	2	0	0.2	0	star coral	.	.	0.4	0
goosefish	2	0	0.8	0	rubbery bryozoan	.	.	0.4	0
pinfish	2	0	0.2	0	sea cucumber	3	0	0.4	0
round herring	2	0	0.1	0	tunicates, misc	16	0	0.4	0
American sand lance	2	0	0.2	0	water jelly	4	0	0.3	0
African pompano	1	0	0.1	0	coastal mud shrimp	1	0	0.2	0
conger eel	1	0	0.3	0	northern comb jelly	.	.	0.1	0
gizzard shad	1	0	0.1	0	moon jelly	.	.	0.1	0
northern pipefish	1	0	0.1	0	<b>Total</b>	<b>11,558</b>		<b>1,257.9</b>	
rock gunnel	1	0	0.1	0					
rougtail stingray	1	0	5.0	0					

Note: nc= not counted

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2013.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=200.

species	count	%	weight	%	species	count	%	weight	%
butterfish	29,569	35.4	1,252.5	7.9					
scup	24,961	29.9	5,945.6	37.5					
Atlantic herring	3,566	4.3	321.2	2.0					
striped searobin	2,724	3.3	1,112.5	7.0					
windowpane flounder	2,096	2.5	326.6	2.1					
weakfish	1,964	2.4	203.7	1.3					
northern searobin	1,934	2.3	161.7	1.0					
spot	1,917	2.3	195.4	1.2					
winter flounder	1,912	2.3	576.8	3.6					
bluefish	1,829	2.2	517.7	3.3					
bay anchovy	1,350	1.6	6.8	0.0					
fourspot flounder	1,144	1.4	203.4	1.3					
summer flounder	1,071	1.3	726.6	4.6					
smooth dogfish	1,051	1.3	2,162.3	13.6					
spotted hake	927	1.1	66.8	0.4					
moonfish	868	1.0	10.0	0.1					
red hake	849	1.0	61.1	0.4					
little skate	583	0.7	317.8	2.0					
silver hake	519	0.6	23.6	0.1					
black sea bass	449	0.5	181.2	1.1					
alewife	376	0.5	34.1	0.2					
hogchoker	250	0.3	27.2	0.2					
Atlantic menhaden	234	0.3	87.5	0.6					
American shad	222	0.3	15.3	0.1					
clearnose skate	218	0.3	387.0	2.4					
striped bass	200	0.2	421.0	2.7					
tautog	161	0.2	160.8	1.0					
smallmouth flounder	128	0.2	5.2	0.0					
winter skate	91	0.1	111.2	0.7					
blueback herring	68	0.1	4.3	0.0					
hickory shad	33	0.0	10.8	0.1					
rough scad	28	0.0	1.3	0.0					
red goatfish	21	0.0	0.5	0.0					
spiny dogfish	21	0.0	91.5	0.6					
cunner	20	0.0	1.8	0.0					
northern kingfish	14	0.0	2.3	0.0					
American sand lance	7	0.0	0.1	0.0					
haddock	5	0.0	0.4	0.0					
oyster toadfish	5	0.0	0.9	0.0					
Atlantic sturgeon	4	0.0	98.0	0.6					
Atlantic silverside	3	0.0	0.3	0.0					
northern puffer	3	0.0	0.3	0.0					
fourbeard rockling	3	0.0	0.2	0.0					
bullnose ray	2	0.0	5.7	0.0					
harvestfish	2	0.0	0.2	0.0					
northern pipefish	2	0.0	0.2	0.0					
conger eel	1	0.0	1.2	0.0					
Atlantic croaker	1	0.0	0.1	0.0					
glasseye snapper	1	0.0	0.1	0.0					
pollock	1	0.0	0.1	0.0					
round scad	1	0.0	0.1	0.0					
red cornetfish	1	0.0	0.1	0.0					
longhorn sculpin	1	0.0	0.4	0.0					
striped anchovy	1	0.0	0.1	0.0					
northern stargazer	1	0.0	0.1	0.0					
<b>Total</b>	<b>83,413</b>		<b>15,843.7</b>						
					<b>Finfish not ranked</b>				
					anchovy spp. (yoy)				
					Atlantic herring. (yoy)				
					American sand lance (yoy)				
					gadid spp. (yoy)				
					<b>Invertebrates</b>				
					blue mussel	3	0.0	622.1	31.9
					horseshoe crab	265	3.4	531.8	27.3
					long-finned squid	5,393	69.6	170.8	8.8
					spider crab	nc		156.5	8.0
					lion's mane jellyfish	1,067	13.8	150.0	7.7
					common slipper shell	nc		61.0	3.1
					American lobster	144	1.9	37.3	1.9
					bushy bryozoan	nc		26.8	1.4
					boring sponge	nc		26.1	1.3
					mantis shrimp	646	8.3	21.6	1.1
					flat claw hermit crab	nc		21.4	1.1
					knobbed whelk	51	0.7	18.7	1.0
					channeled whelk	95	1.2	18.6	1.0
					hydroid spp.	nc		13.2	0.7
					lady crab	nc		13.2	0.7
					rock crab	nc		13.0	0.7
					blue crab	52	0.7	10.4	0.5
					Tubularia, spp.	nc		6.7	0.3
					common oyster	nc		5.3	0.3
					mud crabs	nc		3.5	0.2
					sand shrimp	nc		2.9	0.1
					northern moon snail	nc		2.9	0.1
					surf clam	8	0.1	2.4	0.1
					starfish spp.	1	0.0	2.1	0.1
					sea grape	nc		2.1	0.1
					arks	nc		1.9	0.1
					hard clams	6	0.1	0.9	0.0
					comb jelly spp	nc		0.8	0.0
					red bearded sponge	nc		0.6	0.0
					rubbery bryozoan	nc		0.5	0.0
					purple sea urchin	10	0.1	0.5	0.0
					coastal mud shrimp	4	0.1	0.3	0.0
					deadman's fingers sponge	nc		0.3	0.0
					mixed sponge species	nc		0.3	0.0
					star coral	nc		0.2	0.0
					sea cucumber	2	0.0	0.2	0.0
					fan worm tubes	nc		0.1	0.0
					ghost shrimp	1	0.0	0.1	0.0
					Japanese shore crab	1	0.0	0.1	0.0
					northern red shrimp	1	0.0	0.1	0.0
					ribbed mussel	nc		0.1	0.0
					<b>Total</b>	<b>7,750</b>		<b>1,947.4</b>	

Note: nc= not counted

**Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2014.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=199.

species	count	%	weight	%	species	count	%	weight	%
butterfish	69,372	45.3	1,707.6	10.6					
scup	45,705	29.9	5,161.4	31.9					
weakfish	10,477	6.8	334.8	2.1					
bluefish	4,457	2.9	522.7	3.2					
northern searobin	2,584	1.7	225.9	1.4					
striped searobin	2,544	1.7	1,020.8	6.3					
moonfish	2,200	1.4	23.2	0.1					
windowpane flounder	2,191	1.4	365.6	2.3					
Atlantic herring	1,838	1.2	91.2	0.6					
bay anchovy	1,424	0.9	9.4	0.1					
winter flounder	1,372	0.9	459.7	2.8					
black sea bass	1,295	0.8	543.3	3.4					
smooth dogfish	1,197	0.8	2,799.2	17.3					
summer flounder	859	0.6	567.4	3.5					
fourspot flounder	820	0.5	145.0	0.9					
little skate	770	0.5	428.2	2.6					
Atlantic menhaden	723	0.5	267.8	1.7					
alewife	555	0.4	43.2	0.3					
spotted hake	505	0.3	59.5	0.4					
red hake	398	0.3	33.5	0.2					
silver hake	323	0.2	10.6	0.1					
striped bass	255	0.2	407.5	2.5					
hogchoker	246	0.2	27.8	0.2					
tautog	194	0.1	192.5	1.2					
American shad	162	0.1	12.3	0.1					
smallmouth flounder	152	0.1	6.0	0.0					
clearnose skate	104	0.1	207.7	1.3					
winter skate	82	0.1	133.8	0.8					
blueback herring	58	0.0	4.2	0.0					
northern kingfish	51	0.0	3.2	0.0					
hickory shad	30	0.0	10.5	0.1					
inshore lizardfish	30	0.0	2.8	0.0					
spot	20	0.0	1.8	0.0					
spiny dogfish	15	0.0	62.2	0.4					
Atlantic sturgeon	13	0.0	272.4	1.7					
American sand lance	12	0.0	0.2	0.0					
blue runner	10	0.0	0.9	0.0					
northern puffer	10	0.0	1.3	0.0					
striped cusk-eel	6	0.0	0.6	0.0					
Atlantic cod	5	0.0	0.3	0.0					
rough scad	5	0.0	0.5	0.0					
planehead filefish	4	0.0	0.4	0.0					
fourbeard rockling	4	0.0	0.4	0.0					
crevalle jack	2	0.0	0.2	0.0					
Atlantic croaker	2	0.0	0.2	0.0					
cunner	2	0.0	0.2	0.0					
Atlantic mackerel	2	0.0	0.2	0.0					
silver perch	2	0.0	0.2	0.0					
oyster toadfish	2	0.0	0.6	0.0					
Atlantic silverside	1	0.0	0.1	0.0					
black drum	1	0.0	0.1	0.0					
blue spotted cornetfish	1	0.0	0.1	0.0					
lookdown	1	0.0	0.1	0.0					
mackerel scad	1	0.0	0.1	0.0					
northern pipefish	1	0.0	0.1	0.0					
round scad	1	0.0	0.1	0.0					
red goatfish	1	0.0	0.1	0.0					
banded rudderfish	1	0.0	0.4	0.0					
sea raven	1	0.0	1.5	0.0					
white perch	1	0.0	0.2	0.0					
<b>Total</b>	<b>153,100</b>		<b>16,173.8</b>						
					<b>Finfish not ranked</b>				
					anchovy spp. (yoy)				
					Atlantic herring. (yoy)				
					American sand lance (yoy)				
					gadid spp. (yoy)				
					<b>Invertebrates</b>				
					longfin inshore squid	13,436	86.3	582.3	37.9
					horseshoe crab	261	1.7	497.3	32.4
					spider crab	nc		145.6	9.5
					blue mussel	nc		52.2	3.4
					lion's mane jellyfish	1,262	8.1	48.2	3.1
					American lobster	178	1.1	31.5	2.1
					bushy bryozoan	nc		24.8	1.6
					mixed sponge species	nc		20.6	1.3
					common slipper shell	nc		18.8	1.2
					mantis shrimp	332	2.1	14.4	0.9
					flat claw hermit crab	nc		14.0	0.9
					knobbed whelk	34	0.2	12.3	0.8
					lady crab	nc		9.3	0.6
					sea grape	nc		7.3	0.5
					channeled whelk	29	0.2	5.9	0.4
					hydroid spp.	nc		5.3	0.3
					rock crab	nc		4.8	0.3
					northern moon snail	nc		4.6	0.3
					Tubularia, spp.	nc		4.6	0.3
					boring sponge	nc		4.3	0.3
					sand shrimp	nc		4.1	0.3
					blue crab	18	0.1	3.0	0.2
					arks	nc		2.7	0.2
					mud crabs	nc		2.6	0.2
					starfish spp.	2	0.0	1.6	0.1
					ribbed mussel	nc		1.6	0.1
					comb jelly spp	nc		1.4	0.1
					star coral	nc		0.7	0.0
					purple sea urchin	4	0.0	0.6	0.0
					surf clam	4	0.0	0.5	0.0
					coastal mud shrimp	1	0.0	0.3	0.0
					rubbery bryzoan	nc		0.3	0.0
					tunicates, misc	nc		0.3	0.0
					anemones	5	0.0	0.2	0.0
					brown shrimp	2	0.0	0.2	0.0
					common razor clam	1	0.0	0.2	0.0
					hard clams	nc		0.2	0.0
					common oyster	nc		0.2	0.0
					red bearded sponge	nc		0.1	0.0
					deadman's fingers sponge	nc		0.1	0.0
					ghost shrimp	1	0.0	0.1	0.0
					water jelly	1	0.0	0.1	0.0
					<b>Total</b>	<b>15,571</b>		<b>1,529.2</b>	

Note: nc= not counted

**Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2015.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=200.

species	count	%	weight	%	species	count	%	weight	%
scup	80,534	49.3	6,045.5	38.7	round scad	1	0.0	0.1	0.0
butterfish	53,265	32.6	1,011.2	6.5	rock gunnel	1	0.0	0.1	0.0
weakfish	10,077	6.2	530.4	3.4	rougtail stingray	1	0.0	7.8	0.0
striped searobin	2,728	1.7	1,058.2	6.8	short bigeye	1	0.0	0.1	0.0
bluefish	2,650	1.6	324.4	2.1	sea lamprey	1	0.0	1.2	0.0
smooth dogfish	1,438	0.9	2,804.1	17.9	Atlantic thread herring	1	0.0	0.1	0.0
winter flounder	1,340	0.8	319.7	2.0	<b>Total</b>	<b>163,223</b>		<b>15,625</b>	
Atlantic menhaden	1,279	0.8	361.2	2.3	<b><u>Finfish not ranked</u></b>				
windowpane flounder	1,150	0.7	191.1	1.2	anchovy spp, (yoy)				
black sea bass	1,109	0.7	678.0	4.3	Atlantic herring, (yoy)				
moonfish	891	0.5	14.6	0.1	American sand lance (yoy)				
summer flounder	808	0.5	449.3	2.9	gadid spp, (yoy)				
northern searobin	805	0.5	133.2	0.9	<b><u>Invertebrates</u></b>				
Atlantic herring	630	0.4	71.8	0.5	longfin inshore squid	28,266	97.0	1366.2	69.6
alewife	485	0.3	30.5	0.2	horseshoe crab	159	0.5	288.3	14.7
red hake	480	0.3	44.5	0.3	spider crab	nc		133.3	6.8
bay anchovy	399	0.2	3.1	0.0	common slipper shell	nc		29.8	1.5
little skate	387	0.2	192.0	1.2	American lobster	92	0.3	24.0	1.2
fourspot flounder	386	0.2	76.3	0.5	knobbed whelk	37	0.1	15.7	0.8
tautog	308	0.2	339.7	2.2	bushy bryozoan	nc		10.1	0.5
spotted hake	302	0.2	40.1	0.3	mantis shrimp	187	0.6	9.8	0.5
American shad	275	0.2	24.7	0.2	flat claw hermit crab	nc		8.1	0.4
hogchoker	255	0.2	31.2	0.2	sea grape	1	0.0	7.8	0.4
blueback herring	249	0.2	7.1	0.0	boring sponge	nc		7.6	0.4
striped bass	187	0.1	405.2	2.6	lion's mane jellyfish	347	1.2	6.5	0.3
rough scad	144	0.1	7.1	0.0	mixed sponge species	nc		6.3	0.3
clearnose skate	131	0.1	225.0	1.4	channeled whelk	26	0.1	5.8	0.3
silver hake	100	0.1	6.5	0.0	blue crab	22	0.1	4.7	0.2
northern kingfish	97	0.1	7.1	0.0	blue mussel	nc		4.2	0.2
smallmouth flounder	73	0.0	3.6	0.0	northern moon snail	1	0.0	4.0	0.2
blue runner	68	0.0	6.7	0.0	hydroid spp.	nc		3.9	0.2
winter skate	30	0.0	51.8	0.3	rock crab	nc		3.8	0.2
fourbeard rockling	20	0.0	2.0	0.0	sand shrimp	nc		3.7	0.2
spiny dogfish	19	0.0	80.8	0.5	mud crabs	nc		2.9	0.1
red cornetfish	14	0.0	0.6	0.0	starfish spp.	nc		2.5	0.1
spot	14	0.0	1.7	0.0	lady crab	nc		2.4	0.1
cunner	13	0.0	1.8	0.0	arks	nc		1.5	0.1
hickory shad	12	0.0	5.5	0.0	common oyster	nc		0.8	0.0
northern puffer	11	0.0	0.8	0.0	rubbery bryzoan	nc		0.7	0.0
Atlantic croaker	6	0.0	1.5	0.0	Tubularia, spp.	nc		0.5	0.0
Atlantic silverside	5	0.0	0.4	0.0	coastal mud shrimp	2	0.0	0.4	0.0
Atlantic cod	5	0.0	4.7	0.0	surf clam	2	0.0	0.4	0.0
crevalle jack	4	0.0	0.4	0.0	red bearded sponge	nc		0.3	0.0
Atlantic mackerel	4	0.0	0.4	0.0	deadman's fingers sponge	nc		0.3	0.0
American sand lance	4	0.0	0.1	0.0	fan worm tubes	nc		0.3	0.0
bigeye scad	3	0.0	0.3	0.0	hard clams	1	0.0	0.3	0.0
planehead filefish	2	0.0	0.2	0.0	polychaetes	nc		0.3	0.0
glasseye snapper	2	0.0	0.1	0.0	brown shrimp	2	0.0	0.2	0.0
goosefish	2	0.0	0.1	0.0	comb jelly spp	nc		0.2	0.0
ocean pout	2	0.0	0.5	0.0	star coral	nc		0.2	0.0
northern pipefish	2	0.0	0.2	0.0	ghost shrimp	1	0.0	0.2	0.0
longhorn sculpin	2	0.0	0.7	0.0	purple sea urchin	2	0.0	0.2	0.0
striped anchovy	2	0.0	0.1	0.0	anemones	nc		0.1	0.0
oyster toadfish	2	0.0	0.9	0.0	sand dollar	1	0.0	0.1	0.0
yellowtail flounder	2	0.0	0.7	0.0	common razor clam	1	0.0	0.1	0.0
Atlantic sturgeon	1	0.0	15.8	0.1	tunicates, misc	nc		0.1	0.0
bigeye	1	0.0	0.1	0.0	<b>Total</b>	<b>29,150</b>		<b>1,958.6</b>	
conger eel	1	0.0	0.3	0.0	Note: nc= not counted				
mahogany snapper	1	0.0	0.1	0.0					
round herring	1	0.0	0.1	0.0					

**Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2016.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=196.

species	count	%	weight	%	species	count	%	weight	%
scup	175,632	63.4	16,006.2	56.2					
butterfish	65,596	23.7	2,036.1	7.1	<b><u>Finfish not ranked</u></b>				
striped searobin	5,886	2.1	1,964.4	6.9	anchovy spp. (yoy)				
weakfish	4,689	1.7	297.6	1.0	Atlantic herring. (yoy)				
northern searobin	3,178	1.1	452.1	1.6	American sand lance (yoy)				
alewife	2,811	1.0	132.0	0.5	gadid spp. (yoy)				
bluefish	2,793	1.0	1,118.7	3.9					
spotted hake	2,456	0.9	113.8	0.4	<b><u>Invertebrates</u></b>				
windowpane flounder	1,593	0.6	154.7	0.5	longfin inshore squid	12,424	94.1	464.4	41.1
smooth dogfish	1,338	0.5	2,785.6	9.8	horseshoe crab	164	1.2	315.5	28.0
bay anchovy	1,239	0.4	8.7	0.0	spider crab	nc		140.6	12.5
black sea bass	1,181	0.4	823.4	2.9	lion's mane jellyfish	221	1.7	72.1	6.4
winter flounder	1,108	0.4	261.0	0.9	American lobster	74	0.6	25.2	2.2
fourspot flounder	1,056	0.4	175.3	0.6	common slipper shell	nc		19.2	1.7
American shad	944	0.3	46.2	0.2	bushy bryozoan	nc		11.2	1.0
silver hake	891	0.3	32.9	0.1	mantis shrimp	206	1.6	9.5	0.8
Atlantic menhaden	876	0.3	69.4	0.2	knobbed whelk	23	0.2	8.8	0.8
red hake	668	0.2	50.3	0.2	flat claw hermit crab	nc		8.7	0.8
summer flounder	462	0.2	386.4	1.4	boring sponge	nc		7.4	0.7
blueback herring	448	0.2	12.2	0.0	rock crab	nc		6.8	0.6
little skate	377	0.1	193.1	0.7	channeled whelk	29	0.2	6.0	0.5
hogchoker	354	0.1	41.8	0.1	hydroid spp.	nc		5.9	0.5
Atlantic herring	340	0.1	37.1	0.1	blue crab	20	0.1	5.0	0.4
tautog	306	0.1	288.5	1.0	hard clams	22	0.2	3.2	0.3
moonfish	265	0.1	5.2	0.0	mud crabs	nc		2.5	0.2
striped bass	167	0.1	261.9	0.9	mixed sponge species	nc		1.9	0.2
smallmouth flounder	148	0.1	4.2	0.0	sand shrimp	nc		1.8	0.2
clearnose skate	134	0.0	228.7	0.8	lady crab	nc		1.7	0.2
goosefish	70	0.0	23.3	0.1	Tubularia, spp.	nc		1.5	0.1
northern kingfish	31	0.0	4.8	0.0	northern moon snail	nc		1.3	0.1
hickory shad	18	0.0	4.2	0.0	arks	3	0.0	1.3	0.1
winter skate	17	0.0	31.6	0.1	starfish spp.	1	0.0	0.9	0.1
blue runner	15	0.0	1.5	0.0	blue mussel	1	0.0	0.8	0.1
Atlantic sturgeon	12	0.0	318.3	1.1	common oyster	5	0.0	0.6	0.1
spot	12	0.0	1.7	0.0	surf clam	1	0.0	0.5	0.0
spiny dogfish	9	0.0	43.6	0.2	comb jelly spp	nc		0.2	0.0
striped anchovy	8	0.0	0.5	0.0	star coral	nc		0.2	0.0
northern puffer	5	0.0	0.9	0.0	ghost shrimp	1	0.0	0.2	0.0
cunner	4	0.0	0.5	0.0	anemones	nc		0.1	0.0
inshore lizardfish	4	0.0	0.3	0.0	bobtail squid	1	0.0	0.1	0.0
oyster toadfish	4	0.0	1.7	0.0	red bearded sponge	nc		0.1	0.0
Atlantic silverside	3	0.0	0.3	0.0	common razor clam	1	0.0	0.1	0.0
fourbeard rockling	3	0.0	0.3	0.0	Japanese shore crab	1	0.0	0.1	0.0
striped cusk-eel	3	0.0	0.1	0.0	polychaetes	1	0.0	0.1	0.0
northern sennet	2	0.0	0.2	0.0	tunicates, misc	nc		0.1	0.0
bluntnose stingray	1	0.0	0.6	0.0	purple sea urchin	nc		0.1	0.0
Atlantic cod	1	0.0	4.9	0.0	water jelly	1	0.0	0.1	0.0
crevalle jack	1	0.0	0.1	0.0	<b>Total</b>	<b>13,200</b>		<b>1,125.8</b>	
haddock	1	0.0	0.1	0.0	Note: nc= not counted				
pinfish	1	0.0	0.1	0.0					
pollock	1	0.0	0.1	0.0					
rougthead stingray	1	0.0	45.4	0.2					
rough scad	1	0.0	0.1	0.0					
sea raven	1	0.0	0.2	0.0					
sand tiger shark	1	0.0	21.8	0.1					
<b>Total</b>	<b>277,166</b>		<b>28,495</b>						

**Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2017.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=144.

species	count	%	weight	%	species	count	%	weight	%
scup	75,763	56.4	9,616.8	51.4					
butterfish	35,814	26.7	1,426.0	7.6	<b><u>Finfish not ranked</u></b>				
weakfish	5,904	4.4	311.2	1.7	anchovy spp. (yoy)				
striped searobin	3,942	2.9	1,400.0	7.5	Atlantic herring. (yoy)				
bluefish	2,408	1.8	263.6	1.4	American sand lance (yoy)				
smooth dogfish	1,624	1.2	3,391.3	18.1	gadid spp. (yoy)				
northern searobin	1,430	1.1	196.2	1.0					
spotted hake	1,253	0.9	111.2	0.6	<b><u>Invertebrates</u></b>				
bay anchovy	1,069	0.8	7.7	0.0	longfin inshore squid	14,186	96.5	584.5	54.5
black sea bass	980	0.7	714.8	3.8	horseshoe crab	112	0.8	224.4	20.9
windowpane flounder	974	0.7	127.1	0.7	spider crab	nc		129.4	12.1
hogchoker	391	0.3	50.1	0.3	boring sponge	nc		46.9	4.4
fourspot flounder	366	0.3	67.9	0.4	common slipper shell	nc		20.8	1.9
summer flounder	354	0.3	244.0	1.3	bushy bryozoan	nc		12.1	1.1
silver hake	309	0.2	12.3	0.1	flat claw hermit crab	nc		8.3	0.8
moonfish	273	0.2	4.2	0.0	knobbed whelk	36	0.2	7.3	0.7
Atlantic menhaden	239	0.2	72.2	0.4	mantis shrimp	173	1.2	7.3	0.7
American shad	230	0.2	21.0	0.1	blue crab	18	0.1	4.1	0.4
red hake	152	0.1	11.9	0.1	American lobster	12	0.1	4.0	0.4
spot	114	0.1	10.5	0.1	lion's mane jellyfish	102	0.7	3.7	0.3
little skate	113	0.1	63.0	0.3	lady crab	nc		3.5	0.3
winter flounder	112	0.1	27.7	0.1	blue mussel	nc		2.7	0.3
blueback herring	89	0.1	3.5	0.0	channeled whelk	18	0.1	2.4	0.2
tautog	77	0.1	99.0	0.5	sand shrimp	nc		1.6	0.1
clearnose skate	73	0.1	147.1	0.8	hard clams	5	0.0	1.2	0.1
striped bass	73	0.1	186.8	1.0	comb jelly spp	24	0.2	1.2	0.1
smallmouth flounder	44	0.0	2.0	0.0	hydroid spp.	nc		1.1	0.1
alewife	38	0.0	2.0	0.0	arks	6	0.0	1.1	0.1
winter skate	19	0.0	34.1	0.2	mud crabs	nc		1.1	0.1
northern kingfish	11	0.0	2.3	0.0	northern moon snail	nc		1.0	0.1
Atlantic herring	10	0.0	1.1	0.0	rock crab	nc		0.8	0.1
American sand lance	7	0.0	0.1	0.0	surf clam	10	0.1	0.8	0.1
rough scad	7	0.0	0.6	0.0	red bearded sponge	nc		0.5	0.0
Atlantic cod	4	0.0	0.1	0.0	purple sea urchin	3	0.0	0.4	0.0
cunner	4	0.0	0.5	0.0	star coral	nc		0.2	0.0
hickory shad	4	0.0	1.3	0.0	anemones	nc		0.1	0.0
northern puffer	4	0.0	0.7	0.0	ghost shrimp	1	0.0	0.1	0.0
Atlantic mackerel	3	0.0	1.3	0.0	jingle shell clams	1	0.0	0.1	0.0
spiny dogfish	3	0.0	15.6	0.1	common oyster	nc		0.1	0.0
black drum	2	0.0	0.2	0.0	mixed sponge species	nc		0.1	0.0
Atlantic sturgeon	1	0.0	60.9	0.3	<b>Total</b>	<b>14,707</b>		<b>1,072.9</b>	
blue runner	1	0.0	0.1	0.0					
bigeye	1	0.0	0.1	0.0					
crevalle jack	1	0.0	0.1	0.0					
glasseye snapper	1	0.0	0.1	0.0					
inshore lizardfish	1	0.0	0.1	0.0					
naked goby	1	0.0	0.1	0.0					
Spanish mackerel	1	0.0	0.1	0.0					
oyster toadfish	1	0.0	0.3	0.0					
<b>Total</b>	<b>134,295</b>		<b>18,710.9</b>						

Note: nc= not counted



**Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2018.**

Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=172.

species	count	%	weight	%	species	count	%	weight	%
scup	81,228	53.4	12,947.2	56.1					
butterfish	42,025	27.6	1,412.7	6.1	<b><u>Finfish not ranked</u></b>				
weakfish	7,544	5.0	270.2	1.2	anchovy spp, (yoy)				
striped searobin	4,223	2.8	1,582.6	6.9	Atlantic herring, (yoy)				
northern searobin	2,949	1.9	460.8	2.0	American sand lance (yoy)				
smooth dogfish	1,598	1.0	3,024.9	13.1	gadid spp, (yoy)				
black sea bass	1,434	0.9	690.7	3.0					
windowpane flounder	1,266	0.8	189.6	0.8	<b><u>Invertebrates</u></b>				
alewife	1,052	0.7	87.5	0.4	horseshoe crab	264	1.9	512.3	44.3
spotted hake	1,015	0.7	151.7	0.7	longfin inshore squid	13,146	92.2	408.8	35.3
hogchoker	811	0.5	98.9	0.4	spider crab	nc		77.1	6.7
summer flounder	753	0.5	397.0	1.7	bushy bryozoan	nc		39.4	3.4
fourspot flounder	711	0.5	147.6	0.6	common slipper shell	nc		29.4	2.5
bluefish	702	0.5	161.4	0.7	lion's mane jellyfish	458	3.2	13.8	1.2
bay anchovy	641	0.4	3.3	0.0	mantis shrimp	297	2.1	11.6	1.0
blueback herring	579	0.4	36.5	0.2	mixed sponge species	nc		10.8	0.9
winter flounder	500	0.3	132.2	0.6	hydroid spp.	nc		10.2	0.9
silver hake	450	0.3	18.3	0.1	flat claw hermit crab	nc		8.7	0.7
red hake	361	0.2	25.8	0.1	knobbed whelk	15	0.1	6.5	0.6
Atlantic herring	352	0.2	45.0	0.2	American lobster	15	0.1	3.8	0.3
striped bass	269	0.2	457.4	2.0	channeled whelk	23	0.2	3.4	0.3
American shad	230	0.2	17.6	0.1	Tubularia, spp.	nc		3.2	0.3
tautog	230	0.2	209.0	0.9	rock crab	nc		2.7	0.2
Atlantic menhaden	227	0.1	80.5	0.3	blue crab	18	0.1	2.7	0.2
striped anchovy	222	0.1	4.1	0.0	sand shrimp	nc		1.7	0.1
blue runner	195	0.1	19.9	0.1	northern moon snail	nc		1.3	0.1
little skate	151	0.1	82.4	0.4	arks	nc		1.2	0.1
moonfish	143	0.1	2.6	0.0	hard clams	3	0.0	1.2	0.1
smallmouth flounder	86	0.1	2.9	0.0	lady crab	nc		1.1	0.1
clearnose skate	81	0.1	149.8	0.6	star coral	nc		0.9	0.1
northern kingfish	75	0.0	9.9	0.0	fan worm tubes	nc		0.8	0.1
spot	36	0.0	3.8	0.0	mud crabs	nc		0.7	0.1
Atlantic cod	11	0.0	3.2	0.0	sea grape	nc		0.6	0.1
Atlantic mackerel	10	0.0	0.7	0.0	surf clam	4	0.0	0.6	0.0
Atlantic sturgeon	7	0.0	98.6	0.4	blue mussel	nc		0.4	0.0
inshore lizardfish	7	0.0	0.5	0.0	Jonah crab	nc		0.4	0.0
crevalle jack	6	0.0	0.5	0.0	comb jelly spp	nc		0.4	0.0
hickory shad	6	0.0	2.2	0.0	red bearded sponge	nc		0.3	0.0
northern puffer	5	0.0	0.3	0.0	water jelly	3	0.0	0.2	0.0
spiny dogfish	5	0.0	16.7	0.1	purple sea urchin	2	0.0	0.2	0.0
cunner	4	0.0	0.5	0.0	Japanese shore crab	nc		0.2	0.0
northern pipefish	3	0.0	0.2	0.0	boring sponge	nc		0.1	0.0
winter skate	3	0.0	4.1	0.0	coastal mud shrimp	1	0.0	0.1	0.0
harvestfish	2	0.0	0.2	0.0	green sea urchin	1	0.0	0.1	0.0
rougthead stingray	2	0.0	18.9	0.1	jingle shell clams	1	0.0	0.1	0.0
oyster toadfish	2	0.0	0.8	0.0	green crab	1	0.0	0.1	0.0
Atlantic croaker	1	0.0	0.1	0.0	polychaetes	nc		0.1	0.0
planehead filefish	1	0.0	0.1	0.0					
goosefish	1	0.0	0.9	0.0	<b>Total</b>	<b>14,252</b>		<b>1,156.5</b>	
haddock	1	0.0	1.6	0.0					
fourbeard rockling	1	0.0	0.1	0.0	Note: nc= not counted				
striped cusk-eel	1	0.0	0.1	0.0					
Spanish mackerel	1	0.0	0.1	0.0					
northern stargazer	1	0.0	0.2	0.0					
<b>Total</b>	<b>152,220</b>		<b>23,074.2</b>						

**Appendix 5.5: Endangered Species Interactions:** Seven (7) Atlantic Sturgeon were captured on five (5) of the 172 tows completed in 2018; an encounter rate (2.9%) comparable to the average for the LISTS time series of tows (2.3%). The captures occurred at five sites in the deeper mud and transition sites off the North shore of Long Island and central Sound. All encounters were reported to NMFS within 24 hours and all fish were released alive and uninjured. Details are provided below:

Sample	Date	Site	Tow Start	Duration (min)	Species	Total Length	Fork Length	Weight (kg)	Left Pec T-bar	Dorsal T-bar	PIT	Tissue Sample	Photo	Release time	Release lat (N)	Release lon (W)
FA2018007	9/5/2018	59-24	14:54	30	ATS	1,356	1,192	11.81			ADDED	YES	YES	15:53	41.0298	72.7147
FA2018037	9/26/2018	02-22	10:42	30	ATS	875	760	2.63			ADDED	NO	YES	11:34	41.0282	72.8857
FA2018046	10/10/2018	04-30	10:32	30	ATS	1,350	1,158	12.62			ADDED	YES	YES	11:18	41.0667	72.5580
FA2018046	10/10/2018	04-30	10:32	30	ATS	1,495	1,314	17.77*			ADDED	YES	YES	11:22	41.0628	72.5622
FA2018046	10/10/2018	04-30	10:32	30	ATS	1,600	1,396	22.57			ADDED	YES	YES	11:25	41.0590	72.5693
FA2018073	10/31/2018	00-22	9:42	30	ATS	1,461	1,285	16.93			ADDED	NO	YES	10:34	41.0408	72.8334
FA2018080	11/1/2018	09-26	13:50	30	ATS	1,422	1,215	14.25			ADDED	NO	YES	14:48	41.1739	72.6163

\* estimated weight based on length

**Appendix 5.6: Cold and warm temperate species captured in LISTS.** Thirty-three (33) species are included in the cold temperate group, while thirty-four (34) species are included in the warm temperate group. Cold temperate species are defined as being more abundant north of Cape Cod, MA than south of New York, behaviorally adapted to cold temperatures including subfreezing but prefers ~3-15<sup>0</sup>C, and spawns at lower end of temperature tolerance. Warm temperate species are defined as being more abundant south of New York than north of Cape Cod, MA, behaviorally avoids temperatures < 7-10<sup>0</sup>C; prefers ~11-22<sup>0</sup>C, and spawns at higher end of temperature tolerance.

Cold Temperate Group		Warm Temperate Group	
Common Name	Scientific Name	Common Name	Scientific Name
alewife	<i>Alosa pseudoharengus</i>	American eel	<i>Anguilla rostrata</i>
American plaice	<i>Hippoglossoides platessoides</i>	American shad	<i>Alosa sapidissima</i>
Atlantic herring	<i>Clupea harengus</i>	Atlantic bonito	<i>Sarda sarda</i>
Atlantic cod	<i>Gadus morhua</i>	Atlantic croaker	<i>Micropogonias undulatus</i>
Atlantic mackerel	<i>Scomber scombrus</i>	Atlantic silversides	<i>Menidia menidia</i>
Atlantic salmon	<i>Salmo salar</i>	black seabass	<i>Centropristis striata</i>
Atlantic seasnail	<i>Liparis atlanticus</i>	blueback herring	<i>Alosa aestivalis</i>
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	bluefish	<i>Pomatomus saltatrix</i>
Atlantic tomcod	<i>Microgadus tomcod</i>	butterfish	<i>Peprilus triacanthus</i>
bamdoor skate	<i>Dipturus laevis</i>	clearnose skate	<i>Raja eglanteria</i>
cunner	<i>Tautoglabrus adspersus</i>	conger eel	<i>Conger oceanicus</i>
fawn cusk-eel	<i>Lepophidium profundorum</i>	gizzard shad	<i>Dorosoma cepedianum</i>
fourspot flounder	<i>Hippoglossina oblonga</i>	hickory shad	<i>Alosa mediocris</i>
grubby	<i>Myoxocephalus aeneus</i>	hogchoker	<i>Trinectes maculatus</i>
haddock	<i>Melanogrammus aeglefinus</i>	lined seahorse	<i>Hippocampus erectus</i>
little skate	<i>Leucoraja erinacea</i>	menhaden	<i>Brevoortia tyrannus</i>
longhorn sculpin	<i>Myoxocephalus octodecemspinosus</i>	naked goby	<i>Gobiosoma bosc</i>
lumpfish	<i>Cyclopterus lumpus</i>	northern kingfish	<i>Menticirrhus saxatilis</i>
monkfish (goosefish)	<i>Lophius americanus</i>	northern puffer	<i>Sphaeroides maculatus</i>
northern pipefish	<i>Syngnathus fuscus</i>	northern searobin	<i>Prionotus carolinus</i>
ocean pout	<i>Zoarces americanus</i>	oyster toadfish	<i>Opsanus tau</i>
pollock	<i>Pollachius virens</i>	scup (porgy)	<i>Stenotomus chrysops</i>
rainbow smelt	<i>Osmerus mordax</i>	sea lamprey	<i>Petromyzon marinus</i>
red hake	<i>Urophycis chuss</i>	smallmouth flounder	<i>Etropus microstomus</i>
rock gunnel	<i>Pholis gunnellus</i>	smooth dogfish	<i>Mustelus canis</i>
rockling	<i>Enchelyopus cimbrius</i>	spot	<i>Leiostomus xanthurus</i>
searaven	<i>Hemitripterus americanus</i>	spotted hake	<i>Urophycis regia</i>
spiny dogfish	<i>Squalus acanthias</i>	striped bass	<i>Morone saxatilis</i>
whiting (silver hake)	<i>Merluccius bilinearis</i>	striped cusk-eel	<i>Ophidion marginatum</i>
windowpane	<i>Scophthalmus aquosus</i>	striped searobin	<i>Prionotus evolans</i>
winter flounder	<i>Pseudopleuronectes americanus</i>	summer flounder	<i>Paralichthys dentatus</i>
winter skate	<i>Leucoraja ocellata</i>	tautog (blackfish)	<i>Tautoga onitis</i>
yellowtail flounder	<i>Limanda ferruginea</i>	white perch	<i>Morone Americana</i>
		weakfish	<i>Cynoscion regalis</i>