

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

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

### **CRUISE RESULTS FROM THE 2021 SPRING AND FALL SURVEYS**

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

The Connecticut DEEP Marine Fisheries Program completed the thirty-eighth year of the Long Island Sound Trawl Survey in 2021. 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 through the 2021 spring and fall sampling period and provides time series information since the commencement of the survey in 1984.

#### *2021 Sampling Intensity:*

Due to the COVID-19 global pandemic, the State of Connecticut and CT DEEP instituted strict policies in 2020 to prevent the spread of the virus. These policies limited the crew size on the *R/V John Dempsey* to three (3) permanent staff members and essentially prohibited the completion of the Survey in 2020. However, during the spring of 2021 crew size limitations were relaxed to five (5) permanent crew. Sampling resumed in May and June with an abbreviated sampling intensity of 33 sites per cruise. It was determined that an approximately 20% reduction in sampling would be required to complete a monthly cruise with a limited crew size and the number of days available for the survey. Systematically reducing the number of sites by approximately 20% while retaining the two sites per stratum minimum results in 33 sites per month (a 17.5% reduction).

With the goal of returning to a full sampling schedule, a slightly different intensity was attempted for the fall of 2021. The typical forty sites were randomly selected using the standard weighting scheme based on strata. Then thirty-three (33) sites of the forty (40) were randomly selected, maintaining the minimum of 2 sites per stratum (similar to the spring). The remaining seven (7) each month were considered “optional” and would be sampled if there was sufficient time left in the month after completing 33 samples. In September, all 40 sites were completed, however, in October, due to several bad weather days, there was only sufficient time to complete the 33 of 40 sites.

#### **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 most analysis purposes, 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 length 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 a subsample of summer flounder stratified by length group of fish less than 60 cm and all fish 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; 102 menhaden age samples were taken in 2021. 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) 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 year. 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. Most tautog were processed onboard in 2021, however some 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 each year; 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)). Nineteen (19) Atlantic Sturgeon were captured on eleven (11) of the 139 tows completed in 2021. One other protected species, loggerhead turtle, was encountered on two individual tows in September of 2021. 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 - 2021 for 38 finfish species, lobster, and long-finned squid (1986 - 2021). 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, bluefish, 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 and bluefish was derived using both ASMFC provided coastal keys for earlier years and LISTS keys since 2013. 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 weakfish by using observed modes in the LISTS length frequencies to separate the two groups. Prior to 2019, a recruitment index was similarly calculated for bluefish using modal length groups, however, the ASMFC bluefish Technical Committee has accepted and has used LISTS full index-at-age for assessment purposes since 2013. The bluefish index-at-age methodology is now presented and described below.

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

- ◆ **Bluefish.** In 2012 a coast wide biological sampling program was initiated through ASMFC Addendum 1 of the bluefish management plan. This sampling program was initiated to address the lack of bluefish samples being collected by coastal states for use in the bluefish assessment. This was particularly a problem for the Northern States where few ages were available and contributing to the coastal key. Connecticut collected and aged bluefish samples in 1984, however few samples were collected annually after the initial Survey year. Since robust age-length keys were not available for the Long Island Sound region, until 2013, bluefish age keys for 1985-2012 were provided by the ASMFC Bluefish Technical Committee as combined coastwide annual keys for use to calculate indices-at-age for those earlier years. Currently the 1984 and the 2013-2019 index-at-age uses annual fall (Sept-Oct) age keys generated by CT LISTS ageing program. In 1984, 294 samples (scales) were aged and contributed to the key, along with 1,476 samples (otoliths) from the 2013-2019 period. In 2021, age samples were taken from 145 bluefish; six (6) from the spring period and 139 from the fall period.
- ◆ **Scup.** Scales from 744 scup were collected in 2021; 395 from the spring cruise and 349 from the fall cruise. Ageing is not yet complete for 2021. An index-at-age matrix was developed for 1984-2021 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 16,381 scup aged between 1984 and 2019 were used to make year and season specific age-length keys (1 cm intervals). For 2021, a pooled two year key using 2018 and 2019 ages were used to calculate a preliminary 2021 index-at-age. Results will be updated when the 2021 ages are available. Prior to 2021, 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 2021 by apportioning the spring index by the percentage of fish at each age (Table 5.23).

- ◆ **Summer flounder.** Since the 2017 fall cruise, LISTS has collected representative scale samples from all size summer flounder to ensure a robust Connecticut age-key once it became known that there would be no samples from NMFS for the fall 2017 period. Prior to the fall of 2017, 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. Only summer flounder greater than or equal to 60cm were sampled from LISTS for age structures prior to the Fall of 2017. The NMFS keys were supplemented with fish caught and aged by LISTS (60 cm and over). LISTS also provides the age data from these fish (> 60cm) to NMFS. Currently, the age-key is constructed using both LISTS (full size structure) and NMFS age data. In 2021, 460 summer flounder were aged: 295 from the spring (20 – 76 cm) and 165 from the fall (20 – 61 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.** Operculum from 220 tautog were collected in 2021; 58 from the spring cruise and 162 from the fall cruise. Ageing is not yet complete for 2021. An index-at-age matrix was developed for 1984-2019 (Table 5.25). Annual keys were calculated by combining all months in a particular year since so few tautog are captured by LISTS. The 2021 index-at-age matrix will be updated upon completion of the ageing, validation, and QA/QC.
- ◆ **Weakfish.** Age 0 and age 1+ indices were calculated for both spring (1984 – 2021) and fall surveys (1984 – 2009, 2011 - 2021) (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.** Otoliths from 144 winter flounder were collected in 2021 from the spring survey. Ageing is not yet complete for 2021. An index-at-age matrix was developed for 1984-2021 using April and May LISTS data (Table 5.27). For 2021, a pooled three year key using 2017, 2018, and 2019 ages were used to calculate a preliminary 2021 index-at-age. June data were not used for the winter flounder matrix 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 24,831 winter flounder aged between 1984 and 2019 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 an age if the year specific key were not available for the particular length bin.

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 2021 Spring and Fall Surveys**

While no sampling was conducted in 2020 due to COVID-19, LISTS did attempt to complete as much of the 2021 Spring and Fall Surveys as possible. The State of Connecticut and CT DEEP instituted strict policies to prevent the spread of the virus as much as possible. April sampling was not conducted due to the high but declining rates of infection, however in May of 2021 the Agency had implemented a policy which increased the crew limit allowed on the *R/V John Dempsey* from three to five staff. No seasonal staff were hired during the spring of 2021 due to these limitations. Based on the staff resources available, and only 5 permanent staff being allowed onboard as compared to typical crew sizes of 6-8, it was determined that an approximately 20% reduction in sampling would be required to complete a monthly cruise in the number of days available for the survey (see 2021 sampling intensity/planning below). Thirty-three (33) sites were selected and completed for both the May and June cruises. Two resource assistants were

subsequently hired to help during the September and October cruises and the site selection for a typical LISTS forty-tow cruise was resumed, with one caveat. Forty sites were randomly selected using the standard weighting scheme based on strata. Then thirty-three (33) of the forty (40) were randomly selected, maintaining the minimum of 2 sites per stratum (similar to Spring). The remaining seven (7) each month were considered “optional” and would be sampled if there was sufficient time left in the month after completing 33 samples. In September, all 40 sites were completed, however, in October, there was only sufficient time to complete the 33 of 40 sites.

As noted in previous reports, the LISTS database of counts, weights and lengths were all collected electronically. This marks the third year in which the system was successfully used to capture all records electronically. 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.

May sampling started on May 11 and continued until June 1, completing 33 sites in twelve (12) days underway. June sampling began on June 11 and ended on June 28, taking ten (10) days underway to complete the 33 sites. The September Survey commenced on September 8 and concluded on September 29, completing 40 tows in fourteen (14) days underway. The October Survey commenced on October 12 and concluded on November 2, completing 33 tows in ten (11) days underway, not including four (4) days lost to inclement weather. In total, 139 LISTS sites were completed in 47 days underway during the spring and fall 2021 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, average tow speed, distance towed and approximate area swept for each tow. Surface, bottom temperature and salinity data were collected but not available at the time of this report.

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.

### ***Post-processing QA/QC:***

Since initiating a system to electronically record data while sampling in 2018, the procedures for error checking have evolved from looking for keypunch errors (dual entry), or errors occurring from calculations from subsampling, to new post processing procedures to handle changes that may be needed after the sample is electronically recorded. Any changes needed for a particular sample are subsequently captured in a metadata file and all original databases are maintained in a daily backup stored in a monthly folder. This maintains all original files and timestamps if needed during post-processing or needed in the future. There are two main onboard datasheets for handwritten notes taken during each sample. Appropriate notes are cataloged in one of the two deck sheets in the cases where either data needs to be changed or addressed in the database. Notes taken on these datasheets to address unusual events that have occurred during the tow such as gear interactions (not cataloged in the comments of the software program), unusual catches, or follow-up notes to help with analysis afterwards. Sometimes counts and other notes are recorded to confirm and check electronically recorded records. Final age sample tallies are recorded by species on one of the handwritten summary sheets as well for cataloging samples after being delivered to the lab each day.

Post processing files are created for each cruise by combining several Access databases if needed. Most changes as described above occur on the post processed file prior to making SAS datasets. Intermediate Excel files created from certain Access table level data are also utilized to help with post processing and error checking. A final annual SAS dataset is created and stored in the same format as in prior years so that users can continue to utilize time series analysis on all data. Furthermore, some of the same error checking SAS jobs that look for outliers and calculations of predicted weight per sample (by species) can be run to confirm recorded data is correctly cataloged. These procedures ensure that all data collected while onboard and all necessary changes needed are maintained with a record trail and can be accessed in the future (record and file level timestamps and through the use of metadata files).

### ***2021 sampling intensity/planning:***

In early 2021, the pandemic situation in CT had waned sufficiently for the Agency to increase the crew limit allowed on the *R/V John Dempsey* to five (5) permanent staff (no seasonal staff). However, this is still less than the typical LISTS crew size (6-8). With the reduction in crew size mandated by COVID-19 restrictions, it would be unlikely the standard number of tows could be completed each month given the other limitations (day-light, number of work hours per day, number of days R/V is available, etc). Two mechanisms for reducing the amount of sampling to a manageable level with reduced staffing were considered: decreasing tow duration and decreasing number of tows per month.

#### ***Decreased Tow Duration:***

Tows of varying duration are present throughout the LISTS time-series. Standard LISTS protocols consider minimum acceptable tow duration to be 15 minutes and the catch from these “short” tows (any tow less than 30 minutes) are expanded to a “full” tow time of 30 minutes in the database. Standard LISTS protocols also do not distinguish between tows conducted in one part versus tows conducted in multiple parts (see Gottschall et. al. 2019 for discussion of short tows and multi-part tows). In this analysis of tow duration, only “short” tows of 15-20 minutes (inclusive) duration and “full” tows of 30 minutes duration were included. Additionally, only tows



done in a single part were included; GPS towlogs were used to identify tows completed in one part. Since no GPS towlogs were recorded early in the time series, this precludes tows conducted prior to 1995 being used in the analysis. Tows were grouped into two categories for this analysis (30 minutes versus 15-20 minutes). Catch rates from tows with 15-20 minute durations were compared to catch rates from tows with 30 minute durations. Since planning discussions were focused on Spring sampling, Fall tows were not analyzed. And since April catches tend to be much different in species composition and abundance than May and June, no April tows were included. Ten of the more recreationally important or abundant species from the past few springs were selected to look for significant differences in catch rates using T-Tests. The test for equality of variances was used to determine whether to look at significance where variances were equal or unequal. Using 1,747 tows from May and June, differences in catch rates were statistically significant different ( $Pr>|t| < 0.10$ ) for seven of the ten species: black sea bass, butterfish, northern sea robin, scup (porgy), striped bass, tautog (blackfish), and winter flounder. Catch rates were not statistically different ( $Pr>|t| > 0.10$ ) for three of the ten species: summer flounder, smooth dogfish, and striped sea robin.

#### *Decreased Number of Sites:*

Based on the staff resources available (only 5 permanent staff allowed onboard as compared to typical crew sizes of 6-8), it was determined that an approximately 20% reduction in sampling would be required in order to complete a monthly cruise in the number of days available for the survey. Standard LISTS sample design protocols randomly select 40 sites per month distributed proportionally among the strata based on area available for trawling with a minimum of two sites per stratum (see Table 2, Gottschall et.al. 2000). Systematically reducing the number of sites by approximately 20% while retaining the two sites per stratum minimum results in 33 sites per month, a 17.5% reduction.

It was decided that if a reduction in sampling was required based on CT DEEP COVID-19 policies in force at the time of sampling, reducing the number of sites per month to 33 was preferable to reducing tow duration to 15-20 minutes. These somewhat cursory analyses were suitable for the purposes of planning a temporary change to the LISTS survey design during a pandemic. However, if sustained changes to the standard LISTS survey design are contemplated in the future, more rigorous analyses should be conducted.

For 2021 sampling, slightly different site selection intensities were used in the spring vs fall cruises. In the Spring, 33 sites per month were randomly selected in a stratified manner that preserved the 2 site per stratum minimum as described in last year's report (Gottschall et al. 2020). April sampling was cancelled due to COVID concerns, but the 33 sites selected for each of the May and June cruises were completed (Figures 5.3 and 5.4, respectively). In the Fall, hopes were that LISTS would be able to complete the standard 40 sites per month but COVID prevention policies (including the limit on number of crew allowed onboard) were still in effect, so the reduced sampling plan of 33 sites per month was used as a backup. Forty sites were randomly selected using the standard weighting scheme based on strata. Then thirty-three (33) of the forty (40) were randomly selected, maintaining the minimum of 2 sites per stratum. The remaining seven (7) each month were considered "optional" and would be sampled if there was sufficient time left in the month after completing 33 samples. In September, all 40 sites were completed, however, in October, there was only sufficient time to complete the 33 of 40 sites (Figures 5.5 and 5.6, respectively).

## **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 2021, a significant amount of project staff time went toward fulfilling large data requests for NOAA/NMFS, ASMFC, the New England and Mid-Atlantic Councils, several state agencies, Universities, and NGO's. More than forty requests were fulfilled to these agencies and others in 2021. Samples were provided to NY Department of Environmental Conservation, NMFS, CT Health Department, and the University of Connecticut.

## **Number of species identified**

lists observed 54 finfish species in 2021 (table 5.11). no new vertebrate species was encountered during the 2021 surveys. from 1984 to 2021, lists has identified 112 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 40 types of invertebrates were collected in 2021 (table 5.12). most invertebrates are identified to species, however, in some cases, invertebrates were identified to genus or a higher level taxon.

## **Total Catch**

Appendix 5.4 presents a time series (1984-2021) of the finfish species collected each year and their respective rank by numbers. Annual total biomass of invertebrates is also included in this appendix (1992-2021), ranked by weight (kg). A total of 124,630 finfish weighing 17,715 kg were sampled in 2021 (Table 5.13). In the spring of 2021, a total of 39,943 finfish weighing 10,361.2 kg were sampled and a total of 84,685 finfish weighing 7,353.8 kg were sampled in fall of 2021 (Table 5.14). A total of 1,518.8 kg of invertebrates were taken in 2021 (Table 5.13). The total biomass of invertebrate catch taken in the spring of 2021 was 642.2 kg while a total of 876.6 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 5.37-5.38), scup (Table 5.51-5.52), and summer flounder (Table 5.55-5.56).

Length frequencies were prepared for 22 species:

alewife	spring and fall	1989 - 2019	Table 5.28;
American shad	spring and fall	1989 - 2019	Table 5.29;
American lobster	spring and fall (M&F)	1984 - 2019	Table 5.30-Table 5.34;
Atlantic herring	spring and fall	1989 - 2019	Table 5.35;
Atlantic menhaden	spring and fall	1996 - 2019	Table 5.36;
black sea bass	spring and fall	1987 - 2019	Table 5.37, Table 5.38
blueback herring	spring and fall	1989 - 2019	Table 5.39;
bluefish	spring and fall	1984 - 2019	Table 5.40, Table 5.41;
butterfish	spring and fall	1986 - 1990, 1992 - 2019	Table 5.42;
clearnose skate	spring and fall	1993 - 2019	Table 5.43, Table 5.44;
fourspot flounder	spring and fall	1989 - 1990, 1996 - 2019	Table 5.45;
hickory shad	spring and fall	1991 - 2019	Table 5.46;
horseshoe crab	spring and fall (M&F)	1998 - 2019	Table 5.47, Table 5.48;
long-finned squid	spring and fall	1986 - 1990, 1992 - 2019	Table 5.49, Table 5.50;
scup	spring and fall	1984 - 2019	Table 5.51, Table 5.52;
striped bass	spring and fall	1984 - 2019	Table 5.53, Table 5.54;
summer flounder	spring and fall	1984 - 2019	Table 5.55, Table 5.56;
tautog	spring and fall	1984 - 2019	Table 5.57, Table 5.58;
weakfish	spring and fall	1984 - 2019	Table 5.59, Table 5.60;
windowpane flounder	spring and fall	1989, 1990, 1994 - 2019	Table 5.61, Table 5.62;
winter flounder	April-May and fall	1984 - 2019	Table 5.63, Table 5.64;
winter skate	spring and fall	1995 - 2019	Table 5.65.

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 1984-2021 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 bluefish, scup, striped bass, summer flounder, and winter flounder (see below). 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; 1992-2021), American lobster (1984-2021), horseshoe crab (1992-2021), and long-finned squid (1986-2021).

### **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 weakfish.

### **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 1984-2021 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.

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**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 2021.**

*In addition to the species listed below, other rarely occurring species (typically totaling less than 30 fish/year each) were measured. During 2021, 16 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. No sampling was conducted in 2021 due to COVID and although sampling resumed in 2021 crew size limitations inhibited the full 40 tows being conducted each month. Thirty-three tows were selected with the same sampling intensity (stratum selection) as a typical forty tow cruise and an additional 7 samples held if time permitted (October 2021).*

Cruise	Year																												Total											
	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	2019	2020	2021	
April	-	-	35	40	40	40	40	45*	-	40	40	40	40	40	40	40	40	40	40	40	40	40	-	40	40	40	40	12	40	40	40	40	36	-	12	40	-	-		
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	40	38	40	40	40	40	40	40	24	40	40	-	33		
June	19	5	41	40	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	40	-	33	
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	41**	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	40	39	40	40	40	40	40	40	-	33	
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>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>	<b>200</b>	<b>0</b>	<b>139</b>	<b>7,644</b>

**Table 5.5. Station information for LISTS April 2021.**

*No sampling was conducted in April of 2021 due to COVID-19.*

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
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**Table 5.6. Station information for LISTS May 2021.**

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)
SP2021001	5/11/2021	1740	T	2	10:16	30	41.2921	-72.0818	.	.	.	.	2.7	1.37	0.007
SP2021002	5/11/2021	1738	T	2	12:51	30	41.2883	-72.1566	.	.	.	.	1.6	0.82	0.004
SP2021003	5/12/2021	1427	T	1	8:28	30	41.2543	-72.5648	.	.	.	.	3.3	1.64	0.008
SP2021004	5/12/2021	1323	M	2	11:43	30	41.2221	-72.836	.	.	.	.	2.8	1.40	0.007
SP2021005	5/12/2021	1432	S	2	14:22	30	41.2267	-72.4597	.	.	.	.	3.7	1.84	0.009
SP2021006	5/13/2021	931	S	4	8:28	30	41.1621	-72.4325	.	.	.	.	3.2	1.62	0.008
SP2021007	5/13/2021	125	T	4	10:38	30	41.0222	-72.6923	.	.	.	.	3.2	1.59	0.008
SP2021008	5/13/2021	5824	S	1	13:11	30	40.9825	-72.8143	.	.	.	.	3.3	1.63	0.008
SP2021009	5/17/2021	730	S	4	8:54	30	41.1296	-72.4733	.	.	.	.	2.4	1.22	0.006
SP2021010	5/17/2021	426	T	3	11:31	15	41.0648	-72.698	.	.	.	.	3.3	0.84	0.004
SP2021011	5/17/2021	828	S	3	14:33	30	41.1415	-72.6089	.	.	.	.	2.4	1.22	0.006
SP2021012	5/18/2021	1029	S	3	8:42	30	41.17	-72.5427	.	.	.	.	1.9	0.95	0.005
SP2021013	5/18/2021	926	T	4	11:10	30	41.162	-72.6363	.	.	.	.	2.8	1.40	0.007
SP2021014	5/18/2021	925	T	4	13:23	30	41.1288	-72.7043	.	.	.	.	2.8	1.38	0.007
SP2021015	5/19/2021	1325	T	2	9:30	30	41.2243	-72.7321	.	.	.	.	2.6	1.29	0.007
SP2021016	5/19/2021	1225	T	2	11:44	30	41.1921	-72.78	.	.	.	.	2.9	1.45	0.007
SP2021017	5/20/2021	1333	S	1	7:26	30	41.2332	-72.3788	.	.	.	.	2.2	1.08	0.005
SP2021018	5/20/2021	519	M	3	11:31	30	41.0956	-72.9743	.	.	.	.	2.7	1.34	0.007
SP2021019	5/20/2021	618	M	3	14:17	30	41.1096	-73.0145	.	.	.	.	3.2	1.62	0.008
SP2021020	5/24/2021	714	T	1	8:20	30	41.132	-73.1342	.	.	.	.	3.3	1.67	0.008
SP2021021	5/24/2021	5709	S	2	12:00	30	40.9532	-73.4075	.	.	.	.	2.3	1.15	0.006
SP2021022	5/25/2021	110	T	3	10:05	30	41.021	-73.3713	.	.	.	.	2.9	1.45	0.007
SP2021023	5/25/2021	5714	T	3	12:20	30	40.9647	-73.1848	.	.	.	.	2.4	1.22	0.006
SP2021024	5/25/2021	417	T	3	14:54	30	41.0805	-73.0571	.	.	.	.	3.6	1.80	0.009
SP2021025	5/26/2021	214	M	3	8:49	30	41.0523	-73.1631	.	.	.	.	3.4	1.70	0.009
SP2021026	5/26/2021	611	M	1	10:42	30	41.1008	-73.3176	.	.	.	.	3.1	1.55	0.008
SP2021027	5/26/2021	412	M	2	12:41	19	41.0675	-73.304	.	.	.	.	3.2	1.02	0.005
SP2021028	5/26/2021	118	M	4	14:59	30	41.0291	-73.012	.	.	.	.	2.2	1.12	0.006
SP2021029	5/27/2021	321	M	4	8:56	30	41.0538	-72.9303	.	.	.	.	2.3	1.13	0.006
SP2021030	5/27/2021	5919	M	3	11:03	26	40.9962	-72.9835	.	.	.	.	3.1	1.34	0.007
SP2021031	5/27/2021	121	M	4	12:56	30	41.0135	-72.9346	.	.	.	.	3.3	1.63	0.008
SP2021032	5/27/2021	220	M	4	14:58	30	41.0485	-72.9078	.	.	.	.	2.1	1.05	0.005
SP2021033	6/1/2021	1320	M	1	8:19	30	41.219	-72.9504	.	.	.	.	3.3	1.63	0.008

**Table 5.7. Station information for LISTS June 2021.**

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)
SP2021034	6/11/2021	1740	T	2	8:33	30	41.2893	-72.0868	.	.	.	.	2.4	1.20	0.0061
SP2021035	6/11/2021	1335	T	4	10:30	30	41.2373	-72.2488	.	.	.	.	4	1.99	0.0101
SP2021036	6/11/2021	1333	S	1	12:29	30	41.2345	-72.363	.	.	.	.	2.4	1.20	0.0061
SP2021037	6/11/2021	1332	S	1	13:40	30	41.2307	-72.4313	.	.	.	.	2.1	1.06	0.0054
SP2021038	6/14/2021	931	S	4	8:23	30	41.1627	-72.4403	.	.	.	.	2.6	1.30	0.0066
SP2021039	6/14/2021	819	T	2	12:39	30	41.1463	-72.9715	.	.	.	.	3.5	1.73	0.0088
SP2021040	6/15/2021	115	M	4	9:05	30	41.0258	-73.1313	.	.	.	.	2.9	1.43	0.0072
SP2021041	6/15/2021	15	T	4	10:53	30	41.006	-73.1663	.	.	.	.	2.5	1.23	0.0062
SP2021042	6/15/2021	118	M	4	13:27	30	41.0207	-73.0583	.	.	.	.	2.5	1.26	0.0064
SP2021043	6/16/2021	512	M	2	9:12	30	41.0975	-73.2586	.	.	.	.	3	1.48	0.0075
SP2021044	6/16/2021	5709	S	2	11:34	30	40.9523	-73.4077	.	.	.	.	3.1	1.54	0.0078
SP2021045	6/16/2021	5811	M	3	14:57	30	40.9742	-73.3582	.	.	.	.	2.8	1.40	0.0071
SP2021046	6/17/2021	5920	M	2	8:56	30	40.9867	-72.9495	.	.	.	.	3.4	1.72	0.0087
SP2021047	6/17/2021	21	M	3	10:31	30	41.001	-72.9226	.	.	.	.	3.1	1.55	0.0078
SP2021048	6/17/2021	22	M	4	12:14	30	41.0052	-72.8813	.	.	.	.	2.8	1.41	0.0071
SP2021049	6/17/2021	121	M	4	13:40	23	41.0135	-72.8648	.	.	.	.	3.2	1.24	0.0063
SP2021050	6/17/2021	522	M	4	15:19	30	41.1013	-72.838	.	.	.	.	3.1	1.53	0.0077
SP2021051	6/21/2021	1319	M	1	7:51	30	41.2013	-73.0085	.	.	.	.	3.1	1.54	0.0078
SP2021052	6/21/2021	1221	T	2	9:36	30	41.2097	-72.9236	.	.	.	.	3.4	1.71	0.0087
SP2021053	6/21/2021	823	M	3	11:52	15	41.1388	-72.8535	.	.	.	.	3.5	0.88	0.0045
SP2021054	6/21/2021	1124	T	2	13:19	19	41.1895	-72.8036	.	.	.	.	3.5	1.12	0.0057
SP2021055	6/22/2021	831	S	4	7:50	30	41.1418	-72.4521	.	.	.	.	3.6	1.82	0.0092
SP2021056	6/22/2021	524	T	4	10:19	30	41.0993	-72.7531	.	.	.	.	2.7	1.36	0.0069
SP2021057	6/22/2021	429	T	3	13:02	30	41.0776	-72.5475	.	.	.	.	2	1.01	0.0051
SP2021058	6/23/2021	1428	T	1	8:02	30	41.248	-72.5724	.	.	.	.	3.8	1.89	0.0095
SP2021059	6/23/2021	1425	M	1	10:31	30	41.2375	-72.732	.	.	.	.	2.9	1.43	0.0072
SP2021060	6/23/2021	1125	T	3	12:30	30	41.1923	-72.7285	.	.	.	.	3	1.51	0.0076
SP2021061	6/23/2021	1128	T	3	14:35	30	41.183	-72.6398	.	.	.	.	3.9	1.96	0.0099
SP2021062	6/24/2021	531	T	3	8:25	30	41.0903	-72.4771	.	.	.	.	3.9	1.95	0.0099
SP2021063	6/28/2021	929	S	3	8:31	30	41.1643	-72.5283	.	.	.	.	2.3	1.13	0.0057
SP2021064	6/28/2021	529	S	3	10:03	30	41.0983	-72.5498	.	.	.	.	3.2	1.59	0.0080
SP2021065	6/28/2021	129	S	2	11:37	30	41.0198	-72.6135	.	.	.	.	2.2	1.12	0.0056
SP2021066	6/28/2021	1534	T	1	15:18	30	41.2465	-72.3208	.	.	.	.	1.9	0.96	0.0049

**Table 5.8. Station information for LISTS September 2021.**

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)
FA2021001	9/8/2021	06-29	S	4	8:39	30	41.1122	-72.5037	.	.	.	.	3.2	1.6162	0.0082
FA2021002	9/8/2021	58-23	S	1	11:15	30	40.9817	-72.8275	.	.	.	.	3.0	1.5045	0.0076
FA2021003	9/8/2021	58-24	S	1	12:57	30	40.9802	-72.7855	.	.	.	.	3.5	1.7402	0.0088
FA2021004	9/9/2021	07-27	S	3	8:53	30	41.1292	-72.6185	.	.	.	.	3.6	1.8224	0.0092
FA2021005	9/9/2021	09-25	T	4	11:37	30	41.1308	-72.7123	.	.	.	.	2.7	1.3609	0.0069
FA2021006	9/9/2021	12-25	T	2	14:00	30	41.1967	-72.7716	.	.	.	.	3.4	1.7094	0.0086
FA2021007	9/10/2021	14-29	T	2	8:02	30	41.2355	-72.5685	.	.	.	.	3.3	1.6536	0.0084
FA2021008	9/10/2021	12-28	T	3	10:17	30	41.2017	-72.6010	.	.	.	.	2.0	1.0046	0.0051
FA2021009	9/13/2021	17-37	T	1	7:38	30	41.2873	-72.1985	.	.	.	.	3.2	1.6215	0.0082
FA2021010	9/13/2021	17-38	T	2	11:39	30	41.2852	-72.1523	.	.	.	.	3.6	1.7847	0.0090
FA2021011	9/13/2021	18-40	T	1	14:07	30	41.3250	-72.0854	.	.	.	.	3.3	1.6546	0.0084
FA2021012	9/14/2021	13-36	T	4	7:28	30	41.2210	-72.2506	.	.	.	.	2.1	1.0674	0.0054
FA2021013	9/14/2021	08-30	S	4	9:59	30	41.1482	-72.4832	.	.	.	.	2.3	1.1401	0.0058
FA2021014	9/14/2021	05-26	T	3	11:54	30	41.1003	-72.6428	.	.	.	.	3.2	1.6136	0.0082
FA2021015	9/14/2021	04-27	T	3	14:03	30	41.0767	-72.6552	.	.	.	.	2.3	1.1596	0.0059
FA2021016	9/16/2021	07-28	S	3	8:22	21	41.1237	-72.5736	.	.	.	.	2.8	0.9887	0.0050
FA2021017	9/16/2021	02-23	M	4	10:14	30	41.0497	-72.7990	.	.	.	.	2.6	1.3031	0.0066
FA2021018	9/16/2021	04-23	M	4	11:57	30	41.0848	-72.7852	.	.	.	.	2.8	1.3976	0.0071
FA2021019	9/16/2021	03-20	M	4	14:20	30	41.0575	-72.9294	.	.	.	.	3.1	1.5625	0.0079
FA2021020	9/17/2021	13-19	M	1	8:00	30	41.2296	-72.9728	.	.	.	.	3.4	1.6797	0.0085
FA2021021	9/17/2021	11-18	M	1	10:13	30	41.1927	-73.0113	.	.	.	.	3.1	1.5458	0.0078
FA2021022	9/20/2021	02-12	M	3	8:47	30	41.0442	-73.2385	.	.	.	.	3.7	1.8324	0.0093
FA2021023	9/20/2021	57-09	S	2	11:08	30	40.9471	-73.4068	.	.	.	.	3.4	1.6788	0.0085
FA2021024	9/21/2021	00-15	T	4	9:05	30	41.0085	-73.1266	.	.	.	.	3.4	1.6823	0.0085
FA2021025	9/21/2021	58-13	M	3	12:14	30	40.9773	-73.2178	.	.	.	.	3.1	1.5643	0.0079
FA2021026	9/21/2021	55-13	S	2	14:00	30	40.9288	-73.2573	.	.	.	.	3.0	1.5008	0.0076
FA2021027	9/22/2021	11-21	M	2	8:11	30	41.1813	-72.9395	.	.	.	.	2.6	1.3154	0.0066
FA2021028	9/22/2021	07-22	M	3	10:10	30	41.1312	-72.8401	.	.	.	.	3.6	1.7774	0.0090
FA2021029	9/22/2021	00-17	M	4	12:09	30	41.0161	-73.0278	.	.	.	.	3.0	1.4769	0.0075
FA2021030	9/22/2021	05-15	M	2	14:06	30	41.0862	-73.1823	.	.	.	.	3.3	1.6692	0.0084
FA2021031	9/23/2021	03-14	M	3	9:08	30	41.0610	-73.1547	.	.	.	.	3.4	1.6772	0.0085
FA2021032	9/23/2021	01-10	T	3	11:23	22	41.0313	-73.3267	.	.	.	.	3.3	1.2077	0.0061
FA2021033	9/23/2021	02-10	T	2	13:09	30	41.0380	-73.3730	.	.	.	.	2.6	1.2988	0.0066
FA2021034	9/24/2021	05-13	M	2	10:00	30	41.0883	-73.2558	.	.	.	.	2.9	1.4497	0.0073
FA2021035	9/24/2021	04-15	M	3	12:09	30	41.0618	-73.1926	.	.	.	.	2.6	1.2997	0.0066
FA2021036	9/27/2021	09-19	T	2	8:01	30	41.1505	-72.9913	.	.	.	.	3.7	1.8452	0.0093
FA2021037	9/27/2021	12-20	T	1	10:17	30	41.2125	-72.9511	.	.	.	.	3.2	1.5894	0.0080
FA2021038	9/27/2021	03-24	M	4	13:32	30	41.0520	-72.7916	.	.	.	.	2.8	1.3800	0.0070
FA2021039	9/29/2021	04-29	T	3	8:40	30	41.0813	-72.5371	.	.	.	.	2.6	1.2964	0.0066
FA2021040	9/29/2021	05-25	T	4	11:01	30	41.0995	-72.6988	.	.	.	.	2.8	1.3999	0.0071

**Table 5.9. Station information for LISTS October 2021.**

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)
FA2021041	10/12/2021	08-30	S	4	8:11	30	41.1480	-72.4795	.	.	.	.	2.1	1.0407	0.0053
FA2021042	10/12/2021	02-26	T	3	10:04	30	41.0505	-72.6331	.	.	.	.	3.1	1.5325	0.0077
FA2021043	10/12/2021	01-24	M	4	12:34	30	41.0190	-72.7995	.	.	.	.	2.3	1.1593	0.0059
FA2021044	10/12/2021	10-28	T	4	14:51	30	41.1628	-72.6345	.	.	.	.	2.3	1.1258	0.0057
FA2021045	10/13/2021	06-29	S	4	8:34	30	41.1142	-72.5013	.	.	.	.	2.2	1.0905	0.0055
FA2021046	10/13/2021	06-25	T	4	10:36	30	41.1058	-72.7268	.	.	.	.	2.9	1.4539	0.0073
FA2021047	10/13/2021	10-25	T	3	12:45	30	41.1646	-72.7625	.	.	.	.	2.8	1.4100	0.0071
FA2021048	10/14/2021	03-30	S	1	8:55	30	41.0615	-72.4995	.	.	.	.	2.6	1.2877	0.0065
FA2021049	10/14/2021	00-28	T	2	10:13	30	41.0167	-72.5905	.	.	.	.	2.6	1.2966	0.0066
FA2021050	10/14/2021	05-26	T	3	12:05	30	41.0875	-72.6920	.	.	.	.	3.3	1.6287	0.0082
FA2021051	10/14/2021	07-28	S	3	14:14	30	41.1153	-72.6089	.	.	.	.	2.4	1.1818	0.0060
FA2021052	10/15/2021	06-28	S	3	9:21	30	41.1136	-72.5743	.	.	.	.	2.5	1.2261	0.0062
FA2021053	10/15/2021	10-27	T	4	10:54	30	41.1707	-72.6946	.	.	.	.	3.6	1.8059	0.0091
FA2021054	10/15/2021	12-25	T	2	12:59	30	41.2072	-72.7156	.	.	.	.	3.0	1.4853	0.0075
FA2021055	10/18/2021	15-33	S	1	7:39	25	41.2470	-72.3707	.	.	.	.	3.3	1.3901	0.0070
FA2021056	10/21/2021	13-28	T	2	7:57	30	41.2392	-72.5786	.	.	.	.	4.0	1.9950	0.0101
FA2021057	10/21/2021	14-25	M	1	9:39	30	41.2395	-72.7300	.	.	.	.	3.3	1.6282	0.0082
FA2021058	10/21/2021	08-21	M	3	14:09	30	41.1573	-72.9235	.	.	.	.	3.1	1.5311	0.0077
FA2021059	10/22/2021	57-09	S	2	10:03	30	40.9483	-73.4077	.	.	.	.	3.5	1.7369	0.0088
FA2021060	10/25/2021	04-15	M	3	8:27	30	41.0735	-73.1390	.	.	.	.	2.9	1.4550	0.0074
FA2021061	10/25/2021	00-13	M	4	10:27	30	41.0121	-73.2097	.	.	.	.	3.0	1.5016	0.0076
FA2021062	10/25/2021	55-13	S	2	12:34	30	40.9275	-73.2512	.	.	.	.	3.0	1.4837	0.0075
FA2021063	10/25/2021	00-11	M	4	15:14	30	41.0083	-73.3325	.	.	.	.	3.0	1.5107	0.0076
FA2021064	10/28/2021	01-12	M	4	9:06	30	41.0255	-73.2378	.	.	.	.	2.8	1.3935	0.0070
FA2021065	10/28/2021	01-10	T	3	11:24	30	41.0298	-73.3213	.	.	.	.	3.0	1.5100	0.0076
FA2021066	10/28/2021	05-11	M	2	13:19	30	41.0912	-73.3126	.	.	.	.	2.8	1.4132	0.0071
FA2021067	10/28/2021	06-15	M	2	15:30	30	41.0940	-73.2003	.	.	.	.	2.6	1.2961	0.0065
FA2021068	11/1/2021	09-17	T	2	7:52	30	41.1555	-73.0723	.	.	.	.	3.3	1.6736	0.0085
FA2021069	11/1/2021	12-20	T	1	10:36	30	41.2183	-72.9111	.	.	.	.	2.6	1.2918	0.0065
FA2021070	11/1/2021	07-20	M	3	12:07	30	41.1157	-72.9748	.	.	.	.	3.6	1.8032	0.0091
FA2021071	11/1/2021	11-18	M	1	14:10	30	41.1988	-72.9570	.	.	.	.	2.9	1.4254	0.0072
FA2021072	11/2/2021	05-18	M	3	8:18	30	41.0916	-73.0496	.	.	.	.	2.8	1.3895	0.0070
FA2021073	11/2/2021	13-22	T	1	10:13	30	41.2228	-72.8678	.	.	.	.	3.7	1.8531	0.0094

**Table 5.10. Samples with non-standard tow durations and reasons for incomplete tows, spring and fall 2021.**

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

Sample	Date	Site	Bottom Type	Depth Interval	Time	Duration	Reason	Comments
<b>April</b>								
No sampling was done in April 2021								
<b>May</b>								
SP2021010	5/17/2021	04-26	T	3	11:31	15	Hydraulics	Could not bring the 30 min. tow on deck, therefore new tow was half the normal duration
SP2021027	5/26/2021	04-12	M	2	12:41	19	Pots	Speed drops and felt bumps. One pot found in the net.
SP2021030	5/27/2021	59-19	M	3	11:03	26	Speed drop	Speed dropped but there was nothing in net when hauled back.
<b>June</b>								
SP2021049	6/17/2021	01-21	M	4	13:40	23	Speed drop	Hauled back when the speed dropped to 0.5 knots
SP2021053	6/21/2021	08-23	M	3	11:52	15	Hydraulics	Last time this site was towed could not bring full tow on deck, therefore oonly attempted 15 min.
SP2021054	6/21/2021	11-24	T	2	13:19	19	Pots	Hauled back to avoid gear in tow path.
<b>SEPT</b>								
All tows this month were standard duration (30 minutes).								
<b>OCT</b>								
All tows this month were standard duration (30 minutes).								



**Table 5.11. List of finfish species observed in 2021.**

*Fifty-four finfish species were observed in 2021. Since 1984, one hundred-twelve 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>	lizardfish, inshore	<i>Synodus foetens</i>
anchovy, striped	<i>Anchoa hepsetus</i>	mackerel, Atlantic	<i>Scomber scombrus</i>
bigeye, short	<i>Pristigenys alta</i>	mackerel, Spanish	<i>Scomberomorus maculatus</i>
black sea bass	<i>Centropristis striata</i>	menhaden, Atlantic	<i>Brevoortia tyrannus</i>
blue runner	<i>Caranx crysos</i>	moonfish	<i>Selene setapinnis</i>
bluefish	<i>Pomatomus saltatrix</i>	puffer, northern	<i>Sphoeroides maculatus</i>
burrfish, striped	<i>Chilomycterus schoepfi</i>	rockling, fourbeard	<i>Enchelyopus cimbrius</i>
butterfish	<i>Peprilus triacanthus</i>	sand lance, American	<i>Ammodytes americanus</i>
cod, Atlantic	<i>Gadus morhua</i>	scad, bigeye	<i>Selar crumenophthalmus</i>
cunner	<i>Tautoglabrus adspersus</i>	scad, mackerel	<i>Trachurus macarellus</i>
dogfish, smooth	<i>Mustelus canis</i>	scad, rough	<i>Trachurus lathami</i>
eel, conger	<i>Conger oceanicus</i>	sculpin, longhorn	<i>Myoxocephalus octodecemspin</i>
filefish, planehead	<i>Monacanthus hispidus</i>	scup	<i>Stenotomus chrysops</i>
flounder, fourspot	<i>Paralichthys oblongus</i>	searobin, northern	<i>Prionotus carolinus</i>
flounder, smallmouth	<i>Etropus microstomus</i>	searobin, striped	<i>Prionotus evolans</i>
flounder, summer	<i>Paralichthys dentatus</i>	shad, American	<i>Alosa sapidissima</i>
flounder, windowpane	<i>Scophthalmus aquosus</i>	shad, hickory	<i>Alosa mediocris</i>
flounder, winter	<i>Pseudopleuronectes american</i>	shark, sand tiger	<i>Carcharias</i>
hake, red	<i>Urophycis chuss</i>	skate, clearnose	<i>Raja eglanteria</i>
hake, silver	<i>Merluccius bilinearis</i>	skate, little	<i>Leucoraja erinacea</i>
hake, spotted	<i>Urophycis regia</i>	skate, winter	<i>Leucoraja ocellata</i>
herring, alewife	<i>Alosa pseudoharengus</i>	spot	<i>Leiostomus xanthurus</i>
herring, Atlantic	<i>Clupea harengus</i>	striped bass	<i>Morone saxatilis</i>
herring, blueback	<i>Alosa aestivalis</i>	sturgeon, Atlantic	<i>Acipenser oxyrinchus</i>
hogchoker	<i>Trinectes maculatus</i>	tautog	<i>Tautoga onitis</i>
jack, crevalle	<i>Caranx hippos</i>	toadfish, oyster	<i>Opsanus tau</i>
kingfish, northern	<i>Menticirrhus saxatilis</i>	weakfish	<i>Cynoscion regalis</i>

Names taken from: Common and scientific names of fishes from the United States, Canada and Mexico, Sixth Edition (Nelson et al. 2004).

**Table 5.12. List of invertebrates observed in 2021.**

*In 2021, forty 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>	oyster, common	<i>Crassostrea virginica</i>
bryozoan, bushy	<i>Phylum Bryozoa</i>	scallop, bay	<i>Argopecten irradians</i>
bryozoan, rubbery	<i>Alcyonidium verrilli</i>	sea grape	<i>Molgula spp.</i>
clam, hard clams	<i>Artica-Mercinaria-Pitar sp.</i>	sea urchin, purple	<i>Arbacia punctulata</i>
clam, surf	<i>Spisula solidissima</i>	shrimp, brown	<i>Penaeus aztecus</i>
coral, star	<i>Astrangia poculata</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, horseshoe	<i>Limulus polyphemus</i>	sponge spp.	<i>sponge spp.</i>
crab, lady	<i>Ovalipes ocellatus</i>	sponge, boring	<i>Cliona celata</i>
crab, mud	<i>Family Xanthidae</i>	sponge, deadman's fingers	<i>Haliclona spp.</i>
crab, rock	<i>Cancer irroratus</i>	sponge, red bearded	<i>Microciona prolifera</i>
crab, spider	<i>Libinia emarginata</i>	squid, longfin inshore	<i>Doryteuthis pealeii</i>
hydroid spp.	<i>hydroid spp.</i>	starfish spp.	<i>Asteriid spp.</i>
jelly, comb	<i>Phylum Ctenophora</i>	Tubularia hydroids	<i>Tubularia, spp.</i>
jellyfish, lion's mane	<i>Cyanea capillata</i>	tunicates, misc	<i>misc. class ascidiacea</i>
lobster, American	<i>Homarus americanus</i>	<b>wavy astarte</b>	<b><i>Astarte undata</i></b>
mussel, blue	<i>Mytilus edulis</i>	whelk, channeled	<i>Busycotypus canalliculatus</i>
nemertean	<i>Phylum Rhynchocoela</i>	whelk, knobbed	<i>Busycon carica</i>
northern moon snail	<i>Lunatia heros</i>	worms, fan	<i>Myxicola infundibulum</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 2021.**

*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) = 139.*

species	count	%	weight	%	species	count	%	weight	%
scup	54,698	43.9	8,184.6	46.2					
butterfish	38,461	30.9	1,034.9	5.8					
weakfish	8,661	6.9	612.4	3.5					
northern searobin	4,135	3.3	727.1	4.1					
striped searobin	3,460	2.8	1,281.7	7.2					
moonfish	2,255	1.8	28.6	0.2					
smooth dogfish	1,728	1.4	2,909.3	16.4					
bay anchovy	1,618	1.3	6.0	0.0					
bluefish	1,203	1.0	171.0	1.0					
black sea bass	1,089	0.9	521.6	2.9					
spotted hake	886	0.7	73.4	0.4					
windowpane flounder	812	0.7	142.8	0.8					
summer flounder	796	0.6	511.2	2.9					
hogchoker	704	0.6	87.5	0.5					
silver hake	565	0.5	21.2	0.1					
red hake	533	0.4	35.9	0.2					
American shad	403	0.3	26.6	0.2					
striped anchovy	326	0.3	3.7	0.0					
Atlantic menhaden	303	0.2	95.3	0.5					
winter flounder	266	0.2	55.9	0.3					
tautog	225	0.2	193.9	1.1					
fourspot flounder	224	0.2	51.2	0.3					
smallmouth flounder	191	0.2	4.3	0.0					
clearnose skate	165	0.1	278.7	1.6					
alewife	125	0.1	7.4	0.0					
inshore lizardfish	116	0.1	9.3	0.1					
Atlantic herring	114	0.1	0.5	0.0					
striped bass	109	0.1	164.6	0.9					
spot	90	0.1	11.4	0.1					
northern kingfish	76	0.1	6.5	0.0					
northern puffer	56	0.0	2.1	0.0					
little skate	51	0.0	25.0	0.1					
hickory shad	24	0.0	9.1	0.1					
winter skate	23	0.0	21.2	0.1					
mackerel scad	21	0.0	0.4	0.0					
Atlantic sturgeon	19	0.0	378.6	2.1					
Atlantic cod	14	0.0	2.0	0.0					
blue runner	13	0.0	1.0	0.0					
blueback herring	12	0.0	0.4	0.0					
rough scad	11	0.0	0.5	0.0					
fourbeard rockling	10	0.0	1.2	0.0					
oyster toadfish	10	0.0	3.8	0.0					
cunner	5	0.0	0.9	0.0					
Atlantic mackerel	5	0.0	0.3	0.0					
crevalle jack	4	0.0	0.2	0.0					
planehead filefish	4	0.0	0.2	0.0					
bigeye scad	3	0.0	0.2	0.0					
Spanish mackerel	2	0.0	0.3	0.0					
conger eel	1	0.0	0.2	0.0					
American sand lance	1	0.0	0.1	0.0					
short bigeye	1	0.0	0.1	0.0					
striped burrfish	1	0.0	0.3	0.0					
longhorn sculpin	1	0.0	0.3	0.0					
sand tiger shark	1	0.0	8.4	0.0					
<b>Total</b>	<b>124,630</b>		<b>17,715.0</b>						
					<b>Finfish not ranked</b>				
					anchovy spp, (yoy)				
					Atlantic herring, (yoy)				
					American sand lance (yoy)				
					gadid spp, (yoy)				
					<b>Invertebrates</b>				
					horseshoe crab	339	3.0	583.3	38.4
					longfin inshore squid	9,652	85.9	360.3	23.7
					boring sponge	nc		153.3	10.1
					bushy bryozoan	nc		148.6	9.8
					common slipper shell	nc		81.4	5.4
					spider crab	nc		61.4	4.0
					mantis shrimp	813	7.2	27.3	1.8
					knobbed whelk	95	0.8	25.3	1.7
					flat claw hermit crab	nc		16.0	1.1
					lion's mane jellyfish	151	1.3	12.8	0.8
					channeled whelk	64	0.6	9.9	0.7
					blue crab	60	0.5	8.9	0.6
					arks	nc		7.1	0.5
					hydroid spp.	nc		5.2	0.3
					American lobster	6	0.1	2.4	0.2
					mud crabs	nc		2.3	0.2
					hard clams	25	0.2	2.1	0.1
					rock crab	nc		2.0	0.1
					common oyster	nc		1.8	0.1
					sand shrimp	nc		1.1	0.1
					lady crab	nc		0.8	0.1
					sea grape	nc		0.8	0.1
					deadman's fingers sponge	nc		0.6	0.0
					blue mussel	nc		0.6	0.0
					star coral	nc		0.5	0.0
					northern moon snail	nc		0.5	0.0
					purple sea urchin	10	0.1	0.4	0.0
					brown shrimp	16	0.1	0.4	0.0
					mixed sponge species	nc		0.3	0.0
					fan worm tubes	nc		0.3	0.0
					Tubularia, spp.	nc		0.3	0.0
					comb jelly spp	nc		0.2	0.0
					rubbery bryozoan	nc		0.2	0.0
					tunicates, misc	nc		0.1	0.0
					starfish spp.	nc		0.1	0.0
					surf clam	2	0.0	0.1	0.0
					bay scallop	1	0.0	0.1	0.0
					red bearded sponge	nc		0.1	0.0
					nemerteans	nc		0.1	0.0
					wavy astarte	1	0.0	0.1	0.0
					<b>Total</b>	<b>11,235</b>		<b>1,518.8</b>	

Note: nc= not counted

**Table 5.14. Total counts and weight (kg) of finfish taken in the spring and fall sampling periods, 2021.**  
*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 = 66 and Fall = 73.*

species	Spring				species	Fall			
	count	%	weight	%		count	%	weight	%
scup	24,327	60.9	5,522.7	53.3	butterfish	35,596	42.0	818.7	11.1
northern searobin	3,732	9.3	642.1	6.2	scup	30,371	35.9	2,661.9	36.2
butterfish	2,865	7.2	216.2	2.1	weakfish	8,422	9.9	541.1	7.4
striped searobin	2,154	5.4	746.1	7.2	moonfish	2,255	2.7	28.6	0.4
bay anchovy	972	2.4	3.1	0.0	striped searobin	1,306	1.5	535.7	7.3
black sea bass	810	2.0	386.6	3.7	bluefish	1,197	1.4	164.3	2.2
smooth dogfish	703	1.8	1,422.9	13.7	smooth dogfish	1,025	1.2	1,486.3	20.2
spotted hake	616	1.5	24.2	0.2	bay anchovy	646	0.8	2.9	0.0
windowpane flounder	575	1.4	96.3	0.9	hogchoker	510	0.6	63.1	0.9
silver hake	546	1.4	19.2	0.2	northern searobin	403	0.5	85.0	1.2
red hake	464	1.2	28.3	0.3	summer flounder	349	0.4	243.2	3.3
summer flounder	447	1.1	268.0	2.6	American shad	338	0.4	24.5	0.3
weakfish	239	0.6	71.3	0.7	striped anchovy	325	0.4	3.6	0.0
winter flounder	224	0.6	46.2	0.4	black sea bass	279	0.3	135.1	1.8
hogchoker	193	0.5	24.4	0.2	spotted hake	270	0.3	49.2	0.7
fourspot flounder	190	0.5	45.2	0.4	windowpane flounder	237	0.3	46.5	0.6
tautog	166	0.4	156.2	1.5	Atlantic menhaden	162	0.2	48.1	0.7
Atlantic menhaden	140	0.4	47.2	0.5	smallmouth flounder	127	0.1	2.7	0.0
Atlantic herring	114	0.3	0.5	0.0	inshore lizardfish	116	0.1	9.3	0.1
striped bass	100	0.3	141.9	1.4	alewife	96	0.1	3.9	0.1
clearnose skate	84	0.2	156.2	1.5	spot	90	0.1	11.4	0.2
American shad	65	0.2	2.1	0.0	clearnose skate	81	0.1	122.4	1.7
smallmouth flounder	64	0.2	1.6	0.0	red hake	69	0.1	7.6	0.1
little skate	31	0.1	17.2	0.2	northern kingfish	63	0.1	4.3	0.1
alewife	29	0.1	3.5	0.0	tautog	59	0.1	37.7	0.5
winter skate	21	0.1	20.0	0.2	northern puffer	55	0.1	2.1	0.0
Atlantic cod	14	0.0	2.0	0.0	winter flounder	42	0.1	9.7	0.1
northern kingfish	13	0.0	2.2	0.0	fourspot flounder	34	0.0	6.0	0.1
Atlantic sturgeon	10	0.0	236.8	2.3	hickory shad	22	0.0	8.7	0.1
fourbeard rockling	10	0.0	1.2	0.0	mackerel scad	21	0.0	0.4	0.0
blueback herring	6	0.0	0.1	0.0	little skate	20	0.0	7.8	0.1
bluefish	6	0.0	6.8	0.1	silver hake	19	0.0	2.0	0.0
cunner	3	0.0	0.5	0.0	blue runner	13	0.0	1.0	0.0
oyster toadfish	3	0.0	1.3	0.0	rough scad	11	0.0	0.5	0.0
hickory shad	2	0.0	0.4	0.0	Atlantic sturgeon	9	0.0	141.8	1.9
northern puffer	1	0.0	0.1	0.0	striped bass	9	0.0	22.7	0.3
American sand lance	1	0.0	0.1	0.0	oyster toadfish	7	0.0	2.5	0.0
striped burrfish	1	0.0	0.3	0.0	blueback herring	6	0.0	0.2	0.0
longhorn sculpin	1	0.0	0.3	0.0	Atlantic mackerel	5	0.0	0.3	0.0
striped anchovy	1	0.0	0.1	0.0	crevalle jack	4	0.0	0.2	0.0
<b>Total</b>	<b>39,943</b>		<b>10,361.2</b>		planehead filefish	4	0.0	0.2	0.0
					bigeye scad	3	0.0	0.2	0.0
					cunner	2	0.0	0.5	0.0
					Spanish mackerel	2	0.0	0.3	0.0
					winter skate	2	0.0	1.2	0.0
					conger eel	1	0.0	0.2	0.0
					short bigeye	1	0.0	0.1	0.0
					sand tiger shark	1	0.0	8.4	0.1
					<b>Total</b>	<b>84,685</b>		<b>7,353.8</b>	

**Table 5.15. Total catch of invertebrates taken in the spring and fall sampling periods, 2021.**  
*Species are ranked by total weight (kg). Number of tows (sample sizes): Spring = 66 and Fall = 73.*

species	Spring				species	Fall			
	count	%	weight	%		count	%	weight	%
horseshoe crab	133	7.3	227.66	35.4	horseshoe crab	206	2.2	355.7	40.6
bushy bryozoan	nc		121.11	18.9	longfin inshore squid	8,305	88.1	284.5	32.5
longfin inshore squid	1,347	75	75.8	11.8	boring sponge	nc		101.4	11.6
spider crab	nc		54.31	8.5	common slipper shell	nc		28.3	3.2
common slipper shell	nc		53.03	8.3	bushy bryozoan	nc		27.5	3.1
boring sponge	nc		51.87	8.1	mantis shrimp	731	7.8	24.5	2.8
knobbed whelk	65	4	15.58	2.4	lion's mane jellyfish	60	0.6	9.7	1.1
flat claw hermit crab	nc		9.44	1.5	knobbed whelk	30	0.3	9.7	1.1
channeled whelk	48	2.7	7.7	1.2	spider crab	nc		7.0	0.8
hydroid spp.	nc		5.04	0.8	flat claw hermit crab	nc		6.5	0.7
blue crab	21	1.1	3.55	0.6	arks	nc		5.9	0.7
lion's mane jellyfish	91	5	3.03	0.5	blue crab	40	0.4	5.4	0.6
mantis shrimp	82	5	2.83	0.4	channeled whelk	15	0.2	2.2	0.3
rock crab	nc		1.45	0.2	common oyster	nc		1.5	0.2
mud crabs	nc		1.25	0.2	hard clams	16	0.2	1.4	0.2
arks	nc		1.2	0.2	American lobster	2	0.0	1.2	0.1
American lobster	4	0.2	1.19	0.2	mud crabs	nc		1.1	0.1
sand shrimp	nc		1.11	0.2	rock crab	nc		0.6	0.1
sea grape	nc		0.79	0.1	star coral	nc		0.4	0.1
hard clams	9	0.5	0.72	0.1	brown shrimp	16	0.2	0.4	0.0
blue mussel	nc		0.6	0.1	lady crab	nc		0.3	0.0
lady crab	nc		0.56	0.1	comb jelly spp	nc		0.2	0.0
deadman's fingers sponge	nc		0.46	0.1	fan worm tubes	nc		0.2	0.0
northern moon snail	nc		0.37	0.1	purple sea urchin	4	0.0	0.2	0.0
common oyster	nc		0.29	0	hydroid spp.	nc		0.2	0.0
mixed sponge species	nc		0.29	0	rubbery bryzoan	nc		0.2	0.0
Tubularia, spp.	nc		0.25	0	deadman's fingers sponge	nc		0.1	0.0
purple sea urchin	6	0.3	0.2	0	northern moon snail	nc		0.1	0.0
tunicates, misc	nc		0.11	0	bay scallop	1	0.0	0.1	0.0
star coral	nc		0.1	0	mixed sponge species	nc		0.1	0.0
fan worm tubes	nc		0.07	0	starfish spp.	nc		0.1	0.0
red bearded sponge	nc		0.05	0	surf clam	1	0.0	0.1	0.0
nemerteans	nc		0.05	0	wavy astarte	1	0.0	0.1	0.0
rubbery bryzoan	nc		0.05	0	<b>Total</b>	<b>9,428</b>		<b>876.6</b>	
starfish spp.	nc		0.05	0					
surf clam	1	0.1	0.05	0					
<b>Total</b>	<b>1,807</b>		<b>642.2</b>						

Note: nc= not counted

**Table 5.16. Spring indices of abundance for selected species, 1984-2021.**

*The geometric mean count per tow was calculated for 38 finfish and 2 invertebrates using April-June data. An asterisk next to the species name and time series mean, indicates that the spring index is a better estimate than the fall index (Simpson et al. 1991). Two asterisks indicate that both the spring and the fall indices provide good estimates. There was no spring sampling in 2020.*

Species	Spring																										84-20														
	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	2019	2020	2021	Mean		
alewife *	0.43	0.10	0.66	1.00	0.47	0.72	0.54	0.39	0.39	0.84	1.83	0.96	2.18	1.44	1.11	1.89	1.53	0.75	0.95	1.14	1.86	1.30	0.78	1.62	1.32	1.04	1.29	0.94	0.77	1.06	0.88	0.77	1.71	0.07	1.20	1.57	-	0.17	1.04		
black sea bass *	0.16	0.27	0.12	0.05	0.04	0.08	0.10	0.07	0.03	0.07	0.12	0.07	0.11	0.10	0.04	0.08	0.22	0.25	0.67	0.21	0.22	0.07	0.05	0.26	0.22	0.32	0.28	0.27	0.83	0.97	2.73	1.94	1.78	4.56	4.17	3.79	-	5.25	0.70		
bluefish	0.00	0.02	0.19	0.07	0.11	0.07	0.09	0.52	0.31	0.05	0.07	0.03	0.07	0.18	0.12	0.24	0.08	0.07	0.30	0.16	0.11	0.11	0.22	0.16	0.08	0.24	0.01	0.17	0.07	0.11	0.03	0.02	0.05	0.05	0.04	0.01	-	0.05			
butterfish	8.92	0.62	2.38	0.25	0.46	0.80	1.60	2.17	2.60	0.48	1.71	1.06	3.22	6.16	6.51	1.90	3.35	2.94	7.09	3.17	2.10	2.27	18.67	3.48	4.64	9.44	1.99	15.64	13.44	3.38	2.87	3.26	14.13	11.14	5.99	1.91	-	10.46			
cunner *	1.28	0.29	0.28	0.22	0.16	0.29	0.55	0.25	0.11	0.20	0.07	0.16	0.07	0.15	0.18	0.18	0.17	0.20	0.25	0.11	0.07	0.08	0.06	0.05	0.10	0.05	0.08	0.08	0.06	0.06	0.00	0.06	0.02	0.03	0.03	0.00	-	0.03	0.17		
dogfish, smooth	0.39	0.46	0.45	0.21	0.49	0.48	0.34	0.46	0.56	0.26	0.60	0.33	0.44	0.24	0.47	0.54	0.53	0.55	1.19	0.63	0.53	0.44	1.33	0.64	0.87	1.05	0.09	1.51	0.82	0.80	0.78	0.87	1.80	2.90	1.58	1.12	-	3.11			
dogfish, spiny *	0.00	0.15	0.14	0.07	0.12	0.18	0.19	0.06	0.04	0.01	0.06	0.00	0.00	0.01	0.01	0.00	0.04	0.02	0.03	0.03	0.09	0.12	0.07	0.43	0.03	0.19	0.06	0.08	0.06	0.00	0.04	0.03	0.03	0.02	-	0.00	0.07				
flounder, fourspot *	18.18	10.55	3.15	2.38	4.62	4.14	6.53	8.46	9.33	2.37	2.59	5.00	4.82	7.54	4.34	3.53	4.57	3.83	4.82	2.78	2.56	1.14	1.86	3.37	2.94	1.71	1.52	4.09	5.45	2.26	1.90	0.87	1.82	1.90	2.09	1.89	-	1.19	4.19		
flounder, summer	0.63	0.44	0.95	1.06	0.50	0.10	0.35	0.64	0.55	0.51	0.86	0.28	0.96	1.00	1.30	1.44	1.79	1.75	3.19	3.42	1.84	0.80	0.61	2.51	1.61	1.93	2.69	3.85	3.06	3.24	3.00	1.64	1.36	1.66	2.64	4.85	-	4.16			
flounder, windowpane *	172.27	119.82	67.82	40.33	66.02	101.71	39.74	30.87	13.17	24.71	23.54	10.69	37.47	30.43	24.27	14.19	8.11	9.04	5.44	4.90	5.96	2.29	2.98	15.65	10.11	7.08	11.40	9.39	9.85	5.96	5.02	3.26	3.41	4.33	4.17	4.68	-	3.13	26.39		
flounder, winter *	111.96	66.81	61.50	67.92	100.96	135.23	170.12	118.95	54.31	53.34	74.35	48.11	93.05	57.41	59.36	32.80	33.67	46.40	25.49	21.22	16.45	17.47	7.50	20.58	22.34	18.98	20.88	16.68	12.02	6.35	4.10	3.93	3.40	0.76	2.41	1.50	-	1.44	44.68		
hake, red *	15.04	3.02	4.67	3.84	3.64	13.12	4.75	4.35	4.83	6.00	0.89	4.12	1.49	1.41	6.28	7.21	4.01	2.64	5.11	1.18	1.37	1.06	1.30	3.85	3.37	1.48	3.27	0.60	3.35	1.35	0.70	0.26	1.05	0.66	1.05	2.58	-	1.49	3.47		
hake, silver *	7.53	1.83	1.19	2.48	2.25	4.86	5.53	3.87	2.67	1.56	1.73	4.88	1.15	4.32	4.64	12.57	2.28	7.64	5.92	0.76	2.63	0.57	4.75	0.98	19.08	2.30	5.24	2.10	19.45	1.47	1.08	0.25	1.71	1.51	1.70	12.45	-	2.49	4.36		
hake, spotted	0.00	0.00	0.02	0.01	0.22	0.01	0.02	0.22	0.08	0.07	0.02	0.21	0.31	0.25	0.26	1.11	2.68	1.52	2.05	1.18	0.65	1.33	1.47	1.04	3.15	0.65	1.89	1.84	1.60	2.15	1.03	0.43	4.92	5.12	2.66	6.10	-	3.89			
herring, Atlantic *	0.00	0.58	1.12	2.77	2.16	2.27	5.73	4.91	7.23	7.24	2.95	4.23	1.70	2.53	1.06	0.99	1.21	0.85	0.41	0.49	0.53	1.33	0.31	1.66	0.77	1.82	2.56	1.57	0.73	2.64	1.44	0.69	0.69	0.11	0.77	1.01	-	0.25	1.79		
herring, blackback	5.42	0.30	0.34	0.14	0.03	0.05	0.08	0.11	0.20	0.08	0.55	0.29	0.28	0.25	0.15	0.02	0.37	0.19	0.15	0.27	0.46	0.33	0.13	0.29	0.21	0.43	0.37	0.14	0.13	0.26	0.15	0.42	0.28	0.00	0.28	0.28	-	0.04			
hogchoker	0.63	0.45	0.14	0.15	0.18	0.21	0.17	0.14	0.24	0.08	0.11	0.03	0.10	0.05	0.03	0.06	0.11	0.10	0.15	0.15	0.19	0.11	0.08	0.17	0.13	0.11	0.15	0.24	0.29	0.32	0.40	0.21	0.49	1.22	0.97	0.70	-	1.17			
kingfish, northern	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	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	0.01	0.01	0.00	0.01	0.05	0.01	0.00	0.03	-	0.06			
lobster, American**	7.09	3.10	2.76	3.30	2.24	3.76	5.33	7.74	7.88	6.72	4.10	8.36	6.77	7.67	18.52	12.49	11.01	7.56	6.31	3.89	2.50	2.43	1.94	3.22	2.72	1.40	1.30	0.79	0.97	0.44	0.45	0.31	0.33	0.08	0.09	0.10	-	0.04	4.32		
menhaden, Atlantic	0.09	0.11	0.18	0.39	0.17	0.14	0.10	0.03	0.14	0.07	0.05	0.11	0.02	0.02	0.00	0.01	0.03	0.00	0.13	0.01	0.02	0.01	0.04	0.13	0.05	0.07	0.05	0.11	0.63	0.37	0.62	0.66	1.04	0.74	0.25	0.38	-	0.68			
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00		
ocean pout *	0.21	0.04	0.06	0.06	0.07	0.12	0.14	0.14	0.14	0.23	0.10	0.09	0.11	0.08	0.06	0.08	0.03	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-	0.00	0.07
rockling, fourbeard*	2.87	0.37	0.43	0.56	0.61	0.88	0.82	0.58	0.80	0.59	0.27	0.58	0.33	0.60	0.47	0.66	0.55	0.57	0.37	0.36	0.48	0.35	0.09	0.35	0.26	0.18	0.17	0.19	0.16	0.02	0.02	0.08	0.02	0.00	0.01	0.09	-	0.09	0.44		
scad, rough	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	0.00	0.00	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 *	0.20	0.33	0.18	0.15	0.15	0.24	0.65	0.39	0.12	0.06	0.04	0.03	0.04	0.02	0.01	0.01	0.06	0.02	0.02	0.01	0.03	0.00	0.00	0.02	0.01	0.01	0.01	0.01	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	-	0.01	0.08	
scup	2.80	5.65	3.40	1.17	1.11	2.77	2.25	3.09	1.75	1.32	1.88	5.24	3.25	3.23	4.25	2.22	28.46	7.20	50.42	4.84	8.12	3.48	59.05	10.00	19.87	21.92	6.88	22.34	50.24	14.23	14.96	10.13	131.15	362.67	104.70	46.67	-	195.21	28.41		
sea raven*	0.36	0.37	0.29	0.37	0.17	0.11	0.19	0.09	0.03	0.01	0.01	0.01	0.01	0.10	0.04	0.08	0.04	0.06	0.01	0.04	0.02	0.00	0.03	0.00	0.02	0.05	0.02	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	-	0.00	0.07	
searobin, northern *	6.48	14.38	0.82	0.71	1.13	0.85	0.62	1.36	1.18	1.26	1.21	1.07	1.26	1.73	0.72	1.03	2.66	1.55	2.67	1.16	0.80	0.32	1.19	0.82	1.32	1.73	1.52	1.16	5.05	1.90	1.68	0.57	1.82	4.13	2.18	6.83	-	7.48	2.14		
searobin, striped	1.30	1.78	1.33	0.60	0.57	0.66	0.71	1.55	1.52	0.46	0.93	1.28	0.82	0.71	1.48	1.82	3.69	2.36	3.83	1.85	1.40	0.31	0.89	0.95	1.07	2.14	0.77	2.96	5.01	2.80	2.50	1.92	5.91	14.42	5.75	6.33	-	11.05			
shad, American	0.10	1.36	0.57	0.92	0.44	0.80	0.34	0.54	0.75	0.29	0.68	0.49	0.48	1.08	0.86	0.80	0.61	0.20	0.34	0.28	0.25	0.44	0.57	0.57	0.53	0.49	0.46	0.43	0.41	0.48	0.85	0.03	0.32	0.54	-	0.12					
shad, hickory	0.52	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.07	0.05	0.09	0.12	0.09	0.04	0.15	0.09	0.10	0.25	0.27	0.12	0.02	0.03	0.02	0.01	0.07	0.03	0.11	0.04	0.08	0.02	0.02	0.04	-	0.02	
skate, clearnose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.03	0.10	0.04	0.03	0.01	0.07	0.09	0.06	0.08	0.01	0.08	0.39	0.12	0.15	0.15	0.28	0.19	0.14	0.32	-	0.54		
skate, little *	5.71	7.22	7.19	5.34	15.51	21.24	11.50	25.19	12.41	12.03	16.96	6.58																													

**Table 5.17. Fall indices of abundance for selected species, 1984-2021.**

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 and 2020.

Species	Fall																							84-20															
	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	2019	2020	2021	Mean
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	0.34	-	0.41	
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	1.86	-	1.63	
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	11.19	-	7.24	20.62
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	111.46	-	97.42	162.18
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	-	0.02	
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	6.01	-	8.03	2.30
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	0.00	-	0.00	
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	0.20	-	0.23	
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	1.44	-	3.05	2.03
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	1.17	-	1.57	
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	0.11	-	0.32	
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	0.57	-	0.36	
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	0.18	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	0.41	-	0.13		
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	1.80	-	2.14	0.87
herring, Atlantic	0.00	0.00	0.01	0.02	0.40	0.08	0.04	0.03	1.47	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	-	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	0.06	-	0.04	0.17
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	0.06	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	1.15	-	3.10	0.43
kingfish, northern *	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	0.05	-	0.21	0.24	0.09	0.23	0.38	0.16	0.08	0.34	0.08	-	0.41	0.08
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	0.42	0.75	2.20	-	0.02	4.76
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	2.20	-	0.48	0.76
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	4.57	-	4.48	1.46
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	-	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	0.01	-	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	0.07	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	0.00	-	0.08	0.11	
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	-	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	129.46	-	221.80	186.35
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	-	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	1.38	-	2.57	
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	3.50	-	6.56	3.69
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	1.43	-	1.36	0.90
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	0.03	-	0.11	0.06
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	0.29	-	0.58	0.21
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											

**Table 5.18. Finfish and invertebrate biomass indices for the spring sampling period, 1992-2021.**

*The geometric mean weight (kg) per tow was calculated for 38 finfish and 15 invertebrate species for the spring (April-June) sampling period. There was no fall sampling in 2020.*

	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	2019	2020	2021	
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	0.30	-	0.04	
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	2.21	-	2.69	
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	0.00	-	0.05	
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	0.49	-	1.49	
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	0.00	-	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	1.99	-	6.05	
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	0.06	-	0.00	
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	0.71	-	0.43	
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	1.48	1.94	-	2.63	
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	1.06	-	0.80	
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	0.45	-	0.40	
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	0.35	-	0.23	
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	0.71	-	0.23	
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	0.54	-	0.28	
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	0.40	-	0.01	
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	0.03	-	0.00	
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	0.18	-	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	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.01	-	0.02	
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	0.23	-	0.34	
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	-	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	0.00	0.00	0.00	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	0.01	-	0.02	
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	-	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	0.01	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	9.55	9.99	6.47	5.61	3.53	20.25	58.66	27.33	15.36	-	39.53	
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	-	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	1.17	-	1.81	
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	3.10	-	4.92	
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	0.07	0.10	0.06	0.07	0.06	0.15	0.01	0.03	0.07	-	0.02	
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	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	0.48	-	0.85	
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	0.58	-	0.15	
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	0.23	-	0.14	
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	0.20	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	1.11	-	0.59	
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	0.03	-	0.29	
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	0.54	-	0.59	
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	0.11	-	0.44	
<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	0.01	-	0.05	
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	0.04	-	0.10	
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	0.67	-	0.87	
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				



**Table 5.19. Finfish and invertebrate biomass indices for the fall sampling period, 1992-2021.**

*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 and 2020.*

	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	2019	2020	2021	
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	0.04	-	0.04	
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	0.91	-	0.89	
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	1.86	-	1.28	
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	4.98	-	4.50	
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	0.00	-	0.01	
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	10.66	-	10.76	
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	0.00	-	0.00	
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	0.07	-	0.06	
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	0.95	-	2.16	
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	0.29	-	0.43	
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	0.03	-	0.10	
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	0.09	-	0.08	
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	0.05	-	0.02	
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	0.51	-	0.54	
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	0.00	-	0.00	
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	0.00	-	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	0.22	-	0.60	
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	0.01	-	0.05	
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	1.00	-	0.24	
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	0.07	0.11	0.27	0.21	-	0.07	0.04	0.11	0.20	0.12	0.06	0.05	0.03	0.23	-	0.25	
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	
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	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	0.00	-	0.01	
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	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	15.91	-	17.69	
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	
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	0.36	-	0.70	
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	1.82	-	3.03	
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	0.19	-	0.23	
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	0.02	-	0.06	
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	0.43	-	0.79	
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	0.03	-	0.07	
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	0.01	-	0.01	
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	0.08	-	0.09	
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	0.42	-	0.11	
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	0.19	-	0.25	
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	0.20	-	0.20	
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	1.45	-	2.93	
<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	0.03	-	0.05	
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	0.02	-	0.07	
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	0.82	-	1.77	
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	0.00	-	0.00	
crab, rock	0.58	0.55	0.18	0.09	0.45	0.32	0.37	0.22	0.19	0.13	0.12																				

**Table 5.20. Bluefish indices-at-age, 1984-2021.**

The 1984 and the 2013-2021 index-at-age uses annual fall age keys generated by CT LISTS ageing program. Bluefish age keys for 1985-2012 were provided by the ASMFC Bluefish Technical Committee as a combined coastwide annual age keys to calculate LISTS indices-at-age for those earlier years.

Year	season	month	Count	PosTow	Tows	GmMn	Age_0	Age_1	Age_2	Age_3	Age_4	Age_5	Age_6+
1984	FA	Sept/Oct	6,738	84.3	70	<b>23.41</b>	22.4685	0.4116	0.3505	0.1412	0.0243	0.0035	0.0104
1985	FA	Sept/Oct	5,301	87.5	80	<b>19.01</b>	16.9779	0.9518	0.6274	0.2463	0.1456	0.0220	0.0390
1986	FA	Sept/Oct	2,738	92.5	80	<b>13.66</b>	10.8225	1.1835	1.1699	0.1894	0.1280	0.0877	0.0790
1987	FA	Sept/Oct	2,598	93.8	80	<b>14.32</b>	12.1667	1.0064	0.5081	0.3841	0.1321	0.0576	0.0648
1988	FA	Sept/Oct	3,645	93.8	80	<b>15.49</b>	14.2650	0.2111	0.4901	0.1368	0.1703	0.1254	0.0912
1989	FA	Sept/Oct	8,636	88.8	80	<b>26.25</b>	24.9977	0.5751	0.4599	0.0425	0.0196	0.0685	0.0869
1990	FA	Sept/Oct	4,671	93.8	80	<b>23.88</b>	19.3666	2.9695	0.9283	0.1631	0.1284	0.1223	0.2017
1991	FA	Sept/Oct	5,699	98.8	80	<b>33.43</b>	28.4939	1.2789	3.2666	0.1210	0.0555	0.0504	0.1637
1992	FA	Sept/Oct	5,226	97.5	80	<b>25.22</b>	18.8709	1.7599	2.7891	1.3239	0.1818	0.0627	0.2317
1993	FA	Sept/Oct	6,456	91.7	120	<b>18.92</b>	16.7760	0.1098	1.0323	0.3212	0.5663	0.0299	0.0844
1994	FA	Sept/Oct	16,233	93.3	120	<b>32.06</b>	30.5234	0.7623	0.2411	0.1622	0.1373	0.1689	0.0649
1995	FA	Sept/Oct	5,518	92.5	80	<b>24.46</b>	21.6960	1.9621	0.5967	0.0547	0.0447	0.0405	0.0652
1996	FA	Sept/Oct	6,689	91.3	80	<b>20.80</b>	19.8048	0.2200	0.4129	0.2472	0.0132	0.0249	0.0770
1997	FA	Sept/Oct	10,777	92.5	80	<b>37.90</b>	36.5917	0.6024	0.4773	0.0739	0.0668	0.0281	0.0598
1998	FA	Sept/Oct	8,791	91.3	80	<b>31.41</b>	29.8708	0.9734	0.3787	0.1585	0.0107	0.0042	0.0137
1999	FA	Sept/Oct	7,792	96.3	80	<b>45.31</b>	41.8775	2.8916	0.2241	0.2034	0.0501	0.0078	0.0556
2000	FA	Sept/Oct	6,109	92.5	80	<b>20.57</b>	17.2805	2.0259	1.0717	0.1481	0.0011	0.0276	0.0150
2001	FA	Sept/Oct	3,957	93.8	80	<b>24.24</b>	21.4720	1.1260	1.4031	0.1838	0.0204	0.0107	0.0240
2002	FA	Sept/Oct	3,394	90.0	80	<b>18.75</b>	14.0065	3.7885	0.6379	0.0941	0.0192	0.0795	0.1243
2003	FA	Sept/Oct	3,682	92.5	40	<b>28.53</b>	27.3383	0.4251	0.6026	0.0731	0.0206	0.0320	0.0382
2004	FA	Sept/Oct	6,485	90.0	80	<b>29.13</b>	21.4523	5.5148	1.4559	0.3311	0.0677	0.1634	0.1448
2005	FA	Sept/Oct	6,507	88.8	80	<b>18.89</b>	17.7693	0.0868	0.6550	0.2072	0.0884	0.0454	0.0379
2006	FA	Sept/Oct	2,062	92.5	40	<b>15.66</b>	14.2436	0.4875	0.5471	0.2876	0.0639	0.0076	0.0228
2007	FA	Sept/Oct	9,339	87.5	80	<b>30.66</b>	27.2623	1.9842	0.7193	0.4278	0.1097	0.0680	0.0888
2008	FA	Sept/Oct	1,670	97.5	40	<b>14.28</b>	11.8308	0.5624	1.0856	0.3673	0.1193	0.1527	0.1620
2009	FA	Sept/Oct	3,604	97.5	80	<b>18.12</b>	15.6865	0.5196	0.4317	0.8120	0.2967	0.0685	0.2950
2010	FA		No Fall Sampling			-	-	-	-	-	-	-	-
2011	FA	Sept/Oct	2,737	83.8	80	<b>11.10</b>	10.2076	0.2344	0.2097	0.1741	0.1643	0.0465	0.0634
2012	FA	Sept/Oct	3,832	90.0	80	<b>15.06</b>	14.3422	0.2676	0.1849	0.1286	0.0809	0.0220	0.0339
2013	FA	Sept/Oct	1,809	86.3	80	<b>9.71</b>	8.8888	0.0322	0.4112	0.1846	0.0886	0.0403	0.0644
2014	FA	Sept/Oct	4,451	91.1	79	<b>18.61</b>	18.1376	0.2111	0.0689	0.0627	0.0669	0.0418	0.0209
2015	FA	Sept/Oct	2,647	81.3	80	<b>8.42</b>	8.2516	0.0222	0.0604	0.0127	0.0222	0.0318	0.0191
2016	FA	Sept/Oct	2,785	82.5	80	<b>11.25</b>	8.5035	1.5980	0.4246	0.5751	0.0656	0.0210	0.0622
2017	FA	Sept/Oct	2,397	75.0	80	<b>8.05</b>	7.9290	0.0403	0.0303	0.0336	0.0101	0.0000	0.0067
2018	FA	Sept/Oct	697	82.5	80	<b>4.00</b>	3.4097	0.5346	0.0313	0.0206	0.0037	0.0000	0.0000
2019	FA	Sept/Oct	2,047	86.3	80	<b>11.19</b>	10.7158	0.3030	0.1289	0.0273	0.0000	0.0000	0.0109
2020	FA		No Fall Sampling			-	-	-	-	-	-	-	-
2020	FA	Sept/Oct	1,197	82.2	73	<b>7.24</b>	6.9376	0.0415	0.1637	0.0615	0.0297	0.0000	0.0000

**Table 5.21. Scup indices-at-age, 1984-2021.**

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>.

Note: The 2021\*index-at-age is preliminary since ageing is not yet complete. A pooled three year key was used for calculations in 2021.

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	59.502	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
2019	144.077	135.304	0	8.773	15.155	41.436	57.191	13.973	2.997	2.714	0.888	0.652	0.300
2020	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-
2021 *	195.205	153.675	0	41.531	14.048	41.803	65.259	18.267	9.265	3.570	0.841	0.385	0.237
84-20													
Mean	80.753	50.071	0.000	30.683	22.182	16.715	5.965	2.790	1.341	0.615	0.263	0.125	0.075

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	-	-	-	-	-	-	-	-	-	-	-	-	-
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
2019	129.462	48.567	56.796	24.100	5.216	12.116	19.092	9.836	1.138	0.637	0.422	0.090	0.021
2020	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-
2021 *	221.801	48.216	145.734	27.851	3.741	14.327	17.392	9.699	1.740	0.677	0.480	0.131	0.029
84-20													
Mean	186.352	21.635	129.553	35.165	10.415	5.902	3.167	1.326	0.497	0.190	0.097	0.030	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 5.22. Age frequency of striped bass taken in spring, 1984-2021.**

*Ages were derived from trawl survey length data using the average of Hudson River and Chesapeake Bay von Bertalanffy parameters.*

Age	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	2019	2020	2021		
1	0	0	0	0	0	0	0	0	2	0	0	3	0	0	0	1	0	2	1	1	0	0	2	11	5	0	1	11	0	0	0	2	0	0	2	-	0			
2	0	0	0	2	1	5	28	11	4	3	6	98	12	36	119	41	113	47	150	30	15	220	3	46	20	84	3	2	46	49	4	2	71	4	7	26	-	16		
3	0	0	0	0	1	3	8	7	8	7	10	26	97	116	122	87	20	41	76	38	38	54	25	109	15	54	7	2	13	33	94	13	5	10	62	115	-	41		
4	0	0	0	2	4	1	2	3	13	16	20	8	37	40	68	42	22	15	48	23	18	59	15	44	48	130	17	29	13	21	73	23	19	13	41	272	-	18		
5	0	0	0	2	0	1	1	5	5	14	18	7	14	17	28	95	22	28	45	39	21	33	22	44	41	64	24	50	19	12	20	17	23	8	5	35	-	15		
6	0	0	0	2	1	1	3	0	1	8	8	6	7	14	20	46	32	36	52	41	22	28	11	28	11	34	11	44	12	16	6	1	2	3	5	7	-	8		
7	0	0	0	0	0	0	0	2	0	7	1	1	8	9	3	17	12	13	25	23	14	16	10	9	7	10	6	29	5	10	1	1	3	3	9	4	-	1		
8	0	0	0	0	0	0	0	1	2	1	1	3	2	4	1	4	4	2	12	5	3	9	4	3	3	1	2	7	3	15	5	1	0	3	5	2	-	0		
9	0	0	0	0	0	0	0	2	1	1	1	0	3	2	1	0	1	2	3	7	2	1	3	1	1	0	0	1	2	1	1	0	2	1	0	0	-	0		
10	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1	2	0	1	0	0	0	3	3	2	0	0	0	0	0	2	1	0	1	0	0	-	1		
11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	1	0	1	0	1	0	0	0	-	0		
12	0	0	0	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	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
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>7</b>	<b>11</b>	<b>43</b>	<b>32</b>	<b>34</b>	<b>59</b>	<b>65</b>	<b>150</b>	<b>184</b>	<b>238</b>	<b>362</b>	<b>334</b>	<b>229</b>	<b>184</b>	<b>414</b>	<b>207</b>	<b>135</b>	<b>421</b>	<b>97</b>	<b>289</b>	<b>159</b>	<b>382</b>	<b>70</b>	<b>166</b>	<b>125</b>	<b>160</b>	<b>205</b>	<b>59</b>	<b>129</b>	<b>46</b>	<b>136</b>	<b>463</b>	<b>-</b>	<b>100</b>		

*Note: number of fish taken but not measured = one in 1984, one in 1988, two in 1990.*

**Table 5.23. Striped bass indices-at-age, 1984-2021.**

*Spring length data was converted to ages using the average of Hudson River and Chesapeake Bay von Bertalanffy parameters (Vic Crecco, pers comm). Indices-at-age were then determined by apportioning the spring indices (from Table 5.18) by the percentage of fish in each age.*

Year	Index	Spring														
		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	Age 14	
1984	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1985	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1986	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	0.05	0	0.0125	0	0.0125	0.0125	0.0125	0	0	0	0	0	0	0	0	
1988	0.04	0	0.0057	0.0057	0.0229	0	0.0057	0	0	0	0	0	0	0	0	
1989	0.06	0	0.0273	0.0164	0.0055	0.0055	0	0	0	0	0	0	0	0	0	
1990	0.16	0	0.1042	0.0298	0.0074	0.0037	0.0112	0	0	0	0.0037	0	0	0	0	
1991	0.15	0	0.0516	0.0328	0.0141	0.0234	0	0.0094	0.0047	0.0094	0.0047	0	0	0	0	
1992	0.22	0	0.0259	0.0518	0.0841	0.0324	0.0065	0	0.0129	0.0065	0	0	0	0	0	
1993	0.27	0.0093	0.0140	0.0326	0.0745	0.0652	0.0372	0.0326	0.0047	0.0047	0	0	0	0	0	
1994	0.30	0	0.0277	0.0462	0.0923	0.0831	0.0369	0.0046	0.0046	0.0046	0	0	0	0	0	
1995	0.59	0	0.3855	0.1023	0.0315	0.0275	0.0236	0.0039	0.0118	0	0.0039	0	0	0	0	
1996	0.63	0.0103	0.0411	0.3321	0.1267	0.0479	0.0240	0.0274	0.0068	0.0103	0	0.0034	0	0	0	
1997	0.85	0	0.1286	0.4143	0.1429	0.0607	0.0500	0.0321	0.0143	0.0071	0	0	0	0	0	
1998	0.97	0	0.3189	0.3269	0.1822	0.0750	0.0536	0.0080	0.0027	0.0027	0	0	0	0	0	
1999	1.10	0	0.1346	0.2857	0.1379	0.3119	0.1510	0.0558	0.0131	0	0.0033	0.0033	0	0	0	
2000	0.84	0.0037	0.4163	0.0737	0.0811	0.0811	0.1179	0.0442	0.0147	0.0037	0.0074	0	0	0	0	
2001	0.61	0	0.1558	0.1359	0.0497	0.0928	0.1193	0.0431	0.0066	0.0066	0	0	0	0	0	
2002	1.30	0.0063	0.4722	0.2392	0.1511	0.1416	0.1637	0.0787	0.0378	0.0094	0.0031	0	0	0	0	
2003	0.87	0.0042	0.1267	0.1605	0.0971	0.1647	0.1732	0.0971	0.0211	0.0296	0	0	0	0	0	
2004	0.56	0.0042	0.0627	0.1588	0.0752	0.0878	0.0919	0.0585	0.0125	0.0084	0	0.0042	0	0	0	
2005	1.17	0	0.6100	0.1497	0.1636	0.0915	0.0776	0.0444	0.0250	0.0028	0	0.0028	0	0	0	
2006	0.61	0	0.0189	0.1572	0.0943	0.1384	0.0692	0.0629	0.0252	0.0189	0.0189	0.0063	0	0	0	
2007	1.02	0.0071	0.1629	0.3860	0.1558	0.1558	0.0992	0.0319	0.0106	0.0035	0.0106	0	0	0	0	
2008	0.57	0.0394	0.0717	0.0538	0.1721	0.1470	0.0394	0.0251	0.0108	0.0036	0.0072	0	0	0	0	
2009	0.60	0.0078	0.1316	0.0846	0.2037	0.1003	0.0533	0.0157	0.0016	0	0	0	0	0	0	
2010	0.40	0	0.0169	0.0394	0.0958	0.1352	0.0620	0.0338	0.0113	0	0	0	0	0	0	
2011	0.48	0.0029	0.0058	0.0058	0.0839	0.1446	0.1272	0.0839	0.0202	0.0029	0	0	0	0.0029	0	0
2012	0.43	0.0381	0.1595	0.0451	0.0451	0.0659	0.0416	0.0173	0.0104	0.0069	0	0.0035	0	0	0	
2013	0.67	0	0.2052	0.1382	0.0879	0.0503	0.0670	0.0419	0.0628	0.0042	0.0084	0.0042	0	0	0	
2014	0.41	0	0.0080	0.1880	0.1460	0.0400	0.0120	0.0020	0.0100	0.0020	0.0020	0.0000	0	0	0	
2015	0.20	0	0.0068	0.0441	0.0780	0.0576	0.0034	0.0034	0.0034	0.0000	0.0000	0.0034	0	0	0	
2016	0.48	0.0074	0.2642	0.0186	0.0707	0.0856	0.0074	0.0112	0.0000	0.0074	0.0037	0	0.0037	0	0	
2017	0.34	0	0.0296	0.0739	0.0961	0.0591	0.0222	0.0222	0.0222	0.0074	0.0000	0.0074	0	0	0	
2018	0.57	0	0.0291	0.2580	0.1706	0.0208	0.0208	0.0374	0.0208	0	0	0	0	0	0.0083	
2019	0.91	0.0039	0.0511	0.2260	0.5346	0.0688	0.0138	0.0079	0.0039	0	0	0	0	0	0	
2020																
2021	0.38	0	0.0608	0.1558	0.0684	0.0570	0.0304	0.0038	0.0000	0	0.0038	0	0	0	0	
<b>84-20</b>																
<b>mean</b>		<b>0.0040</b>	<b>0.1190</b>	<b>0.1198</b>	<b>0.0996</b>	<b>0.0744</b>	<b>0.0500</b>	<b>0.0260</b>	<b>0.0113</b>	<b>0.0045</b>	<b>0.0021</b>	<b>0.0011</b>	<b>0.0002</b>	<b>0.0000</b>	<b>0.0002</b>	

**Table 5.24. Summer flounder indices-at-age, 1984-2021.**

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.

Spring														
Year	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
2019	4.8467	0	3.4315	0.7787	0.289	0.0957	0.1194	0.0673	0.0275	0.0144	0.0121	0.0057	0.0033	0.0021
2020							No Spring Survey in 2020							
2021	4.1610	0	1.0825	1.1891	0.9064	0.4908	0.2332	0.1153	0.0463	0.0464	0.0222	0	0.0055	0.0233
84-20														
Mean	1.6385	0.0000	0.6777	0.4262	0.2558	0.1404	0.0745	0.0328	0.0164	0.0081	0.0033	0.0020	0.0011	0.0001

Fall														
Year	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							No Fall Survey in 2010							
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	3.7358	0.1633	0.4592	0.8283	1.4239	0.5848	0.1836	0.0631	0.0296	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	0.0080	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
2019	1.4351	0.0180	0.6459	0.4507	0.1263	0.0855	0.0486	0.0184	0.0118	0.0157	0.0077	0.0043	0.0000	0
2020							No Fall Survey in 2020							
2021	3.0464	0.2913	0.5946	0.8952	0.6809	0.3288	0.1296	0.0646	0.0177	0.0302	0.0071	0	0.0064	0
84-20														
Mean	2.0318	0.1322	0.7687	0.6483	0.2923	0.1205	0.0440	0.0136	0.0073	0.0027	0.0009	0.0007	0.0004	0.0001

**Table 5.25. Tautog indices-at-age, 1984-2019.**

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. Note: The 2021\* ageing is not yet complete.

Year	Age										
	1-20+	1	2	3	4	5	6	7	8	9	10
1984	3.4690	0.0109	0.0816	0.1898	0.3030	0.4584	0.4941	0.2911	0.2861	0.3101	0.3531
1985	1.7967	0	0.0212	0.0964	0.1888	0.1655	0.1280	0.1833	0.3004	0.2020	0.0902
1986	1.7201	0.0010	0.0277	0.0971	0.0481	0.1025	0.2009	0.2409	0.2453	0.2864	0.1016
1987	1.2128	0.0243	0.0799	0.0589	0.0594	0.1002	0.1353	0.1911	0.1348	0.0955	0.0522
1988	0.9007	0.0034	0.0335	0.0467	0.0714	0.0446	0.0399	0.0755	0.1007	0.1641	0.0790
1989	1.2590	0	0.0443	0.0691	0.1353	0.0885	0.1154	0.1495	0.1600	0.1046	0.0817
1990	1.1613	0.0112	0.0830	0.1559	0.1112	0.1145	0.0498	0.0502	0.1245	0.0872	0.0623
1991	1.1469	0.0055	0.0279	0.0548	0.1181	0.1241	0.1487	0.0931	0.1253	0.1071	0.1067
1992	1.0253	0.0188	0.0495	0.0715	0.0410	0.0489	0.1230	0.1323	0.0849	0.0632	0.0636
1993	0.5695	0.0035	0.0216	0.0519	0.0299	0.0160	0.0606	0.0595	0.0423	0.0489	0.0522
1994	0.5837	0.0094	0.0373	0.0320	0.0675	0.0555	0.0551	0.0555	0.0799	0.0516	0.0312
1995	0.2530	0.0033	0.0094	0.0087	0.0296	0.0609	0.0265	0.0214	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	0.8003	0.0008	0.0469	0.0577	0.0831	0.0739	0.1402	0.1376	0.0897	0.0392	0.0467
2001	0.8947	0.0062	0.0308	0.0859	0.0830	0.1294	0.1197	0.1193	0.1058	0.0715	0.0454
2002	1.1665	0.0103	0.0234	0.0596	0.1011	0.1748	0.1972	0.1895	0.2091	0.0739	0.0419
2003	0.8976	0.0032	0.0130	0.0077	0.0597	0.1485	0.2385	0.1596	0.0893	0.0778	0.0185
2004	0.6936	0.0067	0.0213	0.0152	0.0359	0.0709	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	0.6136	0.0035	0.0125	0.0173	0.0459	0.0478	0.0608	0.0918	0.0935	0.0966	0.0533
2008	0.7268	0.0065	0.0272	0.0435	0.0620	0.0848	0.1164	0.0708	0.0649	0.0831	0.0640
2009	0.4821	0.0143	0.0368	0.0067	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	0.0714	0.0717	0.0759	0.0981	0.0900	0.0584	0.0266	0.0149
2016	0.8239	0.0005	0.0914	0.0961	0.1033	0.1003	0.1522	0.1358	0.0749	0.0414	0.0100
2017	0.5218	0.0132	0.0200	0.0942	0.0476	0.0338	0.0610	0.0746	0.0474	0.0272	0.0408
2018	0.8975	0.0191	0.0813	0.1399	0.1183	0.1756	0.1086	0.1071	0.0710	0.0238	0.0042
2019	0.8710	0.0141	0.0751	0.1179	0.1237	0.1328	0.1148	0.1068	0.0667	0.0639	0.0312
2020											
2021*	0.9865	Ageing Not Complete									
84-20											
Mean	0.8813	0.0098	0.0440	0.0674	0.0778	0.0972	0.1164	0.1075	0.0992	0.0751	0.0512

Year	Age										
	11	12	13	14	15	16	17	18	19	20+	
1984	0.1257	0.2280	0.0932	0.0506	0.0447	0.0322	0.0467	0.0155	0.0006	0.0536	
1985	0.1595	0.0982	0.0226	0.0994	0	0.0249	0.0039	0.0124	0	0	
1986	0.1422	0.0863	0.0375	0.0521	0.0232	0.0071	0.0114	0.0003	0.0023	0.0062	
1987	0.0606	0.0543	0.0478	0.0313	0.0245	0.0267	0.0104	0.0004	0.0048	0.0204	
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	0.0220	0.0249	0.0089	0.0169	0.0035	0.0034	
1991	0.0609	0.0258	0.0399	0.0361	0.0216	0.0007	0.0159	0.0117	0.0080	0.0150	
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	0.0126	0.0103	0.0048	0.0099	0.0090	0.0087	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	0.0032	
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	0.0032	0.0026	0.0003	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	
2016	0.0056	0.0023	0.0046	0.0032	0	0.0023	0	0	0	0	
2017	0.0204	0.0136	0.0144	0.0068	0	0	0	0	0	0.0068	
2018	0.0007	0.0003	0.0115	0.0177	0	0.0008	0	0.0035	0	0.0069	
2019	0.0132	0.0086	0	0	0	0	0.0022	0	0	0	
2020											
2021*		Ageing Not Complete									
84-20											
Mean	0.0370	0.0294	0.0186	0.0170	0.0102	0.0077	0.0050	0.0037	0.0019	0.0054	

**Table 5.26. Weakfish age 0 and age 1+ indices of abundance, 1984-2021.**

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	0.40	0.04	0.12
2019	14.33	0.74	1.26	0.79	0.53	0.28
2020	-	-	-	-	-	-
2021	27.94	2.21	1.50	1.10	0.88	0.56
<b>84-20</b>						
<b>mean</b>	<b>18.98</b>	<b>1.38</b>	<b>0.35</b>	<b>0.37</b>	<b>0.20</b>	<b>0.24</b>

**Table 5.27. Winter flounder indices-at-age, 1984-2021.**

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). Note: The 2021\*index-at-age is preliminary since ageing is not yet complete. A pooled three year key was used for calculations in 2021.

Catch-at-age: numbers			April-May																
Year	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			
2019	1.85	0.52	0.69	0.52	0.57	0.25	0.24	0.18	0.03	0.01	0.03	0.01	0.01	0	0	0			
2020	-	-	0.42						No Spring Survey in 2020										
2021 *	2.44	0.44	0.39	0.73	0.51	0.75	0.30	0.08	0.00	0.03	0.01	0.01	0.02	0	0	0			
84-20																			
Mean	53.83	8.48	4.86	6.93	24.82	13.60	5.59	1.92	0.61	0.21	0.10	0.03	0.02	0.00	0.00	0.00			

Catch-at-age: biomass (kg)			April-May																
Year	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	0.14	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			
2019	0.60	0.38	NA	0.02	0.10	0.10	0.13	0.13	0.04	0.01	0.04	0.01	0.01	0	0	0			
2020	-	-	NA						No Spring Survey in 2020										
2021 *	0.67	0.30	NA	0.04	0.07	0.25	0.18	0.06	0.00	0.03	0.00	0.01	0.02	0	0	0			
84-20																			
Mean	9.67	3.87	NA	0.25	2.51	3.05	2.19	1.01	0.38	0.16	0.07	0.03	0.02	0.00	0.00	0.00			

Note years with non-standard # of tows: 1984: April = 0 tows,



**TABLES 5.28 - 5.65  
LENGTH FREQUENCIES  
LISTS**

**Table 5.28. Alewife length frequencies, spring and fall, 1 cm intervals, 1989–2021.**

*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	2019	2020	2021
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	0	1	-	0
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	1	0	0	0	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	1	-	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	17	-	0
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	40	-	0
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	28	-	1
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	61	-	0
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	119	-	1
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	224	-	0
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	230	-	0
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	181	-	0
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	70	-	1
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	32	-	0
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	9	-	3
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	61	-	2
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	124	-	4
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	55	-	6
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	22	-	2
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	25	-	4
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	22	-	1
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	13	-	4
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	4	-	0
27	2	0	1	0	0	1	0	0	0	0	1	2	1	2	2	1	0	0	0	0	0	0	1	0	1	1	3	0	0	1	-	0	
28	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	2	1	0	0	1	0	0	2	0	0	0	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	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	1	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	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	-	0
Total	56	21	93	74	556	1,076	334	1,304	701	395	1,275	1,515	274	820	452	749	642	569	1,068	901	1,138	172	364	698	291	449	185	2,796	8	1,021	1,340	-	29

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	2019	2020	2021
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	0	-	0
6	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
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
8	0	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	-	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	0	-	0
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	0	-	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	5	-	8
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	1	-	20
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	2	-	30
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	3	-	11
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	15	-	6
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	24	-	3
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	7	-	7
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	1	-	7
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	0	-	1
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	1	-	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	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	0	-	1
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	1	-	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	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	-	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
27	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
Total	8	1	9	46	377	354	50	95	492	27	117	58																					

**Table 5.29. American shad length frequencies, spring, 1 cm intervals, 1989-2021.**

*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	2019	2020	2021	
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	1	0	0	0	0	0	-	0	
7	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	0	1	-	0
8	0	0	0	0	0	2	2	4	0	0	5	1	1	0	0	1	0	3	0	0	0	0	0	0	1	0	0	2	0	1	2	-	0	
9	0	0	0	0	6	0	13	0	6	4	4	4	2	13	5	1	3	0	0	0	1	0	0	0	10	7	1	14	0	1	8	-	0	
10	0	0	0	1	4	1	12	1	12	11	12	22	1	30	3	7	6	0	0	7	6	5	1	0	31	21	21	38	0	9	12	-	1	
11	0	0	1	2	3	1	4	4	12	16	9	24	0	71	10	1	5	0	5	19	6	7	4	3	17	20	18	51	0	6	19	-	15	
12	0	0	1	3	1	1	2	4	14	36	10	17	2	57	5	3	4	0	9	25	13	6	8	12	23	20	23	68	1	13	16	-	17	
13	4	0	9	5	3	3	9	5	45	49	21	12	0	30	6	11	6	0	11	53	24	15	20	23	15	12	4	135	1	10	22	-	10	
14	13	0	29	7	2	6	10	83	54	54	24	8	0	20	0	21	14	6	20	98	29	30	41	42	10	7	5	65	0	9	16	-	7	
15	36	1	53	10	4	16	12	108	123	55	41	13	2	20	0	24	11	32	34	82	37	47	59	64	10	2	8	61	0	8	14	-	3	
16	20	4	40	7	4	36	32	117	194	43	30	17	4	31	1	3	3	13	25	34	26	39	16	32	9	2	2	56	0	3	3	-	5	
17	9	4	9	16	6	36	36	37	125	53	22	15	0	18	2	3	1	1	18	17	14	8	9	14	2	1	3	95	0	0	3	-	3	
18	5	3	3	17	3	103	27	32	55	22	10	9	0	14	0	1	0	4	7	9	12	2	3	5	2	0	2	54	0	1	2	-	0	
19	0	2	1	16	3	271	13	15	7	11	10	4	0	3	0	1	0	1	2	3	3	0	0	0	1	0	32	0	0	1	-	1		
20	1	1	2	13	2	118	5	3	1	1	17	1	0	2	1	1	4	0	1	0	2	0	0	0	1	1	0	16	0	0	2	-	1	
21	0	2	8	12	4	40	1	6	1	0	18	0	0	2	3	1	2	0	2	3	1	2	1	0	0	0	1	0	0	0	8	-	2	
22	0	1	14	6	3	7	0	6	2	7	31	0	0	5	2	3	6	0	1	3	1	0	0	2	8	8	7	1	0	3	12	-	0	
23	0	2	17	14	2	11	2	10	3	1	18	4	0	2	5	1	1	0	3	0	3	0	0	8	0	8	12	2	0	2	4	-	0	
24	0	0	8	4	1	3	0	9	0	2	10	2	2	3	0	0	2	0	4	0	0	1	0	12	0	1	4	2	0	3	15	-	0	
25	0	2	2	3	0	3	0	5	1	5	4	0	1	1	0	0	1	0	3	0	0	0	0	10	1	1	1	2	0	0	2	-	0	
26	0	1	1	0	0	2	0	4	0	1	1	1	0	0	0	0	2	0	3	0	0	0	0	3	0	0	0	1	0	0	1	-	0	
27	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	0	0	0	0	-	0	
28	0	0	0	0	0	1	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
29	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
30	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
31	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	0	0	0	0	0	-	0
32	0	0	0	0	0	0	0	0	2	0	3	0	0	1	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	1	1	0	0	3	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
34	0	1	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
35	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	-	0	
36	0	0	0	1	0	0	0	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
37	0	0	0	1	0	1	0	0	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0
38	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
39	0	0	0	3	1	2	1	0	0	0	4	0	0	2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0
40	1	0	0	2	0	1	1	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
41	0	0	1	3	2	2	1	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
42	0	0	1	4	2	0	0	0	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-	0
43	0	0	0	0	0	1	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	-	0	
44	0	0	1	2	2	2	2	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	
45	1	0	0	5	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	0	0	-	0	
46	0	0	0	2	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	
47	0	0	0	0	0	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	-	0	
48	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	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	0	0	0	0	0	1	0	0	0	0	0	-	0	
50	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	
Total	91	24	202	163	61	675	189	451	669	379	313	157	14	336	44	83	79	60	151	353	179	165	162	233	142	120	114	697	3	69	164	-	65	

**Table 5.30. American shad length frequencies, fall, 1 cm intervals, 1989-2021.**

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

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	2019	2020	2021	
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	1	0	-	0	
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	0	1	0	0	0	0	0	-	0
8	0	0	2	0	0	1	0	0	2	1	1	0	0	0	1	2	0	0	2	0	0	-	1	2	0	3	0	0	0	2	0	-	0	
9	0	0	5	1	2	5	7	0	4	0	4	0	1	1	4	4	2	0	2	2	0	-	3	2	0	6	0	2	0	1	2	-	1	
10	0	1	1	2	3	6	9	0	9	5	5	0	3	1	5	5	0	0	5	3	10	-	2	3	0	2	4	4	2	1	1	-	0	
11	0	0	3	3	20	20	7	1	11	9	22	0	1	0	9	1	3	0	14	1	17	-	2	1	0	0	9	1	4	2	0	-	0	
12	0	0	5	11	29	96	12	5	20	9	28	0	1	0	18	3	4	0	15	1	12	-	1	2	1	1	9	1	9	0	0	-	0	
13	0	0	2	10	25	112	12	2	8	4	16	0	0	0	4	1	1	0	11	2	11	-	1	0	0	1	9	3	3	1	0	-	1	
14	0	0	2	2	23	173	12	2	5	2	5	0	0	0	2	0	0	0	6	0	28	-	1	0	0	1	4	3	0	2	0	-	0	
15	0	0	2	0	10	72	2	0	0	2	1	0	0	0	0	0	0	0	7	0	8	-	1	0	2	4	3	6	0	3	12	-	8	
16	0	0	1	0	7	18	1	0	4	9	1	0	1	1	10	1	0	2	0	2	-	3	1	1	0	1	18	3	4	66	-	22		
17	0	0	21	7	3	2	1	0	8	54	12	2	4	10	14	67	2	1	0	0	1	-	3	1	7	0	1	62	6	9	149	-	68	
18	0	3	57	8	6	17	24	0	19	114	37	1	15	86	37	73	10	3	2	1	19	-	17	1	10	3	4	74	19	14	63	-	121	
19	32	31	36	33	47	40	60	0	49	176	92	15	32	113	84	83	13	3	3	5	23	-	18	4	21	6	22	60	30	34	24	-	94	
20	65	102	17	57	160	93	163	5	63	108	109	51	23	38	72	15	30	0	4	11	50	-	21	16	22	6	43	10	61	40	19	-	16	
21	63	40	5	45	306	136	172	10	36	15	143	53	11	6	9	6	16	0	4	17	39	-	21	36	10	3	19	1	63	32	6	-	5	
22	28	26	0	26	302	113	64	11	9	0	139	33	3	0	6	0	13	1	6	7	22	-	11	18	5	1	17	0	23	10	4	-	1	
23	2	1	0	4	92	84	19	8	3	0	39	6	0	0	0	1	0	2	0	3	-	3	3	0	0	10	0	4	5	0	-	0		
24	0	0	0	1	24	42	2	2	0	0	13	0	1	0	0	1	0	0	0	0	0	-	0	0	0	2	5	0	0	0	1	-	0	
25	0	0	0	0	0	8	1	2	0	0	4	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0	-	0	
26	0	0	0	3	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	-	1	
27	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	
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	
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	
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	
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	0	0	0	0	0	0	0	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	
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	
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	
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	
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	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	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	
40	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	
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	-	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	
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	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	
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	
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	
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	0	-	0	
48	0	0	0	0	0	0	0	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	0	-	0	
50	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	
Total	191	204	159	214	1,061	1,047	568	48	252	508	673	161	96	256	263	274	98	8	83	52	245	-	109	90	79	40	161	245	227	161	347	-	338	



**Table 5.32. American lobster length frequencies—fall, female, 1 mm intervals, 1984–2021.**  
*Lobsters were measured from each tow.*

Female Length	Fall																																										
	1984 (70)	1985 (80)	1986 (80)	1987 (80)	1988 (80)	1989 (80)	1990 (80)	1991 (80)	1992 (80)	1993 (120)	1994 (122)	1995 (80)	1996 (80)	1997 (80)	1998 (80)	1999 (80)	2000 (80)	2001 (80)	2002 (80)	2003 (40)	2004 (80)	2005 (80)	2006 (40)	2007 (80)	2008 (40)	2009 (80)	2010 (80)	2011 (80)	2012 (80)	2013 (80)	2014 (79)	2015 (80)	2016 (80)	2017 (80)	2018 (80)	2019 (80)	2020 (80)	2021 (73)					
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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	0	0	0	0	0	0	
38	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	0	0	0	0	0	0	0	0	0	
39	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	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	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	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	0	0	0	0	0	0	
43	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	0	0	0	0	0	0	0	0	0	0	0	0	
44	29	7	1	8	1	6	11	6	11	32	32	29	63	14	46	47	9	17	5	0	2	1	2	1	0	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
45	18	0	7	3	2	0	0	12	25	50	17	57	22	38	32	7	27	4	2	2	1	0	1	1	0	0	0	1	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	1	0	0	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	1	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	1	0	0	0	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	1	0	0	0	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	0	0	0	0	0	0	
51	35	8	2	12	2	11	10	44	73	72	94	45	41	49	5	30	13	6	3	1	2	2	0	0	1	0	0	0	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	0	0	0	0	0	0	
53	33	8	3	22	10	7	22	55	82	94	55	43	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	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	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	0	0	0	0	0	0	0
56	45	10	11	36	10	24	62	22	29	82	87	74	45	41	90	23	33	12	1	3	6	0	3	2	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	16	15	16	18	7	7	15	52	71	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	0	0	0	0	0	0
58	23	16	11	19	13	17	16	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	0	0	0	0	0	0	0
59	20	11	13	26	13	23	30	79	66	110	84	48	46	110	35	36	28	18	5	6	10	4	4	0	2	5	0	0	0	0	0	0	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	0	0	0	0	0	0	0
61	10	4	17	24	12	14	37	46	52</																																		









**Table 5.36. Atlantic menhaden length frequency, spring and fall, 1 cm intervals, 1996-2021.**

*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	2019	2020	2021
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	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	32	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	60	0	0	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	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	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	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	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	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	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	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	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	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
19	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	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	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	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
23	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
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	-	2
25	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	0	1	1	1	0	1	-	3
26	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	2	3	6	0	3	8	9	6	-	18
27	0	0	0	0	0	0	1	0	0	0	0	6	2	3	1	4	14	25	46	24	10	15	10	21	-	36
28	0	1	0	0	1	0	1	0	0	0	0	5	4	9	5	10	33	32	81	53	23	36	22	33	-	38
29	0	1	0	0	1	0	0	1	3	0	1	5	2	2	1	18	53	59	79	75	34	40	17	35	-	28
30	0	1	0	0	0	0	1	1	0	0	0	4	1	5	0	10	28	27	34	54	13	18	13	35	-	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	2	-	2
32	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	1	0	1	2	1	0	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	1	-	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	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	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
37	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
38	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
Total	0	6	0	1	9	0	47	2	5	1	5	33	10	19	7	43	195	162	267	229	557	122	77	134	-	140

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	2019	2020	2021
4	0	0	0	0	0	0	0	1	0	0	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	2	-	0
6	0	0	0	0	0	0	0	17	1	0	0	24	0	0	-	0	1	1	0	1	0	2	0	4	-	0
7	1	0	0	20	12	0	2	32	26	0	1	39	2	0	-	0	0	0	0	34	1	9	1	4	-	1
8	0	1	18	51	73	0	6	22	178	11	0	32	2	2	-	0	0	0	0	58	1	10	0	2	-	0
9	0	11	53	152	128	0	8	9	135	22	0	12	6	0	-	0	0	0	0	73	0	8	0	0	-	0
10	1	5	120	471	125	1	9	1	143	19	0	34	3	3	-	0	1	0	2	70	0	3	1	4	-	0
11	0	6	49	337	51	25	14	1	47	13	2	51	2	4	-	0	0	0	1	30	2	1	0	6	-	0
12	0	11	44	25	35	30	10	1	18	9	8	24	1	5	-	6	0	4	5	22	11	3	2	1	-	0
13	0	0	20	2	15	16	14	4	1	1	1	49	0	4	-	7	1	5	0	5	42	7	3	1	-	1
14	0	2	0	0	6	7	20	2	0	3	2	7	0	3	-	9	0	4	0	2	112	3	1	1	-	0
15	0	0	0	0	2	4	24	0	0	1	0	1	1	5	-	6	1	1	0	0	90	1	2	0	-	0
16	0	0	0	0	2	0	8	0	0	2	1	1	4	4	-	3	0	1	0	0	19	0	0	0	-	0
17	0	0	0	0	3	0	12	0	0	0	0	0	3	0	-	0	1	0	0	0	2	0	0	0	-	0
18	0	0	0	0	0	0	17	0	0	0	0	0	0	1	-	0	2	0	0	0	0	0	0	0	-	0
19	0	0	0	0	0	0	16	0	0	0	0	0	0	1	-	0	2	0	0	0	0	0	0	0	-	0
20	0	0	0	1	0	0	2	0	0	0	0	0	0	0	-	0	2	0	0	0	0	0	0	0	-	0
21	0	0	0	1	0	0	1	0	0	1	0	0	0	0	-	0	1	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	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	-	2
24	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	3	1	2	1	1	-	9
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	7	5	1	2	4	12	-	11
26	0	0	0	0	0	0	1	0	0	0	0	3	0	0	-	0	7	2	2	14	2	3	13	34	-	22
27	2	0	0	0	0	0	1	0	0	1	0	21	9	4	-	4	27	6	68	131	11	11	24	101	-	56
28	3	1	0	3	0	0	2	0	3	4	0	35	2	7	-	18	68	13	164	249	17	22	47	180	-	43
29	23	17	0	6	1	0	18	5	10	21	2	31	1	1	-	48	66	12	132	233	4	14	35	192	-	15
30	30	25	0	28	3	0	29	8	44	54	2	18	0	5	-	30	35	14	63	100	1	11	8	93	-	2
31	11	17	1	42	7	1	39	8	65	43	2	7	0	2	-	4	11	5	2	18	0	4	8	38	-	0
32	2	6	1	27	12	0	27	3	51	21	1	2	0	0	-	2	0	1	9	2	0	1	1	5	-	0
33	0	1	0	19	4	2	25	2	10	5	0	0	0	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	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	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	681	-	162





**Table 5.39. Blueback herring length frequencies, spring and fall, 1 cm intervals, 1989-2021.**

*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	2019	2020	2021
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	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	4	-	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	0	9	8	30	13	0	0	17	-	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	17	-	1
10	0	0	5	10	7	74	9	19	45	45	0	18	2	9	26	47	6	23	9	14	19	19	5	18	5	1	32	52	0	22	27	-	5
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	7	-	0
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	7	-	0
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	2	-	0
14	0	0	0	15	0	5	3	1	1	1	0	3	0	0	0	0	0	7	0	1	5	4	2	0	0	0	0	1	0	6	2	-	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	1	-	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	-	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	0	162	2	-	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	0	143	3	-	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	0	42	1	-	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	0	23	1	-	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	0	15	3	-	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	0	6	4	-	0
23	0	0	3	2	0	3	2	3	1	0	0	5	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	11	-	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	2	-	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	1	-	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	-	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	-	0
<b>Total</b>	<b>6</b>	<b>3</b>	<b>29</b>	<b>147</b>	<b>30</b>	<b>373</b>	<b>83</b>	<b>90</b>	<b>338</b>	<b>140</b>	<b>11</b>	<b>136</b>	<b>52</b>	<b>56</b>	<b>89</b>	<b>173</b>	<b>104</b>	<b>49</b>	<b>101</b>	<b>71</b>	<b>272</b>	<b>102</b>	<b>47</b>	<b>45</b>	<b>68</b>	<b>47</b>	<b>153</b>	<b>187</b>	<b>0</b>	<b>574</b>	<b>113</b>	<b>-</b>	<b>6</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	2019	2020	2021
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	4	0	-	0
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	0	2	0	-	0
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	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	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	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	0	1	0	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	0	1	0	1	0	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	0	1	0	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	0	1	0	0	3	0	1	-	0
13	38	1	4	11	24	225	48	0	117	18	0	36	2	0	15	2	2	0	0	0	0	0	0	1	0	1	0	17	0	0	5	-	1
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	4	-	2
15	24	0	0	1	20	94	3	3	34	16	0	3	52	3	4	6	2	4	14	2	5	-	9	0	0	3	60	92	37	0	0	-	3
16	0	0	0	0	2	14	0	0	0	5	2	1	10	0	4	0	0	0	31	0	2	-	9	0	0	1	6	1	14	0	0	-	0
17	0	0	0	0	0	2	0	0	0	1	1	2	2	0	1	0	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	-	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
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	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	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	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
24	0	1	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
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	-	0
<b>Total</b>	<b>140</b>	<b>2</b>	<b>9</b>	<b>27</b>	<b>76</b>	<b>827</b>	<b>172</b>	<b>7</b>	<b>292</b>	<b>72</b>	<b>8</b>	<b>8</b>	<b>227</b>	<b>12</b>	<b>9</b>	<b>42</b>	<b>8</b>	<b>14</b>	<b>55</b>	<b>3</b>	<b>18</b>	<b>-</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>10</b>	<b>94</b>	<b>261</b>	<b>88</b>	<b>6</b>	<b>10</b>	<b>-</b>	<b>6</b>





**Table 5.42. Butterfish length frequencies, 1 cm intervals, spring and fall, 1986-1990, 1992–2021.**

Prior to 2014, length frequencies of butterfish were 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	2019	2020	2021		
3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	1	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	
4	0	0	0	0	0	0	0	2	0	0	0	0	3	0	9	0	15	0	1	1	8	1	5	0	3	3	3	3	0	2	2	0	1	-	0		
5	0	0	0	0	0	2	0	6	0	2	0	0	4	0	51	1	29	1	0	1	5	3	53	0	9	2	39	20	7	16	40	2	4	-	4		
6	0	0	0	0	0	0	0	35	0	21	3	0	0	207	0	7	20	0	2	0	1	276	1	35	6	109	35	65	9	110	13	0	-	11			
7	0	0	0	2	0	0	0	57	1	7	0	3	0	0	202	0	3	95	1	0	0	3	233	0	50	0	218	26	62	2	93	0	0	-	24		
8	0	0	0	2	0	0	0	18	0	0	0	0	0	1	107	0	0	101	2	4	0	0	228	0	34	3	76	14	35	2	8	1	4	-	16		
9	0	0	0	0	0	0	0	4	0	0	57	5	4	0	15	0	4	47	0	61	12	1	197	198	7	279	4	40	1	26	7	33	11	-	12		
10	4	0	0	40	0	2	0	4	7	0	165	183	10	0	5	4	10	146	10	201	73	53	225	530	2	768	13	231	50	539	8	46	23	-	77		
11	29	0	0	269	5	16	3	28	20	19	618	622	16	84	51	44	130	427	27	540	292	74	461	291	28	1,523	95	718	463	2916	46	269	14	-	201		
12	39	0	3	208	7	32	17	45	80	190	1,005	656	55	961	272	202	616	433	216	1,632	794	409	1,426	47	217	1,489	427	608	1063	6194	231	902	32	-	465		
13	26	0	6	34	16	88	25	75	62	485	1,598	466	152	1,265	317	656	546	201	442	3,108	531	976	1,196	110	1,347	1,214	639	326	668	3693	595	785	146	-	444		
14	61	0	7	2	28	111	10	76	30	327	1,296	190	145	317	145	990	129	71	425	1,690	130	739	439	237	1,819	735	531	188	552	1807	371	262	108	-	349		
15	66	0	27	3	26	50	9	117	24	255	1,033	173	122	122	236	851	137	64	234	493	234	646	237	376	1,443	396	200	107	443	1288	332	172	91	-	176		
16	57	0	20	10	26	49	25	156	44	275	951	267	148	31	381	669	155	126	124	173	190	654	201	301	1,228	330	149	278	387	1064	498	244	224	-	226		
17	25	0	14	7	38	41	23	92	25	178	654	175	137	47	332	490	64	107	81	104	146	396	154	61	982	237	149	313	311	645	502	279	226	-	239		
18	20	0	0	0	18	38	10	44	14	83	307	88	106	28	284	335	36	50	71	72	85	405	113	41	599	83	129	252	359	261	182	156	187	-	174		
19	7	0	0	4	16	27	4	9	3	48	110	70	24	23	128	249	26	21	59	84	22	179	49	5	286	35	13	150	265	45	65	93	181	-	238		
20	0	0	1	2	7	10	0	4	1	13	72	29	27	21	53	142	16	9	12	27	18	56	9	13	67	40	14	37	39	5	7	35	70	-	149		
21	4	0	0	1	5	1	0	0	0	2	22	3	8	7	7	26	4	1	4	1	0	1	7	0	33	0	0	7	10	1	1	3	14	-	44		
22	4	0	0	0	7	0	1	0	0	0	0	0	5	3	0	1	4	4	1	0	0	0	0	0	0	0	0	0	6	0	1	1	4	-	13		
23	0	0	0	0	1	2	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	1		
24	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	
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	1	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	3	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	1	0	0	0	0	0	0	0	0	0	0	-	0
Total	342	0	78	584	200	469	127	768	315	1,905	7,906	2,935	965	2,907	2,804	4,666	1,933	1,921	1,710	8,196	2,544	4,598	5,509	2,211	8,191	7,143	2,808	3,353	4,788	18,515	3,099	3,296	1,340	-	2,863		

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	2019	2020	2021	
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	0	0	0	0	-	0
3	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	2	0	0	0	0	0	-	24	0	0	0	0	0	0	0	0	1	-	0
4	0	2	87	0	0	0	20	1	8	2	2	1	3	0	16	15	0	7	0	1	15	0	6	-	0	10	8	0	0	5	30	4	7	-	1	
5	0	3	1,141	23	3	475	436	16	268	180	33	20	13	72	69	53	52	29	260	2	152	29	324	-	78	64	71	80	108	98	85	98	49	-	9	
6	0	10	5,778	144	62	2,429	3,144	197	426	601	461	317	250	334	409	616	685	710	658	34	1,270	230	1,997	-	345	280	662	802	981	151	304	818	519	-	345	
7	12	146	5,728	678	173	13,780	4,344	1,701	5,055	1,540	1,614	920	3,755	2,709	1,405	1,842	4,972	9,342	2,991	162	1,951	771	9,132	-	1,075	1,559	2,164	3,546	12,643	2,448	862	3,639	2,722	-	2,594	
8	117	1,093	4,844	1,425	471	22,246	5,983	7,653	11,919	3,292	5,449	4,070	24,915	8,904	3,196	7,453	5,630	18,524	14,062	1,060	4,508	4,744	18,840	-	3,621	5,148	2,395	14,503	23,067	8,977	3,402	4,866	8,628	-	7,517	
9	277	2,236	5,489	3,196	2,515	22,133	7,781	17,663	12,110	5,856	11,122	14,691	53,739	16,392	4,444	14,401	3,067	13,237	18,276	4,647	5,086	8,864	16,054	-	5,715	7,742	2,127	20,159	6,886	13,489	5,562	5,006	12,747	-	8,766	
10	1,143	2,017	1,068	4,927	5,886	6,614	4,001	8,178	3,765	6,674	10,645	29,516	31,244	13,110	6,002	14,408	832	13,284	16,897	9,830	7,584	6,576	5,377	-	3,197	7,792	1,662	14,199	613	11,727	8,036	8,296	10,391	-	9,054	
11	919	1,204	477	1,661	2,781	634	871	2,414	832	5,493	6,050	23,892	8,496	3,528	2,997	5,682	294	4,193	8,203	5,929	6,404	4,103	1,678	-	648	3,451	798	5,337	666	4,517	5,992	8,175	4,438	-	4,500	
12	623	1,041	51	216	827	65	360	1,951	346	2,344	2,849	7,162	2,009	915	2,004	430	639	982	2,391	3,266	2,614	1,812	5,041	-	2,451	1,426	382	1,474	959	1,032	2,949	4,394	927	-	1,407	
13	409	2,477	204	45	212	94	2,400	2,610	131	976	818	675	1,156	306	1,714	264	570	218	1,265	1,173	1,122	457	9,925	-	2,295	647	867	781	836	88	669	1,070	487	-	545	
14	259	1,946	172	144	52	50	1,721	1,238	273	2,072	289	498	481	93	2,307	247	231	350	212	281	278	4	6,842	-	729	429	2,684	1,657	384	317	138	301	233	-	228	
15	95	1,334	196	139	234	101	797	679	597	2,104	197	272	212	30	2,026	190	95	420	188	184	405	131	2,211	-	240	670	2,051	1,342	627	928	351	330	150	-	137	
16	106	387	197	210	415	177	390	41	951	1,196	238	388	92	151	1,521	85	156	320	203	688	420	368	1,167	-	103	1,296	1,224	836	366	1,963	1,232	438	155	-	80	
17	184	124	228	117	133	130	124	144	853	392	335	574	158	392	391	152	66	208	137	398	228	539	836	-	120	1,318	990	502	176	1,069	1,031	340	157	-	89	
18	48	59	115	102	83	347	54	110	429	59	407	168	80	198	310	266	8	89	177	77																



**Table 5.43. Clearnose skate length frequencies, spring, 1 cm intervals, 1993-2021.**

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	2019	2020	2021		
30	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	
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	-	1	
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	1	-	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	-	1
47	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
48	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
49	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	0	0	1	-	0
50	0	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	1	-	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	0	0	-	1
52	0	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	0	-	4
53	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	-	2
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	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	1	0	0	0	1	-	1
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	2	-	2	
57	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	-	1
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	1	-	1	
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	4	-	3		
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	0	-	0	
61	0	0	1	0	0	0	1	0	0	2	0	0	0	0	1	0	0	0	0	7	0	2	2	5	1	1	2	-	3		
62	0	0	0	0	0	0	2	0	0	1	0	0	0	2	0	2	0	0	0	5	1	1	2	4	2	1	1	-	5		
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	3	-	2		
64	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	0	0	-	8		
65	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	1	0	1	4	0	2	1	2	0	2	5	-	6			
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	4	-	5		
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	7	-	2		
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	6	-	8		
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	4	-	0		
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	3	-	1		
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	-	2			
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	3	-	2		
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	1	-	0		
74	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	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	0	0	-	2		
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	0	1	-	4			
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	1	-	2		
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	2	0	-	3		
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	2	1	-	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	0	3	-	1		
81	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	1	-	2		
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	1	-	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	2	-	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	1	1	-	4		
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	2	-	2		
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	1	-	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	-	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>	<b>69</b>	<b>-</b>	<b>84</b>		

Table 5.44. Clearnose skate length frequencies, fall, 1 cm intervals, 1993-2021.

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	2019	2020	2021	
16	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	-	0
19	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
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	1	0	-	1
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
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	1	0	0	-	0
41	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	-	1
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	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	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	0	0	-	0
47	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	-	1
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	0	0	-	2
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	0	1	0	-	0
50	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	1	-	2
51	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	-	1
52	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	-	1
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	-	0
54	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	3	2	0	3	3	1	3	2	-	2	
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	1	-	2	
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	0	-	1	
57	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	1	0	1	4	1	0	4	0	0	0	1	-	3		
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	2	-	4	
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	0	-	2	
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	4	-	6	
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	2	-	2	
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	1	-	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	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	0	-	3	
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	3	-	7	
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	1	-	3	
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	1	-	5	
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	4	-	5	
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	1	-	2	
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	3	-	4	
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	1	-	3	
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	1	-	3	
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	1	-	1	
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	0	-	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	0	-	0	
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	3	-	0	
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	0	-	0	
78	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	3	1	3	0	1	0	0	0	-	1	
79	0	0	0	0	0	0	1	0	0	0	1	2	1	0	4	1	0	0	0	3	0	2	0	1	0	0	1	-	2	
80	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	0	0	1	1	1	1	0	3	1	0	-	0	
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	2	-	0	
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	-	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	1	-	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	0	-	0	
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	0	-	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	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	0	-	1	
88	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	0	-	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	0	-	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	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	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	-	1	
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	1	-	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	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	0	-	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	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	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	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	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	43	-	81	

**Table 5.45. Fourspot flounder length frequencies, spring and fall, 2 cm intervals (midpoint given), 1989, 1990, 1996-2021.**  
*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	2019	2020	2021	
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	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	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	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	2	-	2	
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	3	-	2	
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	0	-	6	
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	14	-	16	
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	75	-	24	
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	152	-	56	
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	126	-	31	
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	123	-	28	
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	34	-	15	
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	8	-	11	
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	1	-	0	
41	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	1	0	0	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	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	0	-	0	
Total	504	1,440	1,113	1,734	822	548	1,439	999	1,015	879	602	394	271	585	472	455	302	655	1,719	899	659	316	1,007	358	600	538	-	191	

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	2019	2020	2021
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	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	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	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	0	-	0
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	2	-	2
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	0	-	5
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	0	-	2
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	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	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	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	0	-	0
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	2	-	1
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	9	-	8
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	8	-	7
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	9	-	8
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	1	-	0
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	0	-	0
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	0	-	0
Total	31	53	252	239	171	112	266	83	106	46	118	85	33	64	68	192	-	87	69	38	161	71	49	7	110	31	-	34

**Table 5.46. Hickory shad length frequencies, spring and fall, 1 cm intervals, 1991-2021.**

*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																																
	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	2019	2020	2021		
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	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	0	0	0	0	-	0
17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	0	0	0	0	0	0	1	0	0	0	0	0	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	0	0	0	0	-	0
19	0	0	0	1	0	0	1	0	0	0	0	0	0	0	3	5	6	0	1	1	0	0	0	0	0	0	0	0	0	3	-	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	0	0	2	-	0		
21	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	1	1	0	0	1	0	1	0	0	1	0	1	0	0	0	-	0	
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	0	0	0	0	-	0	
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	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	0	0	0	0	-	0	
25	0	0	0	0	0	0	0	2	0	0	0	0	0	1	1	6	5	0	0	0	0	0	0	1	1	0	0	0	0	0	-	1	
26	0	0	0	0	0	0	1	0	0	0	2	0	0	0	6	5	2	0	0	0	0	2	0	3	0	0	1	0	0	0	-	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	0	0	1	0	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	0	0	0	0	-	0	
29	0	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	1	0	0	-	0	
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	4	0	0	1	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	2	0	0	0	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	0	1	1	0	0	0	0	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	1	0	0	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	0	1	2	1	0	0	1	0	-	0	
35	0	0	1	0	0	1	0	2	2	2	0	4	2	2	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	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	0	2	0	0	0	0	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	0	0	0	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	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	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	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	0	1	0	0	0	0	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	
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	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	
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	
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	0	0	0	0	-	0	
Total	1	2	3	4	2	12	9	34	24	26	10	40	16	20	75	53	27	3	6	2	1	14	5	20	9	16	2	2	7	-	2		

length	Fall																														
	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	2019	2020	2021
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	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
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
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	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	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	0	1	-	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	0	0	-	0
26	0	1	2	8	0	3	1	0	5	0	0	0	4	3	0	0	0	0	-	3	1	0	0	0	0	0	0	0	0	-	1
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	0	0	-	0
28	0	1	0	1	0	3	0	0	2	0	0	1	0	1	1	0	0	2	-	0	1	3	0	0	0	0	0	0	0	-	2
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	0	0	-	0
30	0	1	0	1	1	0	1	0	0	0	0	0	0	0	8	7	2	0	3	-	0	3	7	2	0	0	0	1	0	-	0
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	0	-	4
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	0	-	5
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	0	-	2
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	3	-	1
35	0	0	2	0	0	0	0	0	0	2	0	0	0	2	1	1	0	0	0	-	0	0	1	0	0	0	0	0	0	-	6
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	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	0	-	1
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	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
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	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	0	-	0
Total	0	10	7	27	4	16	15	5	32	16	4	5	6	18	60	22	10	2	7	-	7	29	27	6	3	2	2	4	4	-	22

**Table 5.47. Horseshoe crab length frequencies by sex, spring, 1 cm intervals, 1998-2021.**

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

Sex	length	1998*	Spring																							
			1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
F	13		1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
F	14		1	3	0	1	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
F	15		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	-	1
F	16		1	0	0	3	2	1	1	0	0	1	0	0	0	1	0	2	0	0	0	0	0	1	-	2
F	17		1	0	2	2	1	4	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	2	-	4
F	18		2	1	0	3	2	4	0	0	2	1	1	0	0	0	2	3	1	0	0	0	0	1	-	4
F	19		4	1	2	2	5	5	0	0	3	4	1	0	0	2	0	5	1	2	0	0	3	3	-	2
F	20		5	2	0	7	1	2	3	0	3	2	0	0	1	2	0	4	0	0	0	0	4	4	-	6
F	21		8	2	1	8	6	2	1	0	3	8	1	0	3	5	4	5	3	4	0	3	4	4	-	4
F	22		8	6	4	13	10	7	2	0	10	4	6	0	3	3	2	3	3	2	0	0	8	4	-	3
F	23		14	15	18	19	22	17	3	2	9	14	4	3	4	9	7	14	7	4	4	8	4	4	-	7
F	24		15	7	15	32	29	25	5	4	15	11	12	6	3	15	19	13	3	5	3	8	9	4	-	11
F	25		15	10	23	25	22	20	8	5	11	16	10	9	9	14	19	11	11	14	4	13	12	4	-	10
F	26		23	13	28	26	22	23	3	2	16	12	10	4	16	14	17	26	9	4	0	9	11	4	-	11
F	27		15	9	18	18	18	18	8	4	10	9	9	5	18	11	8	22	10	6	2	11	13	4	-	9
F	28		8	6	9	6	7	4	2	2	5	4	10	3	8	10	13	9	3	2	1	8	7	4	-	13
F	29		3	0	3	4	4	4	0	3	5	1	3	4	1	3	2	3	1	0	1	4	2	4	-	1
F	30		1	0	3	2	0	0	3	2	0	2	1	1	4	0	1	1	1	0	0	0	0	0	-	1
F	31		0	0	0	0	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	-	0
F	32		0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-	0
M	14		0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
M	15		0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
M	16		0	0	0	2	5	2	0	1	2	0	0	2	0	0	0	0	0	0	0	1	0	0	-	0
M	17		5	2	4	7	9	9	0	0	3	2	3	0	1	5	0	1	1	1	0	2	2	4	-	2
M	18		11	8	12	19	24	21	2	0	17	10	3	2	5	7	6	9	4	3	1	4	5	4	-	1
M	19		22	13	32	42	25	33	3	0	19	12	10	7	7	8	16	17	7	5	1	3	13	4	-	11
M	20		15	16	30	20	33	31	7	0	21	10	11	7	15	13	10	13	12	2	0	12	14	4	-	17
M	21		18	5	13	14	16	10	1	0	6	12	5	3	3	9	6	6	7	1	0	8	6	4	-	0
M	22		4	5	7	6	7	6	2	0	4	2	1	1	4	5	3	1	0	0	0	2	2	2	-	11
M	23		1	0	3	1	4	2	1	0	0	1	1	0	0	0	2	1	0	0	0	2	1	1	-	1
M	24		2	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-	0
M	25		0	0	0	0	0	1	2	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	-	0
M	26		0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	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	0	0	-	0
M	28		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
M	29		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	-	0
M	30		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
U	22		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
Total			51	204	125	228	285	285	251	60	25	166	141	104	57	105	138	138	173	88	55	17	101	126	-	133

\*note: horseshoe crabs were not sexed during the spring of 1998.

**Table 5.48. Horseshoe crab length frequencies by sex, fall, 1 cm intervals, 1998-2021.**

*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	2019	2020	2021
F	13	0	0	2	0	0	0	3	0	1	0	0	0	-	0	0	0	0	0	2	0	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	0	-	1
F	15	0	0	0	0	2	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	1	-	1
F	16	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	1	-	5
F	17	1	1	0	0	2	1	0	1	1	0	1	0	-	0	0	0	0	1	0	0	0	0	-	2
F	18	0	2	0	1	0	1	1	1	0	0	0	0	-	0	0	0	0	1	1	1	0	1	-	2
F	19	3	2	2	2	0	1	0	0	1	0	1	1	-	0	0	0	2	1	0	0	2	0	-	5
F	20	5	1	1	4	4	2	3	0	2	0	0	2	-	0	0	0	0	1	1	1	1	0	-	1
F	21	3	2	2	3	1	4	6	3	1	1	1	0	-	0	0	0	1	2	1	0	1	0	-	3
F	22	3	8	13	13	10	3	9	4	1	2	6	6	-	6	0	2	2	0	1	1	1	4	-	4
F	23	8	15	15	12	8	8	13	10	7	7	6	14	-	6	2	3	4	6	9	6	5	5	-	11
F	24	7	19	30	27	21	9	24	10	6	17	14	22	-	18	10	12	8	10	14	4	13	4	-	16
F	25	17	12	20	31	33	13	19	6	12	26	17	17	-	19	9	11	11	7	17	13	23	8	-	14
F	26	19	23	33	31	18	9	29	12	10	22	15	24	-	25	16	27	10	9	12	12	26	20	-	22
F	27	14	7	21	22	18	7	22	8	3	17	11	28	-	16	5	15	10	3	9	12	19	7	-	15
F	28	2	4	10	8	13	6	15	5	4	8	11	22	-	11	3	10	6	5	6	9	13	6	-	15
F	29	2	3	2	5	2	3	8	2	0	4	1	5	-	2	4	2	3	1	2	2	2	1	-	5
F	30	0	1	1	2	0	2	1	2	0	2	0	2	-	0	1	2	0	0	1	2	1	1	-	1
F	31	0	1	0	0	1	0	0	2	0	0	0	1	-	0	0	0	1	0	1	0	0	0	-	0
F	32	0	0	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	0	-	0
F	34	0	0	0	0	0	1	0	0	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	0	-	0
M	12	0	0	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	0	-	0
M	14	0	0	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	0	-	0
M	16	0	0	2	1	5	3	0	0	0	1	1	0	-	1	0	0	0	0	0	0	0	0	-	2
M	17	6	5	7	6	3	5	11	0	1	3	1	2	-	3	0	1	1	1	1	1	3	3	-	7
M	18	12	14	28	18	14	15	21	3	9	3	9	18	-	13	4	2	5	1	7	2	2	5	-	16
M	19	10	20	39	27	31	11	39	13	4	12	21	14	-	9	4	6	13	3	5	6	8	8	-	13
M	20	20	23	35	32	22	8	30	12	9	19	23	31	-	10	1	17	4	9	7	8	18	10	-	26
M	21	6	11	18	15	9	4	15	4	2	10	6	13	-	7	1	7	6	4	8	8	10	2	-	9
M	22	5	3	8	4	6	0	10	2	5	6	2	5	-	6	0	5	0	1	3	4	6	1	-	7
M	23	0	0	3	2	6	1	1	0	2	3	1	3	-	0	1	2	0	0	1	1	0	1	-	1
M	24	0	0	1	3	0	0	1	0	1	2	0	2	-	0	0	0	0	0	1	0	1	0	-	0
M	25	0	0	2	0	0	0	0	0	0	0	0	1	-	0	0	1	0	0	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	0	-	0
M	27	0	0	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	1	0	0	0	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	0	-	0
Total		145	177	295	274	229	117	281	101	83	165	148	234	-	152	61	125	87	66	109	94	155	90	-	204

**Table 5.49. Long-finned squid length frequencies, spring, 1 cm intervals, 1986-1990, 1992-2021.**

*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	2019	2020	2021			
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	0	-	3			
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	9	-	10			
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	43	-	107			
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	37	-	168			
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	24	-	125			
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	17	-	77			
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	27	-	44			
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	14	-	39			
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	38	-	67			
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	29	-	102			
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	58	-	118			
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	62	-	75			
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	58	-	81			
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	68	-	61			
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	39	-	75			
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	34	-	36			
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	27	-	22			
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	18	-	10			
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	16	-	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	17	-	15			
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	12	-	16			
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	9	-	12			
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	12	-	16			
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	7	-	4			
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	4	-	11			
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	3	-	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	4	-	7			
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	2	-	5			
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	0	-	2			
31	3	78	14	11	5	4	8	1	3	0	0	0	0	1	1	1	0	3	2	2	1	0	1	0	0	0	1	0	1	0	0	0	0	-	3			
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	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	0	-	2		
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	0	-	2		
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	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	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	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	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	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	0	0	0	-	0
Total	301	4,719	2,918	896	1,347	900	2,371	1,485	2,825	880	1,883	2,044	933	993	721	809	622	3,658	1,670	1,290	609	1,986	2,361	1,134	812	1,047	534	1,625	1,638	2,020	817	1,382	688	-	1,347			







**Table 5.52. Scup length frequencies, fall, 1 cm intervals, 1984-2021.**

*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	2019	2020	2021		
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	0	0	-	0	
3	0	8	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	13	4	9	0	0	-	4	0	0	0	0	2	0	24	0	-	11	
4	1	61	0	0	17	1	3	14	196	0	6	0	0	18	4	1	28	117	19	143	363	11	74	0	34	-	21	29	4	11	21	4	40	317	34	-	39			
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	253	-	462		
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	1,211	-	2,528		
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	2,398	-	3,998		
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	2,375	-	4,803		
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	1,608	-	5,106		
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	571	-	2,495		
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	115	-	1,199		
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	142	-	835		
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	584	-	413		
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	1,188	-	568		
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	1,101	-	759		
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	540	-	453		
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	147	-	194		
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	81	-	70		
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	197	-	135		
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	572	-	403		
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	1,150	-	691		
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	1,774	-	769		
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	1,459	-	934		
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	836	-	1,097		
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	520	-	966		
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	308	-	613		
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	177	-	325		
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	98	-	227		
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	92	-	97		
30	8	16	2	1	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	4	22	75	122	101	36	27	-	196	63	116	88	95	299	91	70	78	-	75	
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	30	-	44		
32	2	1	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	1	0	0	1	14	25	18	20	37	20	21	-	76	17	36	49	76	94	47	17	17	-	26
33	1	2	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	5	10	3	6	27	14	13	-	31	11	24	22	67	58	33	8	11	-	23	
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	8	-	11	
35	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	6	7	-	10	0	7	4	12	9	13	3	2	-	2		
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	2	-	6	
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	0	-	1		
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	0	1	0	3	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	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	1	0	0	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>	<						

**Table 5.53. Striped bass length frequencies, spring, 2 cm intervals (midpoint given), 1984–2021.**

*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	2019	2020	2021														
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	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	0	1	0	0	0	1	0	0	1	0	0	0	0	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	0	8	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0											
17	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	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	1	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	3	0	0	2	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	0	0	0	2	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	0	0	5	0	0												
27	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	6	1	0	1	0	0												
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	1	9	3	0	0												
31	0	0	0	0	0	1	6	2	1	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	7	4	0	0	0	0												
33	0	0	0	1	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	4	0	0	0	0	0	0											
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	3	0	0	0	0												
37	0	0	0	0	0	0	3	1	0	0	1	8	26	25	15	2	11	12	11	11	4	5	16	2	5	2	1	3	10	12	2	3	2	13	3	0	0	0	0	0	0											
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	12	0	0	0	0	0											
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	31	0	0	0	0	0											
43	0	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	61	0	0	0	0	0											
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	81	0	0	0	0	0	0										
47	0	0	0	0	2	0	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	75	0	0	0	0	0	0										
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	55	0	0	0	0	0	0										
51	0	0	0	0	0	1	0	1	4	3	4	2	7	12	6	4	3	9	7	1	4	6	5	10	32	2	8	5	3	13	4	6	4	6	37	0	0	0	0	0	0	0										
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	22	0	0	0	0	0	0										
55	0	0	0	0	0	0	1	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	19	0	0	0	0	0	0										
57	0	0	0	0	0	0	2	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	7	0	0	0	0	0	0										
59	0	0	0	2	0	1	0	0	0	4	2	2	7	7	22	4	5	10	11	4	5	5	5	8	17	6	5	6	6	3	5	3	3	2	4	0	0	0	0	0	0	0	0									
61	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	4	0	0	0	0	0	0	0	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	4	0	0	0	0	0	0	0									
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	5	0	0	0	0	0	0	0	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	1	1	0	0	0	0	0	0	0								
69	0	0	0	0	0	0	2	0	0	3	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	1	0	0	0	0	0	0	0	0	0							
71	0	0	0	1	0	0	1	0	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	5	2	1	0	0	0	0	0	0	0	0							
73	0	0	0	0	0	0	2	0	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	0	0	0	0	0	0	0	0	0	0	0	0						
75	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	6	1	2	4	10	5	5	1	3	0	3	4	8	3	2	1	0	1	2	2	0	1	2	2	0	0	0	0	0	0							
77	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	3	5	2	0	6	1	5	2	1	1	0	9	0	2	0	0	1	1	2	0	1	2	0	0	0	0	0	0	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	1	5	1	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
81	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2	2	0	4	0	2	4	1	2	2	0	1	1	2	5	0	0	0	1	2	0	0	1	2	0	0	0	0	0	0	0	0	0				
83	0	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	0	0	0	0	0	0	0	0	0	0	0	0				
85	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	3	2	0	1	0	0	0	0	0	1	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0				
87	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0	1	0	4	2	0	2	1	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			
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	0	0	1	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
91	0	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	0	0	0	0	0	0	0	0	0	0	0	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	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
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	0	0	1	1	0	1	0	0																	

**Table 5.54. Striped bass length frequencies, fall, 2 cm intervals (midpoint given), 1984–2021.**

*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	2019	2020	2021			
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	1	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	1	1	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	7	2	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	13	1	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	9	1	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	4	2	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	1	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	3	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	1	4	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	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	4	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	7	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	12	2	0	0	
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	1	0	0	0	4	0	0	0	0	0	0	0	14	1	0	0	
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	1	3	0	1	0	1	0	1	21	2	0	0	
47	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	0	5	6	5	6	0	4	25	9	0	0	0	0		
49	0	0	0	0	0	0	0	0	0	1	0	9	9	2	9	1	0	0	14	2	4	22	1	1	0	0	6	5	3	5	0	1	17	4	0	0	0	0	0		
51	0	0	0	0	0	0	0	0	0	4	2	8	4	1	9	0	0	3	0	29	2	5	18	2	4	0	2	2	2	4	16	0	2	10	13	0	0	0			
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	7	0	2			
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	7	0	2			
57	0	0	0	1	1	0	0	1	1	5	0	2	3	11	5	5	2	7	1	11	6	3	6	3	8	0	0	0	3	8	15	4	2	2	5	0	0	0			
59	0	0	0	0	0	0	0	0	1	0	0	0	7	3	0	8	0	2	0	13	6	3	5	3	8	0	6	1	4	14	5	0	1	2	0	0	0	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	6	0	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	1	0	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	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	0	0			
69	0	0	0	0	1	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	1	0	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	1	0	1	2	0	1	1	1	1	0	0	1	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	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	1	1	0	1	1	0	0	2	0	0	0	0	0		
77	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	4	0	4	0	1	0	0	2	3	0	0	5	1	0	1	0	0	1	1	2	0	0	0	0		
79	0	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	1	1	0	1	1	0	1	0	3	1	0	0	0	0	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	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0		
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	2	0	0	0	0	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	1	0	1	0	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	1	0	0	
89	0	0	0	0	0	0	0	0	0	0	1	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	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	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	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	0	0	0	1	0	0	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	0	0	0	1	0	0	0	0	0	0	1	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	2	1	5	0	0	0	0	0	0	0	0	0	0	0	1	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	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	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	2	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	2	0	0	0	0	0	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	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	1	0	1	0	0	0	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	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	1	0	0	0	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																						

**Table 5.55. Summer flounder length frequencies, spring, 1 cm intervals, 1984-2021.**  
*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	2019	2020	2021					
11	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	0	-	0			
12	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		
13	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	0	0	0	-	0	
14	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	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0
15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7	-	0	
16	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	14	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	-	0	
17	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1	1	3	0	0	1	0	0	0	0	0	0	0	0	1	9	-	0		
18	0	0	0	19	0	0	1	0	0	0	0	0	1	0	0	0	2	0	0	2	1	0	26	0	1	3	0	0	0	0	0	0	2	0	0	0	0	0	15	-	0		
19	0	0	0	17	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	21	1	2	7	0	0	0	1	3	1	0	1	0	1	11	-	0				
20	0	0	5	22	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	0	0	0	25	3	8	9	1	0	9	3	4	0	0	3	26	-	1						
21	0	0	6	17	0	0	0	0	0	0	3	2	1	0	0	0	1	0	0	3	0	0	21	2	8	12	0	0	6	2	15	0	0	12	38	-	3						
22	0	0	6	21	0	0	1	0	1	0	4	1	1	0	0	0	0	2	1	3	0	1	16	1	11	16	1	2	12	6	13	0	0	10	56	-	0						
23	0	0	4	10	1	0	0	3	1	0	5	0	1	2	0	0	0	4	0	9	1	1	21	2	10	21	3	0	9	22	0	0	8	85	-	4							
24	0	0	9	13	1	0	0	2	0	3	8	0	1	3	0	0	3	3	0	6	0	0	18	4	21	35	5	2	20	13	26	0	1	28	89	-	10						
25	1	0	13	20	1	0	2	4	1	6	12	1	1	7	1	2	3	2	2	21	3	3	3	3	22	51	16	2	22	16	40	3	5	32	117	-	5						
26	2	0	16	13	5	0	2	6	1	11	18	1	2	1	0	6	3	12	4	32	2	5	0	5	8	25	48	20	7	20	21	43	2	10	45	97	-	5					
27	6	0	27	12	15	0	5	6	5	11	14	2	9	9	2	8	4	14	9	47	6	9	0	6	5	30	45	30	15	38	40	45	5	8	41	80	-	12					
28	5	0	18	5	7	0	9	6	12	9	1	17	9	3	7	9	31	17	63	8	5	0	9	13	28	40	37	24	28	43	31	5	8	40	82	-	24						
29	2	0	21	1	11	0	6	11	2	6	9	8	28	13	2	24	13	29	33	72	17	5	2	10	21	25	38	53	32	28	49	25	9	24	38	37	-	18					
30	4	1	8	0	1	0	9	14	7	4	7	8	22	16	3	23	15	31	40	61	9	8	2	9	12	16	23	37	20	13	42	22	9	5	38	23	-	19					
31	5	0	9	3	17	0	10	9	5	8	12	4	22	11	1	20	8	22	49	42	5	11	3	10	16	8	14	55	31	20	32	27	16	6	18	27	-	19					
32	0	4	9	1	6	1	5	6	7	5	9	2	7	15	3	11	14	8	36	31	12	9	10	3	13	13	6	33	25	17	27	15	9	4	8	26	-	18					
33	0	3	4	4	6	0	7	4	1	2	13	0	7	10	4	11	14	8	20	24	6	6	11	3	12	13	4	37	19	19	37	10	11	7	7	34	-	27					
34	0	6	3	1	6	1	1	4	1	6	8	1	4	7	6	12	12	5	20	26	5	8	7	6	8	15	5	35	22	13	28	10	13	10	11	26	-	22					
35	2	2	1	1	7	2	0	1	5	1	8	1	8	4	5	11	10	5	21	23	8	4	10	3	6	5	2	46	36	23	23	11	10	8	8	22	-	16					
36	0	2	2	1	3	2	1	3	1	4	14	0	4	8	16	14	18	9	30	41	16	7	5	4	6	15	13	42	29	26	29	13	20	9	11	31	-	32					
37	1	1	2	4	5	0	0	3	1	2	6	1	6	12	12	12	17	11	27	35	18	1	9	8	4	13	3	27	31	38	19	17	5	2	5	31	-	24					
38	2	1	2	2	3	1	1	3	1	4	3	0	7	8	21	13	24	5	23	37	26	3	7	8	10	19	14	32	30	36	20	16	7	10	12	27	-	34					
39	1	2	1	2	2	0	1	2	1	3	4	0	5	8	17	5	12	7	38	34	25	6	3	14	4	17	6	23	37	25	13	11	10	5	13	21	-	17					
40	0	3	4	1	4	0	1	3	4	2	1	2	2	6	22	6	17	10	29	42	22	7	3	15	6	18	6	17	17	38	18	14	12	5	8	10	-	17					
41	1	0	3	0	4	2	0	3	1	2	5	1	3	4	13	8	16	8	23	35	26	6	2	11	11	17	6	21	17	30	15	8	5	4	7	12	-	16					
42	0	1	1	0	1	1	0	0	2	3	6	5	5	2	13	10	16	14	14	31	23	5	3	10	7	14	5	10	21	29	15	15	5	5	8	7	-	11					
43	0	0	2	0	1	1	0	0	0	1	0	2	1	4	9	6	6	10	14	27	25	5	2	20	6	14	8	15	22	17	15	5	9	2	12	13	-	9					
44	0	0	0	0	2	0	0	4	4	0	1	0	2	2	8	6	18	7	14	18	16	4	1	13	5	14	3	9	14	21	10	8	8	3	1	9	-	14					
45	0	0	1	1	1	0	0	4	0	0	3	0	3	2	7	5	11	9	7	15	2	1	3	13	1	16	4	10	9	18	13	9	5	1	1	7	-	13					
46	0	0	2	1	1	1	0	4	1	1	3	0	0	4	3	4	8	9	25	18	6	1	13	7	10	10	14	14	18	10	6	9	4	6	1	-	7						
47	0	0	1	2	2	0	1	0	1	0	0	1	2	6	6	10	5	12	18	10	5	2	12	7	4	6	12	10	11	6	6	5	5	3	3	-	7						
48	0	0	1	1	1	0	0	1	0	0	1	0	0	2	8	8	1	8	7	13	16	5	2	18	5	9	7	15	14	14	10	7	4	5	4	3	-	7					
49	1	0	0	0	0	2	0	1	1	0	1	1	3	0	4	9	6	2	7	19	10	1	1	18	4	4	3	5	9	6	7	3	5	4	4	-	5						
50	0	0	2	0	0	0	0	1	1	0	1	0	0	2	5	6	5	4	10	12	3	5	3	20	11	4	4	9	7	8	12	6	2	3	2	1	-	7					
51	0	0	3	0	1	0	0	0	0	0	0	1	1	10	3	3	8	9	7	10	3	4	6	4	12	5	6	8	10	4	2	6	1	5	0	-	5						
52	0	0	1	0	1	0	2	0	0	1	2	0	2	0	4	3	4	6	11	8	3	4	8	11	5	0	7	6	6	9	0	2	2	3	4	-	2						
53	0	0	0	0	0	0	0	1	0	0	0	0	3	3	5	5	2	4	4	10	8	3	0	2	4	3	2	11	2	7	9	8	1	2	2	1	-	2					
54	0	2	0	0	1	0	0	0	1	1	0	0	2	1	5	5	5	3	10	4	8	4	0	5	10	8	1	8	4	6	7	3	3	3	2	-	0						
55	0	0	1	0	0	1	0	0	0	1	1	0	1	1	1	3	3	5	4	6	6	1	2	6	8	6	1	7	4	7	10	1	2	1	2	2	-	3					
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	5	7	2	3	1	1	9	13	8	0	7	1	3	7	3	1	2	5	5	-	3					
57	0	0	0	0	0	1	1	0	0	0	2	0	0	1	3	3	2	3	5	7	0	1	0	1	0	4	1	8	2	7	2	3	7	4	2	1	4	2	-	1			
58	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	6	5																										

**Table 5.56. Summer flounder length frequencies, fall, 1 cm intervals, 1984-2021.**

*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	2019	2020	2021			
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	0	0	0	0	-	0	
12	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	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	2	0	1	-	0	0	0	0	0	0	0	0	0	1	0	-	0	
16	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	1	1	0	-	0		
17	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	2	-	0	0	0	0	0	0	0	0	2	0	-	0		
18	0	2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	1	2	-	0	0	0	0	0	0	0	0	0	0	-	0		
19	0	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0	3	-	0	0	0	0	0	0	0	0	0	0	0	-	0		
20	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	-	0	0	2	0	0	1	0	2	0	-	1				
21	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	1	2	4	-	0	0	0	0	0	0	1	2	0	-	2			
22	0	2	1	0	0	0	0	0	0	1	0	1	2	0	0	0	1	3	0	1	0	0	0	0	5	1	-	0	0	1	3	0	2	2	0	0	-	5			
23	0	2	2	0	0	0	0	0	1	1	0	1	0	0	0	0	0	4	0	2	2	0	0	0	6	5	-	0	2	5	1	0	3	0	5	0	-	4			
24	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	2	3	3	-	1	0	1	0	0	0	1	4	0	-	4			
25	0	4	0	0	0	0	0	2	0	4	0	0	1	0	0	1	1	0	4	0	0	1	0	0	1	2	4	-	2	1	4	3	0	2	1	2	1	-	4		
26	0	3	1	1	0	0	0	0	0	1	0	0	0	0	0	2	3	1	5	0	2	1	0	4	8	6	-	1	2	1	1	1	0	5	8	0	-	2			
27	0	3	2	0	0	1	1	0	0	0	0	0	0	0	1	8	0	12	0	3	1	0	0	9	8	-	3	1	3	0	0	3	4	3	0	-	3				
28	0	2	1	3	0	0	0	0	0	1	0	1	0	0	1	0	0	12	0	1	0	0	1	1	2	-	4	3	6	1	0	0	6	4	2	-	4				
29	0	0	1	4	0	0	1	0	1	0	0	0	0	0	0	2	1	7	0	9	1	0	5	7	4	-	1	2	7	4	5	1	7	6	4	-	4				
30	0	2	1	2	1	0	0	1	0	0	1	0	1	1	0	1	0	1	8	0	1	3	0	14	3	1	-	3	3	10	5	2	1	5	8	7	-	4			
31	0	1	5	7	2	0	0	1	0	0	0	3	2	0	3	2	13	5	0	4	2	0	4	2	4	-	8	4	16	2	6	0	6	10	10	-	7				
32	3	0	7	13	4	0	2	0	3	4	5	2	7	0	5	2	9	6	0	3	15	2	10	1	3	-	8	12	26	4	10	2	7	11	14	-	10				
33	7	0	3	17	6	0	3	1	3	5	4	3	10	10	1	11	1	19	8	3	3	18	3	4	1	5	-	21	22	19	6	17	6	8	17	12	-	15			
34	8	1	21	15	7	0	5	3	5	16	5	7	18	17	8	6	3	37	23	6	1	31	2	12	0	17	-	25	15	17	4	9	10	12	13	26	-	15			
35	14	3	12	20	13	0	5	8	9	13	2	6	15	20	3	12	5	67	47	9	2	24	0	7	1	17	-	10	27	16	8	15	11	10	19	13	-	20			
36	12	4	21	16	18	0	6	14	12	8	3	4	16	17	4	22	14	54	52	10	3	20	1	11	1	20	-	23	32	20	12	16	9	10	22	7	-	22			
37	9	13	23	12	23	0	8	7	7	23	7	2	17	27	6	17	9	55	54	19	3	17	5	4	7	14	-	15	26	17	15	24	14	10	24	17	-	21			
38	15	7	18	11	18	0	5	12	7	13	8	3	18	38	8	24	13	49	92	12	5	17	5	3	12	18	-	28	38	14	17	20	12	7	13	16	-	25			
39	5	3	17	10	19	0	6	15	8	16	17	3	20	34	9	26	20	32	66	16	13	15	4	6	17	22	-	26	35	11	12	20	12	8	15	6	-	20			
40	11	5	10	9	21	0	8	22	3	24	7	5	30	26	7	27	18	39	79	8	12	26	8	7	16	19	-	22	28	25	13	27	15	7	9	7	-	14			
41	5	6	16	7	15	1	10	8	9	12	3	11	19	28	14	25	13	23	41	8	9	31	2	12	20	15	-	19	27	21	10	16	8	3	10	4	-	19			
42	8	11	18	1	12	1	9	5	6	10	3	5	14	16	20	29	20	16	32	10	14	18	7	9	17	16	-	15	22	12	8	8	19	3	3	6	-	15			
43	3	13	8	4	9	0	9	8	7	6	1	4	9	11	14	14	11	12	29	12	11	12	9	8	10	13	-	12	15	15	5	13	13	5	8	8	-	18			
44	2	7	4	2	10	0	6	9	7	2	2	0	5	4	15	10	7	3	45	10	14	13	8	8	5	11	-	11	8	16	11	10	11	3	2	6	-	16			
45	1	9	5	1	8	1	9	4	2	4	3	2	10	6	17	12	6	13	31	11	18	12	5	6	4	9	-	6	15	17	3	5	9	2	3	6	-	18			
46	0	8	5	1	7	0	3	0	4	8	1	1	7	5	20	4	1	9	22	8	16	8	2	4	3	18	-	2	7	9	6	7	11	5	6	3	-	13			
47	2	3	1	5	1	3	0	5	2	3	6	1	6	6	16	4	7	6	13	10	13	7	2	4	2	9	-	4	8	7	2	8	5	3	5	2	-	8			
48	1	6	0	2	2	2	1	3	1	4	0	4	2	10	1	12	14	11	6	16	6	4	6	3	14	-	5	7	8	3	4	9	4	1	2	-	10				
49	2	6	1	0	1	1	1	2	5	2	3	1	4	5	5	3	6	9	13	4	10	9	4	7	2	6	-	3	4	11	1	2	8	5	3	0	-	5			
50	2	1	2	0	1	1	0	5	2	3	0	1	3	3	5	4	5	10	7	4	6	2	1	6	1	5	-	1	12	5	1	4	2	5	3	0	-	5			
51	1	0	2	1	0	1	0	3	2	3	0	2	5	1	4	3	6	10	7	4	3	5	0	9	1	2	-	1	3	6	3	3	0	3	0	-	3				
52	0	1	0	0	0	2	1	3	3	2	1	0	2	2	1	7	4	3	4	2	7	4	4	7	0	7	-	1	5	1	3	3	4	2	2	1	-	2			
53	1	0	2	2	1	2	0	4	1	1	0	0	1	3	6	5	3	5	1	3	0	4	0	8	1	3	-	0	6	7	3	0	2	3	4	0	-	0			
54	0	2	1	0	0	0	1	3	2	0	0	1	0	2	1	1	4	5	0	0	1	0	2	3	0	4	-	3	2	5	1	5	1	1	4	1	-	3			
55	1	0	0	2	1	0	1	1	0	1	0	1	0	1	3	2	1	4	1	2	3	3	0	4	0	4	-	1	12	3	2	1	4	2	0	0	-	0			
56	0	0	1	2	1	0	0	0	1	1	0	0	0	2	0	0	1	3	5	1	3	0	0	2	1	1	-	0	0	3	1	1	2	0	1	0	-	1			
57	2	0	0	0	0	0	1	0	0	1	1	1	1	0	2	2	1	2	5	1	1	1	2	1	0	1	-	1	0	1	2	1	1	1	3	2	-	1			
58	0	0	0	0	0	1	0	1	0	0	1	2	0	0	2	1	4	2	1	6	3	1	0	0	4	0	0	-	1	0	2	1	2	1	1	0	1	-	0		
59	0	0	1	0	0																																				







**Table 5.59. Weakfish length frequencies, spring, 2 cm intervals (midpoint given), 1984-2021.**

*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	2019	2020	2021			
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	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	0	0	-	3		
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	2	0	2	1	3	0	1	11	2	1	8	-	74		
21	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	50	-	73				
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	20	-	13			
25	0	0	0	0	1	0	1	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	4	-	3				
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	1	-	1			
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	2	-	1			
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	2	-	2			
33	0	0	0	0	0	0	0	12	0	3	2	1	5	19	10	10	1	5	0	0	11	0	3	0	0	0	0	0	17	1	0	0	10	13	1	6	-	3			
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	4	-	5			
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	0	2	31	3	1	0	13	8	2	10	-	3		
39	0	0	0	0	1	0	0	4	0	0	0	1	1	0	2	0	0	2	0	0	0	1	0	0	0	1	0	0	3	26	6	2	0	15	6	0	6	-	4		
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	1	-	6			
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	0	-	11			
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	0	-	7			
47	0	0	0	0	0	0	0	1	1	0	0	0	1	2	2	1	0	1	0	0	0	0	2	0	0	1	0	2	2	1	0	1	1	0	0	0	-	14			
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	0	0	-	7		
51	0	0	0	0	0	1	0	1	2	0	0	0	0	0	6	3	2	0	1	0	0	2	0	0	0	0	0	0	1	3	0	0	0	3	0	1	-	5			
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	0	1	0	0	7	3	0	0	0	1	0	1	-	4			
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	0	6	4	0	1	0	0	0	1	-	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	0	3	0	0	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	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	1	0	0	0	0	0	0	1	1	0	0	0	0	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	0	0	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	0	1	0	0	0	0	0	0	0	-	0	
67	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	0	0	1	0	0	0	0	-	0	
69	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	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	0	0	0	-	0
73	1	0	1	0	1	0	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	0	1	0	0	-	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	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	0	2	0	0	2	0	0	0	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	0	1	0	0	0	0	0	1	0	0	0	0	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	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	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	117	-	239			

**Table 5.60. Weakfish length frequencies, fall, 2 cm intervals (midpoint given), 1984-2021.***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	2019	2020	2021		
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	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	0	8	-	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	181	-	48		
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	802	-	515		
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	1,418	305	457	588	1,237	831	-	1,133		
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	855	-	1,199		
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	391	-	2,051		
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	153	-	1,632		
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	59	-	938		
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	11	-	362		
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	0	-	65		
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	2	-	34		
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	15	-	6		
29	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	11	0	0	0	1	0	0	0	-	9	0	1	0	0	22	18	4	51	-	25		
31	0	0	0	0	0	0	1	0	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	111	-	67	
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	0	12	-	16	7	3	1	20	44	29	33	92	-	106	
35	2	1	0	0	0	0	1	1	1	1	0	6	12	8	3	1	12	0	1	0	4	0	4	0	0	0	14	-	21	18	22	0	16	45	12	21	33	-	83	
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	9	-	39		
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	9	-	16		
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	3	-	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	5	-	2		
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	5	-	6		
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	8	-	12		
49	0	1	1	0	0	0	1	22	0	1	4	5	1	10	2	9	1	8	0	0	0	3	0	1	0	1	-	10	10	4	0	0	5	7	1	8	-	20		
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	4	-	24		
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	0	1	-	6	7	2	0	1	5	3	0	0	-	15		
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	2	-	9		
57	1	2	0	0	2	0	0	0	3	0	0	0	0	2	2	4	2	0	1	0	0	0	1	0	0	0	-	2	1	1	0	0	0	0	0	0	-	6		
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	0	-	4		
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	0	-	2		
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	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	0	1	-	0	0	0	0	0	0	0	1	0	0	-	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	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	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	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	-	6	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	0	1	0	0	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	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	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	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	1	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	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	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	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	0	0	0	-	0
<b>Total</b>	<b>259</b>	<b>2,650</b>	<b>5,415</b>	<b>246</b>	<b>234</b>	<b>4,628</b>	<b>1,911</b>	<b>4,270</b>	<b>1,299</b>	<b>2,047</b>	<b>8,141</b>	<b>2,850</b>	<b>6,332</b>	<b>3,823</b>	<b>3,404</b>	<b>12,331</b>	<b>23,561</b>																							

**Table 5.61. Windowpane flounder length frequencies, spring, 1 cm intervals, 1989, 1990, 1994-2021.**

*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	2019	2020	2021	
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	0	0	-	0
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	0	-	0	
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	6	-	0	
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	11	-	0	
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	21	-	3	
9	0	40	16	3	2	9	5	2	11	10	21	20	11	0	18	6	10	13	24	16	4	31	1	133	34	31	32	-	9		
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	28	-	15	
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	19	-	23	
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	-	18	
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	3	-	12	
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	1	-	9	
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	3	-	4	
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	4	-	5	
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	9	-	7	
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	20	-	6	
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	39	-	4	
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	77	-	14	
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	82	-	18	
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	96	-	35	
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	112	-	46	
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	143	-	82	
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	126	-	59	
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	97	-	74	
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	85	-	44	
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	60	-	37	
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	38	-	30	
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	23	-	7	
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	15	-	3	
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	6	-	6	
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	1	-	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	1	-	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	1	-	0	
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	-	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	1	-	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	-	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	-	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	
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	
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	-	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>	<b>1,173</b>	<b>-</b>	<b>574</b>	

**Table 5.62. Windowpane flounder length frequencies, fall, 1 cm intervals, 1989, 1990, 1994-2021.**

*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	2019	2020	2021	
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	0	0	-	0
7	5	0	5	0	6	0	1	0	0	0	0	2	0	0	0	0	4	-	1	0	0	0	0	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	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	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	0	-	3	
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	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	3	-	2	
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	1	-	2	
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	1	-	4	
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	7	-	3	
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	7	-	4	
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	11	-	5	
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	27	-	9	
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	28	-	4	
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	36	-	9	
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	21	-	16	
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	12	-	9	
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	12	-	18	
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	16	-	21	
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	20	-	26	
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	15	-	17	
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	12	-	28	
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	11	-	15	
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	7	-	20	
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	1	-	12	
31	0	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	2	-	5
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	0	1	1	-	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	0	1	-	1
<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>	<b>252</b>	<b>-</b>	<b>236</b>	

**Table 5.63. Winter flounder length frequencies, April-May, 1 cm intervals, 1984-2021.**

*Winter flounder were measured from every tow.*

length	April-May																																											
	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	2019	2020	2021						
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	0	0	0	-	0			
6	0	0	0	0	0	0	0	0	0	7	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	
7	0	0	0	0	0	0	0	0	0	36	4	2	3	0	0	1	0	2	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
8	0	0	5	8	3	1	10	3	1	72	26	28	4	2	5	7	2	5	0	1	5	5	0	1	6	2	1	1	0	0	1	0	1	0	1	0	0	0	0	0	0	-	0	
9	1	7	6	52	16	17	38	29	7	208	41	97	21	15	41	18	3	20	4	2	22	32	0	2	19	13	7	6	7	0	6	4	4	0	0	0	1	0	0	0	-	0		
10	3	9	35	49	29	70	139	54	18	433	137	307	61	75	128	50	23	55	5	11	36	73	5	10	85	42	35	21	22	3	12	6	7	0	6	3	0	0	0	-	2			
11	26	28	188	114	135	312	375	121	75	698	442	618	246	260	283	135	84	161	34	28	129	164	6	37	238	147	117	67	72	12	20	28	22	0	15	15	-	1						
12	35	127	455	239	359	628	1,117	228	136	921	835	877	461	528	492	252	145	256	88	57	174	278	55	73	367	229	179	113	139	20	46	37	28	0	34	22	-	8						
13	149	284	617	483	869	954	2,563	342	170	713	1,006	772	582	497	554	252	169	239	148	50	188	337	48	91	322	220	174	110	162	12	33	42	51	0	25	17	-	9						
14	196	219	733	820	1,378	1,260	3,243	729	180	528	1,149	854	788	517	488	225	185	223	132	54	132	209	39	80	233	169	152	107	128	16	20	42	48	2	14	14	-	11						
15	255	308	808	1,060	1,882	1,424	3,847	1,127	254	526	1,487	792	956	484	481	204	177	162	148	50	81	163	19	80	142	119	146	68	101	25	24	27	39	2	8	10	-	9						
16	177	467	771	1,033	1,819	1,579	3,627	1,169	323	485	1,680	766	992	553	574	214	210	159	174	66	53	128	16	163	136	155	109	53	67	39	12	10	29	1	2	10	-	12						
17	182	473	763	1,028	1,953	1,651	3,544	1,568	373	501	1,540	698	1,099	599	713	290	254	245	160	76	41	122	40	180	74	147	112	53	60	52	17	19	21	0	3	9	-	8						
18	153	574	730	1,006	1,507	1,724	3,145	1,648	398	580	1,467	692	1,149	666	658	313	248	251	206	86	65	108	52	203	85	237	138	73	65	99	13	30	20	0	5	6	-	2						
19	117	794	780	855	1,596	1,532	3,054	1,690	397	542	1,217	632	1,032	574	622	283	327	313	317	142	72	117	41	242	94	214	130	73	58	99	11	26	28	2	8	20	-	12						
20	169	607	665	666	1,136	1,462	2,434	1,676	344	624	896	515	1,012	529	685	296	311	362	364	174	59	148	65	246	51	232	166	101	110	108	12	22	16	2	9	12	-	4						
21	108	591	600	592	1,045	1,358	1,904	1,493	277	626	742	469	821	429	592	320	314	308	353	127	79	125	54	194	59	166	109	122	122	77	8	18	22	2	4	14	-	6						
22	104	486	534	552	963	1,407	1,481	1,332	302	549	556	367	795	444	524	218	289	306	353	87	53	69	45	156	56	129	108	118	133	66	24	15	22	1	6	14	-	10						
23	63	479	521	442	897	1,160	1,416	1,099	212	426	359	346	676	402	486	290	266	233	337	84	48	71	28	135	67	100	72	84	141	41	21	13	15	0	8	9	-	13						
24	81	346	427	377	748	971	1,092	1,113	278	418	310	311	701	401	544	260	218	205	395	79	47	51	22	128	55	48	89	109	82	34	28	14	27	3	9	9	-	6						
25	74	318	341	374	520	1,015	1,018	939	202	349	296	318	692	377	529	344	228	244	311	97	46	49	28	137	60	44	92	105	69	35	40	13	25	3	12	11	-	7						
26	90	187	375	333	541	982	846	858	242	383	219	231	719	461	527	300	223	249	285	129	61	36	13	144	62	42	58	95	58	35	35	10	25	1	6	11	-	4						
27	62	232	240	281	420	736	639	788	181	320	216	318	568	496	505	360	251	259	259	150	84	36	23	168	81	39	67	102	82	50	58	7	20	1	12	14	-	5						
28	43	129	244	230	366	648	586	598	181	197	173	260	549	416	518	418	252	311	187	170	92	25	29	168	84	35	75	72	52	51	66	14	34	3	7	6	-	8						
29	29	86	189	220	253	502	525	511	160	221	122	244	460	401	466	389	285	326	248	200	103	32	17	200	73	28	77	81	70	78	66	22	38	4	15	12	-	3						
30	42	70	178	154	266	339	305	397	133	178	103	180	540	365	448	362	279	299	215	206	96	35	20	186	86	28	52	72	58	47	71	22	34	2	18	11	-	7						
31	24	71	124	151	120	247	307	241	96	200	117	130	367	313	323	321	300	286	201	166	112	33	27	136	93	32	55	58	56	59	81	38	17	4	18	9	-	12						
32	20	85	77	113	169	163	171	157	98	142	91	76	375	260	277	249	227	228	171	167	95	38	28	133	87	42	45	65	47	61	60	48	33	3	16	19	-	5						
33	7	69	86	61	111	73	218	108	60	139	72	63	267	193	195	228	262	172	155	138	122	45	20	87	90	36	34	79	63	75	69	50	43	0	19	12	-	3						
34	7	45	56	85	69	47	113	107	38	159	65	42	190	166	140	191	220	189	109	116	94	48	20	74	99	43	37	51	51	80	59	69	43	0	18	10	-	3						
35	12	19	42	47	54	68	70	65	35	112	52	30	119	136	136	159	195	189	107	115	88	31	20	50	80	45	28	50	42	76	48	58	53	2	21	10	-	5						
36	4	11	39	53	33	65	44	30	26	79	49	33	84	89	79	103	150	143	94	73	91	34	18	53	61	44	28	26	37	66	42	38	27	0	13	9	-	1						
37	4	8	15	20	25	20	24	25	26	36	25	12	50	68	32	90	120	133	60	53	93	27	15	24	36	20	25	27	27	61	41	31	20	2	6	4	-	2						
38	0	15	17	19	15	18	48	7	4	10	21	16	28	37	35	80	77	59	79	46	25	4	17	18	17	16	23	18	43	32	19	7	0	10	7	-	2							
39	0	4	18	11	22	3	18	13	0	17	15	14	12	18	13	18	54	70	24	44	56	25	6	9	6	9	14	16	18	27	28	9	9	0	3	0	-	1						
40	0	0	18	8	9	8	12	9	3	3	16	7	13	10	5	20	16	35	32	38	34	11	3	2	7	5	19	16	7	29	22	12	8	0	2	4	-	0						
41	0	0	1	2	6	7	3	1	0	5	6	3	1	6	3	14	20	26	11	17	18	7	5	9	5	4	9	7	2	21	15	1	9	0	4	1	-	0						
42	0	1	3	0	8	3	8	5	0	2	6	3	6	2	2	4	7	10	9	7	9	9	1	9	2	2	2	4	6	2	6	4	5	1	0	3	3	-	0					
43	0	0	2	3	3	0	1	1	0	2	1	0	2	1	0	3	11	3	4	13	1	3	0	3	3	2	1	2	3	7	2	3	1	0	3	3	-	1						
44	0	1	4	0	2	1	1	1	0	0	0	1	3	0	1	3	4	1	1	3	7	2	0	1	1	0	0	1	1	6	4	2	2	0	2	2	2	-	1					
45	0	1	0	1	1	0	8	1	0	0	0	0	0	0	0	1	2	0	3	4	2	2	1	2	2	0	2	2	1	1	1	0	0	0	0	0	1	-	0					
46	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2	0	0	2	1	0	0	1	0	0														

**Table 5.64. Winter flounder length frequencies, fall, 1 cm intervals, 1984-2021.**

*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	2019	2020	2021	
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	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	0	0	0	0	
7	0	0	0	0	1	0	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	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	0	1	0	0	0	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	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	0	0	0	0	0	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	0	2	0	0	0	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	0	2	4	0	1	3	0	0	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	0	5	14	0	3	8	0	0	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	0	7	38	1	3	12	6	0	0	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	0	19	59	3	7	12	11	0	2	1	0		
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	0	28	62	3	12	21	5	1	0	4	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	0	22	61	5	9	10	1	0	0	1	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	0	25	50	6	12	9	5	1	0	3	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	0	18	26	4	10	9	7	0	1	0	0		
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	0	11	25	3	8	4	4	1	0	0	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	0	11	16	0	8	9	4	0	1	0	0		
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	0	5	15	3	3	10	6	1	0	1	0	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	0	7	22	2	2	3	1	0	2	1	0	0	
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	0	4	20	4	4	10	6	0	0	0	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	0	4	30	2	5	5	3	1	0	1	0	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	0	2	20	5	2	2	1	1	1	0	0	0	
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	0	7	20	3	9	2	5	1	1	0	0	0	
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	0	6	16	2	3	1	4	2	0	0	0	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	0	5	7	3	4	4	2	1	1	0	0	0	
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	0	3	5	4	5	3	5	1	1	0	0	0	
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	0	2	7	1	2	5	5	1	1	0	0	0	
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	0	2	7	3	1	3	0	0	0	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	0	2	4	1	2	5	2	0	1	0	0	0	0
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	0	3	4	1	1	1	1	1	0	1	0	0	0
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	0	1	5	1	2	2	2	0	1	0	0	0	
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	0	4	0	1	2	0	2	1	1	0	0	0	
37	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	1	3	1	3	1	2	2	0	1	3	2	0	2	2	0	2	3	5	0	1	1	0	0
38	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	1	5	4	2	2	0	0	4	2	0	0	1	4	0	1	8	3	0	0	0	0	0	
39	2	0	0	0	0	0	0	0	0	3	0	0	0	1	0	1	3	5	0	2	2	0	0	2	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
40	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	0	0	1	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	3	0	2	0	0	0	0	0	0	0	0	1	1	0	2	1	0	0	0	0	0	0
42	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
43	0	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	0	3	0	0	0	0	1	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	0	1	0	0	0	0	1	0	0	0
45	0	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	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	0	0	1	0	0	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	0	211	547	61	128	170	97	13	17	14	0	42	

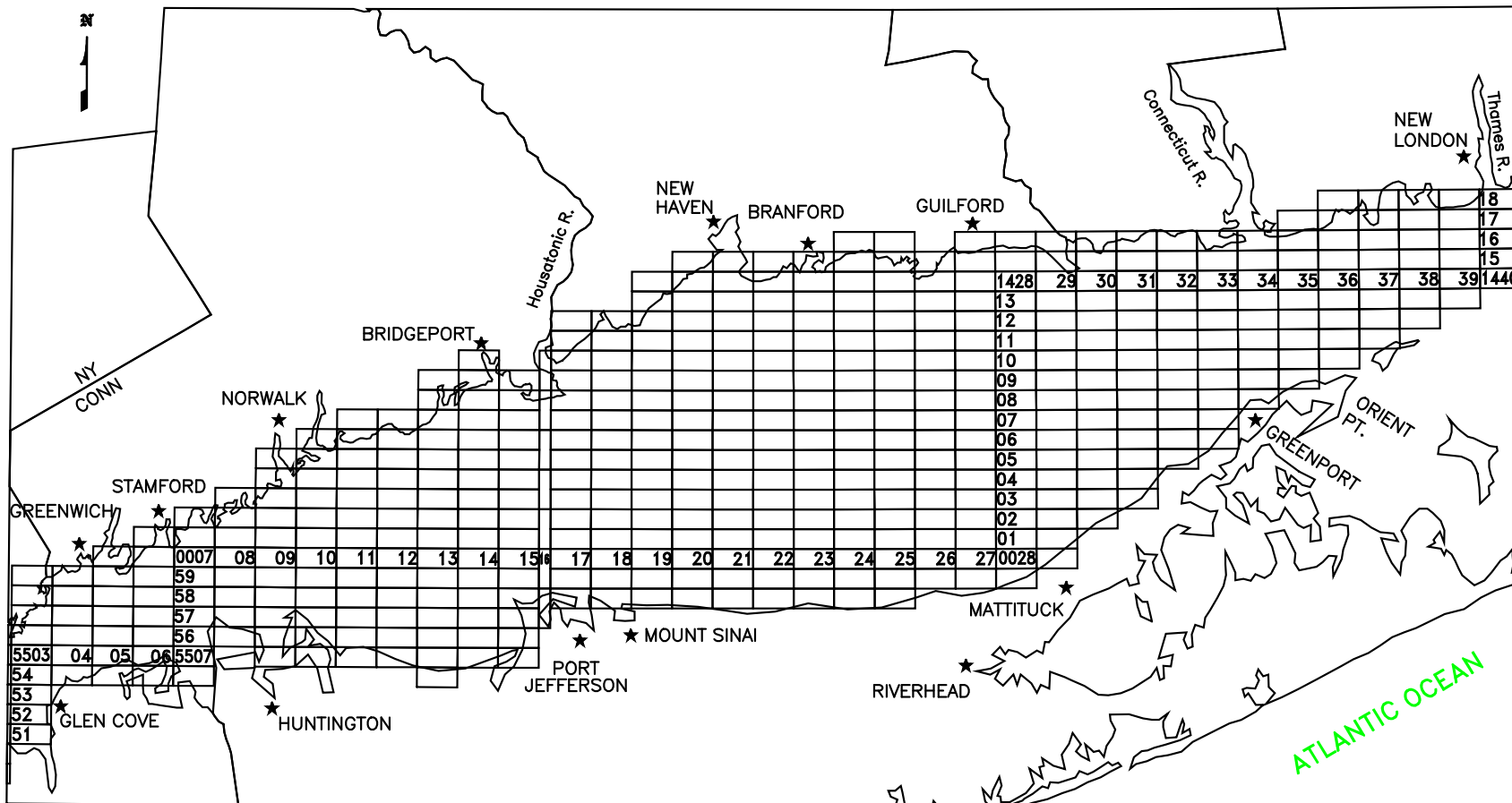
**Table 5.65. Winter skate length frequencies, spring and fall, 2 cm intervals (midpoint given), 1995-2021.**  
*Winter skate were scheduled to be measured from every tow. However, the following numbers of skate were not measured: 4 in 1995, 10 in 1996, and 2 in 1997.*

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	2019	2020	2021	
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	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
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	1	-	0
33	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	-	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	0	1	2	-	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	0	-	3	
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	5	-	6	
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	2	-	0	
43	0	0	0	0	0	3	0	1	2	4	1	0	0	1	2	1	0	9	3	0	0	0	0	0	0	-	2	
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	1	-	2	
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	0	-	0	
49	0	0	0	0	0	2	0	0	1	2	1	1	1	2	2	0	0	3	2	7	1	0	0	0	2	-	1	
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	3	-	3	
53	0	0	0	0	1	3	1	0	1	0	0	1	1	0	1	0	0	3	3	6	2	1	0	0	2	-	0	
55	0	0	2	3	1	1	0	0	1	1	1	4	3	0	1	0	0	2	5	5	4	1	0	0	0	-	1	
57	1	2	4	3	2	0	0	0	6	0	0	1	2	1	3	0	2	4	2	3	1	1	0	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	3	-	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	1	-	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	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	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	3	-	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	0	-	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	3	-	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	1	-	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	2	-	0	
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	2	-	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	3	-	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	0	-	1	
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	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	0	-	0	
87	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	-	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	0	-	1	
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	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	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	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	39	-	21	

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	2019	2020	2021
37	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
39	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	-	0	2	0	0	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	0	-	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	0	-	1
45	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	-	0	4	3	2	1	0	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	0	-	1
49	1	5	1	0	0	0	0	0	0	0	1	0	0	0	0	-	0	1	4	1	0	0	0	0	0	-	0
51	0	0	1	0	2	0	2	0	0	0	0	0	0	1	0	-	0	2	1	0	0	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	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	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	0	-	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	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	0	-	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	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	0	-	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	0	-	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	0	-	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	0	-	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	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	0	-	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	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	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	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	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	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	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	1	-	2

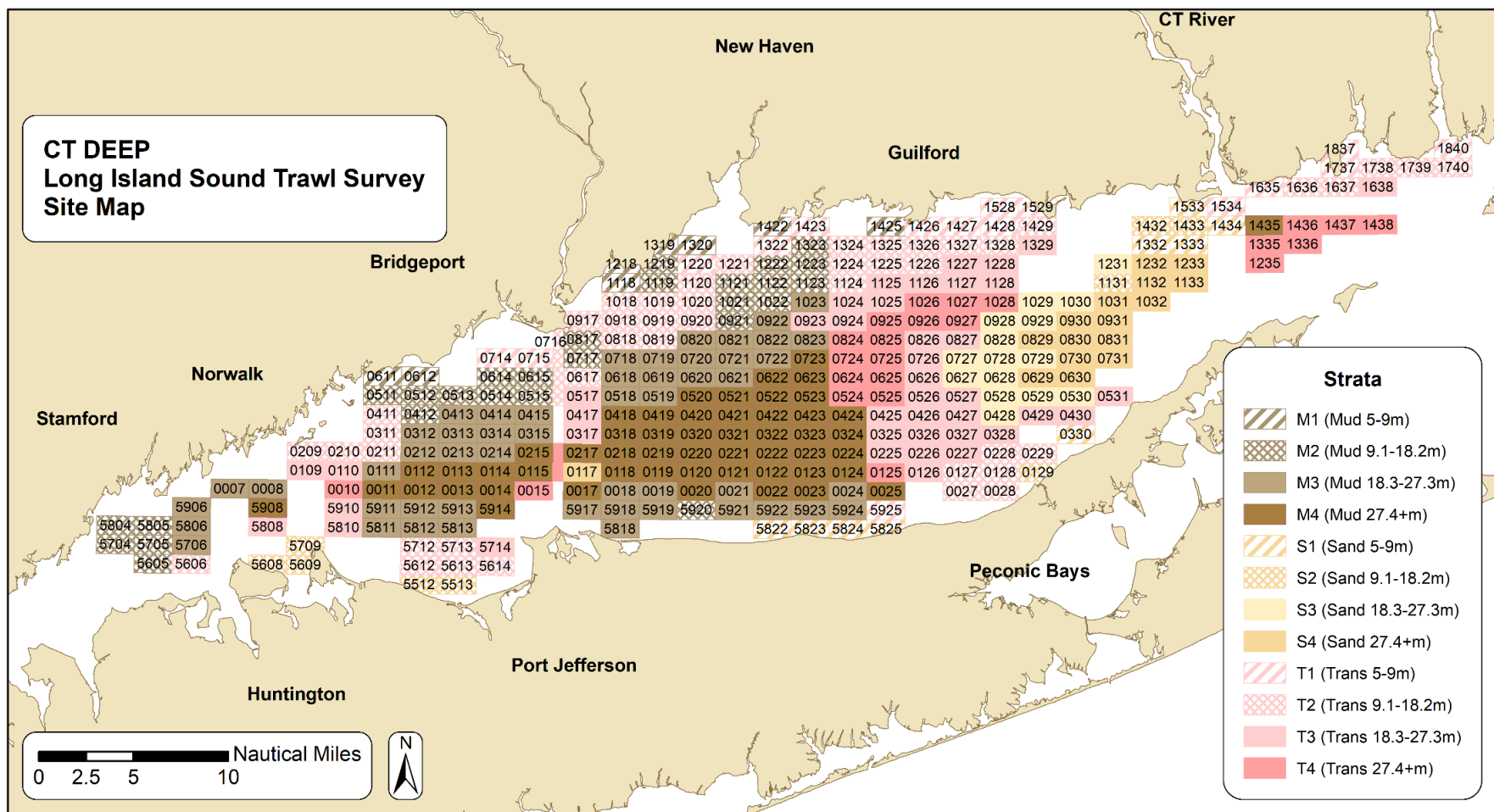
**FIGURES 5.1 - 5.18  
LISTS**





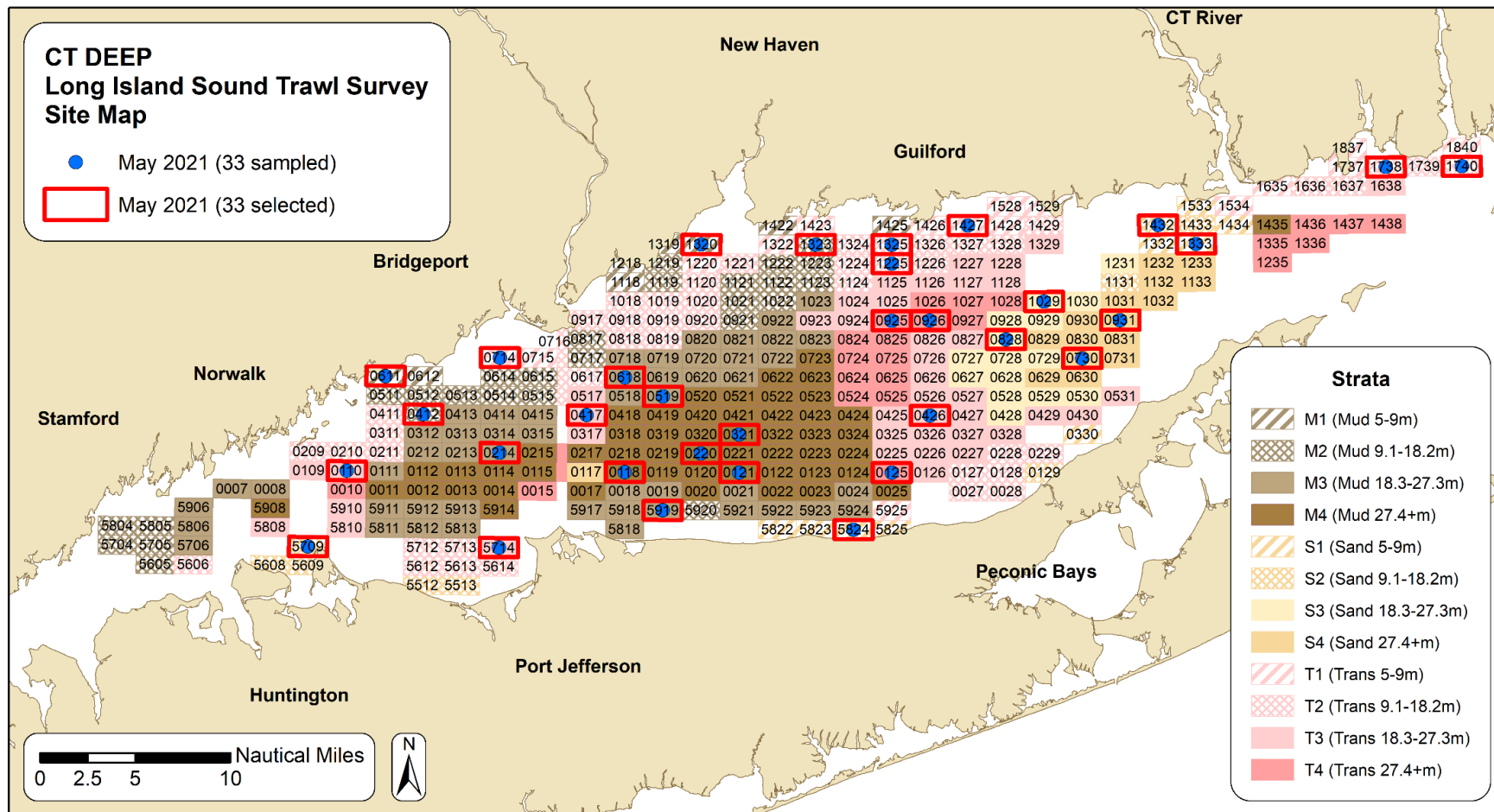
**Figure 5.1. Trawl Survey site grid.** Each sampling site is 1x2 nmi (nautical miles). A four-digit number identifies the site: the first two digits are the row numbers (corresponding to minutes of latitude) and the last two digits are the column numbers (corresponding to two nautical miles in length 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 2021 sites selected and sampled. No sites were sampled during April 2021 due to COVID-19 related issues.



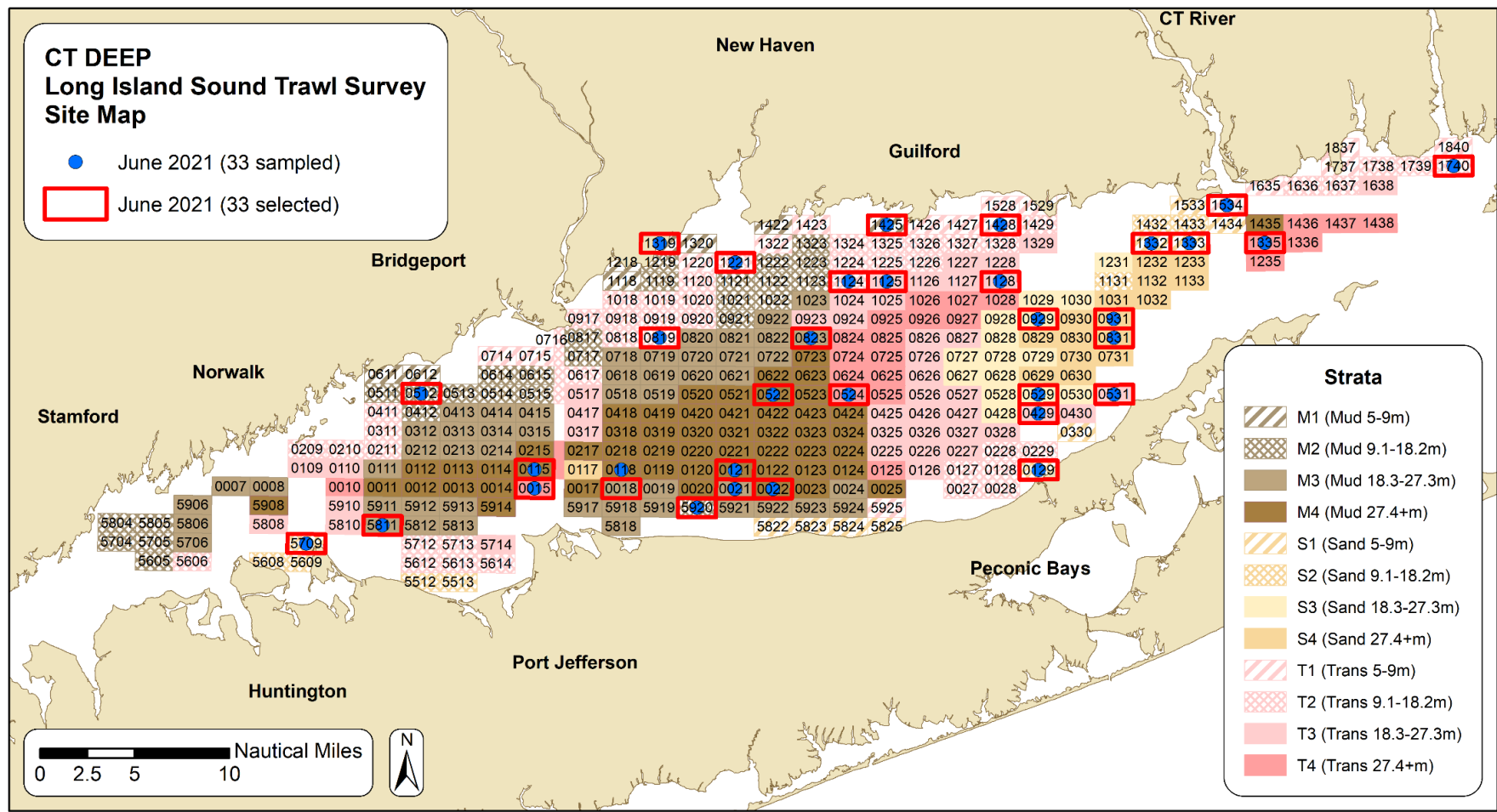
Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
					No sites were attempted during this cruise

**Figure 5.3. May 2021 sites selected and sampled.** A reduced number of sites (n=33) were selected this month due to COVID-19, as explained in text. 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.



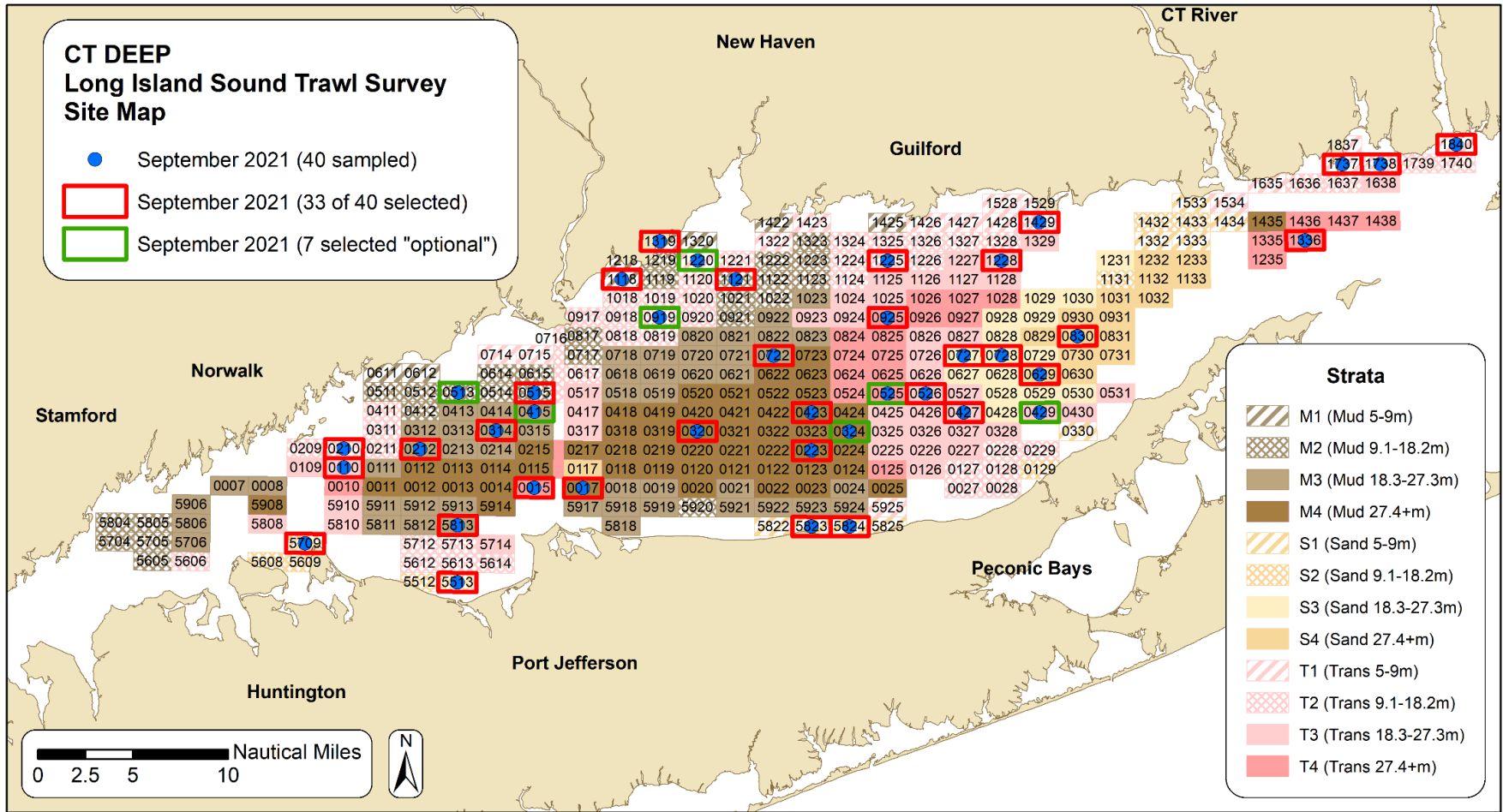
Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
					No sites were moved during this cruise

**Figure 5.4. June 2021 sites selected and sampled.** A reduced number of sites (n=33) were selected this month due to COVID-19, as explained in text. 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
SP2021042	0118	M4	0018	M3	wrong site & stratum was towed by mistake

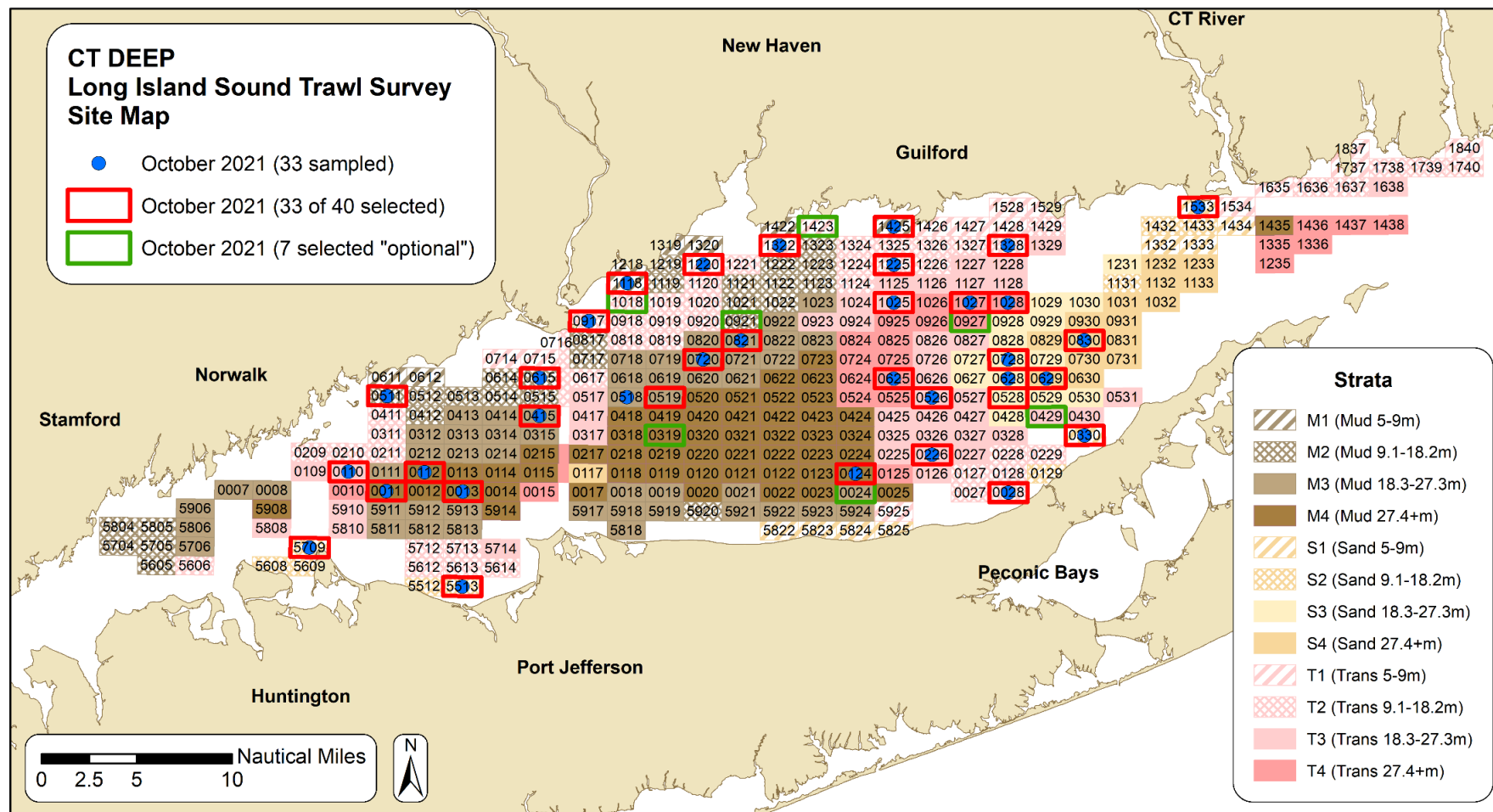
**Figure 5.5. September 2021 sites selected and sampled.** The standard 40 sites were selected for this month. The red outlined rectangles are the 33 of the 40 sites selected to allow for reduced sampling if needed, as described in text. The green outlined rectangles are the remaining 7 sites selected that were considered “optional” and to be done if time permitted after completing the first 33 (red) sites. 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
					No sites were moved during this cruise

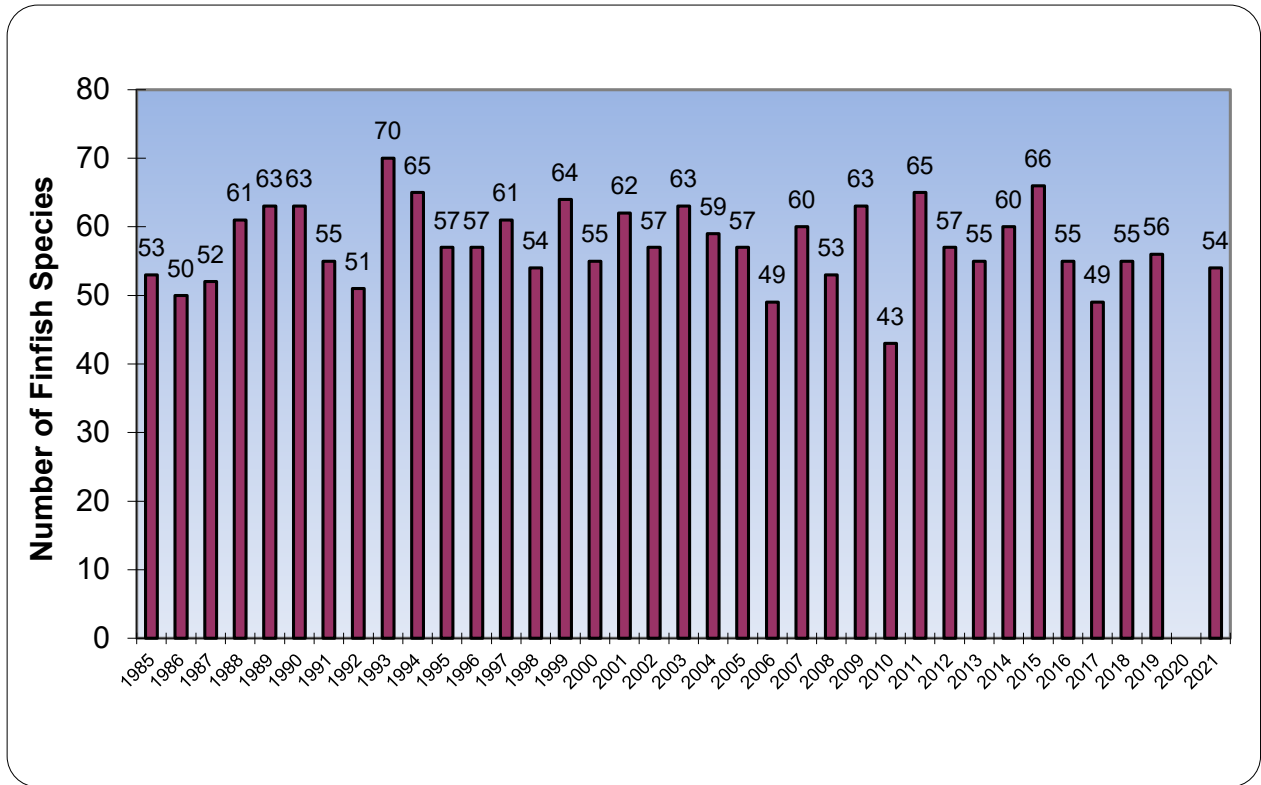


**Figure 5.6. October 2021 sites selected and sampled.** The standard 40 sites were selected for this month. The red outlined rectangles are the 33 of the 40 sites selected to allow for reduced sampling if needed, as described in text. The green outlined rectangles are the remaining 7 sites selected that were considered “optional” and to be done if time permitted after completing the first 33 (red) sites. 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.

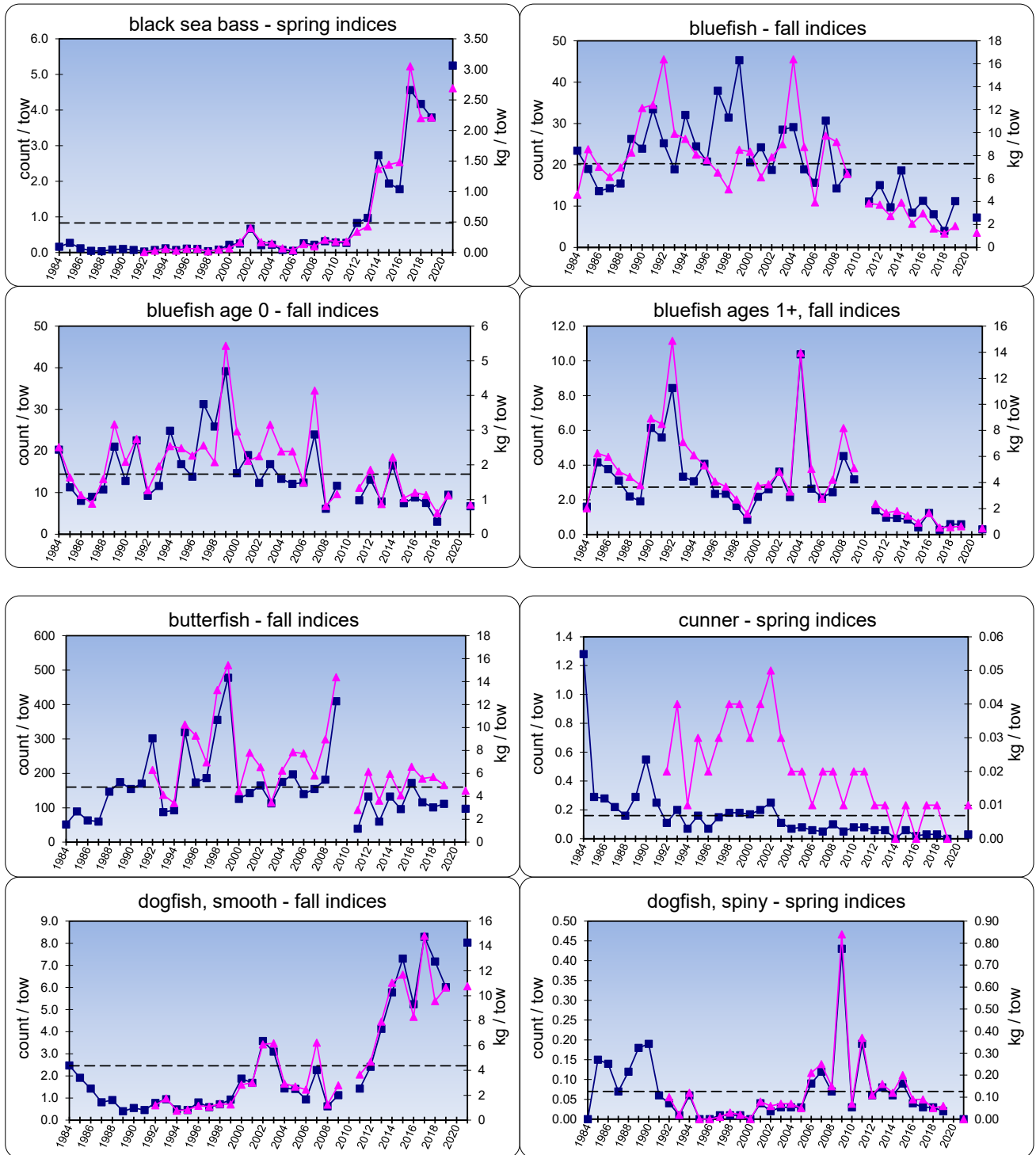


Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
FA2021052	0628	S3	0528	S3	attempted 0528 but lots of pots in area & snagged pots 25 minutes into tow, so moved site
FA2021072	0518	M3	0519	M3	realized while towing that tow was being done at wrong site, so moved site to match location

**Figure 5.7. Number of finfish species observed annually, 1984-2021.** *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 57.3 for the time-series*



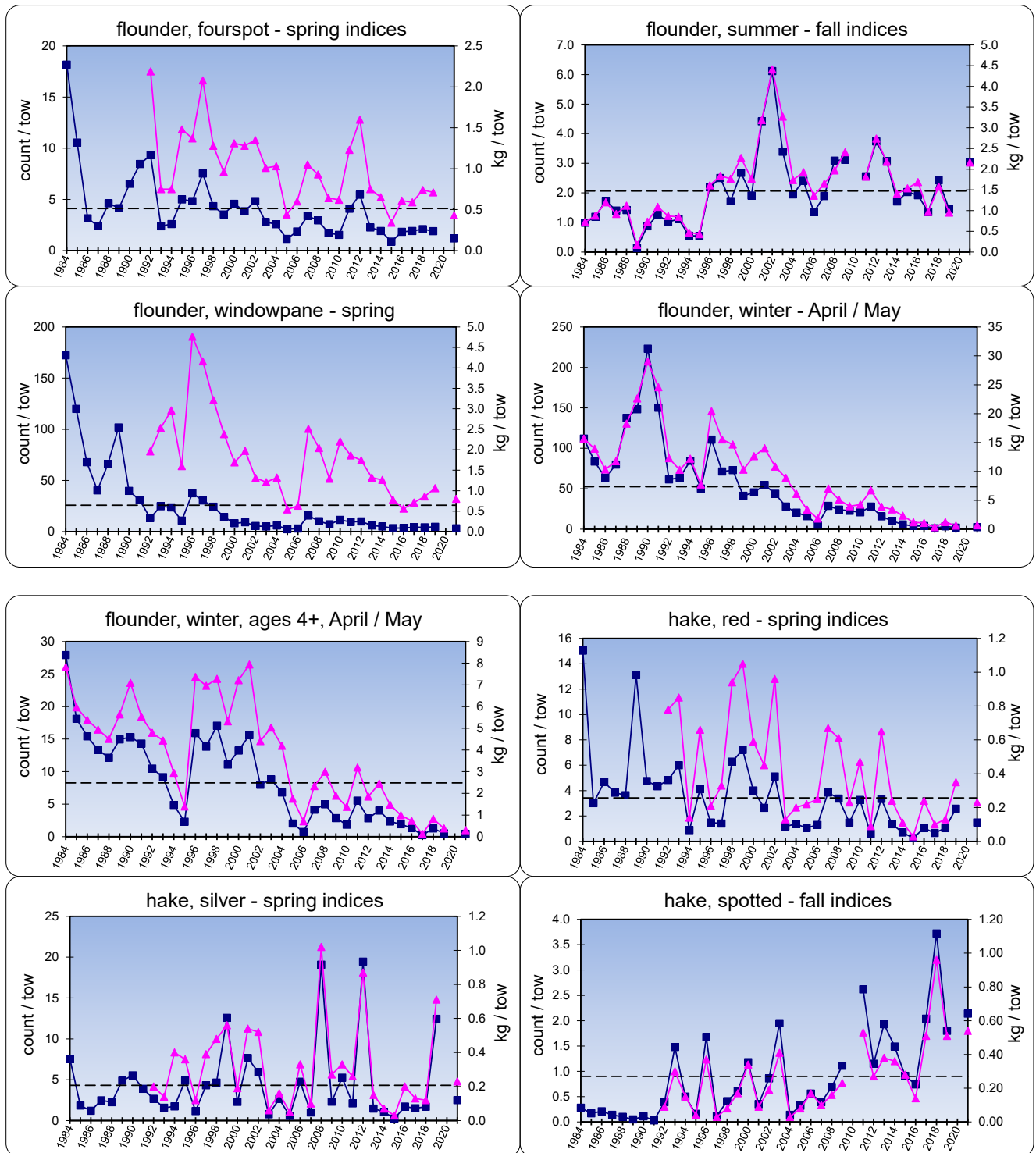
**Figure 5.8. Plots of abundance indices for: black sea bass, bluefish (total, age 0, and ages 1+), butterfish, cunner, and dogfish (smooth and spiny).**



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

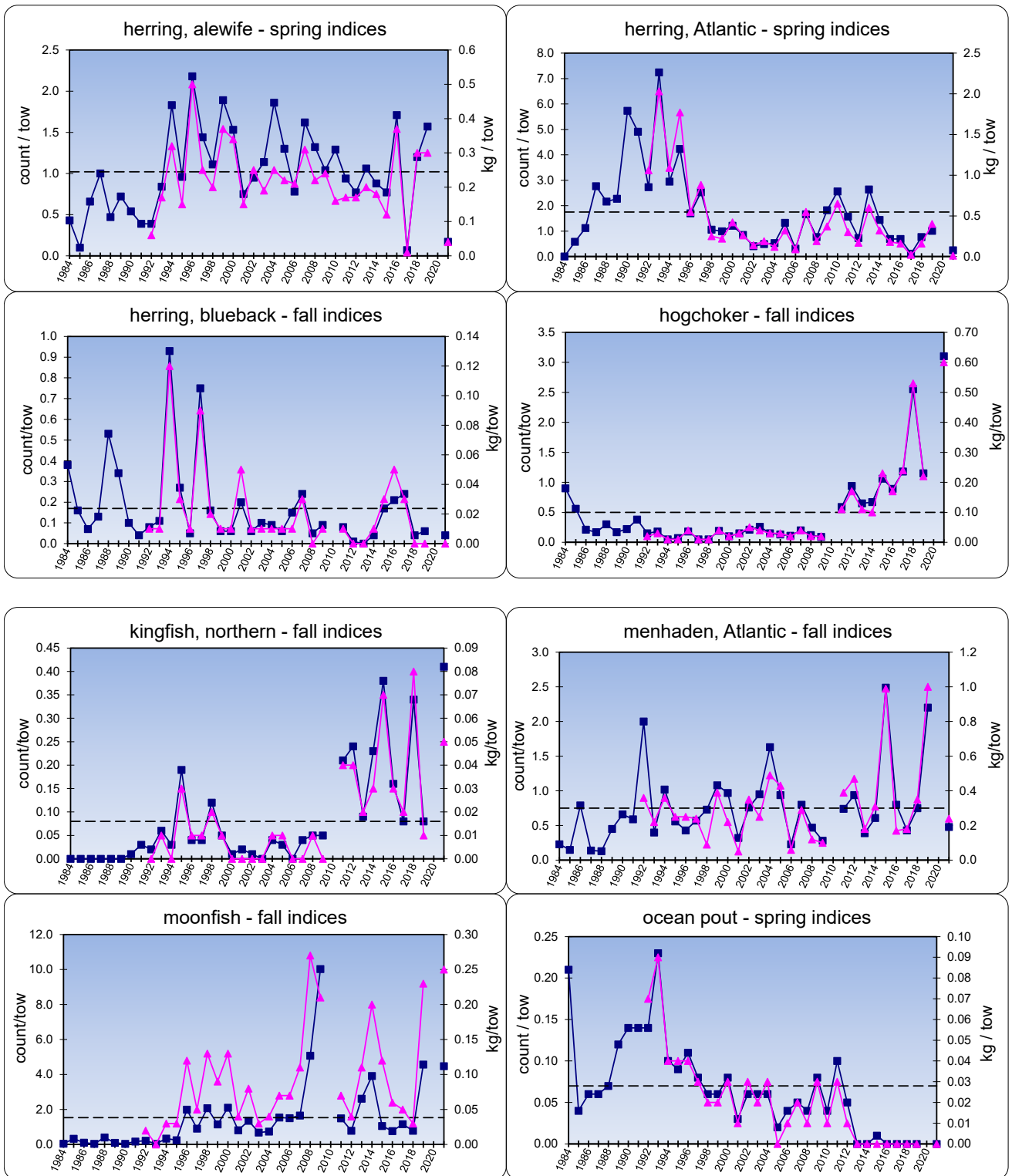


**Figure 5.9. Plots of abundance indices for: flounders (fourspot, summer, windowpane, winter, and winter ages 4+) and hakes (red, silver, and spotted).**



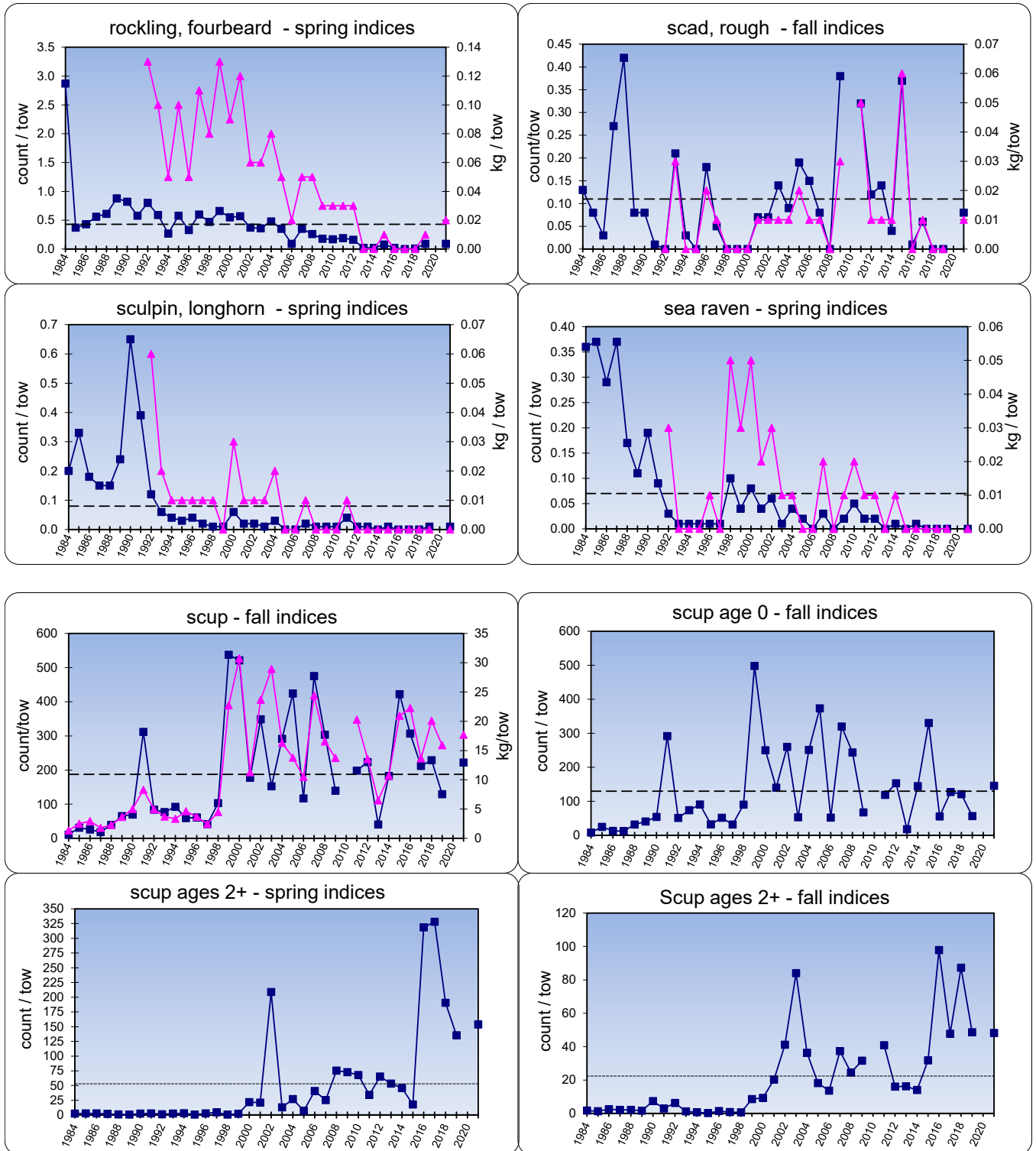
Legend:  
■ = count / tow  
▲ = kg / tow  
 ---- = mean count / tow

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



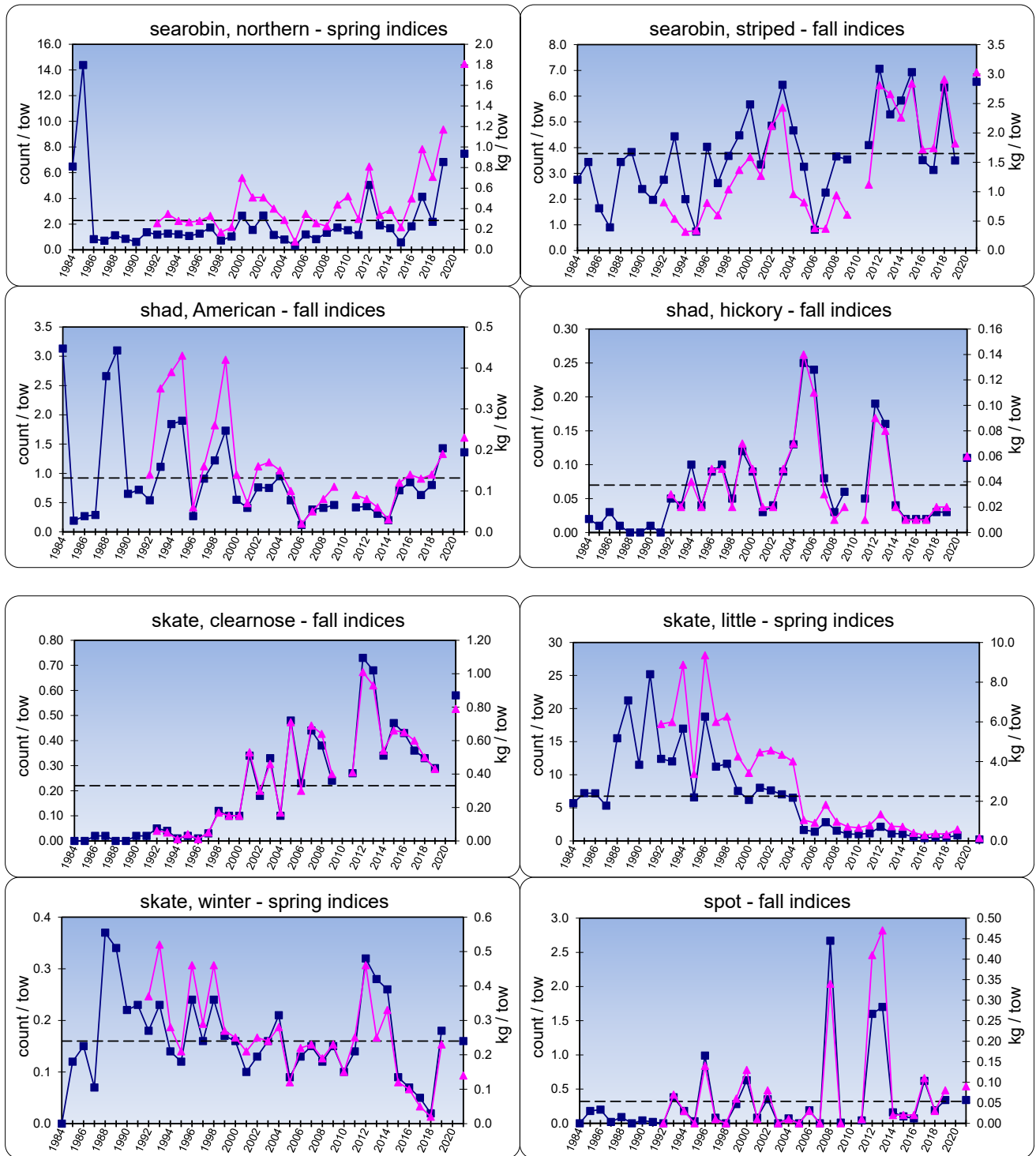
Legend:  
■ = count / tow  
▲ = kg / tow  
 --- = mean count / tow

**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+).**



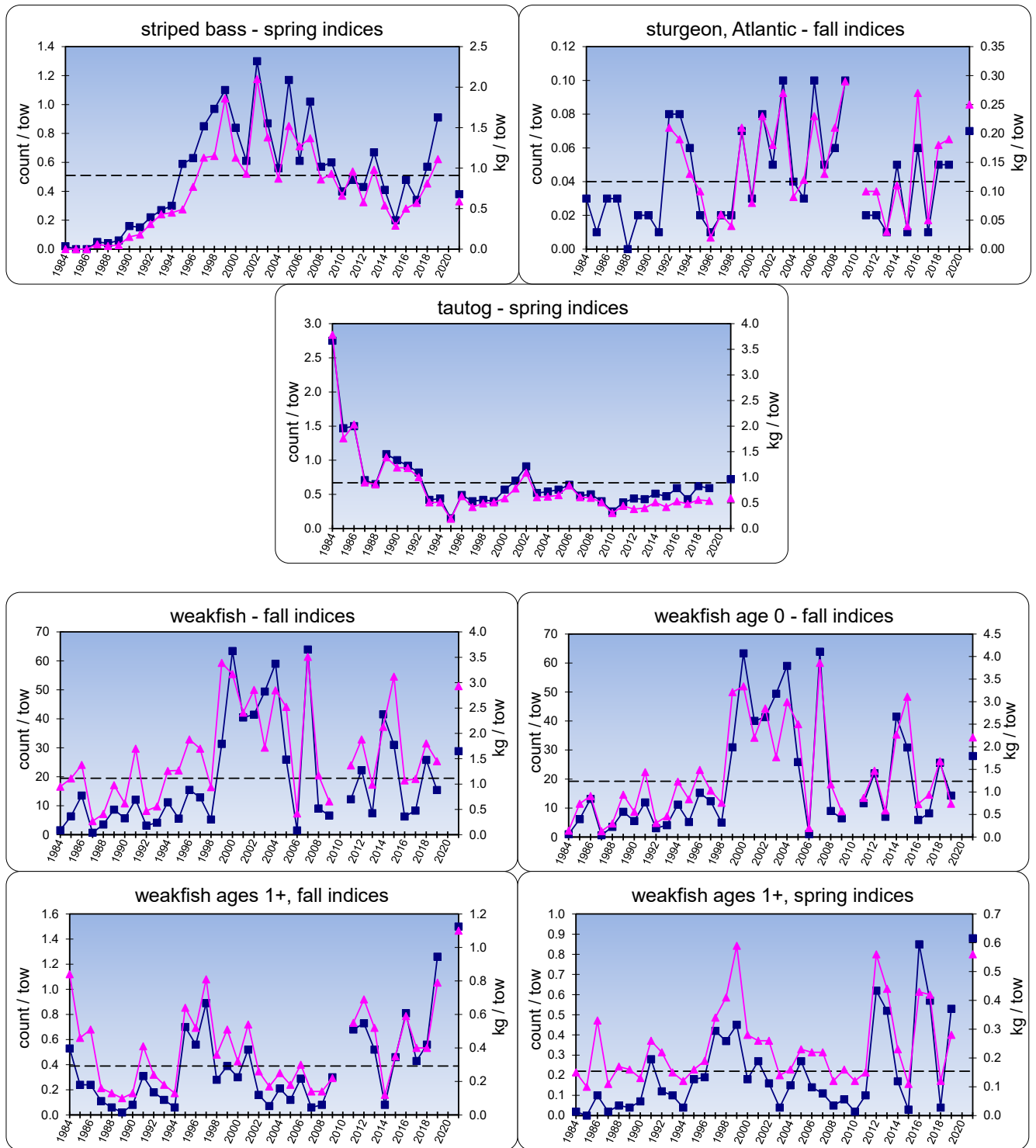
Legend:  
■ = count / tow  
▲ = kg / tow  
 ---- = mean count / tow

**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

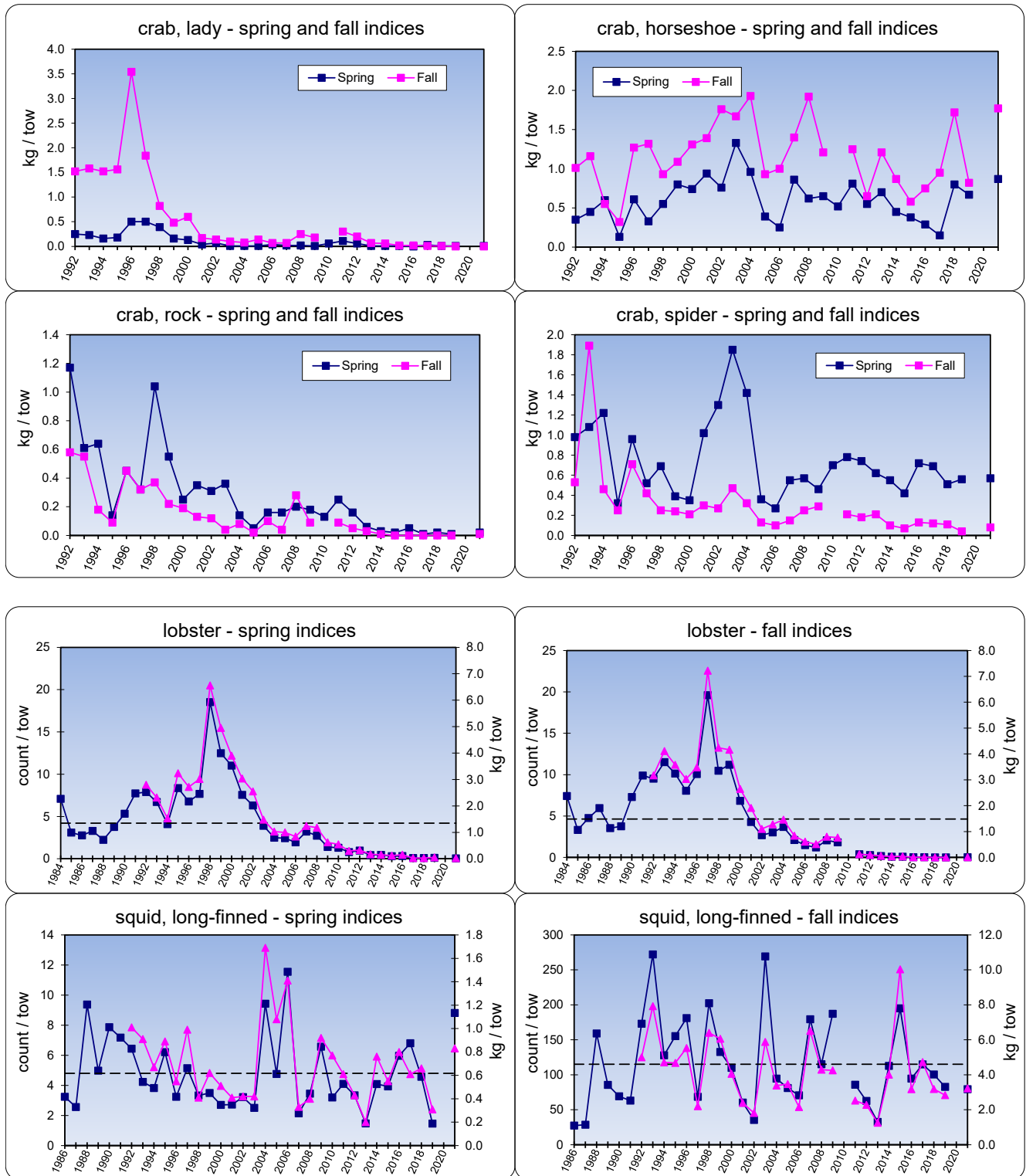
Figure 5.13. Plots of abundance indices for: striped bass, Atlantic sturgeon, tautog, and weakfish (all ages, age 0, and ages 1+).



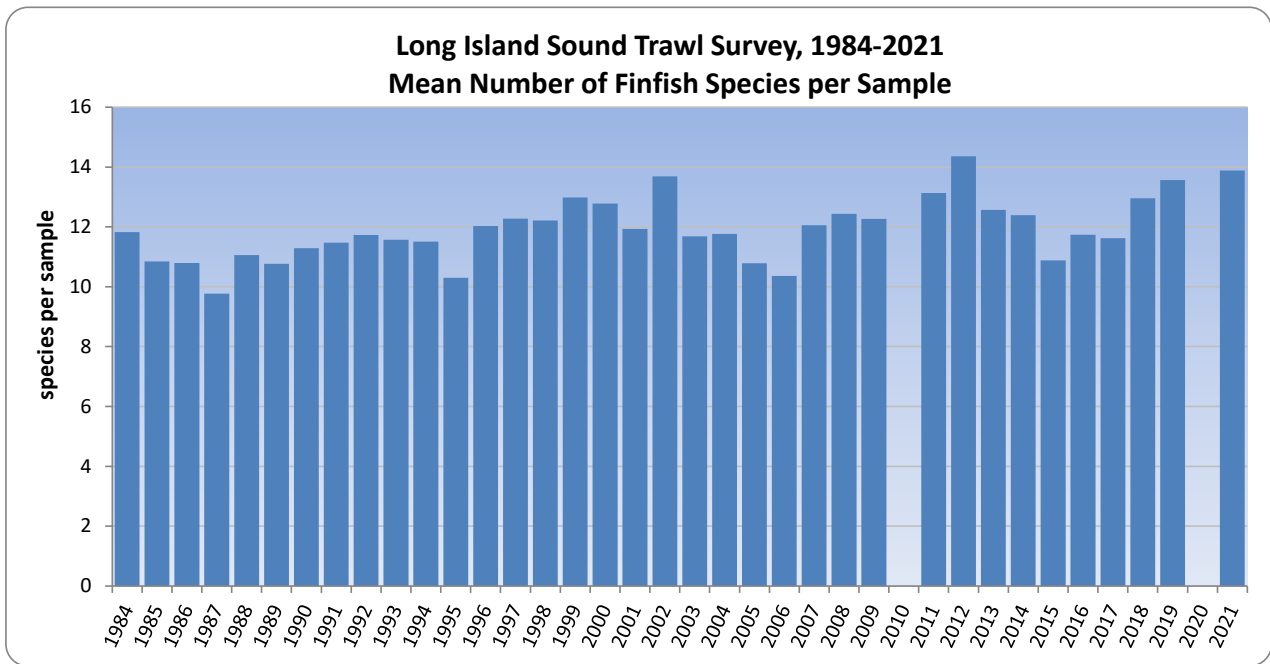
Legend:

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

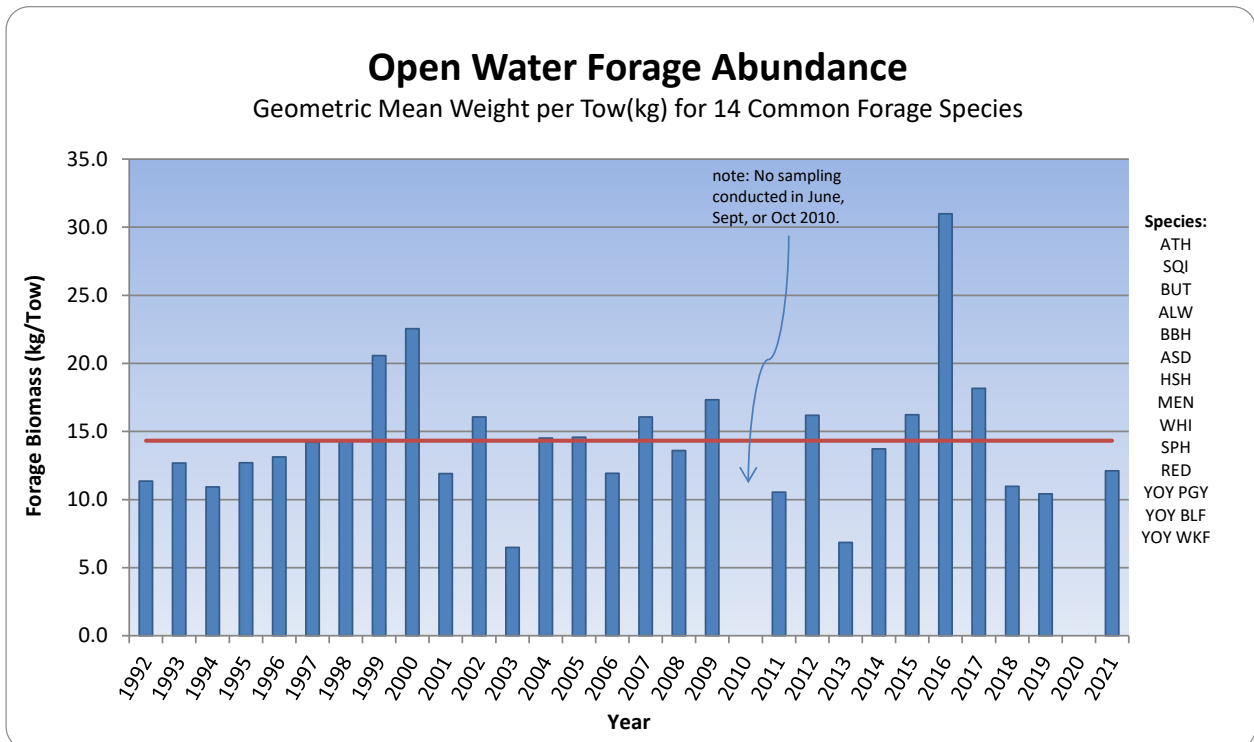
**Figure 5.14. Plots of abundance and biomass indices for: crabs (lady, rock, and spider), horseshoe crab, American lobster, and long-finned squid.**



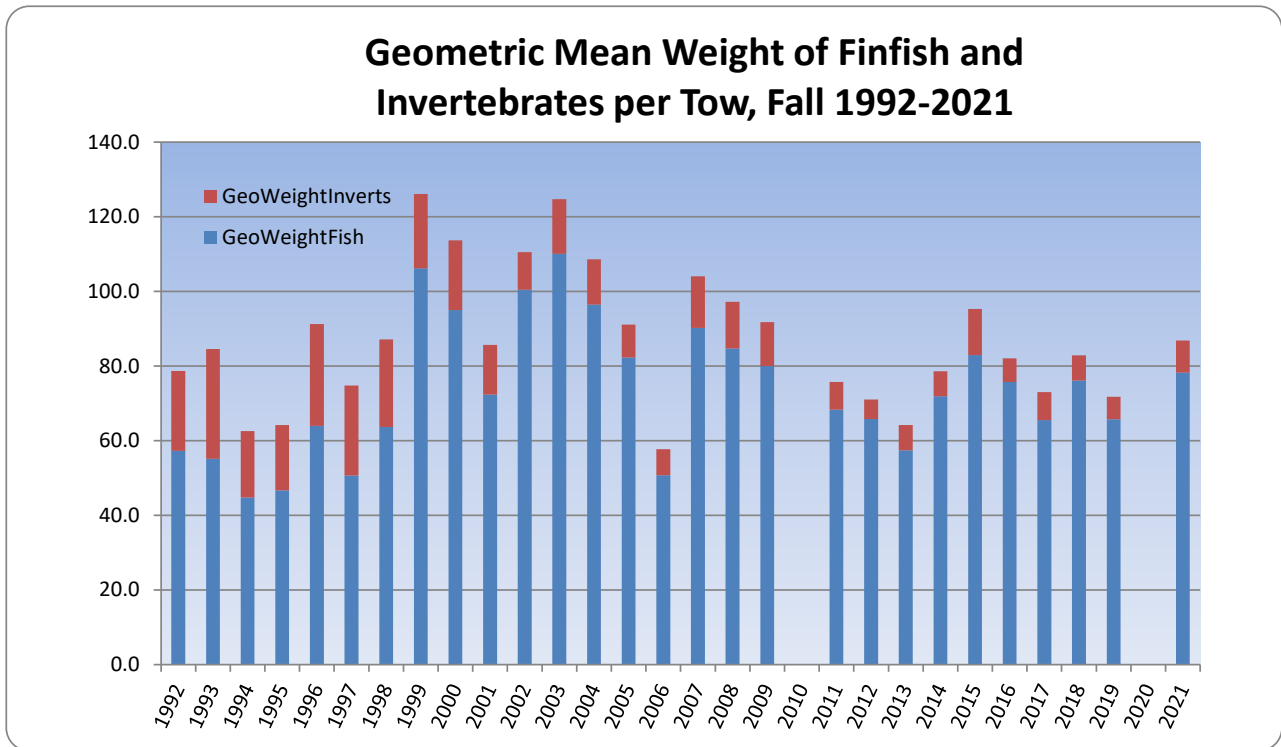
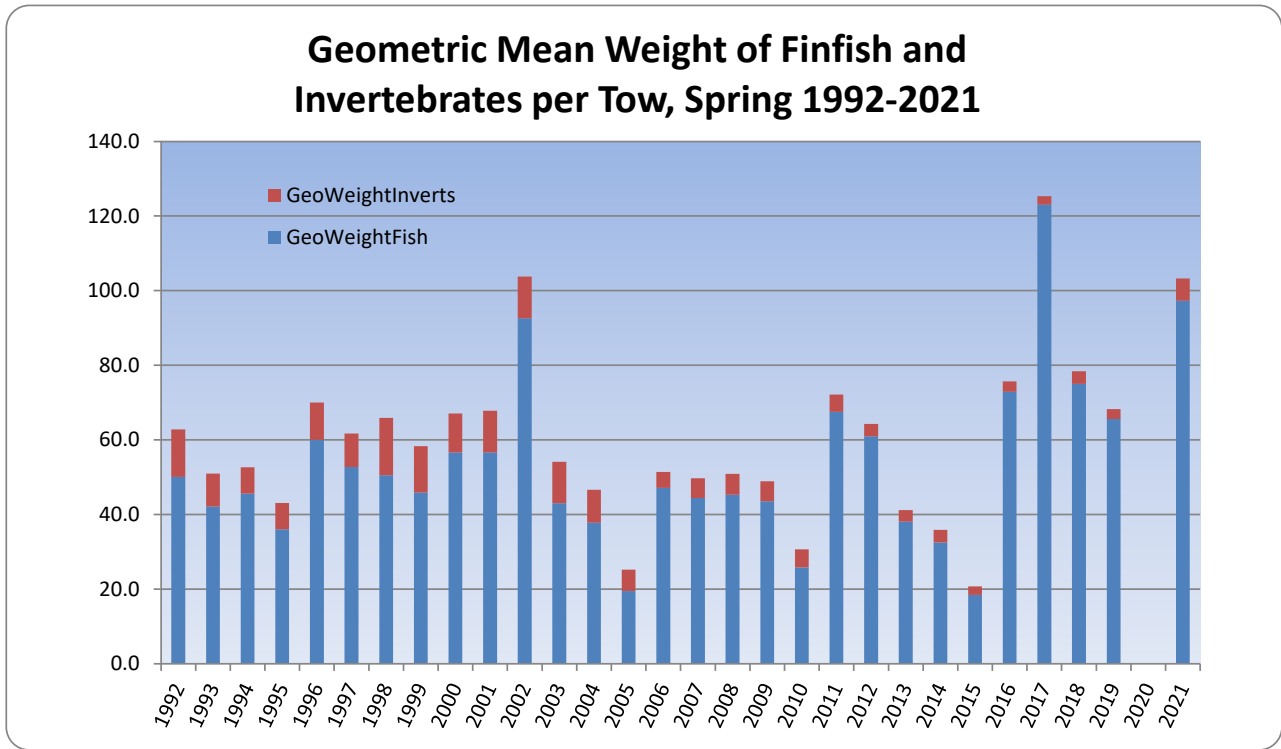
**Figure 5.15. Mean number of finfish species per sample, spring and fall, 1984-2021.** This index measures the diversity of species supported within the Sound's various habitats.



**Figure 5.16. Open water forage abundance, 1992-2021.** 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 14.33 kg/tow (red line).

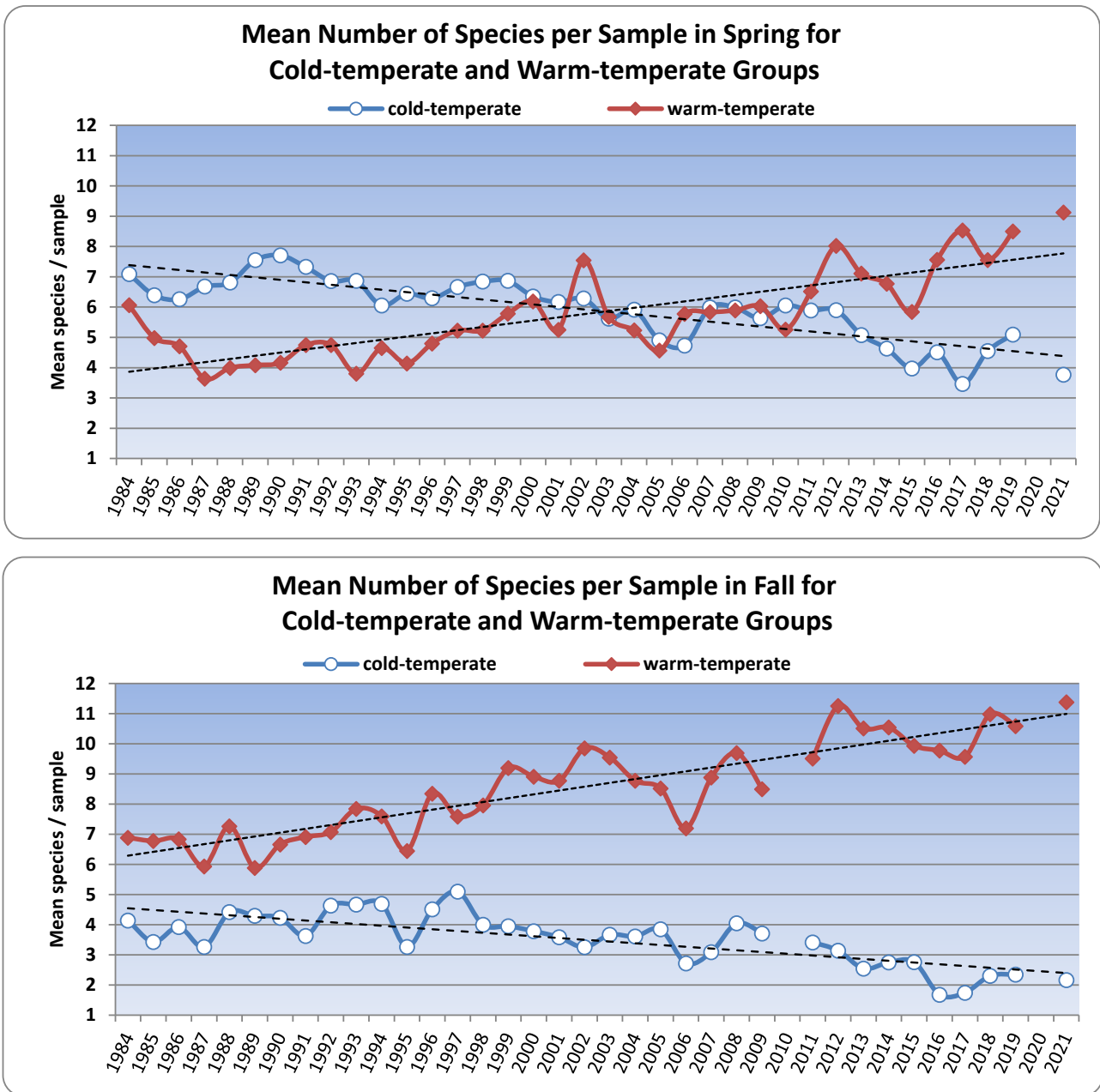


**Figure 5.17. Geometric mean biomass of finfish and invertebrates per sample, spring and fall, 1992-2021.**  
 This index measures the diversity of species supported within the Sound's various habitats.





**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-twelve (112) finfish species from 1984-2021.

*This appendix contains a list of 157 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
cusk-eel, fawn	<i>Lepophidium profundorum</i>	LISTS
cusk-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.

Common Name	Scientific Name	Survey
Puffer, smooth	<i>Lagocephalus laevigatus</i>	LISTS
pumpkinseed	<i>Lepomis gibbosus</i>	ESS;ISS;NCA;TN;CTR
radiated shanny	<i>Ulvaria subbifurcata</i>	SNFH
ray, bluntnose 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>Hemitripterus americanus</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. Annual total count of finfish, lobster, horseshoe crab and squid taken in the LISTS, 1984-2021.

Counts include all tows- number of tows conducted shown in second row. Refer to Appendix 5.4 for details on number of tows conducted per month. Note: nc = not counted. Anchovy spp., (yoy), Atlantic herring (yoy), and sand lance, (yoy) are estimated.

Common name (number of tows)	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	2019	2020	2021	Total				
	200	246	316	320	320	320	297	200	160	240	240	200	200	200	200	200	200	200	200	200	199	200	120	200	160	200	144	172	200	200	199	200	196	144	172	200	0	139	7,838				
anchovy, bay	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	548	2,303	443	992	2,434	1,523	814	1,492	2,440	1,128	11,128	475	4,693	1,296	1,350	1,424	399	1,239	1,069	641	1,346	-	1,618	40,785				
anchovy, striped	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	11	0	216	0	47	0	2	0	0	0	6	1	5	0	1	3	1	0	2	8	0	222	21	-	326	872				
anchovy, spp (yoy-est)	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	2,667	15,700	935	1,515	3,410	13,110	3,254	2,179	1,267	8,537	1,135	0	2,382	93	2,004	9,786	19,220	2,536	12,888	2,492	1,391	-	243	106,744				
bigeye	0	0	0	1	2	2	1	0	0	0	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	-	0	15				
black sea bass	1	2	0	0	1	2	0	0	0	1	1	0	3	2	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	21		
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	0	0	0	0	0	0	4			
blue runner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	34	0	24	27	0	10	68	15	1	195	59	-	13	451				
bluefish	9,927	8,946	5,712	3,517	12,568	8,195	5,845	5,269	6,469	16,245	5,524	6,705	10,815	8,814	7,843	6,135	3,986	3,450	3,766	6,504	6,532	2,100	9,378	1,699	3,657	2	2,765	3,851	1,829	4,457	2,650	2,793	2,408	702	2,048	-	1,203	198,164					
bonito, Atlantic	0	2	0	1	1	1	0	0	0	2	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	9			
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	0	0	0	0	0	0	0	0	1	3		
butterfish	37,137	67,944	44,624	42,519	60,746	94,928	80,778	40,537	95,961	67,087	54,378	64,930	49,360	70,985	136,926	191,100	60,490	45,264	66,550	36,133	94,735	92,996	50,022	49,137	48,766	108,087	2,894	42,141	60,539	29,569	69,372	53,265	65,596	35,814	42,025	43,434	-	38,461	2,335,230				
cod, Atlantic	0	0	0	0	0	0	1	0	0	0	0	2	0	1	0	0	1	0	0	58	33	10	0	0	15	21	109	0	0	5	5	1	4	11	15	-	14	307					
Gadus spp. (yoy/larvae)	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	34	8	17	0	0	5	16	2	0	17	7	-	3	145				
coronatedfish, red	0	0	0	0	0	1	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	14	0	0	0	0	0	0	0	17			
coronatedfish, 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	1		
crab, horseshoe	0	0	0	0	0	0	0	0	0	0	0	0	0	204	303	384	420	503	517	450	534	161	109	333	289	340	58	257	199	265	261	159	164	112	264	218	-	339	6,841				
croaker, Atlantic	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	1	0	0	1	2	6	0	0	1	0	0	0	0	56			
cunner	359	98	97	129	72	268	196	75	30	65	25	41	17	43	65	51	50	51	55	42	21	24	8	16	26	18	11	14	20	2	13	4	4	4	0	0	0	0	5	2,037			
cusck-eeel, fawn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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		
cusck-eeel, striped	0	0	0	0	1	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	1	0	5
dogfish, smooth	846	919	850	526	564	374	284	193	304	420	361	168	275	167	310	305	467	598	1,019	570	503	467	332	580	328	588	10	613	610	1,051	1,197	1,438	1,338	1,624	1,598	1,243	-	1,728	24,788				
dogfish, spiny	89	252	173	76	434	99	417	14	6	14	58	0	1	7	18	10	4	48	17	85	38	41	11	32	35	148	3	58	16	21	15	19	9	3	5	4	-	0	2,281				
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	2	
eel, American	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	0	0	0	0	0	0	0	0	0	0	10		
eel, american (yoy/larvae)	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	4
eel, conger	0	0	0	0	0	0	0	0	1	3	0	2	1	0	0	2	0	2	0	3	0	0	0	0	0	0	0	3	1	1	0	1	0	0	0	0	0	2	-	1	23		
eel, conger (yoy/larvae)	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	3
filefish, orange	0	1	0	0	0	1	0	0	0	1	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	4	
filefish, planehead	4	20	1	0	25	13	23	1	0	10	1	0	3	0	0	0	1	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121	
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
flounder, fourspot	2,691	2,759	2,126	2,112	4,653	2,924	4,698	3,553	2,774	1,447	1,674	2,584	2,815	4,122	1,908	1,393	2,590	2,167	1,859	1,877	1,406	688	466	1,094	902	1,036	402	1,400	2,597	1,144	820	386	1,056	366	711	570	-	224	67,993				
flounder, smallmouth	2	0	2	15	39	13	4	20	12	30	17	19	41	58	97	96	61	98	139	49	50	44	7	48	89	96	31	67	258	128	152	73	148	44	86	186	-	191	2,509				
flounder, summer	208	249	716	531	414	47	242	263	186	293	282	121	434	486	436	582	555	875	1,356	1,181	644	506	203	733	477	881	517	1,051	980	1,071	859	808	462	354	753	1,309	-	796	21,889				
flounder, winter	26,200	18,936	22,514	15,588	26,919	31,082	14,738	8,482	2,980	8,526	6,678	3,815	14,116	10,324	6,483	4,643	2,488	3,065	1,991	2,177	2,275	1,982	1,077	4,051	3,511	2,496	2,850	2,831	3,536	2,096	2,191	1,150	1,593	974	1,266	1,427	-	812	267,881				
flounder, yellowtail	13,921	13,851	19,033	22,696	36,706	45,563	59,981	26,623	9,548	16,843	21,481	15,558	22,722	14,701	15,697	10,288	8,867	9,826	6,884	4,676	4,021	4,692	1,699	4,550	4,973	4,068	2,579	3,092	3,565	1,912	1,372	1,340	1,108	112	500	422	-	266	435,533				
glassseye snapper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	
goatfish, dwarf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	
goatfish, red	1	0	0	0	0	0	2	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	0	0	0	0	0	0	0	0	1	0
goby, naked	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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
goosefish	1	8	1	1	1	15	3	8	10	4	8	4	1																														



Appendix 5.2 cont.

Total count of finfish, lobster, horseshoe crab and squid taken in the LISTS, 1984-2021.

<u>Year</u>	<u>Tows</u>	<u>Total Count</u>
1984	200	122,527
1985	246	152,574
1986	316	153,383
1987	320	136,139
1988	320	216,479
1989	320	294,027
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
2019	200	146,967
2020	0	-
2021	139	135,078
	<u>7,638</u>	<u>7,040,447</u>





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	2019	2020	2021	Total
	160	240	240	200	200	200	200	200	200	200	200	200	199	200	120	200	160	200	78	172	200	200	199	200	196	144	172	200	0	139	5,419
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	3.7	-	0.3	19.7	
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	280.7	-	95.3	2,769.1
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	22.6	-	28.6	254.7
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	0.0	0.1	0.1	0.0	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	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	0.0	-	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	0.2	-	0.0	5.0
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	0.0	-	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	0.2	-	0.0	5.3
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	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	0.0	-	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	1.4	-	2.1	18.6
puffer, smooth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	0.0	-	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	0.0	0.0	0.0	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	16.8	-	0.0	194.9
rockling, 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	1.3	-	1.2	228.9
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	0.4	0.0	0.0	0.0	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	0.0	-	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	0.0	-	0.1	26.3
sand lance, (yo-y - 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	0.0	-	0.1	11.4
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	0.0	0.3	0.0	0.0	0.0	0.0	-	0.2	2.5
scad, macdonell	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	0.0	-	0.4	1.5
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	0.0	-	0.5	34.6
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	0.1	0.1	0.0	0.0	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	0.1	-	0.3	37.6
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	11,169.0	-	8,184.6	163,219.8
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	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	0.0	-	0.0	3.8
sea turtle, loggerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	136.1
seahorse, lined	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	0.0	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	450.5	-	727.1	5,552.5
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	1,264.4	-	1,281.7	20,444.8
sesunil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	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	-	0.0	0.7
senneil, 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	0.0	0.7	0.0	0.2	0.0	0.4	0.0	0.1	0.3	0.0	0.0	0.2	0.0	0.0	0.1	-	0.0	3.0
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	32.3	-	26.6	1,207.2
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	0.0	-	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	3.1	-	9.1	291.7
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	0.0	0.0	0.0	-	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	0.0	-	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	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.0	0.0	0.3	0.1	0.4	0.3	0.0	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	0.0	-	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	213.8	-	278.7	3,679.5
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																							

**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>Invertebrates</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.*

<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	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>Invertebrates</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.*

<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	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.*

<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	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>		-	
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>		-	



**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>			-
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>			-

**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.*

<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	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					
summer flounder	224	0.2	137.9	1.1	<b>Invertebrates</b>				
tautog	157	0.1	308.2	2.6	American lobster	10,306	20.6	2,173.5	34.4
Spanish mackerel	136	0.1	2.2	0	long-finned squid	39,723	79.4	1,176.5	18.6
blueback herring	96	0.1	4.3	0	blue mussel	nc	nc	945.1	15.0
rough scad	92	0.1	3.8	0	horseshoe crab	nc	nc	673.8	10.7
striped bass	78	0.1	198.7	1.7	spider crab	nc	nc	511.2	8.1
ocean pout	66	0.1	16.4	0.1	lady crab	nc	nc	428.0	6.8
cunner	64	0.1	6.1	0.1	rock crab	nc	nc	155.9	2.5
Atlantic sturgeon	60	0.1	633.6	5.3	flat claw hermit crab	nc	nc	45.7	0.7
winter skate	59	0.1	213.2	1.8	starfish spp.	nc	nc	37.4	0.6
spot	57	0.1	4.5	0	boring sponge	nc	nc	36.6	0.6
hogchoker	56	0.1	5.2	0	whelks	nc	nc	34.0	0.5
Atlantic silverside	54	0.1	1.0	0	mantis shrimp	nc	nc	31.6	0.5
northern puffer	23	0	0.4	0	lion's mane jellyfish	nc	nc	27.6	0.4
smallmouth flounder	23	0	2.1	0	bluecrab	nc	nc	20.0	0.3
Atlantic croaker	20	0	1.1	0	northern moon snail	nc	nc	8.9	0.1
black sea bass	16	0	5.0	0	common oyster	nc	nc	2.0	0
spiny dogfish	14	0	58.4	0.5	surf clam	nc	nc	1.0	0
Atlantic mackerel	11	0	0.9	0	hard clams	nc	nc	0.9	0
longhorn sculpin	11	0	3.2	0	purple sea urchin	nc	nc	0.7	0
planehead filefish	9	0	0.7	0	arks	nc	nc	0.7	0
hickory shad	9	0	4.1	0	mud crabs	nc	nc	0.4	0
northern pipefish	9	0	0.4	0	star coral	nc	nc	0.3	0
rainbow smelt	9	0	0.6	0	blood star	nc	nc	0.2	0
crevalle jack	5	0	0.4	0	common slipper shell	nc	nc	0.2	0
northern kingfish	5	0	0.6	0	sand shrimp	nc	nc	0.1	0
Atlantic tomcod	5	0	0.8	0	sand dollar	nc	nc	0.1	0
clearnose skate	4	0	7.7	0.1	northern red shrimp	nc	nc	0.1	0
white perch	4	0	0.3	0	polychaetes	nc	nc	0.1	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					
summer flounder	242	0.2	141.6	1.2	<b>Invertebrates</b>				
tautog	207	0.2	346.5	2.8	American lobster	7,057	31.6	1,533.9	38.6
spotted hake	148	0.1	25.7	0.2	long-finned squid	15,299	68.4	594.8	15.0
moonfish	93	0.1	2.6	0	horseshoe crab	nc	nc	386.7	9.7
fourbeard rockling	92	0.1	8.4	0.1	blue mussel	nc	nc	377.5	9.5
striped bass	81	0.1	198.6	1.6	lady crab	nc	nc	338.5	8.5
Atlantic sturgeon	60	0.1	848.6	6.9	spider crab	nc	nc	335.0	8.4
spiny dogfish	55	0	186.2	1.5	rock crab	nc	nc	136.8	3.4
ocean pout	42	0	9.1	0.1	starfish spp.	nc	nc	124.6	3.1
hogchoker	36	0	3.8	0	flat claw hermit crab	nc	nc	51.4	1.3
black sea bass	33	0	10.9	0.1	northern moon snail	nc	nc	34.6	0.9
winter skate	33	0	101.5	0.8	common oyster	nc	nc	18.4	0.5
American sand lance	25	0	0.6	0	whelks	nc	nc	14.1	0.4
Spanish mackerel	25	0	1.7	0	mantis shrimp	nc	nc	9.8	0.2
cunner	18	0	1.3	0	lion's mane jellyfish	nc	nc	4.2	0.1
smallmouth flounder	15	0	1.3	0	bluecrab	nc	nc	3.7	0.1
hickory shad	14	0	3.7	0	arks	nc	nc	3.0	0.1
rough scad	13	0	0.2	0	boring sponge	nc	nc	1.9	0
Atlantic mackerel	11	0	0.9	0	hard clams	nc	nc	1.3	0
spot	11	0	1.1	0	bushy bryozoan	nc	nc	0.6	0
rainbow smelt	9	0	0.6	0	mud crabs	nc	nc	0.3	0
crevalle jack	8	0	0.5	0	surf clam	nc	nc	0.3	0
goosefish	8	0	2.0	0	purple sea urchin	nc	nc	0.1	0
northern kingfish	7	0	0.5	0	<b>Total</b>	<b>22,356</b>		<b>3,972</b>	

**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	<b>Invertebrates</b>				
spotted hake	384	0.3	42.6	0.3	American lobster	9,490	29.5	2,113.5	39.1
smooth dogfish	275	0.2	862.8	5.8	lady crab	nc	nc	1,160.4	21.5
striped bass	232	0.2	373.5	2.5	long-finned squid	22,720	70.5	720.4	13.3
spot	195	0.1	14.1	0.1	horseshoe crab	nc	nc	717.0	13.3
tautog	136	0.1	225.9	1.5	spider crab	nc	nc	293.9	5.4
fourbeard rockling	109	0.1	8.6	0.1	rock crab	nc	nc	162.7	3.0
blueback herring	97	0.1	6.2	0	lion's mane jellyfish	nc	nc	42.7	0.8
Atlantic menhaden	88	0.1	40.5	0.3	blue mussel	nc	nc	42.5	0.8
winter skate	88	0.1	212.7	1.4	flat claw hermit crab	nc	nc	39.4	0.7
hogchoker	45	0	5.4	0	whelks	nc	nc	33.0	0.6
smallmouth flounder	41	0	2.3	0	mantis shrimp	nc	nc	20.9	0.4
rough scad	35	0	1.5	0	boring sponge	nc	nc	19.2	0.4
hickory shad	29	0	10.2	0.1	bushy bryozoan	nc	nc	15.2	0.3
black sea bass	27	0	12.1	0.1	starfish spp.	nc	nc	6.2	0.1
ocean pout	26	0	7.2	0	arks	nc	nc	4.3	0.1
cunner	17	0	2.6	0	northern moon snail	nc	nc	4.3	0.1
striped anchovy	11	0	0.2	0	bluecrab	nc	nc	4.0	0.1
longhorn sculpin	7	0	2.1	0	hard clams	nc	nc	3.2	0.1
northern kingfish	6	0	0.6	0	surf clam	nc	nc	1.4	0
yellow jack	6	0	0.5	0	mud crabs	nc	nc	0.3	0
Atlantic mackerel	5	0	0.5	0	purple sea urchin	nc	nc	0.1	0
planehead filefish	3	0	0.3	0	<b>Total</b>	<b>32,210</b>		<b>5,405</b>	
mackerel scad	3	0	0.1	0					

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

**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 bryozoan	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
rougetail 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	unicates, 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.*

<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>
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>Finfish not ranked</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>Invertebrates</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 bryozoan	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					
striped searobin	5,886	2.1	1,964.4	6.9	<b>Finfish not ranked</b>				
weakfish	4,689	1.7	297.6	1.0	anchovy spp, (yoy)				
northern searobin	3,178	1.1	452.1	1.6	Atlantic herring, (yoy)				
alewife	2,811	1.0	132.0	0.5	American sand lance (yoy)				
bluefish	2,793	1.0	1,118.7	3.9	gadid spp, (yoy)				
spotted hake	2,456	0.9	113.8	0.4	<b>Invertebrates</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	Note: nc= not counted				
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>						

**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>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	<b>Total</b>	<b>14,252</b>		<b>1,156.5</b>	
goosefish	1	0.0	0.9	0.0					
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>						

**Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2019.**

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	53,617	40.2	11,169.4	50.3					
butterfish	43,434	32.5	1,114.1	5.0	<b><u>Finfish not ranked</u></b>				
silver hake	4,348	3.3	126.1	0.6	anchovy spp, (yoy)				
weak fish	3,766	2.8	245.5	1.1	Atlantic herring, (yoy)				
striped searobin	3,181	2.4	1,264.4	5.7	American sand lance (yoy)				
northern searobin	3,112	2.3	450.5	2.0	gadid spp, (yoy)				
moonfish	2,270	1.7	22.6	0.1					
bluefish	2,048	1.5	224.5	1.0	<b><u>Invertebrates</u></b>				
spotted hake	2,027	1.5	178.3	0.8	horseshoe crab	218	1.8	391.9	33.3
black sea bass	1,584	1.2	816.7	3.7	longfin inshore squid	10,934	92.1	368.4	31.3
windowpane flounder	1,427	1.1	242.5	1.1	spider crab	nc		115.9	9.9
alewife	1,401	1.0	86.1	0.4	common slipper shell	nc		71.8	6.1
bay anchovy	1,346	1.0	6.6	0.0	lion's mane jellyfish	386	3.3	67.6	5.8
summer flounder	1,309	1.0	464.3	2.1	bushy bryozoan	nc		60.2	5.1
Atlantic herring	1,294	1.0	302.7	1.4	mixed sponge species	nc		43.2	3.7
smooth dogfish	1,243	0.9	2,957.2	13.3	American lobster	25	0.2	7.6	0.6
red hake	1,215	0.9	77.5	0.3	mantis shrimp	223	1.9	7.2	0.6
Atlantic menhaden	815	0.6	280.7	1.3	flat claw hermit crab	nc		6.5	0.6
fourspot flounder	570	0.4	147.8	0.7	hydroid spp.	nc		5.7	0.5
striped bass	535	0.4	773.6	3.5	knobbed whelk	17	0.1	4.8	0.4
American shad	512	0.4	32.4	0.1	blue crab	21	0.2	3.9	0.3
winter flounder	422	0.3	103.1	0.5	common oyster	nc		3.8	0.3
little skate	418	0.3	220.9	1.0	channeled whelk	22	0.2	3.3	0.3
hogchoker	383	0.3	50.8	0.2	sand shrimp	nc		2.5	0.2
tautog	373	0.3	351.9	1.6	rock crab	nc		1.7	0.1
smallmouth flounder	186	0.1	4.1	0.0	hard clams	10	0.1	1.4	0.1
blueback herring	124	0.1	6.0	0.0	lady crab	nc		1.4	0.1
clearnose skate	113	0.1	213.8	1.0	mud crabs	nc		1.3	0.1
spot	66	0.0	8.2	0.0	northern moon snail	nc		1.1	0.1
Spanish mackerel	65	0.0	3.7	0.0	Tubularia, spp.	nc		1.0	0.1
blue runner	59	0.0	3.8	0.0	arks	nc		0.8	0.1
winter skate	41	0.0	72.7	0.3	deadman's fingers sponge	nc		0.6	0.0
striped anchovy	21	0.0	0.4	0.0	blue mussel	nc		0.4	0.0
fourbeard rockling	20	0.0	1.3	0.0	fan worm tubes	nc		0.4	0.0
Atlantic cod	15	0.0	5.1	0.0	star coral	nc		0.3	0.0
northern kingfish	14	0.0	1.9	0.0	comb jelly spp	nc		0.3	0.0
hickory shad	11	0.0	3.1	0.0	sea cucumber	2	0.0	0.2	0.0
Atlantic sturgeon	9	0.0	104.7	0.5	sea grape	nc		0.2	0.0
northern puffer	9	0.0	1.4	0.0	green sea urchin	2	0.0	0.1	0.0
northern pipefish	5	0.0	0.2	0.0	red bearded sponge	nc		0.1	0.0
crevalle jack	4	0.0	0.2	0.0	northern red shrimp	1	0.0	0.1	0.0
spiny dogfish	4	0.0	23.8	0.1	polychaetes	nc		0.1	0.0
oyster toadfish	4	0.0	1.1	0.0	coastal mud shrimp	1	0.0	0.1	0.0
bigeye	3	0.0	0.2	0.0	ghost shrimp	1	0.0	0.1	0.0
conger eel	2	0.0	0.3	0.0	Japanese shore crab	nc		0.1	0.0
fawn cusk-eel	2	0.0	0.1	0.0	moon jelly	nc		0.1	0.0
goosefish	2	0.0	0.8	0.0	starfish spp.	nc		0.1	0.0
inshore lizardfish	2	0.0	0.1	0.0	surf clam	1	0.0	0.1	0.0
white perch	2	0.0	0.2	0.0	purple sea urchin	1	0.0	0.1	0.0
American eel	1	0.0	0.6	0.0	<b>Total</b>	<b>11,865</b>		<b>1,176.2</b>	
planehead filefish	1	0.0	0.1	0.0	Note: nc= not counted				
harvestfish	1	0.0	0.1	0.0					
northern sennet	1	0.0	0.1	0.0					
rougtail stingray	1	0.0	16.8	0.1					
longhorn sculpin	1	0.0	0.1	0.0					
<b>Total</b>	<b>133,439</b>		<b>22,184.7</b>						

**Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2021.**

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)=139.

species	count	%	weight	%	species	count	%	weight	%
scup	54,698	43.9	8,184.6	46.2					
butterfish	38,461	30.9	1,034.9	5.8	<b><u>Finfish not ranked</u></b>				
weakfish	8,661	6.9	612.4	3.5	anchovy spp, (yoy)				
northern searobin	4,135	3.3	727.1	4.1	Atlantic herring, (yoy)				
striped searobin	3,460	2.8	1,281.7	7.2	American sand lance (yoy)				
moonfish	2,255	1.8	28.6	0.2	gadid spp, (yoy)				
smooth dogfish	1,728	1.4	2,909.3	16.4					
bay anchovy	1,618	1.3	6.0	0.0					
bluefish	1,203	1.0	171.0	1.0	<b><u>Invertebrates</u></b>				
black sea bass	1,089	0.9	521.6	2.9	horseshoe crab	339	3.0	583.3	38.4
spotted hake	886	0.7	73.4	0.4	longfin inshore squid	9,652	85.9	360.3	23.7
windowpane flounder	812	0.7	142.8	0.8	boring sponge	nc		153.3	10.1
summer flounder	796	0.6	511.2	2.9	bushy bryozoan	nc		148.6	9.8
hogchoker	704	0.6	87.5	0.5	common slipper shell	nc		81.4	5.4
silver hake	565	0.5	21.2	0.1	spider crab	nc		61.4	4.0
red hake	533	0.4	35.9	0.2	mantis shrimp	813	7.2	27.3	1.8
American shad	403	0.3	26.6	0.2	knobbed whelk	95	0.8	25.3	1.7
striped anchovy	326	0.3	3.7	0.0	flat claw hermit crab	nc		16.0	1.1
Atlantic menhaden	303	0.2	95.3	0.5	lion's mane jellyfish	151	1.3	12.8	0.8
winter flounder	266	0.2	55.9	0.3	channeled whelk	64	0.6	9.9	0.7
tautog	225	0.2	193.9	1.1	blue crab	60	0.5	8.9	0.6
fourspot flounder	224	0.2	51.2	0.3	arks	nc		7.1	0.5
smallmouth flounder	191	0.2	4.3	0.0	hydroid spp.	nc		5.2	0.3
clearnose skate	165	0.1	278.7	1.6	American lobster	6	0.1	2.4	0.2
alewife	125	0.1	7.4	0.0	mud crabs	nc		2.3	0.2
inshore lizardfish	116	0.1	9.3	0.1	hard clams	25	0.2	2.1	0.1
Atlantic herring	114	0.1	0.5	0.0	rock crab	nc		2.0	0.1
striped bass	109	0.1	164.6	0.9	common oyster	nc		1.8	0.1
spot	90	0.1	11.4	0.1	sand shrimp	nc		1.1	0.1
northern kingfish	76	0.1	6.5	0.0	lady crab	nc		0.8	0.1
northern puffer	56	0.0	2.1	0.0	sea grape	nc		0.8	0.1
little skate	51	0.0	25.0	0.1	deadman's fingers sponge	nc		0.6	0.0
hickory shad	24	0.0	9.1	0.1	blue mussel	nc		0.6	0.0
winter skate	23	0.0	21.2	0.1	star coral	nc		0.5	0.0
mackerel scad	21	0.0	0.4	0.0	northern moon snail	nc		0.5	0.0
Atlantic sturgeon	19	0.0	378.6	2.1	purple sea urchin	10	0.1	0.4	0.0
Atlantic cod	14	0.0	2.0	0.0	brown shrimp	16	0.1	0.4	0.0
blue runner	13	0.0	1.0	0.0	mixed sponge species	nc		0.3	0.0
blueback herring	12	0.0	0.4	0.0	fan worm tubes	nc		0.3	0.0
rough scad	11	0.0	0.5	0.0	Tubularia, spp.	nc		0.3	0.0
fourbeard rockling	10	0.0	1.2	0.0	comb jelly spp	nc		0.2	0.0
oyster toadfish	10	0.0	3.8	0.0	rubbery bryzoan	nc		0.2	0.0
cunner	5	0.0	0.9	0.0	tunicates, misc	nc		0.1	0.0
Atlantic mackerel	5	0.0	0.3	0.0	starfish spp.	nc		0.1	0.0
crevalle jack	4	0.0	0.2	0.0	surf clam	2	0.0	0.1	0.0
planehead filefish	4	0.0	0.2	0.0	bay scallop	1	0.0	0.1	0.0
bigeye scad	3	0.0	0.2	0.0	red bearded sponge	nc		0.1	0.0
Spanish mackerel	2	0.0	0.3	0.0	nemerteans	nc		0.1	0.0
conger eel	1	0.0	0.2	0.0	wavy astarte	1	0.0	0.1	0.0
American sand lance	1	0.0	0.1	0.0	<b>Total</b>	<b>11,235</b>		<b>1,518.8</b>	
short bigeye	1	0.0	0.1	0.0	Note: nc= not counted				
striped burrfish	1	0.0	0.3	0.0					
longhorn sculpin	1	0.0	0.3	0.0					
sand tiger shark	1	0.0	8.4	0.0					
<b>Total</b>	<b>124,630</b>		<b>17,715.0</b>						

**Appendix 5.5: Endangered Species Interactions, 2021:** Nineteen (19) Atlantic Sturgeon were captured on eleven (11) of the 139 tows completed in 2021; an encounter rate (7.9%) higher than the average for the LISTS time series of tows (2.4%). The captures occurred at 11 sites in the deeper sand and transition sites off the North shore of Long Island and central Sound. Two (2) loggerhead turtles were captured at 2 sites; and encounter rate of 1%. All encounters were reported to NMFS within 24 hours and all animals were released alive and uninjured. Details are provided below:

Sample	Date	Site	Tow Start	Duration (min)	Species	Total Length (mm)	Standard Length (mm)	Weight (kg)	Left Pec T-bar	Dorsal T-bar	PIT	Tissue Sample	Photo	Release Time	Release Latitude	Release Longitude
SP2021013	5/18/2021	09-26	11:10	30	ATS	991	876	5.67			RECAP	NO	YES	12:10	41.1517	72.6796
SP2021035	6/11/2021	13-35	10:30	30	ATS	1,210	1,070	9.15			ADDED	YES	YES	11:25	41.2313	72.3438
SP2021055	6/22/2021	08-31	7:54	30	ATS	1,830	1,660	47.90			ADDED	YES	YES	8:49	41.1270	72.5510
SP2021056	6/22/2021	05-24	10:19	30	ATS	2,480	2,225	83.60			ADDED	YES	YES	11:26	41.0950	72.7904
SP2021062	6/24/2021	05-31	8:26	30	ATS	2,685	2,470	25.24			RECAP	NO	YES	9:46	41.0734	72.5693
SP2021062	6/24/2021	05-31	8:26	30	ATS	1,510	1,290	18.45			RECAP	NO	NO	9:50	41.0729	72.5723
SP2021062	6/24/2021	05-31	8:26	30	ATS	1,194	1,052	8.65			ADDED	YES	NO	9:56	41.0657	72.5773
SP2021062	6/24/2021	05-31	8:26	30	ATS	1,475	1,310	21.34			ADDED	YES	YES	10:26	41.0454	72.5869
SP2021062	6/24/2021	05-31	8:26	30	ATS	1,130	970	6.32			ADDED	YES	YES	10:13	41.0499	72.5791
SP2021062	6/24/2021	05-31	8:26	30	ATS	1,240	1,060	10.5			ADDED	YES	YES	10:22	41.0480	72.5838
FA2021015	9/14/2021	04-27	14:03	30	LST	737	720	56.7			N/A	NO	YES	15:05	41.0823	72.6342
FA2021037	9/27/2021	12-20	10:17	30	LST	860	800	79.4			N/A	NO	YES	10:58	41.2293	72.9104
FA2021040	9/29/2021	05-25	11:01	30	ATS	1,466	1,274	17.4			ADDED	YES	YES	12:00	41.0922	72.7343
FA2021042	10/12/2021	02-26	10:04	30	ATS	1,143	1,125	14.6			ADDED	YES	YES	10:49	41.0371	72.6892
FA2021042	10/12/2021	02-26	10:04	30	ATS	1,118	1,105	8.01			ADDED	YES	YES	11:06	41.0371	72.6892
FA2021044	10/12/2021	10-28	14:51	30	ATS	1,911	1,676	45.36			ADDED	YES	YES	15:57	41.1717	72.5983
FA2021044	10/12/2021	10-28	14:51	30	ATS	1,132	1,115	11.35			ADDED	YES	YES	15:50	41.1795	72.5828
FA2021044	10/12/2021	10-28	14:51	30	ATS	1,395	1,123	13.92			ADDED	YES	YES	16:03	41.1813	72.5693
FA2021049	10/14/2021	00-28	10:13	30	ATS	900	810	3.22			ADDED	YES	YES	11:30	41.0088	72.6345
FA2021050	10/14/2021	05-26	12:05	30	ATS	1,610	1,430	24.92			ADDED	YES	YES	13:30	41.0902	72.6875
FA2021056	10/21/2021	13-28	7:57	30	ATS	825	740	3.03			ADDED	YES	YES	8:51	41.2356	72.6352



**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°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°C; prefers ~11-22°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 undulates</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>