JOB 5: MARINE FINFISH SURVEY

LONG ISLAND SOUND TRAWL SURVEY

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OVERVIEW OF 2020 PROJECT RESULTS AND SPRING AND FALL SURVEY TIME SERIES

STUDY PERIOD AND AREA

The Connecticut DEEP Marine Fisheries Program did not complete it's thirty-seventh year of the Long Island Sound Trawl Survey sampling in 2020. Due to the COVID-19 global pandemic, the State of Connecticut and CT DEEP instituted strict policies to prevent the spread of the virus as much as possible. These policies prohibited LISTS staff from working in the office and limited the crew size on the *R/V John Dempsey* to three (3) permanent staff members (no Seasonal Resource Assistants were allowed). Therefore, no sampling for Job 5 was completed in 2020. While working primarily from home, as much work as possible was completed, including ageing samples from previous years, fulfilling data requests, developing a post-processing QA/QC program, and database management.

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 2019 spring and fall sampling period (the most recent complete survey) and provides time series information since the commencement of the survey in 1984. The focus of this report is on the last year of sampling in 2019, however it also includes a summary and information on work completed during this last segment during the pandemic period.

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^{o} 03' (New London, Connecticut) to longitude 73^{o} 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^2 (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 (^oC) and salinity (ppt), conductivity (mS/m) and dissolved oxygen (mg/l) were measured using an YSI model EXO2 data sonde. 2017 was the first year the EXO2 sonde was used by LISTS, previously a hand-held YSI meter was used. The sonde records numerous water quality parameters while descending from surface to bottom and values are subsequently extracted at the depths most closely matching the 1m below surface and 0.5m above bottom depths used previously in the LISTS timeseries.

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

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

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

Bluefish, menhaden, scup, summer flounder, tautog and winter flounder were sampled for age determination (Table 5.3). The target number of age samples (otolith) for bluefish were 50 from the spring period (defined by ASMFC Bluefish Technical Committee as Jan-July) and 50

from the fall period (August-December). However, bluefish catches are hard to predict so the number of age samples varied greatly; sometimes more than the target number was collected solely from LISTS samples but other times LISTS samples needed to be augmented with samples from the recreational fishery to meet the target number. Sufficient numbers of bluefish age samples from LIS would also make it possible to develop an LIS-specific age key, so bluefish age samples were sometimes still collected even after the target number was reached. Subsamples of scup, stratified by length group, were measured to the nearest mm (fork length) and scales from each individual were taken for ageing. Scup scales were removed posterior to the pectoral fin and ventral to the lateral line. The scales were pressed onto plastic laminate with an Ann Arbor roller press to obtain an impression of the scale, which was then viewed with a microfiche reader at 21x. Scales were also taken from 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; 167 menhaden age samples were taken in 2019. 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. Tautog were iced and taken to the lab, where their total length (mm), sex, and total weight (gm) were recorded and age structures were collected. LISTS has used opercula to age tautog since 1984 (Cooper 1967). The ASMFC Tautog Technical Committee requested that states collect paired age structures for comparison studies 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). 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). Nine (9) Atlantic Sturgeon were captured on seven (7) of the 200 tows completed in 2019. No other protected species were encountered. All interactions with endangered species are detailed in Appendix 5.5.

Data Analysis

Indices of Abundance: Annual Mean Count and Weight per Tow

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

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

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

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

The geometric mean count per tow was calculated from 1984 - 2019 for 38 finfish species, lobster, and long-finned squid (1986 - 2019). The geometric mean weight per tow was calculated using weight data collected since 1992 for the same species, plus an additional 13 invertebrates.

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

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

Annual age specific indices (indices-at-age matrices) were calculated for scup, striped bass, summer flounder, winter flounder and tautog. The age data used to calculate the indices came from three sources: striped bass ages were derived using the von Bertalanffy (1938) equation; summer flounder age-length keys were obtained from the NMFS Northeast Fisheries Science Center spring and fall trawl surveys combined with LISTS ages (>59 cm); scup, winter flounder and tautog age-length keys (in 1 cm intervals) were obtained directly from LISTS 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 2019, age samples were taken from 140 bluefish; one (1) from the spring period and 139 from the fall period.

- **Scup**. Scales from 627 scup were collected in 2019; 350 from the spring cruise and 277 from the fall cruise. Ageing is not yet complete for 2019. An index-at-age matrix was

developed for 1984-2019 using spring (May-June only) and fall (September-October) LISTS data (Table 5.1). April data was omitted since very few scup are taken during the month. A total of 15,852 scup aged between 1984 and 2018 were used to make year and season specific age-length keys (1 cm intervals). For 2019, a pooled three year key using 2016, 2017 and 2018 ages were used to calculate a preliminary 2019 index-at-age. Results will be updated when the 2019 ages are available. Prior to 2019, 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_o = 0.16, Vic Crecco, pers. comm.) were used in the rearranged von Bertalanffy equation:

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

  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 2019 by apportioning the spring index by the percentage of fish at each age (Table 5.23).

- **Summer flounder**. The year and season specific age-length keys (1 cm intervals) used to age LISTS catches were provided by NMFS from their spring and fall trawl surveys. These keys were supplemented with fish caught and aged by LISTS (typically 60 cm and over). LISTS also provides the age data from these fish (> 60cm) to NMFS. Only summer flounder greater than or equal to 60cm were sampled for age structures during the Spring 2017 LISTS cruise. Since the 2017 fall cruise, however, LISTS has also collected representative scale samples from smaller fluke to ensure a robust age-key once it became known that there would be no samples from NMFS for the fall 2017 period. The age-key was constructed using both LISTS and NMFS age data. In 2019, 576 summer flounder were aged: 419 from the spring (14 – 73 cm) and 157 from the fall (25 – 70 cm). Since 2001, whenever the season/year specific key failed at a given 1 cm length interval a pooled year key using only adjacent years was used (Gottschall and Pacileo 2002).

- **Tautog**. An index-at-age matrix was developed for 1984-2015 (Table 5.25). Annual keys were calculated by combining all months in a particular year since so few tautog are captured by LISTS. Preliminary aging from 2016 (n=276), 2017 (n=75), 2018 (n=201) and 2019 (n=274) has been completed but not validated. The index-at-age matrix will be updated upon completion of the validation and QA/QC.

- **Weakfish**. Age 0 and age 1+ indices were calculated for both spring (1984 – 2019) and fall surveys (1984 – 2009, 2011 - 2019) (Table 5.26). Since few weakfish are taken in April, the spring geometric mean was calculated using only May and June. All weakfish taken in spring are assumed to be age 1+. Similar to bluefish, the fall age 0 and 1+ indices were calculated by using length frequencies to separate the catch. Since a break in the fall length frequencies generally occurs between 24 and 32 cm each year (Table 5.57), weakfish less than 30 cm are considered to be age 0 while those greater than or equal to 30 cm are ages 1+.

- **Winter flounder**. An index-at-age matrix was developed for 1984-2019 using April and May LISTS data (Table 5.27). June data were not used since length frequency data suggest that many adult winter flounder have left the Sound by this time (an exception was made for 1984, the first year of LISTS, because very few samples were taken in the spring months). A total of 24,831 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 ages if year specific keys were not available.

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

Species Richness by Group

The Long Island Sound Trawl Survey monitors species richness using groups of species classified as either cold temperate or warm temperate. For the purposes of tracking species richness, American sand lance, bay anchovy, and striped anchovy were omitted (see *Sampling Procedures* section). All other finfish species captured in LISTS were divided into groups based on their temperature preferences and seasonal spawning habits as documented in the literature (Collette and Klein-MacPhee 2002, Murdy et al. 1997). Species in the cold temperate group prefer water temperatures below 15^0C (60^0F), 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 (11-22^0C or 50-77^0F), 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 2020

Not surprisingly, the COVID-19 global pandemic up-ended the 'normal' ways in which the Long Island Sound Trawl Survey (LISTS) has been prosecuted from the previous 36 years. The State of Connecticut and CT DEEP instituted strict policies to prevent the spread of the virus as much as possible. These policies prohibited LISTS staff from working in the office and limited the crew size on the *R/V John Dempsey* to three (3) permanent staff members (no Seasonal Resource Assistants were allowed) in 2020. Therefore, no sampling for Job 5 was completed in 2020. While working primarily from home, as much work as possible was completed, including ageing samples from previous years, fulfilling data requests, developing a post-processing QA/QC program, database management, gear management and an analysis for 2021 sampling intensity.

Aging backlog from previous years:

As a result of not conducting the Long Island Sound Trawl Survey sampling in 2020, aging took priority and staff worked to process the 2019 samples as well as the backlog of samples from previous sampling years. A makeshift aging lab was set up at staff residence as State derived COVID-19 protocols did not allow for entry to our facility aging lab. Samples completed include Scup (2019 n=627), Bluefish (2019 n=140), Summer Flounder (2019 n=576), Winter Flounder (2019 n=302), and Tautog (2016 n=276, 2017 n=75, 2018 n=201, 2019 n=274). In addition to completing all 2019 age samples, staff participated in an ASMFC sponsored tautog aging workshop and exchange. The purpose of this exchange was to compare accuracy and precision of three aging structures between tautog aging labs in hopes of determining whether spines are a viable aging structure for this species. Paired samples of otolith, operculum and spines were provided by each state. Once the collection was combined, each participating state aged all three structures (n=215 samples). Results of that exercise to be released in 2021.

Gear Management:

At the end of the 2019 sample season, it was determined that the deck scale used to weight all the catch sampled aboard the R/V John Dempsey needed to be serviced. It was thought that cable connections from the scale platform to the scale head were occasionally causing irregular error messages. Staff corresponded with Marel scales and the company's repair representatives to get the repairs completed. After replacing all the cables and connectors from the scale to the scale head all issues were resolved. This will be the primary scale used during the 2021 survey year.

Staff spent time coordinating with Levin Marine Supply Company during 2020 to build four new nets for future survey use. Description of the size and net style are incorporated in other potions of this report. These nets will be utilized during the 2021 sample season.

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).

Data requests:

Similar to 2019, in 2020, a significant amount of project staff time went toward fulfilling data requests for NOAA/NMFS, ASMFC, the New England and Mid-Atlantic Councils, several state agencies, Universities, and NGO's. More than thirty requests were fulfilled to these agencies and others in 2020.

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 (still no seasonals). 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.

Overview of LISTS 2019 Spring and Fall Surveys (most recent year surveyed)

As noted in previous reports, the LISTS database of counts, weights and lengths were all collected electronically. This marks the second year in row 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.

April sampling started on April 10 and continued until May 1, completing 40 sites in nine (9) days underway. May sampling started on May 10 and continued until May 23, completing 40 sites in ten (10) days underway. June sampling began on June 4 and ended on June 24, taking ten (10) days underway to complete the 40 sites. The September Survey commenced on September 5 and concluded on September 26, completing 40 tows in twelve (12) days underway, not including six (6) days lost to inclement weather. The October Survey commenced on October 8 and concluded on October 30, completing 40 tows in ten (10) days underway, not including six (6) days lost to inclement weather. In total, 200 LISTS sites were completed in 51 days underway during the spring and fall 2019 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.

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 2019, a significant amount of project staff time went toward fulfilling large data requests for NMFS, ASMFC, and the Councils. Samples were provided to NY Department of Environmental Conservation, NMFS, CT Health Department, University of Connecticut, Audubon and New England Science and Sailing.

Number of Species Identified

LISTS observed 56 finfish species in 2019 (Table 5.11). One new vertebrate species was encountered during the 2019 surveys, smooth puffer (*Lagocephalus Laevigatus*). From 1984 to 2019, 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 41 types of invertebrates were collected in 2019 (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 (1984-2019) of the finfish species collected each year and their respective rank by numbers. Annual total biomass of invertebrates is also included in this appendix (1992-2019), ranked by weight (kg). A total of 133,439 finfish weighing 22,184.7 kg were sampled in 2019 (Table 5.13). In the spring of 2019, a total of 58,277 finfish weighing 14,803.0 kg were sampled and a total of 75,164 finfish weighing 7,381.7 kg were sampled in fall of 2019 (Table 5.14). A total of 1,176.2 kg of invertebrates were taken in 2019 (Table 5.13). The total biomass of invertebrate catch taken in the spring of 2019 was 569.5 kg while a total of 606.7 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, Table5.38
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 1984-2019 for 38 finfish species plus lobster and long-finned squid (squid since 1986). All spring (April-June) and fall (September-October) data were used to compute the abundance indices presented in Tables 5.16 (spring) and 5.17 (fall), with the preferred seasonal index (for counts) denoted by an asterisk. Geometric mean biomass-per-tow indices have been calculated for 38 finfish and 15 invertebrate species (or species groups) since 1992, for both spring and fall (Table 5.18 and 5.19, respectively). Age specific indices of abundance were calculated for selected important recreational species, including scup, striped bass, summer flounder, and winter flounder (see below). Bluefish and weakfish recruitment indices were calculated using modal analyses of the length frequencies. For each of the 38 finfish species, plots including catch per tow in numbers and biomass in kilograms are illustrated in Figures 5.8 through 5.13. These figures also include plots of each of the age specific indices and recruitment indices mentioned above. Figure 5.14 provides plots of abundance (biomass) indices for crabs (lady, rock, spider; 1992-2019), American lobster (1984-2019), horseshoe crab (1992-2019), and long-finned squid (1986-2019).

Indices of Abundance: Important Recreational Species

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

Species Richness by Group

The number of cold temperate and warm temperate species captured in each tow was averaged by seasonal cruise (April-June and September-October) for each year from 1984-2019 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

Based on Agency guidelines for how many people could safely work aboard the *R/V John Demspey* while adhering to COVID-19 prevention protocols and on the analysis of tow duration versus catch estimates, sampling for LISTS in Spring of 2021 will most likely employ a reduced number of sites in any given month (rather than shorter tow durations). This approach will maintain the robustness of the LISTS sampling design and resultant data as much as possible given that reduced number of crew allowed on-board at any time will decrease the amount of sampling that can be completed.

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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.

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

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

Table 5.3. Length and age data collected in 2019.

In addition to the species listed below, other rarely occurring species (typically totaling less than 30 fish/year each) were measured. During 2019, 18 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	Collected from a minimum of 200 fish/year.
	otoliths or pelvic fin rays	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/repaired on the research vessel.

	Year																																		
Cruise	**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**
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
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
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
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
November	29	40	40	40	40	40	40	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**200**	**246**	**316**	**320**	**320**	**320**	**297**	**205**	**160**	**240**	**240**	**200**	**200**	**200**	**200**	**200**	**201**	**200**	**200**	**200**	**199**	**200**	**120**	**200**	**160**	**200**	**78**	**172**	**200**	**200**	**199**	**200**	**196**	**144**	**172**	**200**

Table 5.5. Station information for LISTS April 2019.

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 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
SP2019001	4/10/2019	14-28	T	1	9:07	30	41.2477	-72.5735	.	.	.	.	3.4	1.6802	0.0085
SP2019002	4/10/2019	13-27	T	2	11:04	30	41.2281	-72.6548	.	.	.	.	2.5	1.2493	0.0063
SP2019003	4/10/2019	10-27	T	4	12:58	30	41.1690	-72.7000	.	.	.	.	2.3	1.1558	0.0058
SP2019004	4/10/2019	13-35	T	4	15:57	30	41.2246	-72.3083	.	.	.	.	3.2	1.6011	0.0081
SP2019005	4/18/2019	07-31	S	4	8:26	30	41.1357	-72.4703	.	.	.	.	4.2	2.1116	0.0107
SP2019006	4/18/2019	01-29	S	2	10:25	30	41.0295	-72.5648	.	.	.	.	3.6	1.8149	0.0092
SP2019007	4/22/2019	06-30	S	4	8:21	30	41.1057	-72.5026	.	.	.	.	2.4	1.2243	0.0062
SP2019008	4/22/2019	04-27	T	3	9:52	30	41.0876	-72.6020	.	.	.	.	3.6	1.8151	0.0092
SP2019009	4/22/2019	00-27	T	2	11:53	30	41.0161	-72.5991	.	.	.	.	3.0	1.4941	0.0075
SP2019010	4/22/2019	58-25	S	1	13:53	30	40.9798	-72.7351	.	.	.	.	3.2	1.5961	0.0081
SP2019011	4/22/2019	03-27	T	3	15:29	30	41.0555	-72.6816	.	.	.	.	3.5	1.7285	0.0087
SP2019012	4/23/2019	08-28	S	3	8:35	30	41.1478	-72.5681	.	.	.	.	2.5	1.2299	0.0062
SP2019013	4/23/2019	06-27	S	3	9:58	30	41.1098	-72.6025	.	.	.	.	3.5	1.7391	0.0088
SP2019014	4/23/2019	09-24	T	3	12:38	30	41.1346	-72.7679	.	.	.	.	3.2	1.5946	0.0081
SP2019015	4/23/2019	14-33	S	2	15:38	30	41.2386	-72.4028	.	.	.	.	3.4	1.6940	0.0086
SP2019016	4/24/2019	12-35	T	4	7:44	30	41.2112	-72.2620	.	.	.	.	2.1	1.0593	0.0054
SP2019017	4/24/2019	14-34	S	1	9:25	30	41.2380	-72.3423	.	.	.	.	3.4	1.7024	0.0086
SP2019018	4/24/2019	08-23	M	3	12:15	30	41.1493	-72.8019	.	.	.	.	3.4	1.7146	0.0087
SP2019019	4/24/2019	11-20	T	2	13:45	30	41.1925	-72.9203	.	.	.	.	3.5	1.7667	0.0089
SP2019020	4/24/2019	13-20	M	1	15:51	30	41.2315	-72.9563	.	.	.	.	3.0	1.4948	0.0076
SP2019021	4/25/2019	01-12	M	4	9:08	30	41.0240	-73.2438	.	.	.	.	2.8	1.4136	0.0071
SP2019022	4/25/2019	57-12	T	2	10:52	30	40.9575	-73.2505	.	.	.	.	3.3	1.6375	0.0083
SP2019023	4/25/2019	59-11	M	3	12:30	30	41.0006	-73.2726	.	.	.	.	3.5	1.7403	0.0088
SP2019024	4/25/2019	01-10	T	3	13:39	30	41.0226	-73.3673	.	.	.	.	2.9	1.4689	0.0074
SP2019025	4/29/2019	04-22	M	4	8:54	30	41.0705	-72.8985	.	.	.	.	3.0	1.5219	0.0077
SP2019026	4/29/2019	59-22	M	3	10:27	30	40.9941	-72.8447	.	.	.	.	2.8	1.3997	0.0071
SP2019027	4/29/2019	00-21	M	3	11:52	30	41.0135	-72.8676	.	.	.	.	2.8	1.3758	0.0070
SP2019028	4/29/2019	59-18	M	3	13:19	30	40.9970	-72.9995	.	.	.	.	3.1	1.5368	0.0078
SP2019029	4/29/2019	01-20	M	4	14:58	30	41.0185	-72.9611	.	.	.	.	3.1	1.5278	0.0077
SP2019030	4/29/2019	02-21	M	4	16:11	30	41.0423	-72.8913	.	.	.	.	3.3	1.6541	0.0084
SP2019031	4/30/2019	07-15	T	1	8:16	30	41.1287	-73.1246	.	.	.	.	3.6	1.8190	0.0092
SP2019032	4/30/2019	06-12	M	1	9:45	30	41.1115	-73.2778	.	.	.	.	3.3	1.6389	0.0083
SP2019033	4/30/2019	05-13	M	2	11:27	30	41.0895	-73.2580	.	.	.	.	3.2	1.5810	0.0080
SP2019034	4/30/2019	05-15	M	2	12:49	30	41.0923	-73.1331	.	.	.	.	2.7	1.3634	0.0069
SP2019035	4/30/2019	06-14	M	2	14:09	21	41.1093	-73.2040	.	.	.	.	3.1	1.0886	0.0055
SP2019036	5/1/2019	05-17	T	3	8:33	30	41.1043	-73.0330	.	.	.	.	3.5	1.7304	0.0087
SP2019037	5/1/2019	01-15	M	4	10:16	30	41.0241	-73.1403	.	.	.	.	3.0	1.5169	0.0077
SP2019038	5/1/2019	00-15	T	4	12:15	25	41.0005	-73.1685	.	.	.	.	3.4	1.3991	0.0071
SP2019039	5/1/2019	06-17	T	2	13:38	30	41.1028	-73.0897	.	.	.	.	3.9	1.9312	0.0098
SP2019040	5/1/2019	12-20	T	1	15:11	30	41.2113	-72.9467	.	.	.	.	3.1	1.5694	0.0079

Table 5.6. Station information for LISTS May 2019.

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)
SP2019041	5/10/2019	14-37	T	4	10:08	30	41.2357	-72.2563	.	.	.	.	2.6	1.2764	0.0065
SP2019042	5/10/2019	15-34	T	1	11:47	30	41.2487	-72.3198	.	.	.	.	3.4	1.7224	0.0087
SP2019043	5/13/2019	15-33	S	1	10:46	30	41.2552	-72.3354	.	.	.	.	2.2	1.1051	0.0056
SP2019044	5/14/2019	14-33	S	2	7:58	30	41.2473	-72.3505	.	.	.	.	2.2	1.0777	0.0054
SP2019045	5/14/2019	13-32	S	1	14:06	30	41.2308	-72.3963	.	.	.	.	2.6	1.2907	0.0065
SP2019046	5/14/2019	09-31	S	4	15:20	30	41.1620	-72.4443	.	.	.	.	3.3	1.6400	0.0083
SP2019047	5/15/2019	07-30	S	4	8:19	30	41.1295	-72.4728	.	.	.	.	3.3	1.6265	0.0082
SP2019048	5/15/2019	04-28	S	3	10:16	30	41.0808	-72.5828	.	.	.	.	2.4	1.1813	0.0060
SP2019049	5/15/2019	59-24	M	3	12:05	30	41.0005	-72.7393	.	.	.	.	2.2	1.1114	0.0056
SP2019050	5/15/2019	01-24	M	4	13:16	30	41.0182	-72.7990	.	.	.	.	3.2	1.5879	0.0080
SP2019051	5/15/2019	04-26	T	3	14:32	30	41.0653	-72.7026	.	.	.	.	3.3	1.6579	0.0084
SP2019052	5/15/2019	05-26	T	3	16:13	30	41.0922	-72.6865	.	.	.	.	2.6	1.3142	0.0066
SP2019053	5/16/2019	10-28	T	4	8:22	30	41.1748	-72.5758	.	.	.	.	3.7	1.8259	0.0092
SP2019054	5/16/2019	09-26	T	4	9:49	30	41.1615	-72.6401	.	.	.	.	2.9	1.4432	0.0073
SP2019055	5/16/2019	09-25	T	4	11:27	30	41.1621	-72.7168	.	.	.	.	2.8	1.4228	0.0072
SP2019056	5/16/2019	07-27	S	3	12:43	30	41.1147	-72.6736	.	.	.	.	3.7	1.8636	0.0094
SP2019057	5/17/2019	14-29	T	2	8:06	30	41.2357	-72.5745	.	.	.	.	4.1	2.0456	0.0103
SP2019058	5/17/2019	12-27	T	3	9:29	30	41.2007	-72.6478	.	.	.	.	2.3	1.1515	0.0058
SP2019059	5/17/2019	08-27	T	3	10:50	30	41.1415	-72.6221	.	.	.	.	2.7	1.3414	0.0068
SP2019060	5/17/2019	13-28	T	2	12:36	30	41.2286	-72.6313	.	.	.	.	3.7	1.8650	0.0094
SP2019061	5/17/2019	15-29	T	1	13:56	25	41.2392	-72.6083	.	.	.	.	3.8	1.6033	0.0081
SP2019062	5/20/2019	04-23	M	4	9:37	30	41.0826	-72.7923	.	.	.	.	3.6	1.7784	0.0090
SP2019063	5/20/2019	05-21	M	4	10:47	30	41.0956	-72.8733	.	.	.	.	3.5	1.7617	0.0089
SP2019064	5/20/2019	02-20	M	4	12:12	30	41.0485	-72.9116	.	.	.	.	3.3	1.6378	0.0083
SP2019065	5/20/2019	59-18	M	3	13:22	30	40.9966	-72.9998	.	.	.	.	2.8	1.3967	0.0071
SP2019066	5/20/2019	04-17	T	3	14:46	30	41.0770	-73.0699	.	.	.	.	3.5	1.7712	0.0089
SP2019067	5/21/2019	06-14	M	2	8:29	21	41.1161	-73.1593	.	.	.	.	3.0	1.0523	0.0053
SP2019068	5/21/2019	05-11	M	2	9:51	30	41.0992	-73.2700	.	.	.	.	3.6	1.7757	0.0090
SP2019069	5/21/2019	11-18	M	1	12:34	30	41.1888	-73.0020	.	.	.	.	3.1	1.5397	0.0078
SP2019070	5/21/2019	12-21	T	2	14:00	30	41.2180	-72.8687	.	.	.	.	2.8	1.4196	0.0072
SP2019071	5/21/2019	13-19	M	1	15:38	30	41.2260	-72.9763	.	.	.	.	3.0	1.4824	0.0075
SP2019072	5/22/2019	02-12	M	3	8:55	30	41.0452	-73.2365	.	.	.	.	3.2	1.6057	0.0081
SP2019073	5/22/2019	57-09	S	2	10:32	30	40.9508	-73.4073	.	.	.	.	3.0	1.4790	0.0075
SP2019074	5/22/2019	59-11	M	3	13:07	30	40.9901	-73.3224	.	.	.	.	2.7	1.3738	0.0069
SP2019075	5/22/2019	01-12	M	4	14:26	30	41.0226	-73.2820	.	.	.	.	3.1	1.5380	0.0078
SP2019076	5/22/2019	04-15	M	3	15:38	30	41.0622	-73.1930	.	.	.	.	3.5	1.7337	0.0088
SP2019077	5/23/2019	14-23	T	1	8:23	30	41.2268	-72.8680	.	.	.	.	3.4	1.6872	0.0085
SP2019078	5/23/2019	11-23	M	2	10:02	30	41.1782	-72.8548	.	.	.	.	3.0	1.4955	0.0076
SP2019079	5/23/2019	11-24	T	2	11:13	30	41.1877	-72.8158	.	.	.	.	2.7	1.3704	0.0069
SP2019080	5/23/2019	12-25	T	2	12:28	30	41.1953	-72.7788	.	.	.	.	2.5	1.2502	0.0063

Table 5.7. Station information for LISTS June 2019.

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,	B_Salinity (btm,	Ave Speed	distance (nm)	Area Swept (sq.nm)
SP2019081	6/4/2019	15-34	T	1	7:14	30	41.2585	-72.3610	.	.	.	.	1.8	0.8841	0.0045
SP2019082	6/4/2019	05-30	S	3	10:07	23	41.0947	-72.5103	.	.	.	.	3.2	1.2413	0.0063
SP2019083	6/4/2019	06-30	S	4	11:30	30	41.0987	-72.5421	.	.	.	.	2.3	1.1604	0.0059
SP2019084	6/5/2019	14-28	T	1	8:05	30	41.2485	-72.5735	.	.	.	.	3.6	1.7772	0.0090
SP2019085	6/5/2019	12-28	T	3	9:33	30	41.2042	-72.6155	.	.	.	.	2.1	1.0466	0.0053
SP2019086	6/5/2019	09-29	S	3	11:12	30	41.1537	-72.5800	.	.	.	.	2.1	1.0371	0.0052
SP2019087	6/5/2019	08-27	T	3	12:53	30	41.1413	-72.6216	.	.	.	.	3.2	1.6079	0.0081
SP2019088	6/6/2019	17-37	T	1	13:27	30	41.2890	-72.1923	.	.	.	.	3.2	1.6037	0.0081
SP2019089	6/6/2019	14-37	T	4	15:26	26	41.2465	-72.2085	.	.	.	.	1.8	0.7848	0.0040
SP2019090	6/7/2019	14-33	S	2	7:09	30	41.2477	-72.3505	.	.	.	.	2.5	1.2403	0.0063
SP2019091	6/7/2019	13-32	S	1	8:05	30	41.2292	-72.3981	.	.	.	.	2.8	1.3926	0.0070
SP2019092	6/7/2019	09-26	T	4	10:01	30	41.1640	-72.6303	.	.	.	.	3.5	1.7408	0.0088
SP2019093	6/7/2019	04-26	T	3	11:30	30	41.0662	-72.6985	.	.	.	.	2.4	1.1769	0.0059
SP2019094	6/7/2019	03-28	T	3	12:51	30	41.0485	-72.6456	.	.	.	.	2.4	1.2138	0.0061
SP2019095	6/7/2019	08-31	S	4	14:36	30	41.1328	-72.4955	.	.	.	.	2.5	1.2299	0.0062
SP2019096	6/12/2019	13-35	T	4	7:45	30	41.2380	-72.2444	.	.	.	.	2.8	1.3853	0.0070
SP2019097	6/17/2019	02-29	T	2	8:50	30	41.0452	-72.5585	.	.	.	.	3.7	1.8600	0.0094
SP2019098	6/17/2019	58-24	S	1	10:54	30	40.9745	-72.7530	.	.	.	.	3.5	1.7692	0.0089
SP2019099	6/17/2019	01-24	M	4	12:14	30	41.0172	-72.7990	.	.	.	.	3.2	1.5971	0.0081
SP2019100	6/17/2019	03-24	M	4	13:34	30	41.0578	-72.7530	.	.	.	.	2.6	1.3136	0.0066
SP2019101	6/18/2019	06-17	T	2	8:07	30	41.1126	-73.0421	.	.	.	.	3.7	1.8516	0.0094
SP2019102	6/18/2019	00-19	M	3	9:49	30	40.9901	-73.0568	.	.	.	.	2.7	1.3564	0.0069
SP2019103	6/18/2019	00-21	M	3	11:12	30	41.0016	-72.9211	.	.	.	.	2.9	1.4313	0.0072
SP2019104	6/18/2019	02-21	M	4	12:25	30	41.0421	-72.8913	.	.	.	.	3.1	1.5725	0.0079
SP2019105	6/18/2019	07-20	M	3	13:50	30	41.1243	-72.9276	.	.	.	.	2.8	1.3903	0.0070
SP2019106	6/18/2019	08-17	M	2	15:38	30	41.1383	-73.0519	.	.	.	.	3.0	1.5215	0.0077
SP2019107	6/19/2019	00-10	T	4	9:30	30	41.0095	-73.3230	.	.	.	.	3.5	1.7564	0.0089
SP2019108	6/19/2019	57-09	S	2	10:53	30	40.9473	-73.4066	.	.	.	.	3.5	1.7529	0.0089
SP2019109	6/19/2019	56-12	T	2	12:37	30	40.9431	-73.2988	.	.	.	.	3.2	1.6140	0.0082
SP2019110	6/19/2019	56-14	T	2	14:22	30	40.9341	-73.2286	.	.	.	.	3.3	1.6498	0.0083
SP2019111	6/20/2019	01-14	M	4	8:55	30	41.0180	-73.1805	.	.	.	.	3.3	1.6536	0.0084
SP2019112	6/20/2019	02-13	M	3	10:08	30	41.0387	-73.2663	.	.	.	.	2.5	1.2341	0.0062
SP2019113	6/20/2019	03-12	M	3	11:23	16	41.0615	-73.2468	.	.	.	.	3.3	0.8712	0.0044
SP2019114	6/20/2019	06-12	M	1	12:42	30	41.1107	-73.2735	.	.	.	.	3.5	1.7499	0.0088
SP2019115	6/20/2019	11-18	M	1	14:56	30	41.1761	-73.0608	.	.	.	.	3.3	1.6605	0.0084
SP2019116	6/21/2019	09-17	T	2	7:53	30	41.1568	-73.0601	.	.	.	.	3.4	1.6813	0.0085
SP2019117	6/21/2019	12-19	M	2	9:36	30	41.2140	-72.9575	.	.	.	.	3.7	1.8384	0.0093
SP2019118	6/24/2019	10-22	M	2	8:22	30	41.1732	-72.8849	.	.	.	.	3.6	1.7914	0.0091
SP2019119	6/24/2019	06-23	M	4	9:47	30	41.1013	-72.8484	.	.	.	.	3.2	1.5961	0.0081
SP2019120	6/24/2019	09-24	T	3	11:20	30	41.1403	-72.7686	.	.	.	.	3.1	1.5354	0.0078

Table 5.8. Station information for LISTS September 2019.

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)
FA2019001	9/5/2019	15-33	S	1	7:13	30	41.2556	-72.3361	.	.	.	.	2.0	0.9788	0.0049
FA2019002	9/5/2019	15-29	T	1	9:28	30	41.2491	-72.5738	.	.	.	.	3.1	1.5336	0.0077
FA2019003	9/5/2019	14-23	T	1	11:17	30	41.2390	-72.8108	.	.	.	.	3.6	1.7978	0.0091
FA2019004	9/5/2019	10-29	S	3	14:51	30	41.1618	-72.5955	.	.	.	.	2.2	1.0937	0.0055
FA2019005	9/9/2019	14-33	S	2	7:20	30	41.2470	-72.3510	.	.	.	.	3.1	1.5506	0.0078
FA2019006	9/9/2019	09-29	S	3	9:14	30	41.1650	-72.5216	.	.	.	.	2.5	1.2331	0.0062
FA2019007	9/9/2019	08-25	T	4	10:53	30	41.1455	-72.7178	.	.	.	.	2.5	1.2688	0.0064
FA2019008	9/9/2019	08-30	S	4	12:54	30	41.1388	-72.5266	.	.	.	.	3.3	1.6397	0.0083
FA2019009	9/10/2019	09-31	S	4	7:47	30	41.1621	-72.4328	.	.	.	.	3.7	1.8676	0.0094
FA2019010	9/10/2019	01-29	S	2	9:30	30	41.0288	-72.5699	.	.	.	.	3.1	1.5254	0.0077
FA2019011	9/10/2019	00-27	T	2	11:38	30	41.0172	-72.6030	.	.	.	.	2.6	1.2877	0.0065
FA2019012	9/10/2019	00-24	M	3	13:18	30	41.0045	-72.7483	.	.	.	.	2.5	1.2323	0.0062
FA2019013	9/12/2019	12-25	T	2	8:43	30	41.2076	-72.7209	.	.	.	.	3.9	1.9533	0.0099
FA2019014	9/12/2019	10-22	M	2	10:39	30	41.1863	-72.8223	.	.	.	.	3.4	1.7119	0.0086
FA2019015	9/12/2019	09-23	T	3	12:20	30	41.1466	-72.8350	.	.	.	.	3.2	1.5832	0.0080
FA2019016	9/16/2019	13-33	S	1	7:12	30	41.2351	-72.3605	.	.	.	.	3.3	1.6391	0.0083
FA2019017	9/16/2019	03-26	T	3	9:38	30	41.0655	-72.6663	.	.	.	.	3.7	1.8301	0.0092
FA2019018	9/16/2019	01-25	T	4	11:04	30	41.0213	-72.6928	.	.	.	.	3.3	1.6471	0.0083
FA2019019	9/16/2019	03-25	T	3	12:37	30	41.0563	-72.7524	.	.	.	.	2.9	1.4459	0.0073
FA2019020	9/17/2019	10-25	T	3	8:47	30	41.1760	-72.7141	.	.	.	.	3.4	1.6811	0.0085
FA2019021	9/17/2019	04-24	M	4	10:16	30	41.0745	-72.7640	.	.	.	.	3.5	1.7668	0.0089
FA2019022	9/17/2019	05-24	T	4	12:24	30	41.0900	-72.7889	.	.	.	.	2.4	1.2019	0.0061
FA2019023	9/17/2019	07-24	T	4	13:43	30	41.1212	-72.7432	.	.	.	.	3.2	1.5791	0.0080
FA2019024	9/18/2019	02-23	M	4	9:31	30	41.0555	-72.7911	.	.	.	.	3.5	1.7481	0.0088
FA2019025	9/18/2019	00-19	M	3	11:07	30	41.0016	-72.9993	.	.	.	.	3.5	1.7580	0.0089
FA2019026	9/18/2019	00-17	M	4	13:03	30	41.0163	-73.0288	.	.	.	.	3.3	1.6389	0.0083
FA2019027	9/18/2019	07-15	T	1	14:59	30	41.1283	-73.1237	.	.	.	.	3.2	1.5929	0.0080
FA2019028	9/19/2019	05-13	M	2	8:41	30	41.0977	-73.2106	.	.	.	.	3.2	1.6248	0.0082
FA2019029	9/19/2019	01-10	T	3	11:25	30	41.0300	-73.3380	.	.	.	.	3.6	1.7895	0.0090
FA2019030	9/19/2019	03-12	M	3	13:33	18	41.0538	-73.2913	.	.	.	.	2.4	0.7185	0.0036
FA2019031	9/19/2019	06-14	M	2	14:43	30	41.1093	-73.2038	.	.	.	.	3.1	1.5607	0.0079
FA2019032	9/20/2019	13-19	M	1	7:39	30	41.2036	-73.0038	.	.	.	.	3.5	1.7647	0.0089
FA2019033	9/20/2019	13-20	M	1	9:26	30	41.2267	-72.9683	.	.	.	.	3.3	1.6607	0.0084
FA2019034	9/23/2019	00-12	M	4	9:35	30	41.0077	-73.2827	.	.	.	.	3.4	1.7001	0.0086
FA2019035	9/23/2019	56-13	T	2	11:32	30	40.9408	-73.2391	.	.	.	.	3.4	1.6802	0.0085
FA2019036	9/23/2019	59-12	M	3	14:02	30	40.9948	-73.2450	.	.	.	.	3.2	1.6016	0.0081
FA2019037	9/24/2019	11-24	T	2	8:43	30	41.1878	-72.8162	.	.	.	.	3.5	1.7708	0.0089
FA2019038	9/24/2019	06-22	M	4	10:39	30	41.1005	-72.8298	.	.	.	.	2.3	1.1517	0.0058
FA2019039	9/26/2019	09-19	T	2	7:56	30	41.1503	-72.9896	.	.	.	.	2.9	1.4379	0.0073
FA2019040	9/26/2019	07-22	M	3	9:34	30	41.1197	-72.8948	.	.	.	.	3.0	1.5093	0.0076

Table 5.9. Station information for LISTS October 2019.

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)
FA2019041	10/8/2019	17-37	T	1	8:10	30	41.2877	-72.1910	.	.	.	.	3.2	1.5965	0.0081
FA2019042	10/8/2019	17-40	T	2	9:35	28	41.2917	-72.0768	.	.	.	.	3.4	1.6033	0.0081
FA2019043	10/8/2019	17-38	T	2	11:10	30	41.2878	-72.1618	.	.	.	.	2.9	1.4749	0.0075
FA2019044	10/8/2019	15-34	T	1	12:41	30	41.2475	-72.3158	.	.	.	.	2.6	1.2940	0.0065
FA2019045	10/8/2019	14-33	S	2	14:08	30	41.2481	-72.3520	.	.	.	.	3.2	1.5947	0.0081
FA2019046	10/15/2019	07-30	S	4	7:59	30	41.1292	-72.4748	.	.	.	.	3.3	1.6335	0.0083
FA2019047	10/15/2019	07-29	S	3	10:27	30	41.1193	-72.5355	.	.	.	.	3.5	1.7388	0.0088
FA2019048	10/15/2019	05-26	T	3	11:59	30	41.0898	-72.6888	.	.	.	.	2.7	1.3468	0.0068
FA2019049	10/15/2019	05-28	S	3	13:34	30	41.0848	-72.6068	.	.	.	.	3.3	1.6581	0.0084
FA2019050	10/15/2019	06-29	S	4	14:46	30	41.1035	-72.5598	.	.	.	.	3.5	1.7317	0.0087
FA2019051	10/16/2019	03-30	S	1	8:29	30	41.0653	-72.4955	.	.	.	.	3.9	1.9357	0.0098
FA2019052	10/16/2019	01-28	T	2	9:42	30	41.0306	-72.5767	.	.	.	.	3.8	1.8816	0.0095
FA2019053	10/16/2019	00-27	T	2	11:11	30	41.0096	-72.6473	.	.	.	.	2.4	1.1872	0.0060
FA2019054	10/21/2019	03-27	T	3	9:14	30	41.0641	-72.6233	.	.	.	.	2.7	1.3661	0.0069
FA2019055	10/21/2019	03-25	T	3	10:56	30	41.0665	-72.7056	.	.	.	.	3.0	1.5200	0.0077
FA2019056	10/21/2019	58-24	S	1	12:33	30	40.9833	-72.7982	.	.	.	.	2.7	1.3330	0.0067
FA2019057	10/21/2019	59-24	M	3	13:42	30	40.9908	-72.7848	.	.	.	.	2.3	1.1344	0.0057
FA2019058	10/23/2019	08-26	T	3	8:46	30	41.1468	-72.6213	.	.	.	.	2.3	1.1332	0.0057
FA2019059	10/23/2019	09-25	T	4	10:20	30	41.1325	-72.7029	.	.	.	.	2.5	1.2256	0.0062
FA2019060	10/23/2019	07-25	T	4	11:56	30	41.1306	-72.6890	.	.	.	.	2.4	1.1759	0.0059
FA2019061	10/23/2019	08-24	T	4	13:45	30	41.1390	-72.7521	.	.	.	.	2.5	1.2573	0.0064
FA2019062	10/24/2019	05-22	M	4	8:42	30	41.0923	-72.8898	.	.	.	.	3.1	1.5584	0.0079
FA2019063	10/24/2019	02-22	M	4	10:27	30	41.0420	-72.8401	.	.	.	.	2.5	1.2384	0.0063
FA2019064	10/24/2019	01-23	M	4	12:22	30	41.0367	-72.8028	.	.	.	.	2.4	1.1870	0.0060
FA2019065	10/24/2019	59-22	M	3	13:56	30	40.9937	-72.8423	.	.	.	.	2.9	1.4285	0.0072
FA2019066	10/24/2019	01-20	M	4	15:39	30	41.0295	-72.9121	.	.	.	.	3.1	1.5595	0.0079
FA2019067	10/25/2019	59-18	M	3	9:11	30	40.9970	-72.9960	.	.	.	.	3.0	1.4948	0.0076
FA2019068	10/25/2019	01-15	M	4	10:50	24	41.0241	-73.1415	.	.	.	.	2.4	0.9750	0.0049
FA2019069	10/25/2019	55-13	S	2	12:30	30	40.9276	-73.2500	.	.	.	.	3.1	1.5650	0.0079
FA2019070	10/25/2019	03-15	M	3	14:16	30	41.0568	-73.1682	.	.	.	.	3.4	1.6893	0.0085
FA2019071	10/28/2019	03-13	M	3	8:41	25	41.0566	-73.2191	.	.	.	.	3.7	1.5311	0.0077
FA2019072	10/28/2019	00-10	T	4	10:17	30	41.0092	-73.3285	.	.	.	.	3.2	1.6210	0.0082
FA2019073	10/28/2019	05-11	M	2	12:06	30	41.0906	-73.3093	.	.	.	.	3.2	1.6145	0.0082
FA2019074	10/28/2019	06-11	M	1	13:37	30	41.1008	-73.3208	.	.	.	.	3.6	1.7943	0.0091
FA2019075	10/29/2019	06-15	M	2	8:19	30	41.1028	-73.1479	.	.	.	.	3.8	1.8873	0.0095
FA2019076	10/29/2019	06-12	M	1	9:58	30	41.0980	-73.3188	.	.	.	.	2.5	1.2632	0.0064
FA2019077	10/29/2019	05-17	T	3	11:55	30	41.0953	-73.0822	.	.	.	.	2.6	1.3174	0.0067
FA2019078	10/29/2019	07-17	M	2	13:39	30	41.1176	-73.1025	.	.	.	.	3.2	1.5898	0.0080
FA2019079	10/30/2019	09-19	T	2	8:58	30	41.1503	-72.9894	.	.	.	.	2.6	1.2895	0.0065
FA2019080	10/30/2019	13-22	T	1	10:32	30	41.2221	-72.8705	.	.	.	.	2.8	1.3826	0.0070

Table 5.10. Samples with non-standard tow durations and reasons for incomplete tows, spring and fall 2019.
Standard LISTS tows begin with SP (spring) or FA (fall).

Sample	Date	Site	Bottom Type	Depth Interval	Time	Duration	Reason	Comments
April								
SP2019035	4/30/2019	06-14	M	2	14:09	21	Pots	Three part tow due to multiple pot interations.
SP2019038	5/1/2019	00-15	T	4	12:15	25	Ran out of room	
May								
SP2019061	5/17/2019	15-29	T	1	13:56	25	Ran out of room	
SP2019067	5/21/2019	06-14	M	2	8:29	21	Pots	Hung on string of old pots. Broke port wing cable.
June								
SP2019082	6/4/2019	05-30	S	3	10:07	23	Pots	Avoiding gear interation.
SP2019089	6/6/2019	14-37	T	4	15:26	26	Hang/Pots	Two part tow. Hung down, reset, slowed, hauledback.
SP2019113	6/20/2019	03-12	M	3	11:23	16	Pots	Two part tow. Gear on initial haulback.
SEPT								
FA2019030	9/19/2019	03-12	M	3	13:33	18	Hang	Hung after 18 minutes. Port side hang, but gear clean
OCT								
FA2019042	10/8/2019	17-40	T	2	9:35	28	Speed drop	Speed drop at start of boost (28 minutes). Gear clean upon retreval.
FA2019068	10/25/2019	01-15	M	4	10:50	24	Speed drop	String of old gear on starboard wing
FA2019071	10/28/2019	03-13	M	3	8:41	25	Speed drop	Old gear outside of net, two pots outside the mouth of net had to be cut

Table 5.11. List of finfish species observed in 2019.

Fifty-six finfish species were observed in 2019. Since 1984, one hundred-twelve species of finfish have been identified in LISTS (see Appendix 5.1 for the full list of species).

Common Name	Scientific Name	Common Name	Scientific Name
anchovy, bay	*Anchoa mitchilli*	jack, crevalle	*Caranx hippos*
anchovy, striped	*Anchoa hepsetus*	kingfish, northern	*Menticirrhus saxatilis*
bigeye	*Priacanthus arenatus*	lizardfish, inshore	*Synodus foetens*
black sea bass	*Centropristis striata*	mackerel, Spanish	*Scomberomorus maculatus*
blue runner	*Caranx crysos*	menhaden, Atlantic	*Brevoortia tyrannus*
bluefish	*Pomatomus saltatrix*	moonfish	*Selene setapinnis*
butterfish	*Peprilus triacanthus*	perch, white	*Morone americana*
cod, Atlantic	*Gadus morhua*	pipefish, northern	*Syngnathus fuscus*
cusk-eel, fawn	*Lepophidium profundorum*	puffer, northern	*Sphoeroides maculatus*
dogfish, smooth	*Mustelus canis*	**puffer, smooth**	***Lagocephalus laevigatus***
dogfish, spiny	*Squalus acanthias*	ray, roughtail stingray	*Dasyatis centroura*
eel, American	*Anguilla rostrata*	rockling, fourbeard	*Enchelyopus cimbrius*
eel, conger	*Conger oceanicus*	sculpin, longhorn	*Myoxocephalus octodecemspin*
filefish, planehead	*Monacanthus hispidus*	scup	*Stenotomus chrysops*
flounder, fourspot	*Paralichthys oblongus*	searobin, northern	*Prionotus carolinus*
flounder, smallmouth	*Etropus microstomus*	searobin, striped	*Prionotus evolans*
flounder, summer	*Paralichthys dentatus*	sennet, northern	*Sphyraena borealis*
flounder, windowpane	*Scophthalmus aquosus*	shad, American	*Alosa sapidissima*
flounder, winter	*Pseudopleuronectes american*	shad, hickory	*Alosa mediocris*
goosefish	*Lophius americanus*	skate, clearnose	*Raja eglanteria*
hake, red	*Urophycis chuss*	skate, little	*Leucoraja erinacea*
hake, silver	*Merluccius bilinearis*	skate, winter	*Leucoraja ocellata*
hake, spotted	*Urophycis regia*	spot	*Leiostomus xanthurus*
harvestfish	*Peprilus paru*	striped bass	*Morone saxatilis*
herring, Atlantic	*Clupea harengus*	sturgeon, Atlantic	*Acipenser oxyrinchus*
herring, alewife	*Alosa pseudoharengus*	tautog	*Tautoga onitis*
herring, blueback	*Alosa aestivalis*	toadfish, oyster	*Opsanus tau*
hogchoker	*Trinectes maculatus*	weakfish	*Cynoscion regalis*

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 2019.

In 2019, forty-one 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.

Common Name	Scientific Name	Common Name	Scientific Name
arks	*Noetia-Anadara spp.*	polychaetes	*Class polychfeta*
bryozoan, bushy	*Phylum Bryozoa*	sea cucumber	*Class Holothuroidea*
clam, hard clams	*Artica-Mercinaria-Pitar sp.*	sea grape	*Molgula spp.*
clam, surf	*Spisula solidissima*	sea urchin, green	*Strongylocentrotus droebach*
coral, star	*Astrangia poculata*	sea urchin, purple	*Arbacia punctulata*
crab, mud	*Family Xanthidae*	shrimp, coastal mud	*Upogebia affinis*
crab, Japanese shore	*Hemigrapsus sanguineus*	shrimp, ghost	*Gilvossius setimanus*
crab, blue	*Callinectes sapidus*	shrimp, mantis	*Squilla empusa*
crab, flat claw hermit	*Pagurus pollicaris*	shrimp, northern red	*Pandalus montagui*
crab, horseshoe	*Limulus polyphemus*	shrimp, sand	*Crangon septemspinosa*
crab, lady	*Ovalipes ocellatus*	slipper shell, common	*Crepidula fornicata*
crab, rock	*Cancer irroratus*	sponge spp.	*sponge spp.*
crab, spider	*Libinia emarginata*	sponge, deadman's fingers	*Haliclona spp.*
hydroid spp.	*hydroid spp.*	sponge, red bearded	*Microciona prolifera*
jelly, comb	*Phylum Ctenophora*	squid, longfin inshore	*Doryeuthis pealeii*
jelly, moon	*Aurelia aurita*	starfish spp.	*Asteriid spp.*
jellyfish, lion's mane	*Cyanea capillata*	Tubularia hydroids	*Tubularia, spp.*
lobster, American	*Homarus americanus*	whelk, channeled	*Busycotypus canaliculatus*
mussel, blue	*Mytilus edulis*	whelk, knobbed	*Busycon carica*
northern moon snail	*Lunatia heros*	worms, fan	*Myxicola infundibulum*
oyster, common	*Crassostrea virginica*		

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 2019.
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) = 200.

species	count	%	weight	%
scup	53,617	40.2	11,169.4	50.3
butterfish	43,434	32.5	1,114.1	5.0
silver hake	4,348	3.3	126.1	0.6
weakfish	3,766	2.8	245.5	1.1
striped searobin	3,181	2.4	1,264.4	5.7
northern searobin	3,112	2.3	450.5	2.0
moonfish	2,270	1.7	22.6	0.1
bluefish	2,048	1.5	224.5	1.0
spotted hake	2,027	1.5	178.3	0.8
black sea bass	1,584	1.2	816.7	3.7
windowpane flounder	1,427	1.1	242.5	1.1
alewife	1,401	1.0	86.1	0.4
bay anchovy	1,346	1.0	6.6	0.0
summer flounder	1,309	1.0	464.3	2.1
Atlantic herring	1,294	1.0	302.7	1.4
smooth dogfish	1,243	0.9	2,957.2	13.3
red hake	1,215	0.9	77.5	0.3
Atlantic menhaden	815	0.6	280.7	1.3
fourspot flounder	570	0.4	147.8	0.7
striped bass	535	0.4	773.6	3.5
American shad	512	0.4	32.4	0.1
winter flounder	422	0.3	103.1	0.5
little skate	418	0.3	220.9	1.0
hogchoker	383	0.3	50.8	0.2
tautog	373	0.3	351.9	1.6
smallmouth flounder	186	0.1	4.1	0.0
blueback herring	124	0.1	6.0	0.0
clearnose skate	113	0.1	213.8	1.0
spot	66	0.0	8.2	0.0
Spanish mackerel	65	0.0	3.7	0.0
blue runner	59	0.0	3.8	0.0
winter skate	41	0.0	72.7	0.3
striped anchovy	21	0.0	0.4	0.0
fourbeard rockling	20	0.0	1.3	0.0
Atlantic cod	15	0.0	5.1	0.0
northern kingfish	14	0.0	1.9	0.0
hickory shad	11	0.0	3.1	0.0
Atlantic sturgeon	9	0.0	104.7	0.5
northern puffer	9	0.0	1.4	0.0
northern pipefish	5	0.0	0.2	0.0
crevalle jack	4	0.0	0.2	0.0
spiny dogfish	4	0.0	23.8	0.1
oyster toadfish	4	0.0	1.1	0.0
bigeye	3	0.0	0.2	0.0
conger eel	2	0.0	0.3	0.0
fawn cusk-eel	2	0.0	0.1	0.0
goosefish	2	0.0	0.8	0.0
inshore lizardfish	2	0.0	0.1	0.0
white perch	2	0.0	0.2	0.0
American eel	1	0.0	0.6	0.0
planehead filefish	1	0.0	0.1	0.0
harvestfish	1	0.0	0.1	0.0
northern sennet	1	0.0	0.1	0.0
roughtail stingray	1	0.0	16.8	0.1
longhorn sculpin	1	0.0	0.1	0.0
Total	**133,439**		**22,184.7**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
horseshoe crab	218	1.8	391.9	33.3
longfin inshore squid	10,934	92.1	368.4	31.3
spider crab	nc		115.9	9.9
common slipper shell	nc		71.8	6.1
lion's mane jellyfish	386	3.3	67.6	5.8
bushy bryozoan	nc		60.2	5.1
mixed sponge species	nc		43.2	3.7
American lobster	25	0.2	7.6	0.6
mantis shrimp	223	1.9	7.2	0.6
flat claw hermit crab	nc		6.5	0.6
hydroid spp.	nc		5.7	0.5
knobbed whelk	17	0.1	4.8	0.4
blue crab	21	0.2	3.9	0.3
common oyster	nc		3.8	0.3
channeled whelk	22	0.2	3.3	0.3
sand shrimp	nc		2.5	0.2
rock crab	nc		1.7	0.1
hard clams	10	0.1	1.4	0.1
lady crab	nc		1.4	0.1
mud crabs	nc		1.3	0.1
northern moon snail	nc		1.1	0.1
Tubularia, spp.	nc		1.0	0.1
arks	nc		0.8	0.1
deadman's fingers sponge	nc		0.6	0.0
blue mussel	nc		0.4	0.0
fan worm tubes	nc		0.4	0.0
star coral	nc		0.3	0.0
comb jelly spp	nc		0.3	0.0
sea cucumber	2	0.0	0.2	0.0
sea grape	nc		0.2	0.0
green sea urchin	2	0.0	0.1	0.0
red bearded sponge	nc		0.1	0.0
northern red shrimp	1	0.0	0.1	0.0
polychaetes	nc		0.1	0.0
coastal mud shrimp	1	0.0	0.1	0.0
ghost shrimp	1	0.0	0.1	0.0
Japanese shore crab	nc		0.1	0.0
moon jelly	nc		0.1	0.0
starfish spp.	nc		0.1	0.0
surf clam	1	0.0	0.1	0.0
purple sea urchin	1	0.0	0.1	0.0
Total	**11,865**		**1,176.2**	

Note: nc= not counted

Table 5.14. Total counts and weight (kg) of finfish taken in the spring and fall sampling periods, 2019.
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 = 120 and Fall = 80.

	Spring			
species	**count**	**%**	**weight**	**%**
scup	33,941	58.2	8,517.3	57.5
silver hake	4,283	7.3	122.1	0.8
northern searobin	2,801	4.8	393.4	2.7
striped searobin	2,505	4.3	987.3	6.7
spotted hake	1,730	3.0	120.0	0.8
alewife	1,341	2.3	82.9	0.6
butterfish	1,341	2.3	140.5	0.9
black sea bass	1,322	2.3	700.4	4.7
Atlantic herring	1,294	2.2	302.7	2.0
windowpane flounder	1,174	2.0	206.2	1.4
summer flounder	1,123	1.9	350.2	2.4
red hake	1,120	1.9	68.8	0.5
bay anchovy	666	1.1	3.1	0.0
fourspot flounder	538	0.9	140.2	0.9
striped bass	463	0.8	608.4	4.1
smooth dogfish	421	0.7	1,071.4	7.2
little skate	412	0.7	218.1	1.5
winter flounder	408	0.7	100.1	0.7
tautog	272	0.5	276.9	1.9
hogchoker	236	0.4	30.6	0.2
smallmouth flounder	173	0.3	3.7	0.0
American shad	165	0.3	11.1	0.1
Atlantic menhaden	134	0.2	55.4	0.4
weakfish	117	0.2	27.6	0.2
blueback herring	114	0.2	5.7	0.0
clearnose skate	70	0.1	136.6	0.9
winter skate	40	0.1	72.1	0.5
fourbeard rockling	19	0.0	1.3	0.0
Atlantic cod	15	0.0	5.1	0.0
hickory shad	7	0.0	1.4	0.0
northern kingfish	5	0.0	0.9	0.0
northern pipefish	5	0.0	0.2	0.0
northern puffer	4	0.0	0.7	0.0
spiny dogfish	4	0.0	23.8	0.2
Atlantic sturgeon	2	0.0	14.1	0.1
fawn cusk-eel	2	0.0	0.1	0.0
goosefish	2	0.0	0.8	0.0
oyster toadfish	2	0.0	0.8	0.0
white perch	2	0.0	0.2	0.0
bluefish	1	0.0	0.7	0.0
conger eel	1	0.0	0.1	0.0
American eel	1	0.0	0.6	0.0
longhorn sculpin	1	0.0	0.1	0.0
Total	**58,277**		**14,803.0**	

	Fall			
species	**count**	**%**	**weight**	**%**
butterfish	42,093	56.0	973.6	13.2
scup	19,677	26.2	2,652.1	35.9
weakfish	3,649	4.9	217.9	3.0
moonfish	2,270	3.0	22.6	0.3
bluefish	2,047	2.7	223.9	3.0
smooth dogfish	822	1.1	1,885.9	25.5
Atlantic menhaden	682	0.9	225.3	3.1
bay anchovy	680	0.9	3.5	0.0
striped searobin	676	0.9	277.0	3.8
American shad	347	0.5	21.3	0.3
northern searobin	311	0.4	57.1	0.8
spotted hake	297	0.4	58.2	0.8
black sea bass	263	0.3	116.4	1.6
windowpane flounder	253	0.3	36.4	0.5
summer flounder	186	0.2	114.1	1.5
hogchoker	147	0.2	20.1	0.3
tautog	101	0.1	75.0	1.0
red hake	94	0.1	8.7	0.1
striped bass	72	0.1	165.2	2.2
spot	66	0.1	8.2	0.1
Spanish mackerel	65	0.1	3.7	0.1
silver hake	65	0.1	4.0	0.1
alewife	60	0.1	3.2	0.0
blue runner	59	0.1	3.8	0.1
clearnose skate	43	0.1	77.2	1.0
fourspot flounder	32	0.0	7.6	0.1
striped anchovy	21	0.0	0.4	0.0
winter flounder	14	0.0	3.0	0.0
smallmouth flounder	13	0.0	0.4	0.0
blueback herring	10	0.0	0.3	0.0
northern kingfish	9	0.0	1.1	0.0
Atlantic sturgeon	7	0.0	90.6	1.2
little skate	6	0.0	2.8	0.0
northern puffer	5	0.0	0.7	0.0
crevalle jack	4	0.0	0.2	0.0
hickory shad	4	0.0	1.8	0.0
bigeye	3	0.0	0.2	0.0
inshore lizardfish	2	0.0	0.1	0.0
oyster toadfish	2	0.0	0.3	0.0
conger eel	1	0.0	0.3	0.0
planehead filefish	1	0.0	0.1	0.0
harvestfish	1	0.0	0.1	0.0
northern sennet	1	0.0	0.1	0.0
fourbeard rockling	1	0.0	0.1	0.0
roughtail stingray	1	0.0	16.8	0.2
winter skate	1	0.0	0.6	0.0
Total	**75,164**		**7,381.7**	

Table 5.15. Total catch of invertebrates taken in the spring and fall sampling periods, 2019.
Species are ranked by total weight (kg). Number of tows (sample sizes): Spring = 120 and Fall = 80.

	Spring			
species	**count**	**%**	**weight**	**%**
horseshoe crab	127	11.4	221.21	38.8
spider crab	nc		112.14	19.7
longfin inshore squid	687	62	61.16	10.7
common slipper shell	nc		58.96	10.4
mixed sponge species	nc		43.11	7.6
bushy bryozoan	nc		29.01	5.1
American lobster	25	2	7.63	1.3
hydroid spp.	nc		5.44	1
flat claw hermit crab	nc		4.96	0.9
common oyster	nc		3.71	0.7
lion's mane jellyfish	194	17.4	3.57	0.6
sand shrimp	nc		2.46	0.4
channeled whelk	17	2	2.33	0.4
rock crab	nc		1.62	0.3
knobbed whelk	9	0.8	1.55	0.3
blue crab	9	0.8	1.47	0.3
lady crab	nc		1.39	0.2
mantis shrimp	33	3	1.21	0.2
northern moon snail	nc		1.13	0.2
mud crabs	nc		0.97	0.2
Tubularia, spp.	nc		0.96	0.2
hard clams	7	0.7	0.91	0.2
arks	nc		0.71	0.1
deadman's fingers sponge	nc		0.55	0.1
blue mussel	nc		0.34	0.1
star coral	nc		0.21	0
sea grape	nc		0.15	0
green sea urchin	2	0.2	0.11	0
red bearded sponge	nc		0.1	0
northern red shrimp	1	0.1	0.1	0
polychaetes	nc		0.1	0
coastal mud shrimp	1	0.1	0.05	0
fan worm tubes	nc		0.05	0
Japanese shore crab	nc		0.05	0
starfish spp.	nc		0.05	0
surf clam	1	0.1	0.05	0
Total	**1,113**		**569.5**	

Note: nc= not counted

	Fall			
species	**count**	**%**	**weight**	**%**
longfin inshore squid	10,247	95.3	307.2	50.6
horseshoe crab	91	0.8	170.7	28.1
lion's mane jellyfish	191	1.8	64.1	10.6
bushy bryozoan	nc		31.2	5.1
common slipper shell	nc		12.9	2.1
mantis shrimp	190	1.8	6.0	1.0
spider crab	nc		3.8	0.6
knobbed whelk	8	0.1	3.2	0.5
blue crab	12	0.1	2.5	0.4
flat claw hermit crab	nc		1.6	0.3
channeled whelk	5	0.0	1.0	0.2
hard clams	3	0.0	0.5	0.1
fan worm tubes	nc		0.4	0.1
mud crabs	nc		0.3	0.1
comb jelly spp	nc		0.3	0.0
hydroid spp.	nc		0.2	0.0
sea cucumber	2	0.0	0.2	0.0
common oyster	nc		0.1	0.0
mixed sponge species	nc		0.1	0.0
star coral	nc		0.1	0.0
blue mussel	nc		0.1	0.0
rock crab	nc		0.1	0.0
arks	nc		0.1	0.0
sand shrimp	nc		0.1	0.0
ghost shrimp	1	0.0	0.1	0.0
moon jelly	nc		0.1	0.0
purple sea urchin	1	0.0	0.1	0.0
Total	**10,751**		**606.7**	

Table 5.16. Spring indices of abundance for selected species, 1984-2019.

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.

	Spring																																			84-18
Species	**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**	**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	1.03
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	0.62
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	
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	
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	0.17
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	
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	0.01	0.00	0.04	0.02	0.03	0.03	0.03	0.09	0.12	0.07	0.43	0.03	0.19	0.06	0.08	0.06	0.09	0.04	0.03	0.03	0.02	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	4.26
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	
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	27.01
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	45.91
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	3.49
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	4.13
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	0.37	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	
herring, Atlantic *	0.00	0.58	1.12	2.77	2.16	2.27	5.73	4.91	2.73	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	1.82
herring, blueback	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	
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	
kingfish, northern	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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	0.07	0.01	0.00	0.01	0.05	0.01	0.00	0.03	
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	4.44
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	
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	
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	0.06	0.08	0.03	0.06	0.06	0.06	0.02	0.04	0.05	0.04	0.08	0.04	0.10	0.05	0.00	0.00	0.01	0.00	0.00	0.00	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	0.45
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	0.02	0.00	0.01	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	0.04	0.01	0.01	0.00	0.01	0.00	0.00	0.00	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	27.89
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	0.01	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	0.00	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	2.00
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	
shad, American	0.10	1.36	0.57	0.92	0.44	0.90	0.34	0.54	0.75	0.29	0.68	0.49	0.48	1.08	0.86	0.80	0.38	0.08	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	
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	0.07	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	
skate, clearnose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	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	
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	18.78	11.23	11.65	7.56	6.21	8.03	7.63	7.03	6.54	1.65	1.40	2.82	1.56	1.03	1.02	1.15	2.15	1.11	1.08	0.61	0.43	0.55	0.52	0.84	7.10
skate, winter*	0.00	0.12	0.15	0.07	0.37	0.34	0.22	0.23	0.18	0.23	0.14	0.12	0.24	0.16	0.24	0.17	0.16	0.10	0.13	0.16	0.21	0.09	0.13	0.15	0.12	0.15	0.10	0.14	0.32	0.28	0.26	0.09	0.07	0.05	0.02	0.18	0.16
spot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.01	0.00	
squid, long-finned**	nc	nc	3.24	2.56	9.37	4.98	7.87	7.18	6.44	4.23	3.82	6.21	3.24	5.14	3.33	3.49	2.70	2.73	3.22	2.50	9.43	4.76	11.55	2.14	3.45	6.57	3.20	4.10	3.34	1.47	4.09	3.93	5.97	6.80	4.57	1.46	4.78
striped bass *	0.02	0.00	0.00	0.05	0.04	0.06	0.16	0.15	0.22	0.27	0.30	0.59	0.63	0.85	0.97	1.10	0.84	0.61	1.30	0.87	0.56	1.17	0.61	1.02	0.57	0.60	0.40	0.48	0.43	0.67	0.41	0.20	0.48	0.34	0.57	0.91	0.50
sturgeon, Atlantic	0.06	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.03	0.01	0.01	0.01	0.05	0.04	0.02	0.01	0.05	0.00	0.00	0.02	0.05	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.02	0.00	0.00	0.01	
tautog *	2.75	1.47	1.50	0.71	0.65	1.09	1.00	0.92	0.82	0.42	0.44	0.15	0.49	0.40	0.42	0.40	0.57	0.70	0.91	0.52	0.54	0.57	0.64	0.48	0.50	0.40	0.25	0.38	0.44	0.43	0.51	0.47	0.59	0.43	0.62	0.59	0.67
weakfish	0.02	0.00	0.07	0.01	0.04	0.03	0.05	0.18	0.12	0.06	0.03	0.11	0.12	0.27	0.24	0.28	0.11	0.17	0.12	0.02	0.10	0.17	0.14	0.07	0.03	0.05	0.01	0.08	0.50	0.32	0.11	0.02	0.55	0.57	0.04	0.34	

Table 5.17. Fall indices of abundance for selected species, 1984-2019.

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.

	Fall																																		
Species	**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**	**84-18 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	
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	
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	20.90
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	163.67
cunner	0.09	0.05	0.05	0.06	0.05	0.06	0.05	0.08	0.09	0.05	0.05	0.03	0.01	0.05	0.08	0.06	0.07	0.04	0.03	0.06	0.04	0.05	0.02	0.01	0.05	0.05	-	0.01	0.03	0.01	0.02	0.01	0.00	0.00	0.00	0.00	
dogfish, smooth *	2.47	1.92	1.43	0.81	0.91	0.41	0.55	0.46	0.78	0.95	0.49	0.46	0.80	0.59	0.72	0.93	1.88	1.69	3.58	3.10	1.44	1.41	0.94	2.27	0.63	1.13	-	1.43	2.41	4.13	5.78	7.30	5.24	8.29	7.17	6.01	2.19
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	
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	
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	2.05
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	
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	
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	
hake, silver	0.55	0.23	1.65	0.01	0.30	0.60	0.96	0.32	0.48	0.20	3.34	0.22	0.06	0.80	0.07	0.16	0.09	0.07	0.07	0.18	0.18	0.09	0.64	0.04	0.28	0.18	-	0.41	0.40	0.12	0.11	0.16	0.02	0.12	0.35	0.41	
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	0.84
herring, Atlantic	0.00	0.00	0.01	0.02	0.40	0.08	0.04	0.03	1.47	0.14	0.14	0.00	0.19	0.06	0.25	0.00	0.02	0.00	0.00	0.38	0.02	0.02	0.03	0.02	0.02	0.06	-	0.04	0.00	0.03	0.03	0.10	0.00	0.00	0.07	0.00	
herring, blueback *	0.38	0.16	0.07	0.13	0.53	0.34	0.10	0.04	0.08	0.11	0.93	0.27	0.05	0.75	0.16	0.06	0.06	0.20	0.06	0.10	0.09	0.06	0.15	0.24	0.05	0.09	-	0.08	0.01	0.00	0.04	0.17	0.21	0.24	0.04	0.06	0.18
hogchoker *	0.90	0.56	0.21	0.17	0.30	0.17	0.22	0.38	0.15	0.18	0.05	0.07	0.18	0.05	0.05	0.19	0.10	0.15	0.21	0.26	0.15	0.13	0.11	0.20	0.12	0.09	-	0.59	0.94	0.65	0.67	1.06	0.89	1.18	2.55	1.15	0.41
kingfish, northern *	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.02	0.06	0.03	0.19	0.04	0.04	0.12	0.05	0.01	0.02	0.01	0.00	0.04	0.03	0.00	0.04	0.05	0.05	-	0.21	0.24	0.09	0.23	0.38	0.16	0.08	0.34	0.08	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	0.02	0.01	0.00	4.90
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	0.72
moonfish *	0.05	0.33	0.11	0.04	0.41	0.10	0.04	0.17	0.22	0.04	0.34	0.25	1.99	0.91	2.08	1.15	2.11	0.82	1.36	0.69	0.74	1.55	1.51	1.66	5.08	10.03	-	1.50	0.79	2.62	3.92	1.06	0.77	1.16	0.79	4.57	1.36
ocean pout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
rockling, fourbeard	0.08	0.01	0.04	0.05	0.21	0.15	0.07	0.04	0.06	0.03	0.06	0.01	0.11	0.07	0.03	0.04	0.12	0.03	0.01	0.04	0.04	0.01	0.00	0.02	0.06	0.04	-	0.03	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	
scad, rough *	0.13	0.08	0.03	0.27	0.42	0.08	0.08	0.01	0.00	0.21	0.03	0.00	0.18	0.05	0.00	0.00	0.00	0.07	0.07	0.14	0.09	0.19	0.15	0.08	0.00	0.38	-	0.32	0.12	0.14	0.04	0.37	0.01	0.06	0.00	0.00	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
scup *	10.72	30.97	25.76	18.54	39.70	65.09	69.48	311.57	83.73	77.06	92.52	59.14	61.46	41.28	103.27	537.68	521.10	177.64	348.70	152.23	291.46	424.06	116.75	475.29	303.26	139.38	-	198.23	223.52	40.68	182.58	422.23	307.01	212.15	228.62	129.46	188.03
sea raven	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
searobin, northern	0.20	0.22	0.31	0.03	0.38	0.18	0.43	0.43	0.15	0.25	0.80	0.12	0.27	0.14	0.93	0.62	0.47	1.15	1.25	0.51	1.03	0.68	0.21	1.05	1.11	0.88	-	1.19	2.07	1.56	2.70	0.84	1.24	0.79	2.32	1.38	
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	3.70
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	0.89
shad, hickory *	0.02	0.01	0.03	0.01	0.00	0.00	0.01	0.00	0.05	0.04	0.10	0.04	0.09	0.10	0.05	0.12	0.09	0.03	0.04	0.09	0.13	0.25	0.24	0.08	0.03	0.06	-	0.05	0.19	0.16	0.04	0.02	0.02	0.02	0.03	0.03	0.07
skate, clearnose *	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.05	0.04	0.01	0.02	0.01	0.03	0.12	0.10	0.10	0.34	0.18	0.33	0.10	0.48	0.23	0.44	0.38	0.24	-	0.27	0.73	0.68	0.34	0.47	0.43	0.36	0.33	0.29	0.20
skate, little	4.41	3.62	4.01	2.72	8.13	4.31	7.50	5.24	5.52	10.00	6.41	3.37	11.55	6.90	7.73	5.23	5.25	5.07	5.39	2.99	3.12	3.90	1.03	1.09	1.28	0.99	-	0.84	1.14	0.63	0.82	0.55	0.48	0.20	0.26	0.05	
skate, winter	0.00	0.01	0.00	0.00	0.03	0.03	0.05	0.02	0.07	0.09	0.12	0.07	0.17	0.08	0.05	0.06	0.01	0.13	0.13	0.00	0.07	0.10	0.00	0.06	0.21	0.10	-	0.05	0.17	0.12	0.09	0.04	0.02	0.10	0.00	0.01	
spot *	0.00	0.18	0.20	0.02	0.09	0.00	0.04	0.02	0.00	0.38	0.18	0.03	0.99	0.08	0.00	0.28	0.63	0.08	0.35	0.00	0.07	0.00	0.19	0.00	2.67	0.01	-	0.04	1.60	1.70	0.16	0.10	0.07	0.62	0.19	0.34	0.32
squid, long-finned **	nc	nc	27.40	28.60	159.16	85.60	69.12	62.97	172.95	272.11	127.96	155.28	180.99	68.57	202.29	132.50	109.87	60.18	35.48	269.32	94.47	81.12	70.58	179.39	114.99	187.15	-	85.68	62.53	32.59	112.67	195.00	94.57	114.90	100.45	82.66	117.08
striped bass	0.01	0.00	0.01	0.01	0.03	0.00	0.00	0.05	0.05	0.09	0.06	0.08	0.13	0.40	0.18	0.23	0.27	0.23	0.37	0.12	0.77	0.25	0.47	0.38	0.44	0.30	-	0.24	0.17	0.26	0.17	0.26	0.14	0.16	0.40	0.27	
sturgeon, Atlantic *	0.03	0.01	0.03	0.03	0.00	0.02	0.02	0.01	0.08	0.08	0.06	0.02	0.01	0.02	0.02	0.07	0.03	0.08	0.05	0.10	0.04	0.03	0.10	0.05	0.06	0.10	-	0.02	0.02	0.01	0.05	0.01	0.06	0.01	0.05	0.05	0.04
tautog	0.72	0.32	0.22	0.50	0.25	0.17	0.16	0.23	0.20	0.15	0.14	0.11	0.07	0.11	0.23	0.36	0.23	0.20	0.26	0.37	0.16	0.19	0.20	0.13	0.23	0.08	-	0.07	0.14	0.15	0.18	0.15	0.23	0.09	0.28	0.28	
weakfish *	1.55	6.35	13.57	0.73	3.54	8.69	5.71	12.11	3.22	4.18	11.21	5.64	15.49	12.93	5.28	31.36	63.42	40.51	41.45	49.46	59.07	26.00	1.50	63.96	9.11	6.65	-	12.27	22.27	7.50	41.56	31.05	6.33	8.37	25.84	15.44	19.35

Table 5.18. Finfish and invertebrate biomass indices for the spring sampling period, 1992-2019.

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

	Spring																											
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
moonfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ocean pout	0.07	0.09	0.04	0.04	0.04	0.03	0.02	0.02	0.03	0.01	0.03	0.02	0.03	0.00	0.01	0.02	0.01	0.03	0.01	0.03	0.01	0.00	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
scad, rough	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sculpin, longhorn	0.06	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.03	0.01	0.01	0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.01	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
sea raven	0.03	0.00	0.00	0.00	0.01	0.00	0.05	0.03	0.05	0.02	0.03	0.01	0.01	0.00	0.00	0.02	0.00	0.01	0.02	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
searobin, northern	0.26	0.35	0.28	0.27	0.28	0.33	0.17	0.22	0.70	0.51	0.51	0.40	0.29	0.08	0.35	0.26	0.23	0.44	0.52	0.30	0.81	0.34	0.39	0.22	0.50	0.98	0.71	1.17
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
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
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
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
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
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
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
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
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
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
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
Invertebrates																												
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
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
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
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	0.01
crab, rock	1.17	0.61	0.64	0.14	0.45	0.32	1.04	0.55	0.25	0.35	0.31	0.36	0.14	0.05	0.16	0.16	0.20	0.18	0.13	0.25	0.16	0.06	0.03	0.02	0.05	0.01	0.02	0.01
crab, spider	0.98	1.08	1.22	0.32	0.96	0.52	0.69	0.39	0.35	1.02	1.30	1.85	1.42	0.36	0.27	0.55	0.57	0.46	0.70	0.78	0.74	0.62	0.55	0.42	0.72	0.69	0.51	0.56
jellyfish, lion's mane	0.01	0.11	0.01	0.15	0.10	0.08	0.19	0.06	0.06	0.03	0.02	0.23	0.14	0.38	0.11	0.00	0.10	0.03	0.08	0.08	0.01	0.16	0.14	0.05	0.01	0.03	0.09	0.03
lobster, American	2.80	2.32	1.53	3.24	2.72	3.02	6.56	4.95	3.90	3.04	2.55	1.48	1.03	1.00	0.84	1.24	1.18	0.62	0.55	0.30	0.33	0.17	0.15	0.12	0.15	0.03	0.03	0.05
mussel, blue	0.31	0.01	0.07	0.03	0.03	0.01	0.05	0.03	0.04	0.01	0.17	0.08	0.11	0.09	0.04	0.04	0.02	0.00	0.02	0.02	0.04	0.06	0.08	0.02	0.00	0.02	0.00	0.00
northern moon shell	0.05	0.04	0.12	0.03	0.02	0.02	0.04	0.05	0.05	0.08	0.10	0.10	0.06	0.02	0.00	0.03	0.03	0.04	0.04	0.04	0.01	0.02	0.03	0.02	0.01	0.01	0.01	0.01
oyster, common	0.04	0.00	0.06	0.00	0.00	0.01	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.01	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.01
shrimp, mantis	0.06	0.13	0.05	0.05	0.04	0.03	0.03	0.07	0.18	0.08	0.04	0.03	0.03	0.01	0.02	0.05	0.04	0.04	0.01	0.07	0.05	0.05	0.03	0.02	0.04	0.06	0.02	0.01
squid, long-finned	1.01	0.91	0.67	0.89	0.55	0.99	0.41	0.62	0.51	0.41	0.42	0.42	1.69	1.08	1.41	0.33	0.40	0.92	0.77	0.61	0.43	0.20	0.76	0.55	0.80	0.61	0.66	0.31
starfish sp.	0.22	0.13	0.06	0.02	0.03	0.03	0.05	0.04	0.06	0.28	0.24	0.29	0.12	0.06	0.03	0.09	0.13	0.11	0.12	0.09	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00
whelks	0.16	0.04	0.07	0.01	0.07	0.03	0.06	0.08	0.09	0.13	0.12	0.31	0.15	0.05	0.05	0.12	0.11	0.08	0.05	0.13	0.06	0.10	0.05	0.03	0.06	0.04	0.03	0.03

Table 5.19. Finfish and invertebrate biomass indices for the fall sampling period, 1992-2019.

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

	Fall																										
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Invertebrates																												
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
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
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
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
crab, rock	0.58	0.55	0.18	0.09	0.45	0.32	0.37	0.22	0.19	0.13	0.12	0.04	0.08	0.02	0.10	0.04	0.28	0.09	-	0.09	0.05	0.03	0.01	0.00	0.00	0.00	0.00	0.00
crab, spider	0.53	1.89	0.46	0.25	0.71	0.42	0.25	0.24	0.21	0.30	0.27	0.47	0.32	0.13	0.10	0.15	0.25	0.29	-	0.21	0.18	0.21	0.10	0.07	0.13	0.12	0.11	0.04
jellyfish, lion's mane	0.02	0.01	0.03	0.17	0.18	0.50	0.17	0.03	0.22	0.17	0.10	0.01	0.13	0.12	0.46	0.45	0.02	0.58	-	0.01	0.03	0.59	0.07	0.00	0.43	0.01	0.04	0.52
lobster, American	3.17	4.11	3.58	3.03	3.48	7.22	4.24	4.16	2.65	1.91	1.10	1.28	1.46	0.84	0.61	0.51	0.80	0.77	-	0.12	0.10	0.06	0.04	0.04	0.01	0.01	0.00	0.00
mussel, blue	0.07	0.06	0.12	0.02	0.00	0.01	0.09	0.00	0.04	0.12	0.11	0.02	0.10	0.10	0.02	0.07	0.04	0.03	-	0.03	0.02	0.16	0.06	0.01	0.00	0.01	0.00	0.00
northern moon shell	0.03	0.02	0.03	0.01	0.01	0.00	0.02	0.01	0.00	0.04	0.10	0.00	0.00	0.01	0.00	0.00	0.03	0.01	-	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
oyster, common	0.01	0.02	0.00	0.00	0.00	0.01	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	-	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
shrimp, mantis	0.05	0.08	0.02	0.02	0.13	0.06	0.02	0.09	0.18	0.05	0.06	0.02	0.04	0.03	0.04	0.06	0.08	0.06	-	0.22	0.20	0.14	0.11	0.08	0.05	0.03	0.11	0.07
squid, long-finned	5.00	7.92	4.71	4.68	5.53	2.20	6.40	6.06	4.05	2.39	1.81	5.88	3.38	3.47	2.15	6.51	4.29	4.25	-	2.52	2.28	1.25	4.01	10.03	3.17	4.73	3.18	2.83
starfish sp.	0.11	0.08	0.07	0.00	0.01	0.02	0.05	0.02	0.12	0.22	0.09	0.01	0.10	0.11	0.02	0.05	0.09	0.06	-	0.03	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
whelks	0.28	0.28	0.06	0.08	0.22	0.10	0.27	0.23	0.38	0.52	0.38	0.24	0.24	0.20	0.08	0.20	0.30	0.20	-	0.21	0.15	0.17	0.09	0.15	0.06	0.06	0.06	0.04

Table 5.20. Bluefish indices-at-age, 1984-2019.

The 1984 and the 2013-2019 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	Geometric Mean	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6+
1984	FA	Sept/Oct	6,738	84.3	70	**23.41**	22.46846	0.41161	0.35053	0.14118	0.02432	0.00347	0.01042
1985	FA	Sept/Oct	5,301	87.5	80	**19.01**	16.97788	0.95184	0.62743	0.24627	0.14557	0.02202	0.03899
1986	FA	Sept/Oct	2,738	92.5	80	**13.66**	10.82247	1.18353	1.16988	0.18939	0.12798	0.08771	0.07904
1987	FA	Sept/Oct	2,598	93.8	80	**14.32**	12.16673	1.00642	0.50812	0.38414	0.13211	0.05764	0.06484
1988	FA	Sept/Oct	3,645	93.8	80	**15.49**	14.26504	0.21113	0.49008	0.13684	0.17035	0.12539	0.09118
1989	FA	Sept/Oct	8,636	88.8	80	**26.25**	24.99768	0.57512	0.45987	0.04245	0.01955	0.06846	0.08687
1990	FA	Sept/Oct	4,671	93.8	80	**23.88**	19.36665	2.96951	0.92831	0.16309	0.12845	0.12227	0.20173
1991	FA	Sept/Oct	5,699	98.8	80	**33.43**	28.49387	1.27891	3.26664	0.12095	0.05552	0.05045	0.16366
1992	FA	Sept/Oct	5,226	97.5	80	**25.22**	18.87085	1.75987	2.78912	1.32392	0.18181	0.06275	0.23169
1993	FA	Sept/Oct	6,456	91.7	120	**18.92**	16.77605	0.10982	1.03233	0.32124	0.56632	0.02988	0.08436
1994	FA	Sept/Oct	16,233	93.3	120	**32.06**	30.52338	0.76225	0.24109	0.16222	0.13727	0.16887	0.06492
1995	FA	Sept/Oct	5,518	92.5	80	**24.46**	21.69603	1.96209	0.59672	0.05471	0.04473	0.04053	0.06520
1996	FA	Sept/Oct	6,689	91.3	80	**20.80**	19.80478	0.22004	0.41286	0.24725	0.01322	0.02488	0.07697
1997	FA	Sept/Oct	10,777	92.5	80	**37.90**	36.59172	0.60241	0.47727	0.07386	0.06682	0.02814	0.05979
1998	FA	Sept/Oct	8,791	91.3	80	**31.41**	29.87079	0.97342	0.37865	0.15855	0.01072	0.00417	0.01370
1999	FA	Sept/Oct	7,792	96.3	80	**45.31**	41.87752	2.89157	0.22410	0.20336	0.05010	0.00776	0.05559
2000	FA	Sept/Oct	6,109	92.5	80	**20.57**	17.28053	2.02593	1.07170	0.14808	0.00112	0.02760	0.01503
2001	FA	Sept/Oct	3,957	93.8	80	**24.24**	21.47198	1.12599	1.40312	0.18378	0.02042	0.01072	0.02399
2002	FA	Sept/Oct	3,394	90	80	**18.75**	14.00653	3.78846	0.63786	0.09413	0.01921	0.07948	0.12433
2003	FA	Sept/Oct	3,682	92.5	40	**28.53**	27.33834	0.42510	0.60263	0.07313	0.02058	0.03197	0.03825
2004	FA	Sept/Oct	6,485	90	80	**29.13**	21.45225	5.51484	1.45586	0.33113	0.06769	0.16343	0.14479
2005	FA	Sept/Oct	6,507	88.8	80	**18.89**	17.76926	0.08680	0.65503	0.20716	0.08841	0.04539	0.03794
2006	FA	Sept/Oct	2,062	92.5	40	**15.66**	14.24365	0.48746	0.54706	0.28763	0.06386	0.00759	0.02276
2007	FA	Sept/Oct	9,339	87.5	80	**30.66**	27.26228	1.98415	0.71928	0.42779	0.10968	0.06798	0.08883
2008	FA	Sept/Oct	1,670	97.5	40	**14.28**	11.83085	0.56236	1.08556	0.36727	0.11927	0.15267	0.16203
2009	FA	Sept/Oct	3,604	97.5	80	**18.12**	15.68648	0.51962	0.43171	0.81205	0.29667	0.06847	0.29501
2010	FA	No Fall Sampling											
2011	FA	Sept/Oct	2,737	83.8	80	**11.10**	10.20763	0.23440	0.20973	0.17409	0.16426	0.04650	0.06339
2012	FA	Sept/Oct	3,832	90	80	**15.06**	14.34220	0.26758	0.18493	0.12859	0.08088	0.02196	0.03386
2013	FA	Sept/Oct	1,809	86.3	80	**9.71**	8.88876	0.03221	0.41116	0.18465	0.08857	0.04026	0.06441
2014	FA	Sept/Oct	4,451	91.1	79	**18.61**	18.13764	0.21114	0.06893	0.06270	0.06688	0.04180	0.02090
2015	FA	Sept/Oct	2,647	81.3	80	**8.42**	8.25160	0.02224	0.06037	0.01271	0.02224	0.03177	0.01906
2016	FA	Sept/Oct	2,785	82.5	80	**11.25**	8.50348	1.59796	0.42465	0.57513	0.06557	0.02101	0.06221
2017	FA	Sept/Oct	2,397	75	80	**8.05**	7.92900	0.04033	0.03025	0.03361	0.01008	0.00000	0.00672
2018	FA	Sept/Oct	697	82.5	80	**4.00**	3.40974	0.53462	0.03128	0.02063	0.00372	0.00000	0.00000
2019	FA	Sept/Oct	2,047	86.3	80	**11.19**	10.71582	0.30298	0.12894	0.02734	0.00000	0.00000	0.01093

Table 5.21. Scup indices-at-age, 1984-2019.

Spring (May and June) and fall (September and October) catch and age data were used to determine the geometric mean indices-at-age[1]. 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[2].

Note: The 2019index-at-age is preliminary since ageing is not yet complete. A pooled three year key was used for calculations in 2019

Spring (May-June)

Year	0-10+	2+	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10+
1984	2.797	2.308	0	0.489	1.311	0.577	0.307	0.074	0.004	0.002	0	0	0.034
1985	5.648	2.707	0	2.941	2.002	0.327	0.244	0.047	0.025	0.050	0	0.004	0.008
1986	7.230	2.785	0	4.444	1.651	0.988	0.137	0.003	0.003	0.003	0	0	0.003
1987	2.186	1.758	0	0.428	1.646	0.071	0.034	0.007	0	0	0	0	0
1988	2.061	0.893	0	1.168	0.309	0.502	0.054	0.026	0	0	0	0	0.003
1989	6.249	0.615	0	5.634	0.563	0.034	0.016	0.000	0.001	0.001	0	0	0
1990	4.867	2.345	0	2.521	2.098	0.206	0.037	0.005	0	0	0	0	0
1991	7.046	2.795	0	4.251	1.436	1.258	0.086	0.012	0.002	0	0	0	0
1992	1.749	1.360	0	0.389	1.212	0.093	0.052	0.002	0	0.002	0	0	0
1993	2.530	2.492	0	0.038	2.286	0.189	0.006	0.006	0.002	0.002	0	0	0
1994	3.892	3.093	0	0.799	2.038	0.931	0.100	0.015	0.003	0.007	0	0	0
1995	13.587	0.645	0	12.943	0.387	0.199	0.052	0.003	0.003	0	0	0	0
1996	7.766	2.562	0	5.204	2.477	0.074	0.004	0.006	0.002	0	0	0	0
1997	7.558	4.394	0	3.164	2.610	1.679	0.063	0.009	0.023	0.005	0.005	0	0
1998	10.826	0.761	0	10.065	0.578	0.115	0.063	0.005	0	0	0	0	0
1999	4.732	2.021	0	2.711	1.755	0.162	0.074	0.030	0	0	0	0	0
2000	146.224	21.711	0	124.513	17.184	4.237	0.195	0.064	0.030	0	0	0	0
2001	22.486	20.837	0	1.649	18.988	1.575	0.252	0.018	0.003	0.001	0	0	0
2002	257.914	208.764	0	49.150	66.611	123.248	17.437	1.294	0.099	0.035	0.040	0	0
2003	13.116	12.980	0	0.136	4.047	3.284	4.964	0.608	0.069	0.005	0.005	0	0
2004	26.915	26.902	0	0.014	3.965	8.956	4.904	8.207	0.764	0.079	0.018	0.009	0
2005	8.483	7.325	0	1.157	1.278	1.055	1.511	1.269	1.944	0.223	0.045	0	0
2006	59.052	40.570	0	18.482	23.719	5.629	2.072	2.557	3.160	2.897	0.529	0.007	0
2007	32.802	25.288	0	7.514	15.865	5.845	1.489	0.548	0.536	0.541	0.385	0.073	0.007
2008	92.100	75.143	0	16.957	40.620	27.815	4.936	0.911	0.158	0.303	0.236	0.148	0.016
2009	104.454	72.840	0	31.614	28.228	28.413	12.491	2.498	0.613	0.215	0.134	0.250	0
2010	68.138	67.717	0	0.421	24.265	21.998	14.002	6.019	1.187	0.118	0.058	0.041	0.029
2011	36.112	33.985	0	2.127	3.285	11.378	9.812	4.116	3.391	1.421	0.248	0.071	0.263
2012	114.410	65.371	0	49.039	25.925	11.982	9.231	9.567	4.671	2.755	0.871	0.144	0.226
2013	57.922	53.309	0	4.613	29.415	8.721	3.150	4.982	4.451	1.545	0.758	0.169	0.117
2014	60.483	45.822	0	14.661	10.635	23.833	5.069	1.504	2.323	1.486	0.608	0.319	0.045
2015	36.141	17.961	0	18.180	5.546	3.985	5.037	1.747	0.570	0.595	0.266	0.121	0.093
2016	972.305	318.511	0	653.794	191.206	68.931	15.618	29.868	5.192	3.221	2.646	1.294	0.535
2017	362.667	328.064	0	34.603	208.316	81.228	14.656	7.525	11.522	1.836	1.186	0.939	0.856
2018	200.594	190.608	0	9.986	39.936	110.787	29.408	2.909	4.540	2.077	0.547	0.243	0.161
2019	144.077	135.292	0	8.785	15.153	39.378	59.081	14.323	2.927	2.623	0.870	0.583	0.352
84-18 Mean	**78.944**	**47.635**	**0.000**	**31.309**	**22.383**	**16.009**	**4.502**	**2.470**	**1.294**	**0.555**	**0.245**	**0.109**	**0.068**
		50.070											

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	No Fall Survey in 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	49.409	55.591	24.462	7.521	11.072	24.130	4.299	0.980	0.732	0.545	0.113	0.018
84-18 Mean	**188.026**	**20.843**	**131.693**	**35.490**	**10.568**	**5.719**	**2.698**	**1.076**	**0.478**	**0.177**	**0.087**	**0.028**	**0.011**

(1) In some years, less than the number of scheduled tows were conducted in some months (Table 5.4).

(2) Fish in the age 10+ group include: 6 fish taken 1984-1988, 8 fish taken 2002-2010, 81 taken in 2011, 28 taken in 2012, 26 taken in 2013, 15 taken in 2014, 37 fish in 2015, 29 fish in 2016, 51 fish in 2017, and 33 fish in 2018. The oldest scup aged were two 15-year-old fish taken in 2015.

Table 5.22. Age frequency of striped bass taken in spring, 1984-2019.

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

	Year																																		
Age	**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**
1	0	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
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
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
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
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
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
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
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
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
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	2	1	0	1	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	1	1	0	1	0	1	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
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
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	2	0
Total	**0**	**0**	**0**	**8**	**7**	**11**	**43**	**32**	**34**	**59**	**65**	**150**	**184**	**238**	**362**	**334**	**229**	**184**	**414**	**207**	**135**	**421**	**97**	**289**	**159**	**382**	**70**	**166**	**125**	**160**	**205**	**59**	**129**	**46**	**136**	**463**

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, 1984-2019.

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.

		Spring												
Year	**Index**	**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	0.0055	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	0.0029	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
84-18 mean		**0.0040**	**0.1209**	**0.1168**	**0.0872**	**0.0745**	**0.0510**	**0.0265**	**0.0115**	**0.0046**	**0.0022**	**0.0011**	**0.0002**	**0.0000**	**0.0002**

Table 5.24. Summer flounder indices-at-age, 1984-2019.

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
84-18 Mean	**1.5468**	**0.0000**	**0.5991**	**0.4162**	**0.2549**	**0.1417**	**0.0732**	**0.0318**	**0.0161**	**0.0080**	**0.0030**	**0.0018**	**0.0010**	**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	0.0000	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	2.5578	0.1173	0.6933	0.9333	0.5641	0.1232	0.0543	0.0275	0.0130	0.0130	0.0061	0.0052	0.0075	0
2012	3.5522	0.1633	0.4592	0.8283	1.4239	0.5848		0.0631	0.0296	0	0	0	0	0
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	1.4352	0.0180	0.6453	0.4521	0.1253	0.0856	0.0487	0.0184	0.0119	0.0157	0.0077	0.0043	0	0.0022
84-18 Mean	**1.9855**	**0.1356**	**0.7724**	**0.6541**	**0.2971**	**0.1215**	**0.0397**	**0.0135**	**0.0072**	**0.0023**	**0.0007**	**0.0006**	**0.0004**	**0.0000**

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

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

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

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

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

Table 5.26. Weakfish age 0 and age 1+ indices of abundance, 1984-2019.
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.

	Fall		Fall		Spring	
Year	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
84-18 mean	**19.12**	**1.40**	**0.33**	**0.36**	**0.19**	**0.23**

Table 5.27. Winter flounder indices-at-age, 1984-2019.

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).

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	0.01	0	0
84-18 Mean	55.32	8.71	5.13	7.11	25.51	13.98	5.74	1.97	0.63	0.22	0.10	0.04	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	0.18	NA	0.00	0.04	0.16	0.10	0	0.02	0	0.02	0	0	0	0	0
2018	1.22	0.83	NA	0.03	0.06	0.30	0.46	0.16	0.06	0.09	0.02	0.01	0.03	0	0	0
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	0.004	0	0
84-18 Mean	9.93	3.97	NA	0.25	2.58	3.14	2.25	1.04	0.39	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, May = 13 tows, and 19 tows in June used to increase sample size; 1985: April = 0 tows, May = 41 tows; 1992 and 2006: April = 0 tows, May = 40; 1996: April = 17 tows, May = 63 tows; 2005: April = 35 tows, May = 45 tows; 2007: April = 35 tows, May = 45 tows; 2008: April = 36, and May = 44 tows; 2010: May = 38 tows; 2011: April = 12 tows; 2016: April = 36 tows; 2017: April = 0 tows, May = 24 tows; 2018: Apr=12 tows, May 40 tows.

TABLES 5.28 - 5.65
LENGTH FREQUENCIES
LISTS

Table 5.28. Alewife length frequencies, spring and fall, 1 cm intervals, 1989–2019.

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

Spring

length	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
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
6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
27	2	0	1	0	0	1	0	0	0	0	0	1	2	1	2	2	1	0	0	0	0	0	0	1	0	1	1	3	0	0	1
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
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
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
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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**

Fall

length	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
25	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
Total	**8**	**1**	**9**	**46**	**377**	**354**	**50**	**95**	**492**	**27**	**117**	**58**	**364**	**38**	**156**	**113**	**98**	**6**	**468**	**33**	**37**	**0**	**148**	**10**	**83**	**104**	**301**	**15**	**30**	**34**	**60**

Table 5.29. American shad length frequencies, spring, 1 cm intervals, 1989-2019.

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

	Spring																													
length	**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**
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
7	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	1	0	0	1
8	0	0	0	0	2	2	4	0	0	5	1	1	0	0	1	0	3	0	0	0	0	0	0	0	1	0	0	2	0	1	2
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
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
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
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
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
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
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
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
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
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
19	0	2	1	16	3	271	13	15	7	11	10	4	0	3	0	1	0	1	1	2	3	3	0	0	0	1	0	32	0	0	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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	1	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
44	0	0	1	2	2	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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
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
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
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
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	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
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**

Table 5.30. American shad length frequencies, fall, 1 cm intervals, 1989-2019.

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

	Fall																														
length	**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**
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	1	0
7	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	2	0	-	0	0	0	1	0	0	0	0	0
8	0	0	2	0	0	1	0	0	2	1	1	0	0	0	0	1	2	0	0	2	0	-	1	2	0	3	0	0	0	2	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
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
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
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
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
14	0	0	2	2	23	173	12	2	5	2	5	0	0	0	0	2	0	0	6	0	28	-	1	0	0	1	4	3	0	2	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
16	0	0	1	0	7	18	1	0	4	9	1	0	1	1	1	10	1	0	2	0	2	-	3	1	1	0	1	18	3	4	66
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
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
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
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
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
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
23	2	1	0	4	92	84	19	8	3	0	39	6	0	0	0	0	1	0	2	0	3	-	3	3	0	0	10	0	4	5	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Total	**191**	**204**	**159**	**214**	**1,061**	**1,047**	**568**	**48**	**252**	**508**	**673**	**161**	**96**	**256**	**263**	**274**	**98**	**8**	**83**	**52**	**245**	**0**	**109**	**90**	**79**	**40**	**161**	**245**	**227**	**161**	**347**

Table 5.31. American lobster length frequencies-spring, female, 1 mm intervals, 1984–2019.
Lobsters were measured from each tow.

Female	Spring																																		
Length	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
	(32)	(46)	(116)	(120)	(120)	(120)	(120)	(120)	(80)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(119)	(120)	(80)	(120)	(120)	(120)	(78)	(92)	(120)	(120)	(120)	(120)	(116)	(64)	(92)	(120)
16	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	1	0	0	0	0	0	0	0
17	0	0	0	1	0	0	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	0
18	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
19	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	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	2	0	2	0	4	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	1	0	0	3	1	0	2	4	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	4	0	1	3	1	1	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	2	1	8	0	2	0	1	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0	0
25	1	0	0	0	0	1	0	0	1	0	1	1	1	0	3	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	3	5	0	0	0	6	9	3	9	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	1	0	0	1	0	5	7	12	4	6	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	2	0	0	1	0	0	3	0	1	1	0	5	8	6	10	11	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
29	0	0	1	2	0	0	0	4	0	2	0	0	13	14	7	8	13	3	2	1	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0
30	0	0	0	1	1	0	11	6	0	5	3	0	13	12	95	2	19	2	0	1	0	0	0	1	0	0	0	1	5	0	0	0	0	0	0	0
31	0	0	0	0	1	1	6	3	6	1	1	4	8	22	19	16	20	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	1	0	0	13	7	2	20	0	2	15	13	18	21	23	2	2	1	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
33	0	1	0	2	2	6	8	0	5	1	6	21	14	13	35	18	8	3	0	2	1	1	0	5	1	0	0	2	0	0	0	0	0	0	0	0
34	0	3	0	1	0	0	5	8	15	4	0	18	7	22	64	8	37	4	8	2	3	0	0	4	0	0	1	0	0	4	0	0	0	0	0	0
35	4	4	3	2	0	0	9	1	4	6	4	22	15	22	59	22	48	3	5	2	1	2	0	4	0	1	0	0	1	0	1	0	1	0	0	0
36	5	3	2	11	0	0	9	8	6	14	0	8	14	21	41	26	48	3	5	2	0	0	0	0	0	0	0	0	4	3	2	0	0	0	0	0
37	0	4	1	2	0	0	10	9	6	7	11	27	21	42	58	29	36	2	3	4	0	2	0	3	3	0	0	1	4	0	0	0	0	0	0	0
38	2	0	0	7	2	4	6	11	13	17	1	49	10	31	72	42	35	7	10	2	3	0	1	5	0	0	1	1	2	0	0	0	0	0	0	0
39	1	3	0	3	5	1	0	8	12	9	4	22	16	39	73	34	53	7	3	2	3	2	0	10	3	1	2	4	1	1	3	0	0	0	0	0
40	1	4	2	10	4	4	7	6	17	28	8	41	18	30	98	23	68	8	10	6	5	2	3	11	1	0	3	1	1	0	3	1	0	0	0	0
41	2	3	1	18	2	3	22	9	10	23	8	18	18	17	71	36	58	11	8	4	2	2	2	13	1	3	2	0	1	1	1	1	0	0	0	0
42	1	6	3	8	1	3	17	22	9	41	11	46	18	33	143	54	65	11	18	5	6	0	0	5	2	0	1	1	1	2	2	1	0	0	0	0
43	1	1	1	22	0	11	19	16	11	13	11	53	27	44	59	50	84	9	6	8	6	4	1	7	1	2	1	0	3	0	1	1	0	0	1	0
44	1	1	2	16	6	2	13	12	14	25	9	61	22	32	43	38	117	19	15	15	4	5	4	9	3	3	0	1	4	0	0	1	1	0	0	0
45	0	2	1	9	1	12	11	12	5	24	8	38	22	36	135	35	138	9	14	3	3	2	2	9	0	0	1	0	1	1	2	0	0	0	0	0
46	4	3	1	12	3	8	4	18	26	30	2	34	22	42	88	64	102	15	22	4	0	1	4	3	3	1	1	2	3	1	1	1	0	0	0	0
47	2	1	4	31	2	14	4	21	8	40	8	59	35	53	70	77	91	18	20	25	7	2	5	11	3	1	0	1	5	0	4	0	0	0	0	0
48	2	2	2	15	6	20	22	17	28	35	12	54	31	56	104	59	72	11	17	9	7	6	2	7	3	5	3	2	1	1	5	0	0	0	0	0
49	4	4	4	10	4	7	13	28	19	67	15	37	32	55	198	90	89	8	15	15	5	1	3	7	2	2	0	5	6	3	3	1	0	0	0	0
50	6	1	6	7	4	7	16	18	5	40	21	51	43	67	139	63	104	13	21	13	6	2	0	10	6	1	0	3	2	1	3	1	0	0	0	1
51	4	5	6	8	3	15	33	24	22	59	16	58	48	88	133	95	109	31	17	13	5	2	4	16	6	3	1	0	3	0	5	0	0	0	2	0
52	9	8	3	15	3	14	29	45	32	35	33	58	57	73	165	89	125	40	25	11	6	4	3	13	3	3	1	0	4	3	4	2	0	0	0	0
53	10	4	4	20	5	19	14	38	31	54	24	53	47	82	167	89	83	32	26	9	6	6	5	14	3	3	0	0	2	0	2	1	0	0	0	0
54	2	4	6	15	2	22	38	35	18	38	29	44	45	87	140	84	152	30	41	15	6	7	2	9	3	3	1	1	3	0	1	0	0	0	0	0
55	9	2	8	14	3	9	26	19	26	47	17	59	64	82	191	91	132	34	38	21	8	9	11	20	6	7	2	2	4	0	4	0	2	0	0	0
56	6	9	11	12	14	15	31	47	16	60	17	64	56	98	152	99	85	44	24	14	10	14	2	20	7	0	3	0	4	0	4	0	0	0	1	0
57	10	3	6	10	11	23	24	57	61	79	24	46	60	95	159	156	102	44	28	11	7	10	7	17	12	6	1	2	0	3	3	0	0	1	0	0
58	1	8	7	15	6	25	38	35	27	53	17	56	62	111	144	118	118	38	35	11	12	12	7	15	9	5	5	1	3	2	2	0	0	0	0	1
59	10	18	7	14	7	29	13	51	28	52	37	70	66	97	144	147	105	45	32	12	12	11	9	15	4	3	5	0	12	2	2	0	1	0	0	2
60	6	12	11	19	9	25	34	45	43	57	30	91	76	97	114	102	97	60	48	15	16	10	3	24	6	4	1	3	2	1	2	0	1	0	0	0
61	5	14	11	8	12	15	33	49	31	56	44	62	62	92	181	160	79	46	40	21	6	20	13	28	7	3	2	2	3	1	0	0	2	0	0	0
62	12	9	5	11	4	12	57	33	34	75	46	61	67	94	118	116	75	59	46	13	11	14	9	22	10	7	2	2	4	0	0	0	0	0	0	0
63	4	9	10	27	9	27	56	41	25	60	44	60	70	96	133	136	66	43	41	28	14	13	6	23	11	5	4	1	5	0	3	0	1	0	0	0
64	10	16	9	16	8	13	38	33	41	75	24	64	91	86	176	148	110	75	46	23	11	16	8	25	10	6	1	1	0	1	2	2	0	0	0	0
65	9	7	9	29	15	25	46	45	26	68	28	72	78	110	169	160	84	63	48	10	16	19	12	16	13	10	0	0	0	0	0	0	1	0	0	0
66	11	15	18	25	10	21	43	59	48	86	26	84	87	116	147	121	99	55	39	15	19	9	3	21	23	8	1	0	4	0	2	1	0	0	1	0
67	6	20	22	21	14	31	33	51	41	52	28	67	62	98	148	171	90	72	42	16	23	23	9	17	8	4	4	1	7	0	3	0	1	1	0	0
68	21	10	12	43	11	14	41	65	37	45	29	76	73	94	142	158	107	49	48	19	20	13	14	21	15	7	4	2	1	1	2	4	0	0	0	0
69	10	8	18	33	16	16	36	78	56	58	30	71	57	107	148	188	76	79	52	28	16	13	1	13	19	10	2	2	1	0	1	0	0	0	0	1
70	15	5	14	30	13	29	51	59	37	67	27	79	74	119	157	177	86	67	57	25	21	12	6	23	20	6	6	0	1	0	0	1	4	0	0	0
71	10	11	12	21	12	13	29	48	49	67	44	92	88	125	117	166	91	74	45	24	15	18	10	23	14	6	3	4	2	2	2	0	2	0	0	0
72	11	6	20	18	8	24	40	50	48	61	30	77	91	107	157	177	98	75	80	20	13	22	10	30	15	8	0	1	2	4	2	1	2	1	0	0
73	13	9	18	13	14	20	47	39	54	54	37	97	69	107	171	164	99	59	61	30	17	17	8	23	18	8	6	1	3	1	3	1	1	0	0	0
74	10	6	17	20	8	24	24	43	52	45	39	60	74	130	153	215	104	66	70	25	11	12	9	17	13	6	5	0	2	0	2	1	0	0	0	0
75	15	12	17	28	7	20	67	87	56	54	25	83	68	103	181	196	124	80	47	27	16	19	9	17	14	7	5	0	0	4	0	2	0	0	0	0
76	14	9	20	14	8	25	67	71	41	38	24	78	69	114	229	185	102	59	45	15	9	16	11	13	25	5	9	0	4	0	1	0	0	0	0	0
77	9	5	15	19	15	32	41	77	69	44	20	102	65	95	160	195	109	52	39	23	16	13	17	16	11	6	3	2	1	0	1	0	0	0	0	0
78	24	9	15	14	13	49	60	57	63	64	22	90	61	110	177	176	93	48	55	18	7	9	15	16	16	10	4	4	1	1	2	0	3	0	0	0
79	23	6	24	21	10	55	42	64	35	52	30	77	92	117	179	203	98	51	52	11	10	9	13	14	12	14	3	2	3	2	0	1	1	0	0	0
80	22	1	18	10	11	35	34	45	31	71	41	71	79	92	180	200	91	63	41	16	15	9	11	15	8	7	9	3	4	1	0	2	1	0	0	0
81	10	2	7	15	13	19	69	56	49	48	34	72	86	148	170	140	85	62	33	11	15	9	9	12	16	2	8	2	0	1	1	0	1	0	0	0
82	9	0	3	9	5	15	28	41	36	35	21	71	57	110	108	106	47	40	21	14	8	6	5	14	10	4	5	0	1	0	0	1	1	0	0	1
83	9	5	5	8	3	7	25	22	16	7	7	15	31	28	65	59	41	25	17	4	4	7	3	9	14	9	2	1	1	0	0	1	2	0	0	0
84	3	1	7	9	4	11	15	12	7	8	4	11	19	20	7	33	14	18	18	4	4	5	3	5	7	7	2	0	3	3	0	0	1	0	0	1
85	5	2	5	7	6	3	11	5	7	8	8	17	20	28	22	9	15	9	7	1	5	1	0	5	6	2	1	2	0	1	0	0	1	0	0	0
86	9	3	6	3	6	8	14	14	3	3	2	11	23	24	23	10	12	8	11	2	0	3	0	2	7	1	4	0	0	0	1	0	0	0	0	0
87	10	0	3	4	8	13	17	9	7	13	15	16	11	13	12	9	8	7	4	4	1	3	3	0	1	2	1	0	2	0	0	0	0	0	0	0
88	2	3	8	3	9	9	6	11	3	11	2	7	13	18	17	5	1	9	1	0	1	0	0	2	5	3	2	0	0	0	0	0	2	0	0	0
89	3	6	5	8	5	8	12	10	12	5	2	16	12	16	13	11	8	9	5	1	1	1	0	3	0	1	0	0	0	0	0	0	2	0	0	0
90	15	2	4	3	8	4	5	8	11	3	3	9	15	10	11	10	7	10	4	1	4	2	0	1	4	0	0	0	0	0	0	0	0	0	1	0
91	5	1	1	6	2	5	11	8	1	3	0	5	7	11	6	3	2	4	0	0	0	2	1	0	0	0	2	0	1	0	0	0	1	0	0	0
92	4	2	0	2	3	2	7	1	0	3	3	3	5	7	7	2	1	2	7	0	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0
93	0	1	2	1	2	1	2	1	0	0	1	0	6	3	0	2	5	0	1	0	0	0	1	0	1	0	3	0	0	0	1	0	0	0	0	0
94	0	2	1	1	3	1	1	2	0	1	5	1	1	1	4	1	0	1	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0
95	0	0	1	2	2	3	8	4	0	0	0	0	0	0	6	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
96	0	1	0	0	0	2	0	1	0	1	2	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	1	1	1	0	3	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	2	2	0	1	0	1	1	0	1	0	0	0	1	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	3	0	2	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	0	0	0	0	0	0	0
100	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	0	0	0	0	0	0	0	0	0	0	0
101	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	2	0	0	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	0	0	0	0	0	0
103	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
104	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
105	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
106	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
109	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
110	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
111	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
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	451	335	469	838	405	914	1,621	1,946	1,560	2,336	1,131	3,052	2,837	4,220	6,921	5,731	4,595	2,011	1,646	709	483	458	296	737	449	238	144	69	139	56	90	30	36	3	7	7
legal size			81.0			81.8									82.6								83.3		84.1						85.7					

Table 5.32. American lobster length frequencies–fall, female, 1 mm intervals, 1984–2019.

Lobsters were measured from each tow.

Female	Fall																																		
Length	1984 (70)	1985 (80)	1986 (80)	1987 (80)	1988 (80)	1989 (80)	1990 (80)	1991 (80)	1992 (80)	1993 (120)	1994 (120)	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 (0)	2011 (80)	2012 (80)	2013 (80)	2014 (79)	2015 (80)	2016 (80)	2017 (80)	2018 (80)	2019 (80)
16	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
20	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
21	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
22	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	0	-	0	0	0	0	0	0	0	0
23	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
24	0	0	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
25	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	1	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	1	4	0	0	0	1	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	1	0	0	0	3	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	1	0	4	1	1	0	1	1	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	1	1	0	0	3	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	-	0	2	0	0	0	0	0	0
30	0	0	0	0	1	0	4	0	2	5	3	0	5	7	2	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0
31	0	0	1	0	0	0	3	0	7	11	8	1	5	4	0	0	1	1	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0
32	1	0	0	0	0	0	3	1	15	4	13	1	4	5	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
33	0	0	0	2	1	1	3	12	9	2	2	0	0	1	1	5	0	0	0	0	0	0	0	0	1	0	-	1	0	0	0	0	0	0	0
34	1	0	0	0	2	1	0	6	16	3	17	2	6	8	1	8	0	0	0	0	1	0	0	0	0	0	-	1	0	0	0	0	0	0	0
35	0	0	6	1	0	2	3	0	23	5	16	3	8	6	0	2	1	0	0	0	1	0	0	0	0	0	-	1	0	0	0	0	0	0	0
36	4	0	1	1	1	3	1	1	31	7	26	0	8	14	0	5	0	0	0	0	0	0	0	0	1	0	-	0	0	3	0	0	0	0	0
37	4	0	2	0	3	2	10	22	19	2	19	5	5	7	1	8	1	0	1	0	1	1	0	0	0	0	-	0	0	0	0	0	0	0	0
38	3	2	2	3	3	2	8	1	24	9	23	1	18	17	2	13	1	2	0	0	0	1	0	0	0	0	-	0	0	1	0	0	0	0	0
39	6	0	10	1	1	0	9	15	32	6	22	0	7	22	2	4	1	2	1	0	0	0	2	0	0	1	-	0	0	0	0	0	0	0	0
40	0	0	3	1	12	14	14	20	35	16	24	12	23	15	3	8	1	1	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
41	3	0	0	5	2	6	19	21	32	22	52	8	39	15	7	13	2	0	0	1	2	1	0	0	0	0	-	1	0	0	0	0	0	0	0
42	7	0	5	0	4	2	3	36	52	21	43	7	24	49	9	17	2	3	0	0	2	0	1	0	0	0	-	0	0	0	0	0	0	0	0
43	5	0	2	4	4	2	16	23	30	39	52	16	20	25	5	15	3	0	1	1	1	4	0	0	0	0	-	0	1	0	0	0	0	0	0
44	29	7	1	8	1	6	11	32	32	29	63	14	46	47	9	17	5	0	2	1	2	1	0	0	0	2	-	1	1	1	0	0	0	0	0
45	18	0	7	3	2	0	12	25	50	17	57	22	38	32	7	27	4	2	2	1	0	1	1	0	0	1	-	0	1	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	-	1	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	1	-	1	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	1	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	1	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
51	35	8	2	12	3	11	10	44	73	72	94	45	41	49	15	30	13	6	3	1	2	2	0	0	1	0	-	0	1	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	-	1	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	1	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	-	1	1	0	0	1	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	-	3	2	0	0	0	0	0	0
56	45	10	11	36	10	24	22	29	82	87	74	45	41	90	23	32	33	12	1	3	6	0	3	2	1	6	-	3	2	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	-	2	0	0	0	0	0	0	0
58	23	16	11	19	13	17	36	55	63	119	79	69	47	114	29	31	23	14	6	5	5	8	1	2	2	5	-	1	0	1	0	0	0	0	0
59	21	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	2	1	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	-	1	2	0	0	0	0	0	0
61	10	4	17	24	12	14	37	46	52	91	79	51	56	119	34	37	27	9	5	2	12	7	2	1	2	6	-	1	1	0	0	0	0	0	0
62	27	16	23	21	14	32	41	64	53	107	117	44	53	133	39	44	32	19	3	5	10	3	5	1	2	8	-	1	1	1	0	0	0	0	0
63	31	14	13	22	8	20	22	53	66	130	93	58	41	126	51	45	29	19	6	6	16	12	4	4	4	5	-	0	1	0	0	0	0	0	0
64	25	10	15	29	23	31	26	71	38	100	86	79	38	139	34	44	29	21	9	12	19	5	4	4	4	7	-	0	0	0	0	0	0	0	0
65	17	9	39	24	15	28	26	77	44	93	89	49	43	146	49	42	37	18	9	6	15	9	1	2	3	9	-	0	0	0	0	0	0	0	0
66	24	26	25	23	15	16	42	70	56	90	87	82	53	126	51	43	26	19	5	5	10	7	1	4	1	6	-	0	0	1	0	0	0	0	0
67	17	24	33	11	19	16	29	38	43	78	106	51	38	117	26	53	31	17	8	11	14	6	2	3	3	8	-	0	1	0	0	0	0	0	0
68	15	8	27	18	22	30	36	41	42	94	77	48	55	124	54	44	37	19	7	6	4	8	1	6	4	4	-	0	0	0	2	0	0	0	0
69	13	18	15	27	26	32	21	34	61	104	85	38	50	136	54	47	30	22	4	8	16	12	5	1	4	3	-	1	0	0	0	0	0	0	0
70	63	18	42	27	34	23	20	36	51	122	63	60	55	128	47	35	34	23	17	4	13	5	0	4	3	3	-	0	0	0	0	2	0	0	0
71	26	21	28	34	33	40	30	50	50	94	87	62	87	127	50	40	20	20	3	6	14	2	0	2	3	6	-	2	0	0	0	0	0	0	0
72	27	16	27	32	13	12	39	58	31	81	85	38	49	150	41	53	32	25	11	12	10	3	2	3	6	4	-	0	0	0	0	0	0	0	0
73	21	29	42	24	18	15	58	46	33	74	69	60	40	106	41	47	36	24	9	6	10	5	2	6	4	5	-	1	0	1	0	2	0	0	0
74	31	17	23	29	14	21	36	30	39	85	73	44	38	111	37	49	39	19	12	7	16	9	3	2	3	1	-	1	0	1	0	1	0	0	0
75	39	14	25	24	14	12	21	31	25	66	84	31	58	122	67	50	29	28	7	7	16	5	3	7	3	1	-	1	0	1	0	0	0	0	0
76	31	14	22	36	14	13	35	27	35	112	50	38	57	113	47	43	26	21	10	8	15	5	3	4	2	3	-	0	0	0	0	0	0	0	0
77	17	16	10	26	13	14	17	37	40	74	72	36	23	64	41	31	22	18	2	1	18	5	3	4	0	1	-	0	0	0	1	1	0	0	0
78	27	17	24	27	27	21	22	24	19	57	53	19	34	96	43	38	20	33	6	15	5	8	2	2	0	2	-	0	0	0	0	0	0	0	0
79	26	19	16	37	31	13	29	33	26	72	42	28	28	91	34	28	32	21	2	9	12	6	3	5	3	5	-	0	0	0	1	0	0	0	0
80	33	11	15	20	23	12	6	14	23	65	26	25	44	91	25	32	26	19	14	2	16	4	2	5	1	4	-	0	1	0	0	0	0	0	0
81	13	7	13	14	5	10	12	18	24	36	38	36	41	61	25	28	20	20	2	4	3	4	0	0	2	5	-	3	0	0	0	1	0	0	0
82	9	2	19	6	6	2	10	14	10	39	26	25	21	52	23	23	14	7	2	5	3	8	3	2	0	5	-	0	0	1	0	0	0	0	0
83	10	5	8	12	6	12	8	3	11	17	11	12	31	20	10	6	13	7	4	1	2	9	1	5	0	4	-	0	0	0	0	0	0	0	0
84	5	6	2	7	1	1	4	10	8	17	22	10	7	17	5	4	7	6	0	0	2	1	0	0	1	3	-	0	0	1	0	0	0	0	0
85	9	1	8	6	9	3	6	17	7	8	20	5	5	13	5	2	5	3	1	0	2	1	0	1	2	1	-	0	0	0	0	0	0	0	0
86	11	2	9	10	0	1	10	12	4	10	14	1	6	12	5	2	6	1	0	0	2	1	0	0	0	1	-	0	0	0	0	0	0	0	0
87	11	6	9	8	23	4	18	12	5	16	20	1	8	11	3	5	5	3	0	1	1	2	1	0	1	1	-	1	0	0	0	0	0	0	0
88	9	3	9	9	3	1	3	9	9	13	8	1	20	10	7	5	2	1	0	0	0	1	0	0	0	0	-	0	0	2	0	0	0	0	0
89	3	4	6	2	7	3	5	1	8	8	12	5	13	14	1	3	3	3	0	0	0	4	0	0	1	0	-	0	0	0	0	0	0	0	0
90	8	1	3	6	0	1	6	1	5	1	15	9	5	10	1	2	1	2	1	0	0	1	0	0	0	1	-	0	0	0	0	0	0	0	0
91	3	1	2	5	0	1	1	0	3	0	5	0	9	3	2	1	1	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0
92	8	0	0	2	1	1	4	1	7	1	6	1	3	1	3	0	0	0	0	0	0	0	0	0	0	2	-	0	0	0	0	1	0	0	0
93	2	2	0	3	2	0	0	1	2	1	8	0	1	4	2	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
94	0	2	0	1	0	0	0	2	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0
95	1	0	0	1	6	0	1	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
96	3	0	0	1	1	0	1	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
97	15	1	0	1	1	0	1	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
98	2	1	0	1	1	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	0	0	0	0
99	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
100	0	1	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
101	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	0	-	0	0	0	0	0	0	0	0
102	0	2	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
103	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	0	0
104	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
105	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
107	1	0	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
111	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
113	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
117	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
Total	**1,089**	**523**	**759**	**907**	**622**	**688**	**1,133**	**1,917**	**2,301**	**3,264**	**3,198**	**1,795**	**1,979**	**4,196**	**1,329**	**1,511**	**957**	**596**	**223**	**195**	**365**	**225**	**84**	**94**	**96**	**150**	-	**31**	**20**	**18**	**4**	**9**	**0**	**0**	**0**	**0**
legal size:			81.0			81.8								82.6								83.3		84.1							85.7					

Table 5.33. American lobster length frequencies–spring, male, 1 mm intervals, 1984–2019.

Lobsters were measured from each tow.

Male	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
Length	(32)	(46)	(116)	(120)	(120)	(120)	(120)	(120)	(80)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(120)	(119)	(120)	(80)	(120)	(120)	(120)	(78)	(92)	(120)	(120)	(120)	(120)	(116)	(64)	(92)	(120)
16	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	0	0	0	0	0
19	0	0	0	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
20	0	0	0	0	0	0	0	0	0	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
21	0	0	0	0	0	0	0	3	0	0	0	0	1	0	2	0	1	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	3	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	2	0	2	0	1	0	6	0	1	3	0	0	3	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	1	1	0	4	6	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	4	0	0	4	3	2	2	2	1	0	0	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0
27	0	0	0	0	0	9	0	0	1	9	2	0	2	1	2	1	1	2	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
28	0	0	0	0	0	0	0	0	1	3	1	0	2	1	5	2	12	2	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	9	0	0	2	3	5	0	9	3	1	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0
30	0	0	0	1	0	1	5	0	5	1	0	3	10	5	2	4	15	3	1	2	1	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0
31	0	1	0	1	1	0	0	8	4	3	2	0	8	13	14	7	18	3	4	0	0	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0
32	0	0	0	0	3	6	0	6	6	8	1	8	9	12	11	16	17	2	2	5	0	0	0	2	0	0	1	1	3	2	0	0	0	0	1	0
33	0	2	1	2	0	0	1	9	0	6	4	15	6	9	4	15	16	3	9	3	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0
34	0	0	3	2	0	1	1	5	1	6	0	27	19	16	52	12	25	2	4	1	0	0	0	5	0	0	1	0	0	0	1	0	0	0	0	0
35	2	0	2	0	0	0	4	5	9	5	1	20	12	22	26	23	33	2	5	2	4	0	1	2	1	0	0	1	2	0	1	0	0	0	0	0
36	2	4	0	1	1	7	14	4	5	7	3	17	13	24	34	19	26	6	1	3	1	2	0	6	0	0	1	3	3	0	1	0	0	0	0	1
37	1	1	2	5	0	3	2	23	9	12	4	15	20	32	58	35	32	5	3	2	4	2	0	7	1	0	0	1	0	0	0	0	0	0	0	0
38	0	1	1	5	2	7	14	9	1	26	3	18	18	21	93	12	28	3	8	4	2	1	2	7	0	0	2	1	4	0	3	1	0	0	0	0
39	0	0	0	10	0	6	12	5	7	15	4	31	15	20	33	20	35	11	9	4	3	2	3	8	0	1	0	0	1	0	0	0	0	0	0	0
40	0	2	0	7	2	8	3	5	12	17	7	25	21	41	32	20	52	8	10	2	0	1	2	4	2	0	1	3	3	2	1	2	0	0	1	0
41	0	2	2	9	1	0	11	8	7	4	10	28	19	41	75	46	55	3	13	7	3	0	1	6	3	0	2	2	2	0	0	2	0	0	0	0
42	4	2	0	3	1	9	13	10	13	42	7	39	18	46	125	36	63	14	9	10	3	5	0	16	3	2	0	3	4	1	2	0	1	0	0	0
43	1	2	1	16	0	9	14	9	12	23	5	52	26	24	70	51	32	5	9	10	5	2	2	8	1	1	1	0	2	1	1	0	0	0	0	0
44	3	0	1	15	1	3	10	11	6	42	9	17	21	50	170	44	110	10	15	9	1	0	4	12	2	1	3	3	2	0	3	1	1	0	1	1
45	1	5	4	22	3	7	7	20	13	45	6	39	28	46	76	50	65	17	16	20	5	3	2	9	3	1	2	2	4	3	1	3	0	0	0	0
46	0	2	2	24	2	24	7	12	25	37	9	32	22	66	155	71	74	19	18	18	4	3	2	11	0	4	1	3	2	0	6	0	0	0	0	0
47	0	1	2	31	7	3	2	17	47	32	9	54	32	66	146	87	65	17	9	4	4	4	1	16	0	2	2	1	0	0	1	0	0	0	0	0
48	6	6	5	9	1	8	20	17	7	23	6	45	32	78	93	60	57	22	29	6	3	6	5	8	4	2	2	0	2	1	5	1	0	0	0	0
49	9	3	4	24	4	22	20	45	21	40	19	46	18	82	120	87	69	16	18	8	15	3	4	16	3	3	1	0	3	0	1	0	0	0	0	1
50	7	3	1	19	4	23	10	21	25	30	21	29	35	61	66	83	110	34	22	16	7	6	4	9	4	2	0	2	2	0	3	2	0	0	0	0
51	3	4	4	12	2	20	26	42	16	75	16	62	45	57	158	90	65	24	31	19	8	8	9	10	3	5	0	0	1	0	2	0	0	0	0	0
52	9	5	2	12	2	15	23	21	25	37	31	49	52	75	81	80	100	27	27	14	10	6	2	12	3	2	2	0	7	0	3	0	0	0	0	1
53	5	9	7	17	4	10	12	33	16	41	26	60	50	56	138	69	66	25	20	11	5	7	5	19	6	4	1	0	2	1	1	1	0	0	1	0
54	10	3	16	14	7	14	30	45	36	43	29	74	49	74	210	79	110	33	38	26	15	6	5	21	5	4	1	4	4	2	0	1	1	0	0	0
55	5	3	6	18	7	23	16	42	27	50	27	46	51	82	101	101	114	38	23	18	2	9	6	12	5	3	2	1	3	4	4	0	1	0	0	0
56	3	12	11	17	10	6	34	38	37	44	14	70	54	83	130	82	95	37	29	19	13	11	9	7	7	6	6	2	4	0	3	1	0	1	0	1
57	1	7	10	26	11	17	36	30	12	51	27	54	60	68	145	93	95	43	35	22	7	6	5	21	4	3	3	3	1	1	2	2	1	0	0	2
58	12	7	5	10	4	19	44	71	31	47	35	41	83	96	111	111	99	43	46	11	12	8	5	13	8	1	2	1	2	2	0	0	1	0	0	0
59	3	13	7	12	14	25	29	57	27	88	34	71	56	67	63	144	89	43	43	13	6	11	10	24	9	7	4	2	3	0	1	1	0	0	0	0
60	1	9	14	29	8	23	49	50	37	42	34	94	84	156	121	105	105	56	35	24	8	9	6	16	9	6	1	0	4	2	3	1	0	1	0	0
61	9	14	16	12	10	22	39	56	46	62	34	77	59	102	176	123	83	51	36	28	14	10	14	11	11	6	3	3	5	2	3	0	1	0	0	1
62	11	10	13	15	6	30	44	78	36	65	54	57	58	127	152	117	84	69	44	20	11	12	7	12	16	12	2	0	5	0	2	2	0	0	0	0
63	18	15	16	28	8	24	52	65	54	44	36	59	60	101	167	132	73	54	44	24	16	13	13	19	19	5	6	2	5	3	4	2	1	0	0	0
64	8	16	12	26	8	21	45	72	43	63	27	73	90	95	153	133	98	69	46	26	10	14	8	22	16	4	8	3	5	1	0	0	0	1	1	1
65	13	8	11	20	15	20	47	55	36	73	33	77	73	97	165	111	96	75	50	30	21	17	8	16	16	8	2	1	5	1	1	5	1	0	0	0
66	5	10	11	26	16	32	49	71	31	71	23	39	73	107	223	129	64	56	39	23	31	15	6	22	23	2	6	2	0	1	0	2	3	1	0	0
67	1	5	11	26	11	32	29	57	44	39	21	69	60	118	182	149	66	77	53	24	16	14	6	33	19	1	3	1	10	1	0	0	1	0	0	0
68	5	10	13	12	7	21	33	80	48	26	34	67	64	100	147	116	81	82	32	36	22	23	11	20	19	10	5	0	0	1	2	2	1	0	0	1
69	8	9	10	19	24	25	39	71	46	43	32	57	79	101	156	140	77	73	51	25	11	20	8	16	11	4	3	4	3	2	3	2	1	0	0	1
70	8	11	14	23	7	34	38	50	51	27	24	60	77	99	158	152	85	73	44	27	21	16	9	15	21	11	5	2	5	1	2	0	1	1	1	1
71	9	5	13	22	13	29	55	66	23	48	42	85	58	91	112	152	62	71	56	20	29	20	7	4	18	5	11	3	1	0	0	1	2	1	0	0
72	6	17	13	14	17	33	40	93	42	37	41	59	85	111	145	105	72	62	42	23	13	11	8	25	15	7	4	3	5	2	0	2	0	0	0	1
73	14	5	10	21	11	28	37	94	42	34	27	93	64	82	122	109	61	63	46	15	22	16	6	13	14	3	6	1	2	3	1	0	0	0	0	0
74	6	9	27	21	11	45	40	74	36	32	33	67	71	92	146	123	74	85	40	35	15	10	2	15	8	9	5	3	4	2	1	1	2	0	0	0
75	6	3	13	15	10	35	29	63	40	48	21	84	62	73	81	120	52	72	39	21	16	14	6	19	11	5	2	3	3	0	2	0	1	0	0	0
76	12	3	20	16	18	18	33	79	23	32	23	47	48	67	143	122	49	69	50	25	9	11	4	13	8	3	4	2	5	0	0	3	1	0	0	0
77	9	7	10	14	7	22	30	69	31	24	12	50	54	66	115	97	57	63	35	24	18	17	2	8	14	10	6	2	6	0	1	0	0	0	0	1
78	18	3	18	9	11	33	46	37	29	38	20	55	35	46	113	90	37	56	55	14	9	8	4	9	13	8	0	2	3	0	0	1	1	0	0	0
79	7	9	15	21	15	22	31	77	19	41	30	36	43	64	129	83	43	57	31	14	13	9	7	13	7	12	6	4	0	4	0	0	1	0	0	0
80	5	6	9	22	5	23	34	49	22	19	32	52	37	57	77	63	47	67	39	19	8	10	6	15	9	4	7	0	1	1	0	2	0	0	0	1
81	8	0	9	11	1	34	21	53	34	31	19	43	27	70	118	67	44	45	41	11	6	8	5	11	9	10	3	1	1	2	0	0	1	1	0	0
82	2	3	2	10	4	9	18	39	25	13	13	51	27	62	97	83	23	36	31	10	7	2	1	16	8	2	2	0	1	2	1	1	1	0	1	0
83	9	0	5	9	7	18	12	33	24	6	7	15	15	47	33	41	37	25	21	4	8	4	7	2	8	6	0	3	0	1	1	0	1	0	0	0
84	5	1	8	12	2	5	10	33	9	7	3	26	8	34	28	29	24	23	21	8	7	3	3	8	10	2	2	2	2	2	0	1	1	0	0	0
85	3	2	6	8	4	6	9	28	6	3	0	14	4	49	18	20	26	23	18	2	8	3	5	5	1	2	1	1	0	0	0	1	0	0	0	0
86	1	3	5	1	6	26	8	28	7	4	2	15	13	12	19	17	30	23	15	1	8	1	1	7	6	1	2	1	0	2	0	0	0	0	0	0
87	3	0	1	13	8	9	4	31	0	0	6	3	6	30	37	23	11	15	8	3	3	1	2	1	7	4	0	2	0	1	0	0	0	0	0	0
88	0	0	5	4	1	14	2	21	2	0	4	14	4	32	15	27	12	10	13	2	2	1	1	1	4	1	1	0	0	3	0	1	2	0	0	0
89	5	0	2	2	3	2	6	21	5	0	2	11	3	33	28	23	13	10	8	2	1	3	2	0	4	4	2	0	0	0	0	0	0	0	0	0
90	0	0	0	1	5	6	5	24	2	1	0	7	7	30	25	24	16	11	9	3	0	0	1	3	3	4	0	1	0	0	1	0	2	1	0	0
91	4	0	1	7	4	7	5	26	6	1	0	7	2	25	11	20	11	14	8	3	1	4	0	0	3	2	1	1	0	0	1	0	1	0	0	0
92	2	0	2	4	2	3	1	24	1	3	0	8	11	23	15	9	8	10	10	1	0	1	1	0	1	0	0	1	1	1	0	0	0	0	0	0
93	0	0	3	6	1	10	0	5	0	1	0	8	2	6	27	4	13	9	4	0	1	1	0	5	0	0	0	1	0	0	1	0	1	0	0	0
94	0	2	1	3	0	1	0	9	1	0	0	9	2	7	16	17	11	9	4	3	2	0	1	0	3	0	0	1	0	0	0	0	0	0	0	1
95	1	0	0	5	0	0	0	1	0	1	2	7	1	4	5	8	7	0	1	2	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0
96	0	0	1	1	0	0	2	8	1	1	0	6	0	1	8	4	5	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	3	3	1	2	1	9	2	2	4	0	0	3	0	6	3	4	1	2	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	3	0	0	1	1	0	0	1	0	0	2	0	0	1	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
99	2	0	0	1	0	1	0	2	0	0	0	1	1	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
100	0	0	0	1	0	0	0	0	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	0	0	0
101	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
104	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
105	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
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	317	295	436	854	375	1,030	1,362	2,429	1,371	1,906	1,064	2,690	2,389	3,875	6,112	4,554	3,624	2,198	1,633	843	541	439	266	690	451	231	149	99	154	64	77	51	36	7	7	18
legal size			81.0			81.8							82.6										83.3		84.1						85.7					

Table 5.34. American lobster length frequencies–fall, male, 1 mm intervals, 1984–2019.
Lobsters were measured from each tow.

Male	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
Length	(70)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(120)	(120)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(40)	(80)	(80)	(40)	(80)	(40)	(80)	(0)	(80)	(80)	(80)	(79)	(80)	(80)	(80)	(80)	(80)
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
26	0	0	2	0	0	0	0	0	1	0	1	0	0	1	0	1	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	2	0	0	1	9	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0
28	1	2	0	0	0	0	3	0	0	3	4	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	-	1	0	0	0	0	0	0	0	0
29	0	0	0	0	0	1	3	0	0	6	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	3	0	3	0	4	0	3	2	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0
31	0	0	2	0	1	0	2	0	4	2	3	0	6	2	2	0	0	0	0	0	0	1	0	1	0	0	-	0	0	0	0	0	0	0	0	0
32	4	0	0	4	0	0	0	5	13	2	3	0	4	5	2	2	0	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
33	1	0	0	2	0	1	0	3	4	0	9	1	11	3	1	5	3	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
34	1	0	0	2	1	0	2	1	13	4	11	0	4	1	1	1	1	0	0	0	0	0	0	0	1	1	-	0	0	0	0	0	0	0	0	0
35	3	0	0	1	0	0	3	7	13	15	12	1	8	3	0	4	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
36	3	0	0	1	0	1	5	8	25	8	21	1	7	14	2	1	0	0	0	1	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
37	3	0	6	0	1	1	7	4	38	4	21	1	11	7	0	2	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0
38	2	2	2	3	2	0	0	6	40	6	34	1	17	14	3	5	0	0	0	0	1	4	3	0	0	0	-	0	0	0	0	0	0	0	0	0
39	0	0	2	1	2	1	5	8	34	5	25	4	16	28	7	17	3	0	1	0	0	1	0	0	1	0	-	0	0	0	0	0	0	0	0	0
40	3	0	6	2	1	5	10	8	35	21	35	6	15	14	5	7	1	0	2	0	0	0	0	0	0	1	-	0	1	0	0	0	0	0	0	0
41	6	1	1	3	4	1	12	13	43	14	54	5	11	24	1	6	1	0	1	0	0	1	2	0	1	0	-	0	0	0	0	0	0	0	0	0
42	4	6	2	0	11	3	12	13	43	34	55	5	29	25	9	8	5	0	1	1	2	1	0	0	1	0	-	1	1	0	0	0	0	0	0	0
43	1	0	3	3	2	1	7	7	49	17	56	12	23	41	5	21	2	2	0	0	0	1	1	1	1	0	-	0	0	0	0	0	0	0	0	0
44	4	1	1	5	11	1	6	13	35	13	63	26	16	40	5	19	3	2	1	1	3	0	0	0	0	2	-	2	0	0	0	0	0	0	0	0
45	7	3	3	3	8	10	11	42	44	34	43	20	44	53	9	18	5	3	2	1	2	2	2	0	0	1	-	1	0	0	0	0	0	0	0	0
46	2	2	1	7	4	14	10	31	44	19	58	33	18	35	7	16	5	2	3	0	0	2	0	0	2	1	-	2	0	0	0	0	0	0	0	0
47	13	4	3	10	10	5	16	14	66	60	26	26	33	41	13	20	7	2	2	1	2	3	0	1	1	0	-	0	0	0	0	0	0	0	0	0
48	15	3	5	7	14	4	16	10	67	49	72	19	49	72	8	20	9	9	1	0	3	2	0	0	0	0	-	0	2	0	0	0	0	0	0	0
49	4	2	10	8	2	12	18	45	48	100	56	33	30	48	10	37	9	1	0	1	6	3	2	0	1	2	-	0	0	0	0	0	0	0	0	0
50	13	5	8	21	9	11	16	37	63	56	55	53	28	56	15	44	9	3	2	0	5	4	3	1	0	0	-	1	2	0	0	0	0	0	0	0
51	51	6	5	17	10	11	24	46	74	30	88	27	22	88	21	37	18	6	3	3	3	0	1	0	0	1	-	0	1	0	0	0	0	0	0	0
52	15	5	11	17	3	16	31	43	65	78	82	56	30	80	36	42	9	4	2	0	3	4	1	1	1	3	-	0	0	0	1	0	0	0	0	0
53	13	9	3	30	5	15	22	57	55	83	83	61	37	103	29	29	15	8	3	1	7	1	0	1	0	1	-	1	0	0	0	0	0	0	0	0
54	24	12	19	26	21	17	25	76	47	59	97	59	30	116	23	43	21	7	2	3	8	5	2	1	3	3	-	1	1	0	0	0	0	0	0	0
55	23	4	17	23	13	26	25	47	83	84	70	80	32	96	26	46	38	9	2	2	12	3	3	1	0	7	-	1	1	0	0	0	0	0	0	0
56	18	12	25	18	13	13	13	37	65	104	90	52	43	89	39	39	21	10	3	4	10	3	3	0	2	6	-	0	0	0	0	0	0	0	0	0
57	9	0	10	30	26	18	36	43	64	101	79	92	27	111	44	42	27	10	5	4	8	8	1	7	2	4	-	0	0	0	0	0	0	0	0	0
58	29	15	24	23	13	30	34	51	68	68	107	58	48	80	42	57	21	10	8	5	6	7	3	1	1	5	-	1	0	0	0	0	0	0	0	0
59	47	8	26	31	16	14	23	43	86	109	78	76	40	143	33	54	29	24	10	8	10	13	6	5	1	6	-	0	2	0	0	0	0	0	0	0
60	16	6	11	26	7	26	39	56	77	103	109	69	30	134	56	61	37	9	9	7	13	7	2	2	0	1	-	0	0	0	0	0	0	0	0	0
61	23	5	10	25	30	12	24	57	68	138	120	78	59	128	53	64	44	15	8	5	17	8	5	4	1	3	-	0	0	0	0	0	0	0	0	0
62	50	17	26	23	10	13	36	37	57	125	92	80	42	145	57	49	28	19	10	7	10	6	3	1	4	7	-	0	2	0	0	0	0	0	0	0
63	14	18	37	20	15	19	28	63	68	144	107	74	41	149	60	63	39	29	15	7	4	9	5	4	1	10	-	2	0	0	0	0	0	0	0	0
64	28	17	22	24	35	19	25	86	74	87	106	73	77	138	57	68	42	35	9	8	19	12	2	2	2	8	-	0	3	0	0	0	0	0	0	0
65	36	10	39	31	20	16	39	87	49	107	83	75	73	161	75	48	37	34	17	10	14	14	3	4	6	11	-	1	1	0	0	0	0	0	0	0
66	22	13	21	41	31	27	22	60	59	81	87	93	40	130	63	61	41	24	12	7	21	6	4	2	6	11	-	3	1	1	1	0	1	0	0	0
67	14	16	39	28	21	24	30	78	82	108	119	63	46	136	51	38	43	38	13	7	17	12	2	7	7	14	-	1	3	0	1	0	0	0	0	0
68	16	18	30	31	17	19	42	71	69	107	79	55	34	113	67	61	57	33	21	7	15	12	5	5	4	16	-	0	4	1	0	0	0	0	0	0
69	46	13	22	32	31	30	24	51	81	131	101	75	28	121	52	54	41	21	20	11	23	10	2	5	5	8	-	0	2	0	0	0	0	0	0	0
70	32	11	28	31	14	24	26	63	56	117	112	79	36	122	60	78	42	22	12	8	30	7	1	4	3	6	-	3	0	0	1	0	0	0	0	0
71	8	14	25	23	21	25	24	58	63	115	83	52	63	126	69	75	48	47	21	13	20	6	6	0	4	12	-	1	0	0	0	0	0	0	0	0
72	23	20	31	36	29	19	33	89	61	86	76	65	66	86	77	64	47	52	13	9	19	10	6	9	2	8	-	0	1	2	0	0	0	0	0	0
73	40	18	42	29	13	42	40	53	44	85	83	51	44	98	54	70	47	32	6	5	20	9	0	3	4	9	-	1	0	0	0	1	0	0	0	0
74	36	18	22	25	22	19	39	28	69	130	108	56	42	99	64	65	37	39	21	14	10	4	1	8	6	12	-	1	0	0	0	0	0	0	0	0
75	9	8	23	18	16	28	33	38	53	101	97	58	35	99	62	63	39	33	14	6	23	12	0	3	1	11	-	1	1	0	0	0	0	0	0	0
76	21	15	24	25	12	36	20	37	33	75	66	37	32	88	55	66	33	28	14	5	16	4	5	7	0	6	-	1	1	0	0	0	0	0	1	0
77	13	6	23	19	33	18	32	28	53	79	52	55	37	94	55	60	31	33	17	3	7	9	5	6	2	7	-	0	0	0	0	0	0	0	0	0
78	28	12	9	32	13	29	24	36	46	70	55	59	33	76	46	54	28	38	11	5	8	3	1	5	4	2	-	2	1	0	1	0	0	0	0	0
79	5	13	11	33	8	19	19	56	48	61	66	43	47	81	52	59	35	35	17	6	9	4	2	5	4	6	-	2	2	0	0	0	0	0	0	0
80	15	18	13	20	22	15	38	40	49	102	53	39	29	78	44	51	34	26	7	5	5	7	3	4	0	3	-	0	0	0	0	0	0	0	0	0
81	23	11	18	10	8	17	16	45	39	47	66	46	32	83	37	52	25	18	14	2	12	5	0	4	0	2	-	0	0	1	0	1	1	0	0	0
82	7	7	20	10	6	6	21	19	21	46	26	41	15	57	34	29	23	21	10	3	8	5	3	5	4	5	-	0	0	0	0	0	0	0	0	0
83	6	6	12	5	6	11	14	23	29	26	25	23	10	23	20	20	12	4	3	1	3	2	1	0	4	2	-	0	0	0	0	0	0	0	0	0
84	4	2	13	5	8	10	6	10	23	12	15	31	8	19	6	15	7	6	1	2	3	2	0	4	1	1	-	0	0	0	0	0	0	0	0	0
85	7	2	15	8	10	3	14	15	39	11	13	17	5	12	4	10	8	3	1	1	3	2	0	0	0	3	-	0	0	0	0	0	0	1	0	0
86	7	5	11	5	5	3	8	2	10	10	30	26	14	20	7	10	3	3	0	0	2	0	0	0	2	0	-	0	1	0	0	0	0	0	0	0
87	5	0	15	5	7	6	17	2	16	8	13	15	4	16	6	17	3	1	0	0	0	3	0	1	0	1	-	0	0	0	1	0	0	0	0	0
88	3	1	12	7	2	0	26	2	16	9	25	13	8	14	6	7	7	3	0	0	3	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
89	7	5	9	5	9	7	7	4	19	9	20	17	10	15	8	12	5	0	0	0	0	0	0	0	0	2	-	0	0	0	0	0	0	1	0	0
90	18	3	13	3	5	7	8	8	10	3	22	10	5	14	3	4	6	0	1	0	4	0	0	0	0	0	-	0	0	1	0	0	0	0	0	0
91	4	2	14	5	2	11	5	7	12	17	15	6	3	15	4	7	3	0	0	0	1	0	0	1	0	2	-	0	0	0	0	0	0	0	0	0
92	7	0	8	4	14	1	3	2	10	3	19	6	3	10	4	5	1	0	0	0	0	0	0	0	0	2	-	0	0	0	0	0	0	0	0	0
93	1	0	0	1	6	0	6	5	7	3	12	12	0	8	3	3	1	0	0	0	1	0	0	0	2	0	-	0	0	0	0	0	0	0	0	0
94	1	1	2	1	0	1	4	2	3	2	12	2	1	6	0	2	1	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
95	0	1	5	1	0	0	0	1	3	2	9	1	0	4	5	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
96	0	0	3	1	0	14	0	0	1	4	1	2	0	4	4	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
97	13	0	4	3	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
98	1	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
99	0	1	4	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	0	0	0
100	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
101	0	0	1	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
102	0	1	0	1	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	0
103	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
104	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
105	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
106	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	1	-	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
Total	**930**	**436**	**888**	**945**	**712**	**814**	**1,198**	**2,043**	**2,853**	**3,563**	**3,673**	**2,406**	**1,750**	**4,165**	**1,783**	**2,107**	**1,202**	**814**	**375**	**200**	**454**	**266**	**101**	**126**	**100**	**235**	-	**31**	**34**	**6**	**8**	**2**	**2**	**2**	**1**	**0**
legal size:	81.0					81.8		82.6														83.3	84.1				85.7									

Table 5.35. Atlantic herring length frequencies, spring and fall, 1 cm intervals, 1989-2019.

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

Spring

length	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
3	0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4	0	0	0	0	4	0	0	0	0	18	504	61	0	0	1	2	0	0	0	1	213	2	12	0	29	3	2	0	0	5	5
5	0	2	0	11	3	1	0	0	1	149	1,547	104	0	0	8	30	76	3	20	36	3,416	28	35	15	429	29	51	18	2	79	37
6	1	3	3	16	1	0	1	3	0	92	237	1	3	0	9	10	140	2	2	13	449	12	59	2	227	0	7	5	1	10	20
7	0	1	4	15	2	0	2	15	69	84	18	7	11	1	0	8	118	1	0	12	44	1	103	2	38	2	1	3	2	4	27
8	0	0	7	0	1	0	0	5	165	28	5	1	6	1	0	9	73	11	0	23	48	1	132	0	10	1	0	3	0	5	16
9	0	0	3	0	1	0	1	1	27	11	4	0	8	0	0	3	8	10	0	16	59	0	43	1	1	2	0	0	1	0	1
10	0	0	0	0	3	1	0	0	0	2	0	0	1	0	0	0	0	0	0	2	6	0	3	1	0	5	0	0	0	1	0
11	0	0	0	0	3	1	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	46	0	0	0	0	0
12	0	0	0	0	38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	492	0	0	0	0	0
13	0	8	0	0	215	8	0	0	5	0	0	0	0	0	0	1	3	0	0	0	0	5	1	1	0	483	0	0	0	0	0
14	0	1	0	0	203	11	0	1	29	0	0	0	1	0	0	9	7	0	0	0	1	29	26	6	23	200	0	0	0	0	0
15	2	0	8	0	122	9	6	0	59	5	0	0	2	0	0	49	14	0	9	1	9	39	55	16	112	48	1	0	0	0	0
16	3	1	38	0	174	17	7	3	12	8	0	3	0	0	0	65	20	0	14	0	91	49	19	12	121	6	4	0	0	0	0
17	2	31	33	0	100	42	8	2	4	5	0	6	2	0	0	140	63	0	27	2	149	25	3	3	119	18	2	4	0	2	0
18	2	4	29	2	28	32	12	0	10	2	0	0	1	0	3	275	98	0	166	6	28	31	7	0	49	95	8	41	0	4	1
19	0	16	19	29	21	39	12	6	21	0	1	0	11	2	1	117	57	0	467	1	203	86	14	20	32	85	39	63	0	2	0
20	0	161	67	15	41	43	78	10	40	5	1	6	65	3	2	67	67	0	228	7	521	222	14	107	50	52	47	36	0	1	0
21	0	333	72	24	35	29	283	26	14	4	2	11	85	17	0	12	19	0	99	11	279	106	8	196	148	16	60	10	0	1	0
22	0	424	70	111	96	14	399	15	19	11	10	38	77	32	0	16	11	3	105	9	162	71	24	91	847	4	58	3	0	12	2
23	0	201	160	61	387	111	245	20	7	4	15	36	14	87	4	0	15	4	106	13	144	97	59	23	824	60	29	10	0	25	8
24	0	195	297	311	436	224	290	22	18	1	19	47	33	71	17	0	25	3	150	27	71	105	173	21	268	71	90	30	2	19	5
25	0	315	337	751	645	485	416	46	117	2	9	99	31	18	36	3	21	5	122	38	87	108	214	16	104	30	90	47	1	44	55
26	1	447	360	503	921	560	1,028	85	202	31	10	70	46	30	63	3	78	3	125	39	108	110	210	18	96	50	72	47	0	55	332
27	0	347	514	382	807	947	723	93	236	33	35	80	24	27	65	14	106	9	122	38	69	95	147	11	30	30	34	10	1	59	521
28	0	338	513	391	825	604	706	64	234	44	37	104	34	19	72	9	87	6	116	36	85	62	65	4	5	4	16	9	0	8	206
29	2	247	319	492	550	387	337	37	82	21	25	69	29	52	52	1	40	3	47	15	44	26	48	4	1	0	1	0	0	1	53
30	0	156	383	142	287	204	231	29	31	1	11	24	8	3	27	3	19	1	6	6	27	7	2	0	0	0	0	0	0	0	0
31	2	127	139	77	129	29	14	4	15	2	0	0	4	0	8	1	0	0	0	2	6	0	2	0	0	0	0	0	0	0	0
32	0	50	22	1	33	6	14	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	11	13	2	0	2	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
34	0	8	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**15**	**3,427**	**3,411**	**3,341**	**6,119**	**3,808**	**4,814**	**489**	**1,421**	**566**	**2,491**	**767**	**497**	**363**	**368**	**847**	**1,165**	**64**	**1,931**	**355**	**6,319**	**1,317**	**1,479**	**570**	**3,563**	**1,834**	**612**	**339**	**10**	**337**	**1,289**

Fall

length	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
7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	1	0
8	0	0	0	99	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0	0
9	0	0	0	328	16	4	0	0	2	3	0	0	0	0	1	0	0	0	0	0	4	-	1	0	1	0	0	0	0	1	0
10	0	0	0	176	3	6	0	14	6	59	0	0	0	0	12	1	0	0	0	0	2	-	0	0	1	0	0	0	0	5	0
11	0	3	0	34	5	9	0	11	3	49	0	1	0	0	47	0	0	2	0	0	1	-	0	0	1	0	2	0	0	1	0
12	0	0	0	3	9	11	0	1	0	0	0	0	0	0	20	1	0	0	1	0	0	-	0	0	0	0	1	0	0	0	0
13	0	0	0	0	13	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-	0	0	0	0	0	0	0	0	0
14	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
15	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
16	0	0	0	1	7	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	-	0	0	0	1	3	0	0	0	0
17	0	0	1	0	7	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-	1	0	0	2	2	0	0	0	0
18	0	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	-	1	0	0	0	6	0	0	1	0
19	0	0	5	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	1	0	0	1	0
20	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
21	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
22	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	1	0	0	0	0	0	0	0	0
23	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	-	0	0	0	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	1	0	0	1	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	2	0	0	1	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	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	0	0	0	1	0
Total	**0**	**3**	**12**	**642**	**110**	**40**	**0**	**27**	**12**	**112**	**0**	**2**	**0**	**0**	**80**	**3**	**3**	**2**	**2**	**1**	**9**	-	**4**	**0**	**3**	**3**	**19**	**0**	**0**	**14**	**0**

Table 5.36. Atlantic menhaden length frequency, spring and fall, 1 cm intervals, 1996-2019.

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.

Spring

length	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	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**

Fall

length	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
4	0	0	0	0	0	0	0	1	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
6	0	0	0	0	0	0	0	17	1	0	0	24	0	0	-	0	1	1	0	1	0	2	0	4
7	1	0	0	20	12	0	2	32	26	0	1	39	2	0	-	0	0	0	0	34	1	9	1	4
8	0	1	18	51	73	0	6	22	178	11	0	32	2	2	-	0	0	0	0	58	1	10	0	2
9	0	11	53	152	128	0	8	9	135	22	0	12	6	0	-	0	0	0	0	73	0	8	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
11	0	6	49	337	51	25	14	1	47	13	2	51	2	4	-	0	0	0	1	30	2	1	0	6
12	0	11	44	25	35	30	10	1	18	9	8	24	1	5	-	6	0	4	5	22	11	3	2	1
13	0	0	20	2	15	16	14	4	1	1	1	49	0	4	-	7	1	5	0	5	42	7	3	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
15	0	0	0	0	2	4	24	0	0	1	0	1	1	5	-	6	1	1	0	0	90	1	2	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
17	0	0	0	0	3	0	12	0	0	0	0	0	3	0	-	0	1	0	0	0	2	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
19	0	0	0	0	0	0	16	0	0	0	0	0	0	1	-	0	2	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
21	0	0	0	1	0	0	1	0	0	1	0	0	0	0	-	0	1	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
23	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	1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	3	1	2	1	1
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	7	5	1	2	4	12
26	0	0	0	0	0	0	1	0	0	0	0	3	0	0	-	0	7	2	2	14	2	3	13	34
27	2	0	0	0	0	0	1	0	0	1	0	21	9	4	-	4	27	6	68	131	11	11	24	101
28	3	1	0	3	0	0	2	0	3	4	0	35	2	7	-	18	68	13	164	249	17	22	47	180
29	23	17	0	6	1	0	18	5	10	21	2	31	1	1	-	48	66	12	132	233	4	14	35	192
30	30	25	0	28	3	0	29	8	44	54	2	18	0	5	-	30	35	14	63	100	1	11	8	93
31	11	17	1	42	7	1	39	8	65	43	2	7	0	2	-	4	11	5	2	18	0	4	8	38
32	2	6	1	27	12	0	27	3	51	21	1	2	0	0	-	2	0	1	9	2	0	1	1	5
33	0	1	0	19	4	2	25	2	10	5	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
35	0	0	0	0	1	0	5	0	1	1	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**

Table 5.37. Black sea bass length frequencies, spring, 1 cm intervals, 1986-2019.
Since 1987, black sea bass have been measured from every tow.

	Spring																																
length	**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**
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	1
5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	6
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8	0	0	0	0	1	1	2	0	0	3	0	2	0	0	0	0	13
9	0	0	0	0	0	2	0	0	0	0	0	0	0	1	2	0	9	0	0	0	0	1	1	1	0	0	9	2	2	0	0	0	1	2
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5	0	0	0	0	7	7	2	0	0	8	2	9	0	0	0	2	4
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	1	2	1	0	0	11	0	10	0	0	0	0	4
12	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	5	0	0	0	0	1	2	2	0	1	14	0	2	1	2	0	1	3
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	9	0	0	0	0	2	1	1	0	1	12	1	0	0	0	0	2	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	1	0	0	0	0	0	2	0	0	0	0	1	0	1
15	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	1	2	0	0	1	7	1	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	9	2	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	14	2	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	1	1	0	0	6	1	0	1	15	1	0
19	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	14	1	1	0	12	9	0
20	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	24	9	0	2	22	15	3
21	0	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	1	1	1	0	0	1	1	0	0	0	1	33	9	2	0	23	7	2
22	0	2	0	1	0	0	0	1	1	0	1	0	0	0	1	2	0	1	0	0	1	4	2	2	1	2	2	34	6	0	2	14	24	4
23	0	1	0	0	2	0	0	1	1	0	3	0	1	0	1	0	1	2	1	0	0	4	3	3	1	2	4	22	10	8	2	13	25	2
24	0	3	0	0	0	0	1	1	3	3	2	1	2	1	8	1	5	4	0	0	0	0	0	3	1	2	1	12	19	1	5	8	27	5
25	2	0	0	2	0	0	1	2	2	1	0	2	1	0	0	0	2	0	1	0	0	4	1	2	0	2	1	11	39	4	6	3	51	9
26	0	0	1	0	1	0	1	0	1	3	0	1	1	0	1	5	2	0	1	0	0	1	2	1	1	0	3	3	67	6	4	3	87	20
27	0	0	0	0	0	0	0	0	1	1	0	1	1	2	2	4	1	0	1	0	0	1	0	0	2	0	6	2	93	7	5	2	124	33
28	1	0	0	0	4	0	0	1	0	0	0	0	0	0	3	0	2	0	1	0	1	1	0	2	0	0	3	2	125	5	2	2	155	81
29	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	6	0	0	1	1	2	4	0	3	0	152	17	2	1	132	92
30	0	0	0	1	2	0	0	1	2	0	0	1	0	1	1	3	1	0	4	0	0	0	0	2	4	1	2	0	139	41	8	14	100	119
31	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	3	10	0	7	0	0	0	3	2	2	2	3	1	96	51	8	6	79	138
32	0	0	2	0	1	0	0	2	1	0	1	4	0	1	1	3	15	1	5	0	0	4	5	2	3	3	6	6	91	94	12	10	30	141
33	0	0	1	0	1	0	0	0	2	0	2	1	0	0	1	11	12	1	3	0	0	1	2	2	0	1	7	5	43	91	27	10	32	128
34	2	0	0	1	1	0	0	0	1	0	1	1	1	1	3	6	11	1	2	0	0	3	3	4	6	1	10	9	49	106	50	13	22	108
35	0	0	0	0	0	0	0	1	0	0	1	3	0	0	1	7	11	2	1	1	0	5	0	4	1	3	6	4	19	129	57	13	19	90
36	1	0	1	0	1	0	0	1	1	2	1	0	0	1	0	3	13	0	3	4	0	5	0	7	0	2	7	8	14	107	89	31	14	51
37	0	0	0	0	1	0	0	0	0	0	1	1	0	2	0	5	6	2	0	1	0	1	1	3	2	5	3	10	11	81	110	52	18	42
38	1	0	1	0	0	1	0	0	0	0	0	0	0	1	3	2	11	3	0	1	0	1	0	4	2	4	8	4	9	62	102	60	21	20
39	1	0	0	0	0	2	0	0	2	0	1	0	0	0	0	3	13	1	0	1	0	0	1	7	0	5	12	6	3	56	72	60	22	20
40	0	0	0	1	0	1	0	0	0	0	3	0	0	0	1	2	15	2	1	0	0	2	0	4	0	3	4	9	6	38	77	80	23	17
41	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	3	11	4	4	4	0	1	1	5	2	2	11	8	8	37	69	62	17	23
42	0	1	0	1	0	0	0	0	1	1	0	0	0	1	1	1	11	3	0	4	1	0	0	7	1	2	1	2	3	21	67	44	30	19
43	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	5	3	2	2	0	1	1	3	0	2	6	1	0	9	53	44	34	11
44	2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	5	2	1	1	1	0	0	0	0	1	2	3	1	10	36	44	22	19
45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7	0	1	0	0	1	1	0	1	0	3	2	1	4	36	25	24	11
46	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	6	2	1	0	0	0	1	0	0	1	2	2	2	2	25	24	22	17
47	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	5	0	2	0	0	1	0	2	0	0	2	1	3	1	10	17	23	13
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	1	4	15	14	8	15
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	0	0	0	0	0	1	3	0	4	10	20	8	12
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	2	11	9	5
51	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	1	2	0	10	5	4
52	0	0	0	1	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	1	4	6	6
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3	6	2
54	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	2	1
55	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	2	1	2
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0
57	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	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
Total	**12**	**8**	**8**	**12**	**19**	**16**	**3**	**12**	**22**	**11**	**20**	**18**	**8**	**16**	**47**	**67**	**239**	**46**	**49**	**19**	**7**	**58**	**43**	**84**	**36**	**48**	**186**	**263**	**1,058**	**1,004**	**971**	**826**	**1,266**	**1,321**

Table 5.38. Black sea bass length frequencies, fall, 1 cm intervals, 1986-2019.
Since 1987, black sea bass have been measured from every tow.

	Fall																																		
length	**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**
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	3	0	1	0	0	1	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	2	0	0	1	-	0	1	3	3	0	1	2	2	0
5	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	-	4	0	2	0	0	2	0	2	1
6	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	3	1	0	7	0	0	1	1	0	-	4	1	3	5	1	1	1	3	0
7	0	0	0	0	0	4	0	3	1	0	1	0	0	3	0	6	4	0	23	2	0	3	2	0	-	2	1	3	2	1	0	5	5	3
8	0	2	0	1	0	4	0	1	2	0	1	0	0	0	1	5	8	0	15	2	0	4	0	2	-	1	2	1	2	1	0	4	1	2
9	0	0	0	0	1	3	0	0	4	0	0	0	1	0	0	3	6	0	10	2	0	1	2	0	-	1	2	0	4	0	1	5	2	0
10	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	1	3	0	5	2	0	2	0	0	-	0	2	0	0	0	0	0	1	1
11	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5	0	2	2	0	1	0	0	-	0	5	0	0	0	0	0	0	2
12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	-	0	3	0	0	0	3	0	0	1
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	-	0	4	0	0	0	3	1	0	4
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	-	0	14	0	0	0	22	0	0	14
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	-	0	21	0	0	0	19	1	0	12
16	0	0	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	0	0	0	1	5	0	-	0	37	0	0	0	15	2	0	12
17	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	7	0	0	0	1	4	8	2	-	0	20	3	0	0	19	2	0	14
18	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	16	1	0	0	1	1	14	6	-	0	20	3	0	0	5	6	0	14
19	0	0	0	0	0	0	0	0	0	0	0	2	0	3	1	0	23	0	0	0	2	2	10	4	-	0	23	1	0	0	11	9	1	14
20	0	0	0	0	0	3	0	0	0	0	2	0	1	6	3	0	19	0	0	0	1	4	10	6	-	0	14	1	0	0	5	6	0	7
21	0	0	0	0	0	1	0	0	0	1	0	1	0	4	1	0	17	0	0	1	3	4	9	4	-	0	9	1	2	0	2	2	2	4
22	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	5	0	0	0	0	1	4	3	-	0	3	8	1	0	0	3	0	1
23	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	1	0	0	2	0	0	-	0	6	11	2	0	1	6	2	1
24	0	0	2	0	0	0	0	0	0	0	1	0	0	3	0	0	2	0	0	0	0	0	0	0	-	0	0	12	1	0	0	10	4	0
25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	-	0	0	14	1	0	1	5	3	1
26	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	-	1	0	18	2	0	1	9	2	0
27	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	2	-	1	1	15	3	3	5	8	3	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	2	0	-	1	2	13	10	2	2	7	12	2
29	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0	1	1	2	0	1	0	0	-	2	1	8	13	2	6	3	14	2
30	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	-	5	1	8	10	1	3	3	14	7
31	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	0	1	1	0	0	0	2	1	0	-	4	1	4	21	4	2	4	17	6
32	0	0	2	0	0	0	0	0	0	0	0	1	0	2	3	2	0	0	0	0	0	2	0	0	-	1	0	4	14	5	0	0	15	8
33	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	2	0	0	0	2	0	0	0	0	-	1	1	4	23	3	1	0	8	11
34	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	0	1	1	0	-	1	1	0	21	9	4	0	8	20
35	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	3	2	1	1	0	0	0	1	1	-	2	1	1	27	11	3	0	12	18
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	-	0	1	2	20	8	3	1	11	16
37	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	9	2	0	0	0	0	1	1	0	-	3	1	3	12	6	2	2	2	13
38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	3	0	0	1	0	1	0	1	-	1	1	6	11	5	6	0	3	11
39	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	2	0	1	-	2	2	1	7	8	7	2	0	9
40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	2	0	1	0	0	0	1	0	-	1	3	7	8	13	7	2	0	6
41	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	0	0	1	0	2	0	0	-	3	2	2	4	4	10	3	0	5
42	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	2	0	0	0	0	-	3	4	3	2	5	7	6	0	4
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	1	0	0	-	0	3	5	3	4	4	2	1	4
44	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	3	1	0	0	0	0	0	0	0	-	1	3	2	0	2	5	4	2	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	-	0	0	3	1	1	0	2	2	0
46	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	0	1	3	5	0	3
47	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	-	0	1	0	1	0	5	3	1	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	-	0	2	2	0	0	2	5	3	3
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	0	0	6	3	2	1
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	-	0	0	1	2	0	2	6	2	1
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	0	1	0	1
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	1	1	0	0	0	1	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	1
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	-	0	1	1	0	0	0	1	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	1	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0
Total	**0**	**3**	**9**	**1**	**8**	**22**	**2**	**8**	**12**	**1**	**6**	**4**	**10**	**33**	**22**	**66**	**155**	**11**	**75**	**23**	**12**	**53**	**77**	**38**	**0**	**45**	**224**	**185**	**239**	**104**	**207**	**151**	**166**	**261**

Table 5.39. Blueback herring length frequencies, spring and fall, 1 cm intervals, 1989-2019.

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

Spring

length	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
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
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
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
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
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
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
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
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
14	0	0	0	15	0	5	3	1	1	1	0	3	0	0	0	0	7	0	1	1	5	4	2	0	0	0	0	1	0	6	2
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	0	1	0	24	1
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	0	78	0
17	0	0	1	11	3	9	1	10	4	0	5	3	10	7	4	4	11	2	37	7	64	2	12	2	5	6	0	1	0	162	2
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
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
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
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
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
23	0	0	3	2	0	3	2	3	1	0	0	5	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	11
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
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
26	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	**6**	**3**	**29**	**147**	**30**	**373**	**83**	**90**	**338**	**140**	**11**	**136**	**52**	**56**	**89**	**173**	**104**	**49**	**101**	**71**	**272**	**102**	**47**	**45**	**68**	**47**	**153**	**187**	**0**	**574**	**113**

Fall

length	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
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	4	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	2	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
7	0	0	0	0	0	0	5	0	2	0	0	0	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	33	0	2	0	0	0	0	0	0	0	0	0	1	0	0	-	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	21	3	2	2	1	0	0	0	0	0	0	0	1	0	2	-	0	0	0	0	0	0	1	0	0
10	0	0	0	0	0	1	3	0	8	1	0	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	1	0	0
11	0	0	0	0	3	13	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0
12	0	0	3	9	8	227	14	0	12	1	1	0	7	0	0	2	0	0	0	0	0	-	0	0	0	1	0	0	3	0	1
13	38	1	4	11	24	225	48	0	117	18	0	0	36	2	0	15	2	2	0	0	0	-	0	1	0	1	0	17	0	0	5
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
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
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
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
18	1	0	0	0	0	1	0	0	0	0	0	1	3	0	0	0	0	0	0	0	5	-	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
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
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
Total	**140**	**2**	**9**	**27**	**76**	**827**	**172**	**7**	**292**	**72**	**8**	**8**	**227**	**12**	**9**	**42**	**8**	**14**	**55**	**3**	**18**	**-**	**25**	**1**	**0**	**10**	**94**	**261**	**88**	**6**	**10**

Table 5.40. Bluefish length frequencies, spring, 1 cm intervals, 1984-2019.
Bluefish lengths were recorded from every tow.

	Spring																																		
length	**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**
23	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	0	0	0
24	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	2	0
25	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	3	0	1	0	0	0	0	1	0	0	0	0	0
26	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	1	0	0	0	1	8	1	3	0	0	0	0	1	0	1	0	0	0
27	0	0	0	0	0	0	1	1	1	0	0	0	0	2	2	0	2	0	0	0	2	0	1	2	0	2	0	1	0	0	0	1	0	0	1	0
28	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	4	0	0	7	0	0	0	0	0	0	0	0	1	0
29	0	0	2	0	0	0	1	2	0	0	0	1	1	1	0	1	4	0	1	0	0	0	1	0	0	3	0	0	0	0	0	0	1	0	0	0
30	0	0	0	0	0	0	0	7	0	0	0	0	0	1	0	0	1	0	0	1	0	1	2	1	0	0	0	0	1	0	0	0	1	0	0	0
31	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0
32	0	0	1	0	0	0	0	11	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0
33	0	0	0	0	0	0	0	6	0	0	0	0	0	2	0	1	0	0	1	0	0	0	2	1	0	2	0	0	2	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0
35	0	0	0	1	0	0	0	9	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	2	0	1	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	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	1
37	0	0	0	0	0	0	0	10	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	1	0	0
38	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1	1	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
40	0	0	1	0	0	0	1	5	0	0	0	0	0	0	0	0	0	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	1	0	0	0	1	6	0	0	0	1	0	0	0	4	0	3	5	4	0	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0
42	0	0	1	1	1	0	0	14	1	0	0	0	0	2	2	2	0	3	5	4	1	1	0	1	3	0	0	1	1	1	0	0	0	4	0	0
43	0	0	1	0	0	0	0	12	0	0	0	0	1	1	0	1	1	6	8	3	0	1	0	0	4	0	0	3	1	2	0	0	0	0	0	0
44	0	0	1	0	0	0	0	10	3	0	0	0	1	0	2	2	0	1	3	1	0	1	1	2	7	0	0	0	0	0	0	0	1	3	0	0
45	0	0	0	0	0	0	1	7	1	0	0	1	1	0	1	0	0	4	3	2	0	0	1	1	3	0	0	4	0	2	0	0	0	1	0	0
46	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2	2	2	0	1	0	2	1	2	0	0	3	0	0	0	0	1	1	0	0
47	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	4	0	0	0	0	1	0	1	0	0	0	0	0	0
48	0	0	1	1	0	0	0	3	3	1	0	0	0	0	1	1	1	1	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0
49	0	0	2	1	3	0	0	1	2	2	0	0	0	0	0	5	0	1	3	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
50	0	0	2	1	1	1	0	1	8	0	0	0	2	4	2	3	1	0	5	1	1	0	3	1	1	0	0	1	0	1	0	0	0	0	0	0
51	0	0	0	0	4	1	1	6	4	2	0	0	1	6	1	3	0	1	4	3	5	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0
52	0	0	2	2	3	1	0	5	3	1	1	0	2	3	0	6	2	0	3	3	1	1	4	1	0	3	0	2	1	2	0	0	1	0	1	0
53	0	0	2	1	3	0	0	1	4	0	1	0	0	3	2	0	0	2	3	0	2	1	2	1	0	4	0	1	1	2	0	0	0	0	0	0
54	0	0	3	0	4	0	0	2	0	0	1	0	0	1	0	2	0	1	4	1	1	2	0	0	0	0	0	2	0	1	0	0	0	0	0	0
55	0	0	1	1	7	0	1	2	0	1	0	0	3	1	1	1	1	0	2	0	0	0	0	3	1	4	0	1	0	1	0	0	0	0	0	0
56	0	0	2	2	3	0	0	0	0	1	0	1	0	1	3	1	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	1	0	0	0
57	0	0	1	0	5	0	0	2	1	1	0	0	0	0	0	1	0	1	0	1	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0
58	0	1	0	0	3	1	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0
59	0	0	0	0	3	0	0	0	0	0	1	0	0	1	0	2	0	0	0	3	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0
60	0	0	0	0	1	1	0	0	1	0	1	0	0	2	0	1	0	0	0	0	1	0	0	0	1	1	3	1	1	0	0	1	0	0	0	0
61	0	0	3	0	1	1	0	0	1	1	3	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	1	0	0	1	0	0	3	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	1	0	0	0	0	0	1	0	0	0
63	0	0	1	0	0	0	0	0	1	1	1	0	0	0	2	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
64	0	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0
65	0	0	0	0	0	2	0	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0
66	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	0	0
67	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	4	0	0	1	1	0	0	0	0	0	0
68	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	1	0	0	1	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
70	0	0	1	0	0	0	1	2	1	1	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
71	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
72	0	0	1	0	0	1	2	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	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
74	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
75	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	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	0	0	0	0	0	0
78	0	0	3	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
79	0	0	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	1	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	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
Total	**0**	**1**	**35**	**13**	**43**	**13**	**17**	**147**	**42**	**13**	**12**	**6**	**15**	**38**	**23**	**51**	**26**	**29**	**56**	**36**	**18**	**25**	**39**	**39**	**29**	**52**	**2**	**28**	**19**	**20**	**6**	**3**	**8**	**11**	**5**	**1**

Table 5.41. Bluefish length frequencies, fall, 1 cm intervals, 1984-2019.
Bluefish lengths were recorded from every tow.

	Fall																																			
length	**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**
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	0	1	0	0	0	0	0	2	33	0	1	0	0	3	12	2	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1
8	1	5	0	2	0	0	0	14	96	1	11	1	0	13	85	40	0	15	1	0	3	1	3	1	0	1	0	0	0	0	4	0	0	0	0	4
9	1	6	0	3	3	0	3	38	228	4	71	0	0	135	344	252	2	25	8	8	15	76	8	30	0	28	0	0	1	0	2	2	1	0	0	14
10	0	4	7	16	39	3	21	115	184	27	183	6	4	941	647	720	14	89	56	33	342	308	76	86	2	93	0	4	0	2	42	13	16	12	4	43
11	38	13	13	79	76	76	53	200	290	56	1266	156	3	2006	1127	484	50	213	96	70	730	421	239	41	19	317	0	2	10	12	167	110	93	75	9	59
12	350	52	20	108	270	249	57	280	269	171	2842	397	10	2905	2008	338	42	136	149	77	748	451	349	157	120	442	0	15	36	22	363	170	268	191	27	122
13	958	96	45	322	332	494	49	260	123	432	2880	428	54	1258	1558	316	168	122	250	33	420	499	64	379	301	324	0	40	90	71	495	229	334	323	56	226
14	1483	556	138	500	183	596	99	202	96	283	2023	154	93	518	834	337	284	122	216	12	299	273	131	231	483	136	0	132	157	250	576	373	182	273	24	235
15	1076	1232	376	482	151	903	409	241	401	149	1763	61	510	351	433	300	126	336	126	32	129	117	110	134	225	120	0	196	501	486	305	484	121	214	17	213
16	1028	1284	533	399	307	1187	540	405	566	146	1033	145	1399	469	160	503	155	679	70	200	113	231	172	328	45	475	0	476	871	363	181	439	111	62	26	183
17	770	783	399	147	472	1155	643	681	495	552	829	497	1924	536	127	361	216	568	36	460	161	389	229	821	22	630	0	603	761	204	404	217	106	156	23	153
18	246	351	258	92	458	1380	729	589	498	1177	512	902	1227	407	97	190	476	363	33	697	241	668	181	1664	49	350	0	491	523	126	638	155	116	297	14	173
19	180	204	128	26	322	1057	493	574	340	1268	529	995	618	363	114	244	724	307	116	790	315	859	106	1733	40	116	0	278	272	53	466	138	198	323	48	179
20	182	64	125	6	360	499	280	383	208	854	482	602	329	188	117	446	1270	228	247	681	348	751	79	1379	49	63	0	168	185	37	330	46	229	226	49	152
21	64	32	44	13	172	404	227	245	56	320	321	333	158	144	82	467	976	164	370	330	328	437	29	772	20	20	0	72	127	14	156	50	172	108	82	89
22	38	12	48	7	171	149	102	270	25	119	336	148	17	98	115	490	491	90	407	97	293	268	43	518	7	7	0	34	75	9	115	51	159	46	101	64
23	30	9	38	2	22	49	48	128	3	95	133	54	15	56	100	606	350	71	316	7	257	161	21	335	1	4	0	18	36	6	43	68	103	27	48	32
24	19	15	9	3	12	11	49	119	1	33	184	7	3	16	181	515	230	49	236	2	214	119	22	151	2	1	0	18	30	1	25	27	76	12	34	9
25	0	9	6	2	6	7	14	92	0	33	81	7	4	9	189	517	107	27	120	0	126	59	6	69	0	1	0	3	18	0	17	18	24	8	19	4
26	0	5	0	0	1	0	5	27	0	8	54	1	0	3	108	311	9	14	29	0	42	25	6	16	1	0	0	1	5	0	9	6	26	4	5	3
27	2	0	0	0	0	5	4	5	0	2	8	2	0	0	59	165	0	4	21	0	11	7	8	2	0	0	0	0	2	0	0	1	1	2	7	1
28	0	0	0	0	0	0	0	1	0	0	1	0	0	0	4	44	0	5	1	0	8	0	2	1	0	0	0	1	2	0	0	0	1	0	2	0
29	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	10	0	0	0	0	2	0	0	3	2	0	0	1	1	0	1	0	1	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	0	0	1	1	2	0	2	1
31	0	0	0	1	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	3	0	0	1
32	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	2	0	0	0	0	0	2	0	1	0	3	0	2	3
33	0	0	0	2	0	0	4	0	0	0	0	2	0	0	1	0	0	0	2	0	10	0	2	1	0	1	0	0	2	0	4	0	4	0	6	5
34	0	0	0	1	0	0	8	0	1	0	0	5	0	0	1	0	0	0	7	0	39	0	3	0	0	0	0	1	3	0	5	0	3	0	8	6
35	0	0	0	3	1	0	9	0	2	0	0	17	0	1	0	0	0	0	6	1	41	0	1	3	0	1	0	0	1	0	4	0	10	2	11	16
36	1	2	0	3	1	1	11	1	2	0	6	31	0	1	1	0	0	3	12	2	58	0	12	0	2	9	0	2	2	1	3	0	3	0	15	10
37	3	6	1	13	1	0	29	0	19	0	4	61	0	1	1	1	2	12	15	4	129	0	15	5	3	26	0	3	3	0	17	0	10	5	19	10
38	11	16	5	18	1	1	70	6	44	0	7	81	2	18	8	2	13	21	24	7	197	0	32	11	17	59	0	5	11	2	12	1	19	2	22	4
39	14	50	30	38	5	9	75	12	74	4	23	111	0	34	20	5	18	31	44	13	231	0	18	34	25	52	0	13	7	1	7	1	23	1	10	5
40	40	72	57	48	12	22	127	38	85	7	57	80	11	60	31	3	46	55	82	9	159	8	17	43	24	55	0	13	11	1	2	2	42	2	2	2
41	24	61	62	36	12	50	118	92	84	12	58	45	7	49	15	12	83	35	70	6	53	7	8	35	11	29	0	10	9	2	0	5	27	2	0	1
42	18	39	81	25	16	51	101	110	55	16	75	25	12	37	15	5	50	18	57	6	22	22	9	37	6	25	0	19	4	3	2	4	14	0	0	1
43	14	24	20	16	15	50	55	118	22	26	50	12	10	15	13	6	23	13	29	7	11	21	2	31	7	10	0	16	6	1	4	3	2	1	0	0
44	5	8	12	13	22	24	20	82	17	36	20	7	10	12	12	0	11	6	8	3	7	31	0	24	5	8	0	8	3	2	2	1	0	0	0	0
45	1	6	8	8	10	10	5	55	18	44	12	3	13	8	18	1	5	9	2	3	8	26	2	16	5	2	0	6	4	4	0	1	2	0	0	1
46	8	3	27	5	9	13	8	35	21	38	3	6	18	2	16	2	2	11	2	8	12	21	0	12	6	0	0	7	3	2	0	1	2	0	0	2
47	5	8	36	4	16	6	17	34	51	37	4	13	43	4	13	5	7	4	6	6	16	17	1	13	5	3	0	1	4	5	0	1	5	1	1	1
48	3	28	24	5	11	10	5	44	72	35	1	8	45	16	15	5	5	8	8	10	21	14	3	15	9	3	0	4	1	9	3	0	1	1	0	2
49	18	27	28	6	8	11	12	44	107	46	8	12	29	11	18	4	9	17	6	9	26	20	3	16	11	7	0	10	2	22	0	0	3	1	0	6
50	13	27	25	9	11	9	17	43	112	26	5	12	26	6	10	0	15	17	6	9	33	31	3	12	15	10	0	3	3	13	0	1	8	1	1	4
51	12	31	18	5	5	10	19	30	98	24	8	9	12	10	14	7	17	9	7	9	26	26	1	14	14	11	0	9	4	6	1	2	11	0	0	1
52	16	27	14	2	9	18	10	11	101	22	17	18	10	4	5	4	26	8	13	4	10	13	7	11	14	5	0	5	5	6	0	0	12	2	0	0
53	15	17	7	12	9	14	6	10	61	4	25	7	7	6	3	6	14	4	6	3	12	9	5	11	14	4	0	1	3	7	0	0	19	0	0	0
54	11	16	7	16	2	12	1	5	54	10	36	5	8	4	6	3	8	3	5	0	13	4	5	10	8	2	0	3	2	2	2	2	29	0	0	0
55	9	9	2	9	6	9	4	0	36	1	20	1	2	1	3	1	8	2	7	6	18	4	2	1	4	2	0	2	3	5	0	1	32	0	0	0
56	8	7	2	15	1	9	1	0	28	12	17	3	5	1	1	3	1	3	3	7	14	3	2	1	3	2	0	1	3	5	0	0	17	0	0	0
57	5	2	2	15	0	3	0	3	26	21	15	0	5	7	1	7	2	1	9	1	34	11	5	4	0	6	0	0	0	3	0	1	11	0	0	0
58	2	2	7	6	6	5	3	5	16	33	4	0	4	8	3	3	6	3	2	1	25	5	3	3	4	3	0	1	0	3	2	1	6	0	1	1
59	2	3	8	5	6	2	0	1	13	35	7	1	4	2	3	9	0	5	7	3	14	10	2	10	1	5	0	2	3	0	8	1	9	0	1	0
60	5	8	3	6	4	1	2	5	4	67	9	4	4	4	3	2	6	5	2	3	11	5	3	22	4	7	0	1	0	3	5	0	7	0	2	1
61	1	12	2	3	4	3	3	1	6	41	11	0	4	6	2	1	5	5	1	2	7	7	3	10	7	7	0	2	1	6	1	0	9	0	0	0
62	2	3	3	3	5	2	2	3	7	34	8	4	2	1	5	2	1	3	2	1	11	13	0	18	4	5	0	0	1	3	1	0	6	3	0	0
63	0	10	8	2	10	2	7	3	4	20	12	1	0	4	5	1	5	0	4	2	10	14	2	6	6	3	0	3	4	4	2	0	17	2	0	0
64	0	6	10	3	4	1	7	1	4	27	12	3	1	0	3	2	8	0	1	1	12	4	1	13	0	1	0	0	0	3	4	0	17	3	0	0
65	0	6	1	3	8	1	6	0	8	3	27	3	0	2	4	1	3	2	4	0	10	10	2	10	5	7	0	0	0	3	0	1	14	0	0	0
66	0	5	7	2	7	2	9	0	1	8	28	3	1	1	4	0	4	1	5	0	6	6	1	8	5	6	0	0	0	1	4	0	10	0	0	0
67	0	6	4	1	7	2	3	1	2	8	21	2	2	3	1	3	3	4	1	1	3	5	0	5	9	12	0	2	2	4	2	2	6	0	0	0
68	1	6	5	5	13	6	4	4	0	1	30	3	0	0	1	3	3	2	3	1	5	7	0	5	6	11	0	2	2	1	4	4	2	1	0	0
69	0	1	3	5	4	4	8	5	4	1	5	1	2	1	1	3	0	3	4	0	7	3	0	6	4	11	0	1	1	2	0	3	2	1	0	0
70	0	1	9	3	4	13	5	4	6	0	10	2	0	0	1	4	3	0	5	2	5	1	0	0	8	11	0	2	0	3	3	0	2	1	0	0
71	1	0	4	1	3	6	10	1	5	1	7	3	3	1	0	3	5	1	2	0	1	0	0	1	3	15	0	4	0	3	1	3	0	1	0	0
72	1	1	2	3	4	3	9	3	6	5	4	2	0	2	1	0	1	1	3	1	4	1	0	3	2	11	0	6	1	4	1	1	3	0	0	0
73	0	1	1	5	3	4	7	2	9	6	3	2	1	3	0	0	1	1	1	0	2	2	0	2	1	9	0	2	4	1	1	2	1	0	0	0
74	0	0	2	1	0	3	5	3	10	2	3	3	5	2	2	1	1	0	1	0	1	2	0	1	1	4	0	3	1	2	0	4	0	0	0	0
75	2	1	3	2	9	2	8	5	7	6	2	1	2	1	2	4	0	1	0	1	0	2	0	0	0	8	0	2	2	1	1	1	6	0	0	1
76	0	2	1	1	2	3	7	6	3	3	5	2	3	2	0	1	0	0	2	0	2	1	0	0	1	2	0	2	0	1	2	2	1	0	0	0
77	0	1	0	0	1	1	3	0	3	1	3	1	5	4	1	0	0	0	1	0	1	0	0	0	0	2	0	1	2	3	0	0	3	0	0	0
78	0	2	2	1	0	2	1	1	2	3	2	1	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	2	0	0	1	0	4	2	0	0
79	0	0	0	0	1	1	0	1	2	3	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	4	0	0	0
80	0	1	0	0	0	0	2	0	1	0	3	0	2	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0
82	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
83	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	1	0	0	0
Total	**6,738**	**5,300**	**2,740**	**2,598**	**3,645**	**8,636**	**4,671**	**5,699**	**5,225**	**6,459**	**16,232**	**5,514**	**6,688**	**10,776**	**8,789**	**7,788**	**6,112**	**3,957**	**3,395**	**3,681**	**6,489**	**6,506**	**2,064**	**9,336**	**1,667**	**3,604**	**0**	**2,735**	**3,829**	**1,809**	**4,452**	**2,650**	**2,785**	**2,395**	**698**	**2,046**

Table 5.42. Butterfish length frequencies, 1 cm intervals, spring and fall, 1986-1990, 1992–2019.

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.

Spring

length	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
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
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
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
6	0	0	0	0	0	0	0	35	0	21	3	0	0	0	207	0	7	20	0	2	0	1	276	1	35	6	109	35	65	9	110	13	0
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
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
9	0	0	0	0	0	0	0	0	4	0	57	5	4	0	15	0	4	47	0	61	12	1	197	198	7	279	4	40	1	26	7	33	11
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
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
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
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
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
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
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
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
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
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
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
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
22	4	0	0	0	7	0	1	0	0	0	0	5	3	0	1	4	4	1	0	0	0	0	0	0	0	0	0	0	6	0	1	1	4
23	0	0	0	0	1	2	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	1	0	0	0	0	0	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
26	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
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
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**

Fall

length	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
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
3	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	2	0	0	0	0	0	-	24	0	0	0	0	0	0	0	1
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
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
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
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
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
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
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
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
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
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
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
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
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
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
18	48	59	115	102	83	347	54	110	429	59	407	168	80	198	310	266	8	89	177	77	145	243	117	-	84	749	821	550	74	167	797	448	207
19	30	10	19	27	91	16	19	2	68	34	211	263	62	106	199	206	0	29	44	39	110	11	63	-	24	105	175	188	62	75	651	316	156
20	4	8	2	26	8	8	3	0	0	11	20	14	7	4	155	94	13	16	11	3	1	68	15	-	1	66	30	62	16	3	220	160	68
21	18	2	0	0	0	1	8	1	0	0	10	62	6	1	31	15	1	1	4	0	0	1	0	-	1	0	0	3	10	0	5	25	39
22	0	0	0	2	0	0	8	0	0	0	0	0	0	0	0	14	1	1	1	0	0	0	0	-	0	0	0	0	4	0	6	0	8
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	1
24	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
25	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
26	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	0	0	0	0	0	0
Total	**4,244**	**14,108**	**25,796**	**13,082**	**13,946**	**69,300**	**32,464**	**44,599**	**38,034**	**32,826**	**40,750**	**83,503**	**126,680**	**47,245**	**29,196**	**46,433**	**17,312**	**61,962**	**65,980**	**27,775**	**32,293**	**28,951**	**79,627**	-	**20,751**	**32,752**	**19,111**	**66,021**	**48,478**	**47,054**	**32,322**	**38,724**	**42,090**

Table 5.43. Clearnose skate length frequencies, spring, 1 cm intervals, 1993-2019.

	Spring																										
length	**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**
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
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	1
47	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1
48	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
49	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	1
50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1
51	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
52	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	4	2	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	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	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
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	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
60	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	8	0	1	0	2	1	0	0
61	0	0	1	0	0	0	1	0	0	2	0	0	0	0	1	0	0	0	0	7	0	2	2	5	1	1	2
62	0	0	0	0	0	0	2	0	0	1	0	0	0	2	0	2	2	0	0	5	1	1	2	4	2	1	1
63	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	1	0	0	1	3	1	1	1	3	1	2	3
64	0	0	0	0	0	0	0	1	0	3	0	1	0	0	1	0	1	0	1	9	0	3	2	3	0	1	0
65	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	2	1	0	1	4	0	2	1	2	0	2	5
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
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
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
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
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
71	0	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
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
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
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
75	0	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
76	0	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Total	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**3**	**6**	**31**	**8**	**5**	**2**	**9**	**22**	**12**	**21**	**1**	**13**	**95**	**24**	**42**	**35**	**64**	**19**	**23**	**69**

Table 5.44. Clearnose skate length frequencies, fall, 1 cm intervals, 1993-2019.

	Fall																										
length	**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**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	1
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
43	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
45	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
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
47	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	3	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
50	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
51	0	0	0	0	0	1	0	0	0	0	1	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	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0
53	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
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
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
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
57	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	1	0	1	4	1	0	4	0	0	0	1
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
82	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	1	0	0	0
83	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	0	0	2	1	0	1	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
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
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
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
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
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
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
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
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
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
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
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
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
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
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
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
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**

Table 5.45. Fourspot flounder length frequencies, spring and fall, 2 cm intervals (midpoint given), 1989, 1990, 1996-2019.
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.

Spring

length	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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**

Fall

length	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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**

Table 5.46. Hickory shad length frequencies, spring and fall, 1 cm intervals, 1991-2019.
Hickory shad were measured from every tow, with the exception of one fish in each of fall 1996, fall 1997, and fall 1998.

Spring

length	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
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
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
17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	0	0	0	0	0	1	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
19	0	0	0	1	0	0	1	0	0	0	0	0	0	3	5	6	0	1	1	0	0	0	0	0	0	0	0	0	3
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
21	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	1	1	0	0	1	0	1	0	1	0	1	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
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
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
25	0	0	0	0	0	0	0	2	0	0	0	0	0	1	1	6	5	0	0	0	0	0	1	1	0	0	0	0	0
26	0	0	0	0	0	0	0	1	0	0	0	2	0	0	6	5	2	0	0	0	0	2	0	3	0	0	1	0	0
27	0	0	0	0	0	0	1	0	1	0	0	1	0	0	18	3	5	0	1	0	0	3	0	2	0	0	0	1	0
28	0	0	0	1	0	1	1	1	2	2	0	4	1	0	14	3	3	0	1	1	0	1	3	4	1	1	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	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
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
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
33	0	0	0	0	0	2	1	2	3	1	0	3	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	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
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
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
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
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
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
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
41	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	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
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
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
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
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
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**

Fall

length	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
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
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
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
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
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
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
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
26	0	1	2	8	0	3	1	0	5	0	0	0	0	4	3	0	0	0	0	-	3	1	0	0	0	0	0	0	0
27	0	0	0	3	0	2	0	0	5	2	0	1	0	3	0	1	0	0	0	-	0	0	0	0	0	0	0	0	0
28	0	1	0	1	0	3	0	0	2	0	0	1	0	1	1	1	0	0	2	-	0	1	3	0	0	0	0	0	0
29	0	0	0	2	0	0	0	0	0	2	0	0	0	1	2	3	0	0	0	-	0	4	7	0	1	1	1	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
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
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
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
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
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
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
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
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
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
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
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
Total	**0**	**10**	**7**	**27**	**4**	**16**	**15**	**5**	**32**	**16**	**4**	**5**	**6**	**18**	**60**	**22**	**10**	**2**	**7**	**0**	**7**	**29**	**27**	**6**	**3**	**2**	**2**	**4**	**4**

Table 5.47. Horseshoe crab length frequencies by sex, spring, 1 cm intervals, 1998-2019.
Horseshoe crabs were measured (prosomal width) from every tow.

			Spring																				
Sex	**length**	**1998***	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
F	**13**		1	0	0	0	0	0	0	0	0	0	0	0	0	1	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
F	**15**	No sex recorded in the spring of 1998	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
F	**16**		1	0	0	3	2	1	1	0	0	1	0	0	0	1	0	2	0	0	0	0	1
F	**17**		1	0	2	2	1	4	1	0	1	1	0	0	0	1	0	0	1	0	0	0	2
F	**18**		2	1	0	3	2	4	0	0	2	1	1	0	0	0	2	3	1	0	0	0	1
F	**19**		4	1	2	2	5	5	0	0	3	4	1	0	0	2	0	5	1	2	0	3	3
F	**20**		5	2	0	7	1	2	3	0	3	2	0	0	1	2	0	4	0	0	0	0	4
F	**21**		8	2	1	8	6	2	1	0	3	8	1	0	3	5	4	5	3	4	0	3	4
F	**22**		8	6	4	13	10	7	2	0	10	4	6	0	3	3	2	3	3	2	0	0	8
F	**23**		14	15	18	19	22	17	3	2	9	14	4	3	4	9	7	14	7	4	4	8	4
F	**24**		15	7	15	32	29	25	5	4	15	11	12	6	3	15	19	13	3	5	3	8	9
F	**25**		15	10	23	25	22	20	8	5	11	16	10	9	9	14	19	11	11	14	4	13	12
F	**26**		23	13	28	26	22	23	3	2	16	12	10	4	16	14	17	26	9	4	0	9	11
F	**27**		15	9	18	18	18	18	8	4	10	9	9	5	18	11	8	22	10	6	2	11	13
F	**28**		8	6	9	6	7	4	2	2	5	4	10	3	8	10	13	9	3	2	1	8	7
F	**29**		3	0	3	4	4	4	0	3	5	1	3	4	1	3	2	3	1	0	1	4	2
F	**30**		1	0	3	2	0	0	3	2	0	2	1	1	4	0	1	1	1	0	0	0	0
F	**31**		0	0	0	0	4	0	0	0	0	1	1	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
M	**14**		0	0	0	0	0	0	0	0	1	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
M	**16**		0	0	0	2	5	2	0	1	2	0	0	2	0	0	0	0	0	0	0	1	0
M	**17**		5	2	4	7	9	9	0	0	3	2	3	0	1	5	0	1	1	1	0	2	2
M	**18**		11	8	12	19	24	21	2	0	17	10	3	2	5	7	6	9	4	3	1	4	5
M	**19**		22	13	32	42	25	33	3	0	19	12	10	7	7	8	16	17	7	5	1	3	13
M	**20**		15	16	30	20	33	31	7	0	21	10	11	7	15	13	10	13	12	2	0	12	14
M	**21**		18	5	13	14	16	10	1	0	6	12	5	3	3	9	6	6	7	1	0	8	6
M	**22**		4	5	7	6	7	6	2	0	4	2	1	1	4	5	3	1	0	0	0	2	2
M	**23**		1	0	3	1	4	2	1	0	0	1	1	0	0	0	2	1	0	0	0	2	1
M	**24**		2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
M	**25**		0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3	1	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
M	**27**		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
M	**29**		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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
U	**22**		1	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**

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

Table 5.48. Horseshoe crab length frequencies by sex, fall, 1 cm intervals, 1998-2019.
Horseshoe crabs were measured (prosomal width) from every tow.

		Fall																				
Sex	**length**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
F	**13**	0	0	2	0	0	0	3	0	1	0	0	0	-	0	0	0	0	0	2	0	0	0
F	**14**	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
F	**15**	0	0	0	0	2	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	1	0
F	**17**	1	1	0	0	2	1	0	1	1	0	1	0	-	0	0	0	0	1	0	0	0	0
F	**18**	0	2	0	1	0	1	1	1	0	0	0	0	-	0	0	0	0	1	1	1	0	1
F	**19**	3	2	2	2	0	1	0	0	1	0	1	1	-	0	0	0	2	1	0	0	2	0
F	**20**	5	1	1	4	4	2	3	0	2	0	0	2	-	0	0	0	0	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
F	**22**	3	8	13	13	10	3	9	4	1	2	6	6	-	6	0	2	2	0	1	1	1	4
F	**23**	8	15	15	12	8	8	13	10	7	7	6	14	-	6	2	3	4	6	9	6	5	5
F	**24**	7	19	30	27	21	9	24	10	6	17	14	22	-	18	10	12	8	10	14	4	13	4
F	**25**	17	12	20	31	33	13	19	6	12	26	17	17	-	19	9	11	11	7	17	13	23	8
F	**26**	19	23	33	31	18	9	29	12	10	22	15	24	-	25	16	27	10	9	12	12	26	20
F	**27**	14	7	21	22	18	7	22	8	3	17	11	28	-	16	5	15	10	3	9	12	19	7
F	**28**	2	4	10	8	13	6	15	5	4	8	11	22	-	11	3	10	6	5	6	9	13	6
F	**29**	2	3	2	5	2	3	8	2	0	4	1	5	-	2	4	2	3	1	2	2	2	1
F	**30**	0	1	1	2	0	2	1	2	0	2	0	2	-	0	1	2	0	0	1	2	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
F	**32**	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
F	**34**	0	0	0	0	0	1	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
M	**12**	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
M	**14**	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
M	**16**	0	0	2	1	5	3	0	0	0	1	1	0	-	1	0	0	0	0	0	0	0	0
M	**17**	6	5	7	6	3	5	11	0	1	3	1	2	-	3	0	1	1	1	1	1	3	3
M	**18**	12	14	28	18	14	15	21	3	9	3	9	18	-	13	4	2	5	1	7	2	2	5
M	**19**	10	20	39	27	31	11	39	13	4	12	21	14	-	9	4	6	13	3	5	6	8	8
M	**20**	20	23	35	32	22	8	30	12	9	19	23	31	-	10	1	17	4	9	7	8	18	10
M	**21**	6	11	18	15	9	4	15	4	2	10	6	13	-	7	1	7	6	4	8	8	10	2
M	**22**	5	3	8	4	6	0	10	2	5	6	2	5	-	6	0	5	0	1	3	4	6	1
M	**23**	0	0	3	2	6	1	1	0	2	3	1	3	-	0	1	2	0	0	1	1	0	1
M	**24**	0	0	1	3	0	0	1	0	1	2	0	2	-	0	0	0	0	0	0	1	0	1
M	**25**	0	0	2	0	0	0	0	0	0	0	0	1	-	0	0	1	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
M	**27**	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	1	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
Total		**145**	**177**	**295**	**274**	**229**	**117**	**281**	**101**	**83**	**165**	**148**	**234**	-	**152**	**61**	**125**	**87**	**66**	**109**	**94**	**155**	**90**

Table 5.49. Long-finned squid length frequencies, spring, 1 cm intervals, 1986-1990, 1992-2019.

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.

	Spring																																		
length	**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**
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	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
31	3	78	14	11	5	4	8	1	3	0	0	0	1	1	1	0	0	3	2	2	1	0	1	0	0	0	0	1	0	1	0	0	0
32	0	61	7	6	9	1	7	0	0	1	0	0	0	0	1	3	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0
33	0	25	7	7	6	9	0	1	5	0	5	0	1	1	0	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	9	2	2	1	8	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0
35	1	38	0	0	2	0	0	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	38	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	2	0	0	5	2	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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**

Table 5.50. Long-finned squid length frequencies, fall, 1 cm intervals, 1986-1990, 1992-2019.

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.

	Fall																																		
length	**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**
0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
1	0	13	0	12	0	0	0	0	0	0	0	0	0	0	0	4	0	0	3	12	0	0	14	-	0	0	11	0	2	60	68	30	75
2	0	31	0	1	0	49	0	9	25	24	6	20	29	2	0	11	0	1	10	74	9	33	90	-	12	10	67	6	30	95	175	83	135
3	0	126	59	112	74	266	914	80	156	57	125	115	104	53	36	80	90	170	91	107	20	87	343	-	80	101	51	25	85	91	108	293	262
4	0	320	212	468	278	1,507	2,336	477	460	598	491	642	362	384	230	261	886	693	763	249	420	294	939	-	618	469	127	517	208	322	279	1222	937
5	0	892	826	743	830	2,906	3,502	1,332	1,223	1,371	1,091	1,888	1,214	1,215	663	695	2,225	1,757	1,539	587	1,367	417	2,332	-	1,417	705	273	1,443	634	1,066	838	2328	1908
6	3	1,019	1,165	677	836	5,015	4,358	1,803	1,896	1,869	1,278	2,737	1,782	1,842	923	1,067	3,185	2,705	2,337	913	2,780	604	2,894	-	1,405	731	426	1,814	1,818	1,475	1650	2342	1867
7	13	817	722	446	469	5,210	4,331	2,152	2,254	2,751	1,169	3,412	2,390	2,204	996	1,193	2,566	2,759	2,552	917	3,822	780	2,746	-	1,315	698	550	1,560	2,753	1,566	1854	1701	1630
8	135	654	333	283	220	3,110	3,811	2,225	2,080	2,224	935	2,939	1,808	1,797	839	929	1,885	1,787	2,006	611	3,549	908	1,791	-	840	638	570	1,394	3,618	1,633	1805	1041	1270
9	16	692	146	108	129	1,594	2,913	2,486	2,124	1,853	570	1,993	1,829	1,081	616	488	1,785	907	1,283	385	2,119	777	1,131	-	670	584	418	1,366	3,465	1,327	1465	712	867
10	13	503	65	58	42	894	1,772	2,055	1,540	1,264	446	1,216	1,332	695	528	354	861	626	970	204	1,974	480	808	-	637	399	306	1,198	3,348	1,015	1234	536	507
11	0	310	62	70	39	737	1,178	1,607	905	698	291	675	780	556	264	214	215	392	541	183	1,379	332	326	-	343	359	178	862	3,227	611	1092	424	270
12	0	165	21	38	24	284	737	843	387	579	153	368	423	380	154	145	58	144	307	85	728	193	222	-	211	232	123	574	2,233	545	780	313	139
13	0	82	24	34	17	242	408	415	159	297	126	328	277	247	132	87	2	96	194	31	447	103	108	-	139	148	62	315	1,698	240	548	209	99
14	0	77	9	17	6	40	278	329	110	160	44	199	235	204	68	53	1	103	64	26	253	47	41	-	40	97	53	253	1,340	132	427	194	95
15	0	31	11	17	3	18	185	181	77	83	31	103	133	128	66	13	2	48	44	9	150	18	27	-	86	64	14	213	767	88	279	105	46
16	0	4	11	13	2	0	53	99	33	46	15	90	111	73	32	10	0	43	30	8	159	7	14	-	18	35	2	106	489	42	257	79	54
17	0	14	0	10	4	0	73	75	15	16	13	23	120	101	8	6	0	1	24	17	103	5	2	-	7	8	6	50	266	64	216	72	38
18	0	1	23	6	1	0	20	31	2	6	10	16	82	34	3	0	0	8	2	11	74	0	1	-	25	12	4	53	282	14	119	35	14
19	0	1	0	0	0	0	3	12	0	1	0	1	34	9	2	4	0	1	1	11	2	0	0	-	0	7	0	37	93	7	69	17	24
20	0	13	0	5	1	0	2	7	0	0	1	1	22	3	2	1	0	4	2	1	3	0	0	-	0	1	0	21	156	9	60	12	3
21	0	15	0	4	0	0	0	3	0	0	0	0	22	9	1	0	0	0	0	0	1	0	0	-	0	5	2	6	42	0	26	1	0
22	0	2	0	3	1	0	0	11	0	6	0	1	17	0	0	0	0	0	1	0	0	0	0	-	0	2	1	0	4	0	14	7	7
23	0	0	0	3	0	0	2	1	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	-	1	0	0	0	28	0	4	1	2
24	0	1	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	-	0	0	0	0	1	0	3	0	0
25	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	4	0	0	2	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	1	0	0	1	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	1	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	1	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
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	2	0
Total	**180**	**5,783**	**3,689**	**3,136**	**2,976**	**21,872**	**26,877**	**16,233**	**13,446**	**13,903**	**6,795**	**16,767**	**13,111**	**11,018**	**5,563**	**5,615**	**13,761**	**12,245**	**12,765**	**4,441**	**19,364**	**5,085**	**13,829**	-	**7,864**	**5,306**	**3,244**	**11,813**	**26,594**	**10,402**	**13,370**	**11,762**	**10,249**

Table 5.51. Scup length frequencies, spring, 1 cm intervals, 1984-2019.
Lengths were recorded from every tow.

	Spring																																		
length	**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**
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	13	0	0	0	0	0	0	0	72	8	0	3
8	0	0	0	6	3	84	0	12	0	0	0	11	0	0	10	24	61	0	16	0	0	4	56	4	145	3	0	0	35	0	15	32	2,674	27	15	102
9	4	30	50	33	46	1,049	11	80	9	0	11	408	152	10	163	128	976	98	400	0	0	77	322	145	606	148	0	19	435	60	77	435	15,025	475	340	373
10	8	138	377	46	160	2,523	270	514	49	3	48	1,202	537	145	1,381	355	5,293	405	2,303	4	1	169	1,151	926	1,700	1,966	14	115	3,169	338	455	2,585	27,025	1,615	1,191	729
11	10	362	724	38	144	2,075	493	1,365	67	4	92	1,437	1,055	311	1,617	313	10,571	645	3,389	19	1	136	1,259	1,033	2,055	3,476	22	203	3,888	460	1,007	3,918	23,949	1,143	796	553
12	5	194	427	9	31	312	280	576	57	3	67	809	826	151	712	131	8,815	586	1,706	33	1	62	1,263	486	950	3,418	7	178	2,589	300	1,402	2,111	12,415	644	241	185
13	2	51	122	4	9	87	56	122	18	4	23	108	397	36	359	51	4,041	265	722	25	2	19	888	78	586	1,141	1	77	1,241	93	623	785	6,004	622	60	78
14	0	7	64	2	0	72	22	0	11	5	2	20	29	25	154	16	1,043	104	498	7	1	8	626	76	357	561	3	16	262	74	123	86	2,758	2,738	314	36
15	2	4	4	11	4	137	40	3	3	77	7	3	3	11	66	1	201	220	247	7	42	56	251	298	426	593	40	19	62	98	108	60	556	8,588	1,836	141
16	9	47	26	65	19	121	202	8	4	217	48	6	61	49	24	13	48	1,349	1,035	121	327	129	722	1,177	1,971	1,430	222	100	52	504	226	229	3,003	7,944	3,322	751
17	37	91	91	119	40	105	310	63	49	339	142	11	264	123	57	75	229	4,517	2,943	415	485	129	1,670	1,607	3,916	2,151	614	215	206	1,343	669	784	9,775	3,796	5,607	1,098
18	22	204	208	174	34	95	231	182	135	286	194	28	545	216	89	161	1,034	8,611	4,097	733	403	140	2,254	1,444	3,722	1,953	780	312	642	2,764	755	1,319	10,201	1,916	10,492	995
19	28	130	182	100	16	50	121	347	258	159	203	30	390	136	66	172	1,451	6,452	3,619	720	261	114	1,607	918	1,978	1,078	527	270	1,123	3,058	520	1,196	5,162	1,282	9,542	2,155
20	11	71	131	33	25	33	30	256	136	35	99	22	153	81	21	130	1,106	1,840	3,679	390	381	29	934	390	1,315	798	424	257	909	1,402	718	593	1,389	3,012	5,012	5,114
21	3	15	36	15	44	13	26	223	65	27	95	19	34	62	11	78	513	518	6,253	427	584	42	559	266	2,149	1,320	599	655	377	271	1,539	371	618	3,939	3,119	6,183
22	7	7	6	4	49	7	18	292	11	17	56	17	10	96	8	29	173	292	8,129	660	1,077	111	416	458	2,835	1,941	723	1,260	200	296	2,305	510	1,214	3,105	3,055	4,696
23	6	22	103	3	33	12	12	225	10	25	44	19	1	86	17	25	240	755	5,618	931	982	174	427	603	2,340	1,522	641	1,387	313	665	1,674	699	1,311	1,618	2,679	3,222
24	4	38	124	5	14	9	6	103	21	14	23	24	8	46	18	26	282	833	2,385	977	745	161	361	558	1,351	1,149	580	1,123	568	738	711	802	1,012	917	1,699	2,229
25	3	28	77	2	4	5	7	33	15	8	10	15	2	20	12	13	199	278	1,292	1,025	844	216	234	272	854	909	573	930	816	591	326	896	1,010	612	1,030	1,696
26	0	11	73	2	3	3	3	15	10	1	8	5	1	5	10	10	154	132	1,266	741	1,215	332	262	128	642	793	523	658	1,000	312	379	847	1,220	564	664	1,144
27	2	3	35	3	1	4	1	5	4	4	6	8	2	3	7	7	50	93	491	363	1,200	353	283	91	382	504	350	651	931	461	338	426	1,367	590	431	720
28	0	12	4	5	4	3	3	1	6	2	2	0	1	3	3	2	13	88	282	201	730	379	427	109	230	267	243	637	721	689	316	243	1,206	722	439	541
29	1	14	6	3	2	0	0	2	2	0	0	0	1	0	1	6	19	36	147	81	331	332	622	115	198	234	153	468	565	753	346	155	741	530	472	407
30	0	11	3	1	0	1	0	2	1	1	1	1	1	3	0	0	8	8	71	33	116	171	618	156	64	90	41	321	467	627	299	158	435	390	278	308
31	0	1	0	1	2	0	0	1	0	0	1	0	1	4	0	1	6	3	35	23	37	101	441	167	54	42	34	235	307	496	227	118	324	195	200	207
32	0	2	1	0	1	1	1	0	1	0	0	1	0	0	0	3	3	2	10	11	28	41	317	126	68	32	15	123	174	310	174	148	262	154	132	138
33	0	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4	2	11	4	11	16	266	65	57	57	14	78	105	152	100	102	166	99	72	52
34	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3	1	4	2	8	1	30	37	47	16	4	44	63	106	61	63	127	60	43	37
35	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	3	0	1	2	17	18	26	10	4	32	31	36	20	31	109	55	26	27
36	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	4	9	11	11	2	28	17	23	8	34	48	14	12	7
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	4	8	1	15	6	8	1	8	41	8	4	3
38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	5	4	10	3	10	28	8	3	4
39	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	1	0	3	2	3	0	3	3	2	0	1
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	3	0	1	3	0	0	0	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	0	1	2	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	0	0	0	1	1
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	1	0	0	0	0	0	0	0	0	0
Total	**166**	**1,497**	**2,877**	**684**	**689**	**6,801**	**2,143**	**4,430**	**942**	**1,232**	**1,183**	**4,204**	**4,474**	**1,624**	**4,806**	**1,771**	**36,537**	**28,134**	**50,654**	**7,955**	**9,817**	**3,506**	**18,292**	**11,764**	**31,052**	**27,623**	**7,155**	**10,435**	**21,283**	**17,042**	**15,528**	**19,760**	**131,250**	**47,392**	**53,127**	**33,937**

Table 5.52. Scup length frequencies, fall, 1 cm intervals, 1984-2019.
Lengths were recorded from every tow.

	Fall																																	
length	**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**
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
3	0	8	0	0	0	7	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
4	1	61	0	0	17	1	3	14	196	0	6	0	0	18	4	1	1	28	117	19	143	363	11	74	0	34	-	21	29	4	11	21	4	40	317	34
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
30	8	16	2	1	0	0	0	0	0	3	0	0	0	0	0	0	3	4	22	75	122	101	36	27	51	35	-	196	63	116	88	95	299	91	70	78
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
32	2	1	0	0	0	0	3	0	0	0	1	0	0	0	0	1	0	0	1	14	25	18	20	37	20	21	-	76	17	36	49	76	94	47	17	17
33	1	2	0	3	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
34	0	1	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
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
36	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
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
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	1	0	3	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	0	0	0	0
Total	**3,050**	**10,641**	**5,030**	**4,344**	**9,496**	**10,592**	**13,249**	**41,363**	**12,705**	**30,983**	**37,272**	**9,782**	**11,609**	**7,957**	**18,939**	**99,319**	**64,927**	**30,198**	**49,829**	**9,602**	**51,706**	**49,133**	**10,533**	**63,921**	**22,507**	**19,371**	-	**24,021**	**31,842**	**7,925**	**30,172**	**60,772**	**44,388**	**28,370**	**28,083**	**19,679**

Table 5.53. Striped bass length frequencies, spring, 2 cm intervals (midpoint given), 1984–2019.

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.

	Spring																																		
length	**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**
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
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	8	0	0	0	1	0	0	0	0	0	0	1
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
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
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	2
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
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
27	0	0	0	0	0	0	5	1	2	0	2	28	2	5	30	2	24	15	38	4	1	67	1	12	4	7	1	0	8	11	0	0	9	1	1	6
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	9
31	0	0	0	0	0	1	6	2	1	2	2	12	4	14	20	10	29	5	17	7	5	19	1	4	4	1	0	0	5	4	1	1	9	0	3	7
33	0	0	0	1	0	0	0	6	1	0	3	7	8	5	20	24	7	6	12	10	10	6	2	5	4	6	0	0	2	7	1	0	3	0	7	4
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
37	0	0	0	0	0	0	3	1	0	0	1	8	26	25	25	15	2	11	12	11	11	4	5	16	2	5	2	1	3	10	12	2	3	2	13	3
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
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
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
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
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
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
51	0	0	0	0	0	1	0	1	4	3	4	2	7	7	12	6	4	3	9	7	1	4	6	5	10	32	2	8	5	3	13	4	6	4	6	37
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
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
57	0	0	0	0	0	0	0	2	2	2	8	1	2	3	6	21	4	5	9	9	6	13	3	15	12	13	8	13	6	0	2	1	6	2	0	7
59	0	0	0	2	0	1	0	0	0	4	2	2	2	7	7	22	4	5	10	11	4	5	5	5	8	17	6	5	6	6	3	5	3	3	2	4
61	0	0	0	0	0	0	0	2	1	2	5	2	3	3	2	26	4	10	17	7	6	6	4	12	5	17	3	13	1	2	4	4	6	1	0	4
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
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
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
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
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
73	0	0	0	0	0	0	0	2	0	3	0	0	7	6	2	5	8	5	12	10	2	6	3	3	3	3	2	7	1	4	0	1	0	0	3	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	2
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
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	2
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
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	0	0	0	1	0	3	0	1	0	2	3	0
85	0	0	0	0	0	0	0	2	0	0	0	0	2	1	0	0	0	1	3	2	0	1	0	0	0	0	0	1	1	0	1	0	0	1	0	0
87	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	0	0	1	0	4	2	0	2	1	1	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	1	1	0	0	3	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	0	1	0	1	0	0	0	0	2	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	1	0	0	0	0	0	1	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	1	1	0	1	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	1	0
Total	**0**	**0**	**0**	**8**	**7**	**11**	**43**	**32**	**34**	**59**	**65**	**151**	**184**	**239**	**361**	**335**	**229**	**184**	**413**	**208**	**135**	**422**	**97**	**287**	**160**	**382**	**69**	**165**	**125**	**160**	**205**	**59**	**128**	**46**	**137**	**461**

Table 5.54. Striped bass length frequencies, fall, 2 cm intervals (midpoint given), 1984–2019.
All striped bass taken in the Survey were measured on each tow.

	Fall																																		
length	**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**
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	-	1	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	-	1	1	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	-	7	2	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	-	13	1	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	-	9	1	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	4	2	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	1	0
35	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	-	3	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	-	1	4	0	0	0	0	0	0	0
39	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	2	4
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	3	0	0	12	2
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	4	0	0	0	0	0	14	1
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	1	3	0	1	0	1	21	2
47	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	11	0	0	1	1	18	1	1	10	0	2	-	0	5	6	5	6	0	4	25	9
49	0	0	0	0	0	0	0	0	0	1	0	0	9	9	2	9	1	0	0	0	14	2	4	22	1	1	-	0	6	5	3	5	0	1	17	4
51	0	0	0	0	0	0	0	0	0	4	2	0	8	4	1	9	0	0	3	0	29	2	5	18	2	4	-	2	2	2	4	16	0	2	10	13
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	-	2	2	4	7	18	1	4	11	7
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	-	3	3	2	6	26	3	1	6	7
57	0	0	0	1	1	0	0	1	1	5	0	2	3	11	5	5	5	2	7	1	11	6	3	6	3	8	-	0	0	3	8	15	4	2	2	5
59	0	0	0	0	0	0	0	0	1	0	0	0	0	7	3	0	8	0	2	0	13	6	3	5	3	8	-	0	6	1	4	14	5	0	1	2
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	-	2	1	2	4	10	10	1	3	6
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	-	3	0	5	2	1	4	1	1	1
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	-	6	0	2	1	4	4	1	0	1
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	-	3	0	0	0	5	2	3	0	0
69	0	0	0	0	1	0	0	0	0	1	1	0	2	2	0	0	4	3	4	0	6	0	3	6	2	6	-	2	0	2	1	1	2	1	0	1
71	0	0	0	0	1	0	0	0	1	0	0	1	1	1	2	0	3	3	5	0	3	3	0	0	0	1	-	1	2	0	1	1	1	0	0	1
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	-	5	1	1	0	0	0	2	1	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
77	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	4	0	4	0	1	0	0	2	3	0	-	5	1	0	1	0	0	1	1	2
79	0	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	1	1	2	1	1	0	1	0	3	1	-	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	1	1	1
83	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	-	0	0	2	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	2	1	0	1	0	3	-	1	0	0	0	1	0	1	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	-	0	0	0	0	0	0	0	0	1
89	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	-	1	0	0	1	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	-	0	0	0	0	0	0	0	0	1
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	-	0	0	0	0	0	0	0	1	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	2	-	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	5	-	0	0	0	0	0	0	0	0	1
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
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
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
105	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
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
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
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
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
Total	**1**	**0**	**1**	**1**	**10**	**0**	**0**	**6**	**8**	**22**	**16**	**15**	**48**	**80**	**37**	**62**	**64**	**28**	**56**	**8**	**243**	**47**	**47**	**131**	**39**	**83**	-	**77**	**46**	**40**	**49**	**128**	**36**	**27**	**132**	**72**

Table 5.55. Summer flounder length frequencies, spring, 1 cm intervals, 1984-2019.

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

	Spring																																			
length	**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**
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
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
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
14	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	1
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	7
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	5
17	0	0	0	5	0	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	1	9
18	0	0	0	19	0	0	1	0	0	0	0	0	1	0	0	0	2	0	0	2	1	0	0	26	0	1	3	0	0	0	0	2	0	0	0	15
19	0	0	0	17	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	11	1	2	7	0	0	0	1	3	1	0	1	11
20	0	0	5	22	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0	25	3	8	9	1	0	9	3	4	0	0	3	26
21	0	0	6	17	0	0	0	0	0	0	3	2	1	0	0	0	1	0	0	3	0	0	0	21	2	8	12	0	0	6	2	15	0	0	12	38
22	0	0	6	21	0	0	1	0	1	0	4	1	1	0	0	0	0	2	1	3	0	1	0	16	1	11	16	1	2	12	6	13	0	0	10	56
23	0	0	4	10	1	0	0	3	1	0	5	0	1	2	0	0	0	4	0	9	1	1	1	21	2	10	21	3	0	9	9	22	0	0	8	85
24	0	0	9	13	1	0	0	2	0	3	8	0	1	3	0	0	3	3	0	6	0	0	0	18	4	21	35	5	2	20	13	26	0	1	28	89
25	1	0	13	20	1	0	2	4	1	6	12	1	1	7	1	2	3	2	2	21	3	3	0	3	3	22	51	16	2	22	16	40	3	5	32	117
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
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
28	5	0	18	5	7	0	9	6	12	9	1	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
46	0	0	2	1	1	1	0	4	1	1	3	0	0	4	3	4	8	9	8	25	18	6	1	13	7	10	10	14	14	18	10	6	9	4	6	1
47	0	0	1	2	2	0	1	0	1	0	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
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
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	5	4	4
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
51	0	0	3	0	1	0	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
52	0	0	1	0	1	0	2	0	0	1	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
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
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	3	2
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
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
57	0	0	0	0	0	1	1	0	0	0	2	0	0	1	3	3	2	3	5	7	0	1	0	4	1	8	2	7	2	3	7	4	2	1	4	2
58	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	6	5	1	2	6	4	3	0	4	4	8	1	6	3	5	1	2	4	3	6	3
59	0	0	0	0	0	1	0	0	0	1	0	0	1	2	2	2	3	1	4	7	4	1	1	1	1	9	2	1	5	4	2	5	1	2	1	1
60	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2	0	1	4	1	2	2	0	1	2	4	2	3	0	2	2	0	1	1	0
61	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	4	3	2	4	3	1	0	1	2	3	1	4	1	1	2	0	0	0	1
62	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	1	3	4	7	0	0	6	2	4	2	5	4	2	2	1	1	1	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	4	6	2	0	4	0	3	4	0	3	2	1	1	0	3	0	2	1
64	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	3	0	6	1	1	0	3	1	4	1	2	3	1	1	1	0	0	1	0
65	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	2	3	1	0	0	4	2	0	5	2	2	4	0	1	1	0	1	1
66	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	2	2	2	0	0	1	0	1	1	0	0	1	1	1	1	0	0	1
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	2	0	1	0	1	0	0	6	0	0	0	0	0	0	0	1
68	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	3	2	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0
69	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2	0	0	1	0	0	0	2	1	1	0	0	0
70	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	4	0	0	0	0	0	0	0	2	1	0	1	0	1	0
72	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	1
74	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	1	1	0	0	0	0	1	0	1	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
76	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	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	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
78	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
Total	**33**	**32**	**189**	**203**	**118**	**18**	**67**	**110**	**72**	**101**	**188**	**51**	**186**	**188**	**230**	**290**	**336**	**341**	**588**	**964**	**416**	**171**	**110**	**513**	**297**	**538**	**514**	**758**	**570**	**699**	**676**	**541**	**236**	**184**	**484**	**1,121**

Table 5.56. Summer flounder length frequencies, fall, 1 cm intervals, 1984-2019.

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

	Fall																																							
length	**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**
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
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
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
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
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	1	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	-	0	0	0	0	0	0	1	1	0
17	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	2	-	0	0	0	0	0	0	0	2	0
18	0	2	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1	2	-	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	0	1	0	3	-	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	2	0	0	0	0	0	2	4	-	0	0	2	0	0	1	0	2	0
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
22	0	2	1	0	0	0	0	0	0	1	0	1	2	0	0	0	0	1	3	0	1	0	0	0	5	1	-	0	0	1	3	0	2	2	0	0
23	0	2	2	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	4	0	2	2	0	0	6	5	-	0	2	5	1	0	3	0	5	0
24	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	2	3	3	-	1	0	1	0	0	0	1	4	0
25	0	4	0	0	0	0	0	2	0	4	0	0	1	0	0	1	1	0	4	0	4	0	0	1	2	4	-	2	1	4	3	0	2	1	2	1
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
27	0	3	2	0	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
28	0	2	1	3	0	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
29	0	0	1	4	0	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
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
31	0	1	5	7	2	0	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
32	3	0	7	13	4	0	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
48	1	6	0	2	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
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
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
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	3	0	3	0
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
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
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
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
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
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
58	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
59	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	1	3	1	1	2	1	0	4	0	4	-	0	2	1	2	2	0	0	2	1
60	0	0	0	1	0	0	0	0	0	1	0	0	0	1	1	1	1	0	0	2	0	1	0	0	0	1	-	3	1	1	1	0	2	2	0	0
61	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	3	-	1	0	1	1	0	0	1	0	1
62	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	1	1	2	1	0	0	1	0	0	3	-	1	0	0	0	0	0	0	1	0
63	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	1	1	0	0	1	0	0	-	0	0	1	0	0	2	0	1	0
64	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	0	1	1	1	0	0	1	0	0	0	-	0	0	1	0	0	0	0	2	0
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	-	0	0	1	0	1	1	0	0	0
66	0	0	0	0	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
67	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	1	0	1	-	1	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	-	0	0	0	1	0	1	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	0	1	0	0
70	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	1	-	0	0	0	1	0	0	0	0	1
71	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
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	0	0	0	0	0	0	0	0	0
74	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
75	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
Total	**117**	**141**	**225**	**171**	**203**	**16**	**102**	**152**	**114**	**193**	**93**	**70**	**248**	**299**	**206**	**293**	**220**	**532**	**770**	**189**	**228**	**331**	**95**	**217**	**177**	**343**	**-**	**293**	**409**	**377**	**184**	**268**	**223**	**170**	**268**	**187**

Table 5.57. Tautog length frequencies, spring, 1 cm intervals, 1984-2019.
All tautog taken in the Survey were measured.

	Spring																																				
length	**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**
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1
12	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	2	2	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0
13	0	0	0	1	1	0	4	1	0	1	0	0	2	1	0	0	0	2	0	0	0	3	0	0	0	1	0	1	4	2	1	1	2	0	1	0	0
14	0	0	0	1	0	4	3	0	2	3	2	0	0	1	0	0	4	2	1	0	1	1	0	0	1	1	2	0	2	0	1	0	6	0	1	0	0
15	0	0	2	2	1	4	7	1	1	0	2	0	1	2	0	0	2	2	0	0	0	0	0	1	0	2	0	2	0	0	1	0	5	0	2	0	0
16	0	0	0	3	1	3	6	1	0	0	2	0	3	3	0	0	0	1	1	0	1	1	0	1	2	1	0	0	2	2	0	1	3	0	0	5	0
17	2	1	2	3	2	3	8	3	3	1	2	0	0	2	0	0	5	2	2	1	0	2	3	0	0	0	0	0	4	1	3	3	1	0	2	2	0
18	2	2	0	3	4	3	14	7	4	4	1	1	0	4	1	0	4	2	2	0	0	0	0	0	1	1	1	1	3	2	1	0	5	0	0	3	0
19	2	0	2	3	4	11	11	6	2	1	1	0	2	1	0	3	0	6	2	2	0	0	0	2	1	0	0	0	2	0	0	1	9	0	2	7	0
20	5	2	2	0	3	7	15	7	2	1	2	1	0	2	1	0	1	3	1	1	0	2	0	0	2	0	0	1	3	9	6	2	3	0	4	7	0
21	3	1	5	2	5	7	12	4	1	5	2	0	0	5	0	3	3	2	4	0	2	1	0	0	0	0	2	3	3	2	5	3	6	2	3	5	0
22	2	5	0	1	7	11	13	11	2	2	1	1	0	5	2	0	2	6	0	1	0	3	3	1	1	0	1	2	3	4	1	6	9	2	1	6	0
23	7	0	6	4	4	12	15	9	2	2	5	1	0	2	2	1	4	7	5	0	1	2	2	2	2	0	0	3	6	1	1	8	1	2	3	4	0
24	5	1	3	1	4	8	8	3	0	3	5	1	1	0	2	1	1	6	6	2	2	2	2	5	1	0	3	1	1	5	6	1	3	1	2	7	0
25	6	8	2	4	4	7	7	5	4	1	2	1	1	7	1	2	4	5	6	2	1	2	2	1	2	1	1	2	3	4	4	6	2	1	7	4	0
26	6	4	7	0	2	4	15	6	0	3	1	0	0	2	2	1	2	7	3	0	3	1	2	1	2	0	0	1	8	3	8	2	8	2	10	9	0
27	5	3	8	3	2	9	5	6	1	1	3	1	1	3	6	2	6	1	8	3	1	0	0	3	1	0	0	5	0	2	3	7	8	3	4	4	0
28	3	8	5	2	3	11	12	6	3	3	9	1	0	2	0	1	4	4	5	1	1	4	1	2	2	0	1	1	1	7	5	1	4	2	3	6	0
29	7	7	3	3	4	7	4	2	3	3	7	1	2	3	2	1	3	0	4	3	4	3	1	4	6	0	0	0	4	4	2	6	5	0	3	11	0
30	6	4	9	3	2	15	10	6	1	3	1	1	1	4	2	1	2	3	12	3	6	1	5	2	1	0	0	1	1	4	5	6	5	1	12	10	0
31	9	3	6	2	8	5	12	1	1	3	4	0	1	5	1	0	1	6	9	3	4	2	4	1	1	2	1	2	4	3	4	11	9	0	4	11	0
32	8	3	6	6	4	6	6	5	2	0	2	1	3	7	9	3	2	3	13	10	9	4	3	5	2	2	2	1	6	3	2	8	8	0	5	9	0
33	5	4	7	8	4	6	7	7	3	1	4	0	2	4	0	6	6	6	18	8	3	4	4	3	2	4	0	0	3	2	5	13	7	4	9	9	0
34	5	7	12	4	5	11	6	6	2	0	2	0	2	9	3	3	6	5	13	5	1	1	5	3	4	3	1	2	1	6	6	12	7	2	9	9	0
35	10	4	6	3	10	5	9	10	7	0	3	0	4	4	3	3	3	5	15	4	6	1	4	6	4	1	0	3	2	2	6	13	16	3	8	15	0
36	7	1	17	13	13	11	7	7	2	2	4	1	1	4	4	2	11	14	17	7	7	5	7	3	3	5	2	1	2	3	5	10	13	1	7	13	0
37	8	8	22	13	12	8	6	11	2	1	5	1	4	4	1	7	9	6	23	12	14	8	5	4	6	4	2	2	0	5	11	16	8	2	9	7	0
38	9	10	17	11	14	5	14	18	10	3	4	1	2	1	3	5	11	7	22	8	10	4	5	2	4	6	3	2	9	5	12	19	9	3	4	16	0
39	8	5	18	7	6	14	7	7	3	2	8	2	9	5	5	5	8	10	25	7	15	9	9	3	17	6	6	3	2	9	6	14	12	3	12	9	0
40	8	8	38	8	14	22	10	17	8	2	7	2	4	2	7	4	10	11	27	10	9	8	9	9	2	5	1	5	4	5	1	8	11	4	7	7	0
41	11	6	27	12	12	16	9	10	6	2	5	2	9	3	9	3	18	16	28	5	12	10	7	7	6	16	1	5	2	5	8	21	16	0	6	9	0
42	11	14	22	10	19	21	12	17	6	3	7	1	6	7	7	10	16	12	24	15	9	6	3	13	6	12	1	4	3	6	8	13	10	1	5	8	0
43	13	9	28	9	18	24	6	8	10	7	5	1	5	8	6	9	11	17	24	9	12	5	8	14	3	9	2	4	4	5	5	12	8	3	7	7	0
44	15	6	31	12	20	27	17	13	11	1	9	1	1	7	8	5	17	12	37	3	19	5	6	15	8	11	2	4	1	3	4	14	8	3	5	9	0
45	20	21	23	12	15	25	32	18	10	10	6	1	6	5	9	12	11	11	33	13	10	5	9	10	7	5	2	3	2	6	2	10	6	3	1	8	0
46	15	9	22	10	17	31	20	18	10	1	8	1	2	6	3	5	8	10	28	11	8	7	7	15	10	8	0	3	4	1	4	7	3	2	3	7	0
47	16	9	37	11	23	22	14	23	15	7	10	3	6	5	7	7	9	10	18	7	1	7	10	17	4	3	4	2	2	2	4	10	0	1	1	8	0
48	15	13	25	8	21	31	21	18	7	5	1	1	3	7	6	8	5	7	20	3	6	10	7	13	0	4	1	2	1	3	1	2	3	2	3	3	0
49	17	11	12	9	19	29	17	20	7	6	12	0	2	3	4	3	5	8	9	4	3	5	11	14	3	7	1	4	5	0	3	2	7	4	1	9	0
50	13	5	10	5	16	27	12	16	9	6	7	1	2	2	7	7	3	10	8	7	5	4	4	17	7	10	2	5	2	2	1	5	3	0	1	2	0
51	9	12	21	5	19	12	26	13	11	3	6	2	6	1	7	2	4	7	10	1	6	4	5	10	3	2	1	2	2	0	5	2	0	1	2	1	0
52	10	8	5	7	14	10	20	10	8	6	7	0	2	3	7	3	5	4	8	3	2	1	8	5	5	2	2	3	1	1	2	2	2	2	0	0	0
53	8	4	11	3	11	17	17	6	8	2	2	1	4	4	2	0	1	5	8	1	0	1	2	5	3	5	0	2	2	1	0	1	0	1	2	1	0
54	3	3	6	6	12	8	14	11	6	6	3	1	7	4	5	2	2	1	5	1	5	2	3	6	5	4	2	2	0	0	1	0	2	1	1	0	0
55	9	0	5	5	11	13	10	5	7	2	3	2	1	3	2	2	6	4	5	1	0	0	4	8	3	2	1	0	1	0	0	0	0	0	1	1	0
56	2	0	7	8	7	9	11	8	3	3	1	3	1	1	3	1	0	2	1	3	1	0	0	3	3	2	0	1	0	0	0	1	0	0	2	1	0
57	2	0	11	2	1	5	5	5	7	1	1	0	3	2	1	3	7	0	3	1	0	1	0	1	2	1	0	0	0	2	0	0	0	0	0	0	0
58	3	2	0	3	3	6	2	4	4	1	2	0	1	1	0	2	2	1	2	1	0	0	0	2	0	0	0	1	0	0	0	2	0	0	1	0	0
59	4	1	3	2	3	5	6	3	3	3	2	0	0	0	0	0	0	2	3	0	1	0	0	2	3	0	0	0	0	1	0	0	0	0	1	0	0
60	2	0	1	0	2	2	1	2	1	1	1	0	0	1	0	0	0	1	0	0	1	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0
61	1	2	0	2	3	2	1	1	2	1	0	0	0	1	1	0	0	0	1	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0
62	0	0	1	3	0	1	2	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
63	0	0	0	0	2	1	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
64	0	0	0	0	0	3	0	1	0	0	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
65	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
66	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
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**337**	**234**	**514**	**258**	**411**	**566**	**528**	**407**	**226**	**129**	**189**	**40**	**113**	**168**	**151**	**139**	**245**	**277**	**521**	**183**	**207**	**149**	**170**	**247**	**153**	**150**	**52**	**93**	**115**	**133**	**160**	**283**	**254**	**63**	**177**	**270**	

Table 5.58. Tautog length frequencies, fall, 1 cm intervals, 1984-2019.

All tautog taken in the Survey were measured.

	Fall																																		
length	**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**
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0
13	1	0	0	3	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
14	0	0	0	0	0	0	0	0	0	0	2	1	2	0	0	2	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	4	0	1	1	1
15	1	0	0	2	0	0	0	0	3	0	0	0	0	0	0	2	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0
16	1	0	0	0	0	0	2	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	1	1	0	0	1	2	0	1	1	0	1	0	0
17	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0	3	0	1	1	0	0	0	0	0	0	0	0	0	1	2	2	1	0	0	1	0
18	2	0	0	2	1	0	2	1	0	0	3	0	0	0	1	4	0	1	0	1	1	1	0	0	0	2	0	2	1	3	0	1	2	1	1	1
19	2	0	0	2	0	0	0	0	0	1	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	3	1
20	3	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4	1	0	1	0	0	0	0	0	1	0	0	1	0	1	0	2	1	0	2	1
21	2	2	0	5	0	0	0	1	2	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	2	1
22	3	0	2	1	2	0	1	0	0	0	1	0	1	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	1	0	3	1	3	0	0	3
23	2	0	2	1	1	0	0	0	0	0	0	0	5	0	2	5	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	5	4
24	5	0	0	0	2	1	2	0	3	0	1	0	5	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3	3	1	0	4	5
25	4	0	2	2	0	0	0	0	0	2	0	0	0	2	0	1	0	0	0	0	1	0	0	0	1	0	0	2	2	0	3	2	0	2	1	4
26	0	3	0	3	3	2	0	0	0	0	0	0	0	2	1	3	2	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	2	0	3	5
27	3	0	0	1	0	0	0	0	1	0	2	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1	3	3	0	0	1	2	2	2
28	1	1	3	0	0	0	2	0	2	1	0	0	0	1	2	4	0	4	1	0	0	1	0	0	0	0	0	0	0	0	0	2	4	0	4	7
29	5	1	3	0	1	0	1	2	2	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	1	0	1	4	6
30	5	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	1	0	0	2	1	2	0	0	0	2	0	3	1	3	0	3	2
31	3	1	0	1	1	2	0	0	1	0	0	5	0	0	1	1	2	3	0	0	0	0	1	1	0	0	0	0	2	2	2	0	4	1	2	3
32	3	1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	1	2	1	0	0	0	0	1	0	0	0	0	1	2	0	2	1	1	9
33	5	4	3	2	2	0	1	0	0	0	0	0	0	0	2	3	0	0	1	1	0	0	0	0	1	1	0	1	0	3	2	0	5	0	2	5
34	3	3	2	2	0	1	1	3	2	0	2	2	0	0	2	1	0	1	0	2	1	0	0	0	1	0	0	0	0	2	3	0	0	0	0	5
35	3	3	2	0	0	1	2	0	0	0	0	1	2	1	2	1	2	6	0	1	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0	6
36	4	1	0	1	0	0	0	6	4	0	0	1	0	1	0	2	2	3	1	0	1	0	0	3	0	0	0	0	0	2	0	0	4	0	1	5
37	7	3	0	1	0	2	0	1	0	0	0	0	2	0	1	5	2	0	3	1	0	3	0	0	2	0	0	0	0	1	3	0	4	0	0	4
38	3	7	1	1	1	0	0	2	2	2	1	0	0	0	1	5	1	0	4	3	2	3	2	0	0	0	0	0	0	4	0	0	1	0	4	4
39	5	4	2	3	0	1	0	5	2	2	1	1	1	0	0	5	1	1	1	2	0	2	2	0	0	0	0	0	0	1	2	0	2	1	1	6
40	8	4	3	0	0	2	1	5	1	0	2	1	0	2	0	5	4	1	1	3	0	3	0	2	1	0	0	0	0	0	0	0	0	0	1	4
41	7	6	2	7	1	0	1	4	0	1	1	1	0	0	0	2	3	2	4	3	3	0	2	1	1	2	0	0	2	0	1	0	1	0	1	4
42	3	4	1	7	3	3	0	2	1	1	2	1	0	0	1	3	1	4	3	0	1	0	0	1	0	0	0	0	0	1	0	1	2	0	0	1
43	3	10	4	3	2	2	1	7	0	1	0	1	1	1	2	2	1	1	1	2	4	0	0	3	0	1	0	0	0	0	0	0	0	0	0	1
44	3	3	1	2	1	4	1	6	1	5	0	1	0	1	1	2	1	0	2	0	1	1	0	0	2	0	0	0	0	1	0	0	0	0	0	1
45	3	2	2	5	1	4	1	3	0	0	1	0	0	0	1	2	1	3	2	3	1	2	0	1	2	0	0	0	0	0	0	0	0	1	0	0
46	5	3	2	5	1	1	0	7	1	0	2	0	0	0	2	2	1	0	4	0	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0
47	4	5	3	3	2	0	1	2	1	4	2	1	1	1	4	0	2	0	1	0	2	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0
48	3	4	0	7	2	1	1	6	0	1	1	0	0	3	2	0	1	1	3	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
49	4	1	0	4	0	0	0	0	0	5	1	0	0	1	2	0	3	1	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
50	3	2	2	4	5	0	0	7	1	0	1	0	0	0	2	1	3	1	0	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0	1	0
51	0	0	2	4	2	1	1	7	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0
52	3	1	1	5	1	0	0	1	1	2	2	0	0	0	2	0	0	0	0	1	2	0	1	3	1	1	0	0	0	0	0	0	1	0	0	0
53	1	0	4	1	0	1	0	1	0	1	3	0	0	0	0	1	1	1	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0
54	0	3	0	1	0	0	0	2	1	3	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
55	3	0	1	2	1	0	3	0	0	3	0	0	0	0	0	1	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
56	1	1	1	3	1	1	0	2	1	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
57	1	0	0	5	0	1	0	6	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
59	0	1	1	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	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
62	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
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	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
Total	**132**	**84**	**52**	**106**	**40**	**32**	**25**	**91**	**36**	**36**	**36**	**21**	**23**	**21**	**41**	**79**	**39**	**41**	**43**	**29**	**24**	**27**	**15**	**28**	**24**	**12**	**0**	**11**	**22**	**30**	**36**	**23**	**46**	**14**	**52**	**101**

Table 5.59. Weakfish length frequencies, spring, 2 cm intervals (midpoint given), 1984-2019.
Weakfish were measured from every tow.

	Spring																																		
length	**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**
5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	3	0	1	11	2	1	8
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	1	3	0	3	10	4	0	3	93	6	0	50
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
25	0	0	0	0	1	0	1	0	0	0	2	3	1	0	1	2	3	4	1	2	9	10	3	0	2	0	0	0	0	6	0	0	15	9	1	4
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
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
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
33	0	0	0	0	0	0	0	12	0	3	2	1	5	19	10	10	1	5	0	0	0	11	0	3	0	0	0	0	17	1	0	0	10	13	1	6
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
37	0	0	0	1	0	0	2	5	0	0	0	1	2	2	3	1	0	0	1	0	0	1	0	2	1	0	0	2	31	3	1	0	13	8	2	10
39	0	0	0	0	1	0	0	4	0	0	0	0	1	1	0	2	0	0	2	0	0	0	0	1	0	0	0	3	26	6	2	0	15	6	0	6
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
43	0	0	0	1	0	0	0	1	1	0	0	0	0	2	3	6	0	0	1	0	0	0	0	1	0	0	0	0	8	1	0	0	1	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	1	0	0	0	0	0	0	0	0	0	0	0	3	1	4	0	0	0	0	0
47	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	2	1	0	1	0	0	0	0	2	0	0	1	0	2	2	1	0	1	1	0	0
49	0	0	1	0	0	0	0	0	0	0	0	1	0	1	5	3	1	0	1	0	0	0	4	1	0	0	0	0	1	4	0	0	0	0	0	0
51	0	0	0	0	0	1	0	1	2	0	0	0	0	0	6	3	2	0	1	0	0	0	2	0	0	0	0	0	1	3	0	0	0	3	0	1
53	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	1	0	0	0	7	3	0	0	0	1	0	1
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
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
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
61	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	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
65	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	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
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
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
81	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
83	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**0**	**9**	**2**	**6**	**5**	**9**	**51**	**18**	**11**	**13**	**28**	**43**	**81**	**92**	**85**	**29**	**59**	**28**	**5**	**28**	**96**	**26**	**31**	**6**	**10**	**1**	**16**	**187**	**86**	**24**	**5**	**261**	**88**	**7**	**117**

Table 5.60. Weakfish length frequencies, fall, 2 cm intervals (midpoint given), 1984-2019.

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

	Fall																																				
length	**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**
3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
5	0	0	0	0	2	1	0	0	0	1	0	2	0	3	0	0	24	13	0	6	0	0	1	0	0	0	-	0	6	0	0	1	0	0	0	8
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
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
11	24	168	1,625	84	63	566	130	423	233	222	413	33	366	749	110	976	7,488	3,672	1,009	1,186	4,329	197	26	2,578	70	528	-	302	1,475	276	1418	305	457	588	1237	831
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
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	3602	2305	1785	2110	1556	391
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
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	1780	215	281	415	59
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
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
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
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
29	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	11	0	0	0	0	1	0	0	-	9	0	1	0	0	22	18	4	51
31	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	1	0	0	3	0	0	7	-	10	6	5	1	14	47	37	28	111
33	0	0	0	0	0	0	0	0	2	0	0	3	3	0	1	0	3	0	0	1	2	0	2	0	0	12	-	16	7	3	1	20	44	29	33	92
35	2	1	0	0	0	0	0	1	1	1	0	6	12	8	3	1	12	0	1	0	4	0	4	0	0	14	-	21	18	22	0	16	45	12	21	33
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	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
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
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
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
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
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
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
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
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
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
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
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
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
65	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	5	0	0	0	0	0	0	0	1	0	-	0	0	0	0	0	0	1	0	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
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
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
73	7	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	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
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
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
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
83	0	1	2	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
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
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
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
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
Total	**259**	**2,650**	**5,415**	**246**	**234**	**4,628**	**1,911**	**4,270**	**1,299**	**2,047**	**8,141**	**2,850**	**6,332**	**3,823**	**3,404**	**12,331**	**23,561**	**12,683**	**10,686**	**5,592**	**17,478**	**9,092**	**216**	**17,355**	**2,524**	**2,594**	-	**2,567**	**6,599**	**1,878**	**10,455**	**10,070**	**4,429**	**5,813**	**7,538**	**3,648**

Table 5.61. Windowpane flounder length frequencies, spring, 1 cm intervals, 1989, 1990, 1994-2019.

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

	Spring																												
length	**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**
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
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
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
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
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
9	0	40	16	3	2	9	5	2	11	10	21	20	11	0	0	18	6	10	13	24	16	4	31	1	133	34	31	32
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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	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
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
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
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
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
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
36	0	4	2	2	1	1	0	0	1	2	0	5	0	2	0	0	1	0	0	0	1	0	1	0	0	0	0	0
37	0	0	0	1	0	0	3	1	1	2	2	1	1	0	0	0	0	0	8	0	0	0	0	0	0	0	0	1
38	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
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**4,171**	**2,256**	**4,064**	**2,001**	**6,234**	**6,274**	**3,812**	**3,147**	**1,381**	**2,118**	**1,002**	**1,015**	**1,365**	**571**	**600**	**2,258**	**1,920**	**1,129**	**2,511**	**1,244**	**1,734**	**1,236**	**1,744**	**863**	**1,146**	**542**	**810**	**1,173**

Table 5.62. Windowpane flounder length frequencies, fall, 1 cm intervals, 1989, 1990, 1994-2019.

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

	Fall																												
length	**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**
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
7	5	0	5	0	6	0	1	0	0	0	0	2	0	0	0	0	0	4	-	1	0	0	0	0	0	0	0	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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	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
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	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
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
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
31	0	0	0	0	0	0	0	0	0	1	0	3	1	2	0	0	2	1	-	0	0	1	1	3	0	0	1	2
32	1	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0	0	1	-	0	1	0	0	0	0	0	1	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	1
Total	**782**	**337**	**578**	**344**	**2,613**	**1,858**	**694**	**267**	**397**	**242**	**223**	**215**	**268**	**968**	**218**	**473**	**429**	**484**	**-**	**668**	**560**	**335**	**446**	**286**	**445**	**430**	**454**	**252**

Table 5.63. Winter flounder length frequencies, April-May, 1 cm intervals, 1984-2019.

Winter flounder were measured from every tow.

	April-May																																		
length	**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**
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
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
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
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	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	1
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
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
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
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
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
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
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
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
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
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
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	160	101	110	108	12	22	16	2	9	12
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
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
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
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
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
26	90	187	375	333	541	982	846	858	242	383	219	231	719	461	527	304	223	249	285	129	61	36	13	144	62	42	58	95	58	35	35	10	25	1	6	11
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
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
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
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
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
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
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
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
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
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
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
38	0	15	17	19	15	18	48	7	4	10	21	16	28	37	37	35	80	77	59	79	46	25	4	17	18	17	16	23	18	43	32	19	7	0	10	7
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
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
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
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	4	6	2	6	4	5	1	0	3	3
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
44	0	1	4	0	2	1	1	1	1	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
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	1
46	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	3	2	0	2	1	0	0	0	1	0	0	2	0	0	0	0
47	0	0	0	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	1	0	0	1
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
49	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	0	0	0	0	0	0	0	0	0
50	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	0	0	0	0	0
51	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
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Total	**2,237**	**7,152**	**10,707**	**11,543**	**19,350**	**22,455**	**37,996**	**20,283**	**5,231**	**11,449**	**15,565**	**11,124**	**16,445**	**10,790**	**12,106**	**7,246**	**6,413**	**6,755**	**5,763**	**3,160**	**2,640**	**2,758**	**833**	**3,636**	**3,127**	**2,887**	**2,576**	**2,235**	**2,234**	**1,617**	**1,152**	**826**	**850**	**40**	**364**	**345**

Table 5.64. Winter flounder length frequencies, fall, 1 cm intervals, 1984-2019.

Winter flounder were measured from every tow.

	Fall																																			
length	**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**
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
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
7	0	0	0	0	1	0	1	1	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	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	1	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
10	0	2	0	0	10	3	2	1	9	39	6	3	11	5	3	0	0	2	0	0	2	1	2	0	0	0	-	1	0	0	0	0	0	0	0	0
11	1	3	2	2	8	6	4	9	6	42	10	16	16	6	3	0	0	6	0	0	9	0	0	0	1	1	-	0	2	0	0	0	0	0	0	0
12	9	16	16	8	34	38	6	34	18	159	63	28	54	23	20	3	5	13	0	1	21	4	1	3	2	11	-	2	4	0	1	3	0	0	0	0
13	18	37	43	47	97	127	34	72	72	331	149	67	157	77	68	44	20	62	6	1	41	28	6	9	10	21	-	5	14	0	3	8	0	0	0	0
14	25	57	82	54	243	343	130	139	85	409	230	87	218	113	137	128	53	123	24	5	65	77	8	10	23	36	-	7	38	1	3	12	6	0	0	0
15	31	63	116	67	295	367	260	144	149	435	219	96	255	165	190	194	111	122	37	10	61	98	17	9	45	51	-	19	59	3	7	12	11	0	2	1
16	60	55	104	72	302	293	345	91	182	377	187	77	225	176	192	243	156	116	40	9	48	99	23	9	60	48	-	28	62	3	12	21	5	1	0	4
17	65	49	118	53	207	315	327	110	140	247	146	61	173	175	160	268	170	80	43	11	37	66	11	6	43	50	-	22	61	5	9	10	1	0	0	1
18	89	53	86	72	167	213	319	99	111	151	142	64	132	116	87	225	169	66	33	10	19	52	5	10	49	35	-	25	50	6	12	9	5	1	0	3
19	111	41	50	79	212	199	326	108	99	85	141	41	119	126	60	158	148	32	31	8	21	33	5	7	25	31	-	18	26	4	10	9	7	0	1	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	-	11	25	3	8	4	4	1	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	-	11	16	0	8	9	4	0	1	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	-	5	15	3	3	10	6	1	0	1
23	63	22	17	44	104	107	146	73	42	39	38	13	65	55	24	29	41	16	28	17	2	6	3	17	4	5	-	7	22	2	2	3	1	0	2	1
24	38	17	13	25	77	68	91	40	37	38	24	10	58	32	15	27	47	33	31	15	1	1	3	18	4	2	-	4	20	4	4	10	6	0	0	0
25	34	14	9	21	40	85	53	48	28	29	26	5	47	23	14	29	35	24	28	10	0	7	2	9	9	6	-	4	30	2	5	5	3	1	0	1
26	36	10	7	14	32	39	49	20	17	30	28	2	25	26	11	19	30	31	27	18	5	6	2	12	10	0	-	2	20	5	2	2	1	1	1	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	-	7	20	3	9	2	5	1	1	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	-	6	16	2	3	1	4	2	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	-	5	7	3	4	4	2	1	1	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	-	3	5	4	5	3	5	1	1	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	-	2	7	1	2	5	5	1	1	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	-	2	7	3	1	3	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	-	2	4	1	2	5	2	0	1	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	-	3	4	1	1	1	1	0	1	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	-	1	5	1	2	2	2	0	1	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	-	4	0	1	2	0	2	1	1	0
37	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	1	1	3	1	2	2	0	1	3	2	-	2	2	0	2	3	5	0	1	1
38	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	2	1	5	4	2	2	0	0	4	2	-	1	4	0	1	8	3	0	0	0
39	2	0	0	0	0	0	0	0	0	3	0	0	0	1	0	1	1	3	5	0	2	2	0	0	2	0	-	0	1	0	1	1	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	2	2	0	1	3	2	-	0	0	0	0	1	0	0	0	0
41	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	3	0	0	2	0	0	0	0	-	1	1	0	2	1	0	0	0	0
42	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	-	0	0	0	1	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	-	0	0	0	0	3	0	0	0	1
44	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	0	0	1	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	-	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	-	1	0	0	0	0	0	0	0	0
Total	**949**	**575**	**769**	**781**	**2,422**	**2,717**	**2,914**	**1,321**	**1,300**	**2,771**	**1,765**	**657**	**1,984**	**1,370**	**1,146**	**1,699**	**1,364**	**907**	**527**	**262**	**392**	**557**	**108**	**213**	**387**	**351**	-	**211**	**547**	**61**	**128**	**170**	**97**	**13**	**17**	**14**

Table 5.65. Winter skate length frequencies, spring and fall, 2 cm intervals (midpoint given), 1995-2019.
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.

Spring

length	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
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
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
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	1
33	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	1	0	0	0	1	2
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
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
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
43	0	0	0	0	0	3	0	1	2	4	1	0	0	1	2	1	0	0	9	3	0	0	0	0	0
45	0	0	0	0	1	3	0	0	0	6	0	0	2	1	1	2	0	7	5	4	0	0	0	0	1
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
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
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
53	0	0	0	0	1	3	1	0	1	0	0	1	1	0	1	0	0	1	3	6	2	1	0	0	2
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
57	1	2	4	3	2	0	0	0	6	0	0	1	2	1	3	0	2	2	4	2	3	1	1	0	1
59	5	4	1	5	3	2	0	1	1	2	0	1	0	0	2	1	0	2	2	3	2	2	0	0	3
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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**

Fall

length	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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**

FIGURES 5.1 - 5.18
LISTS

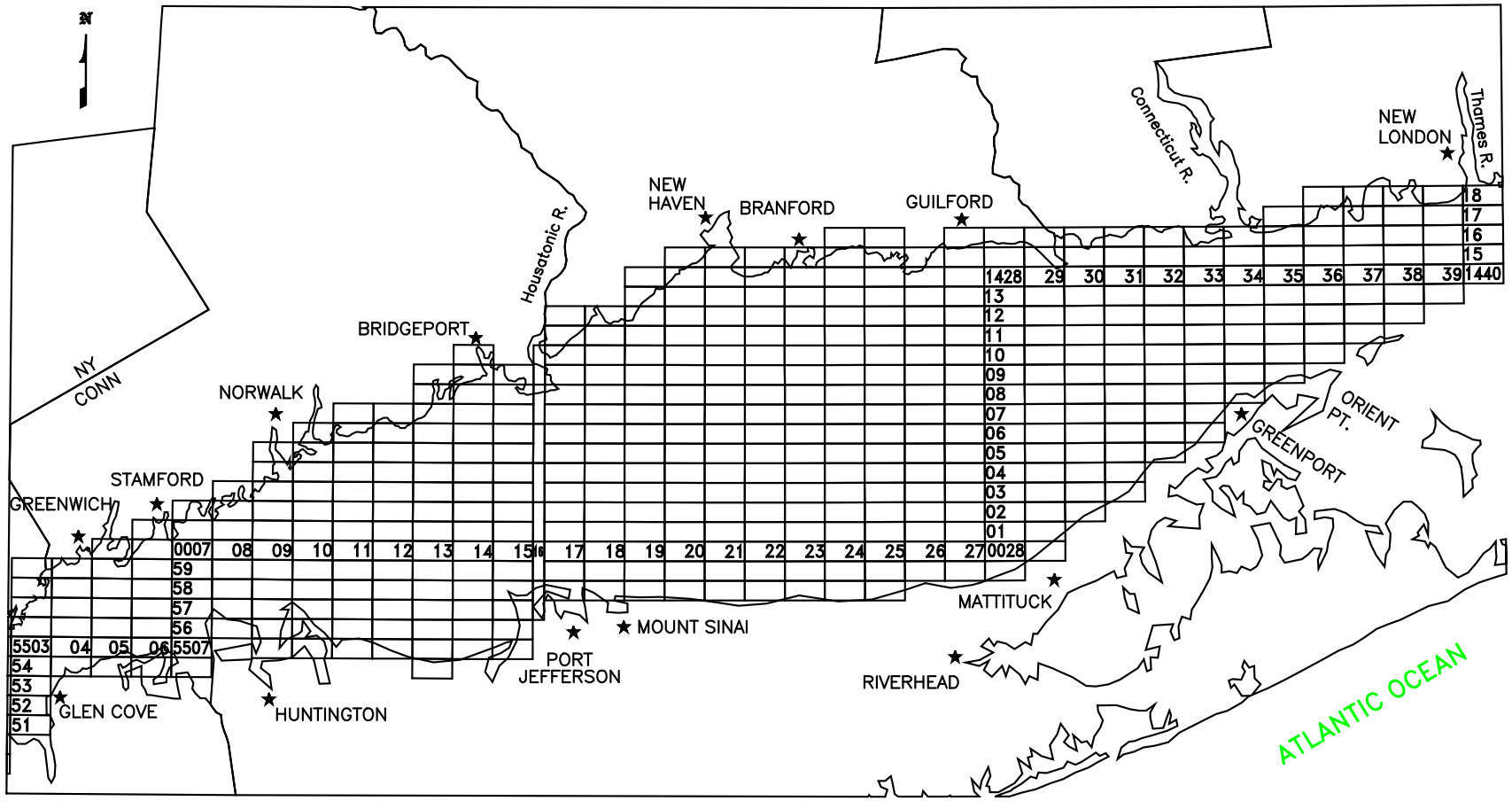
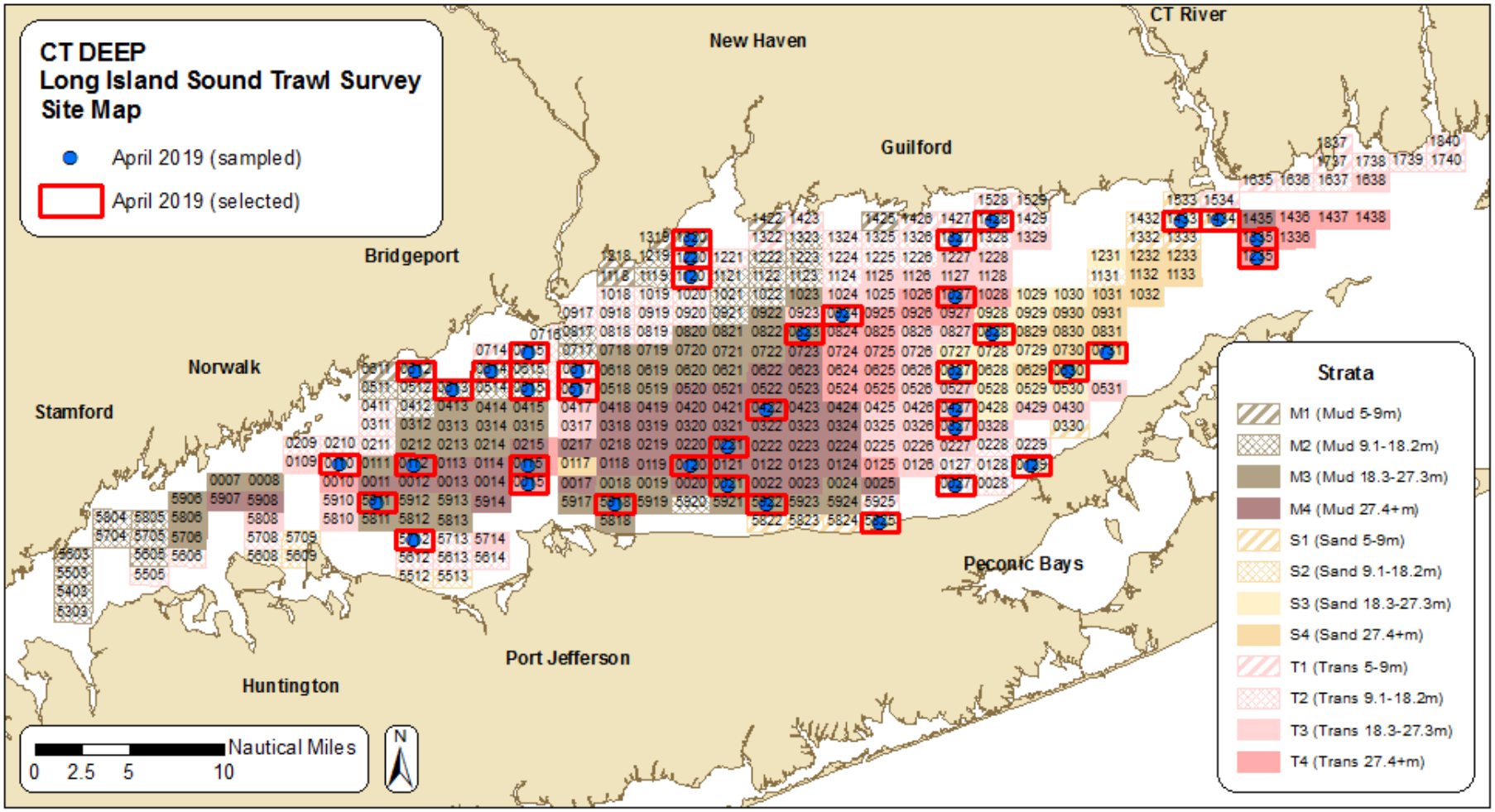


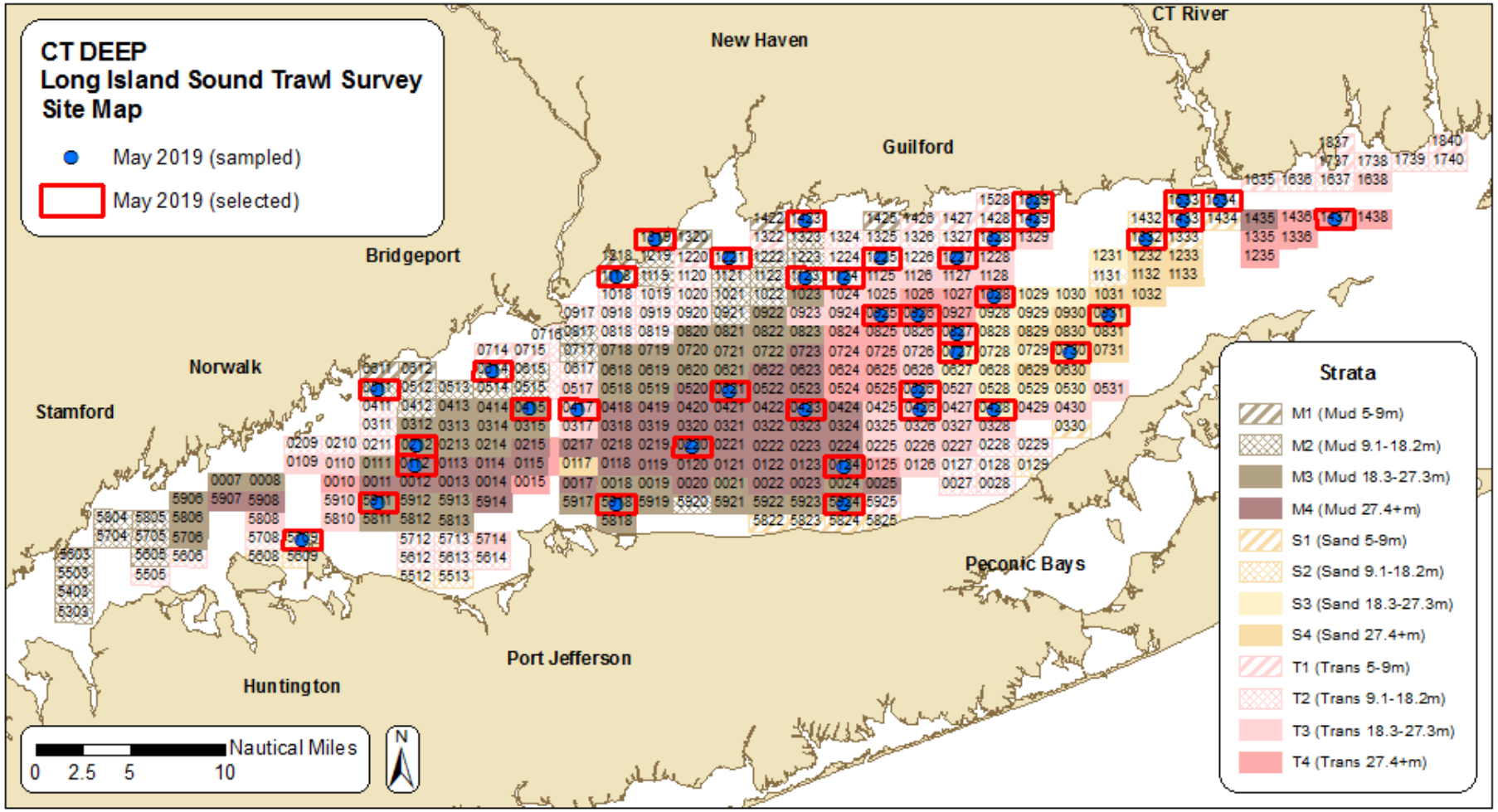
Figure 5.1. Trawl Survey site grid. *Each sampling site is 1x2 nmi (nautical miles). A four-digit number identifies the site: the first two digits are the row numbers (corresponding to minutes of latitude) and the last two digits are the column numbers (corresponding to two nautical miles in length on 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 2019 sites selected and sampled. *The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the "**Notice to Fishermen**" are noted in table below map.*



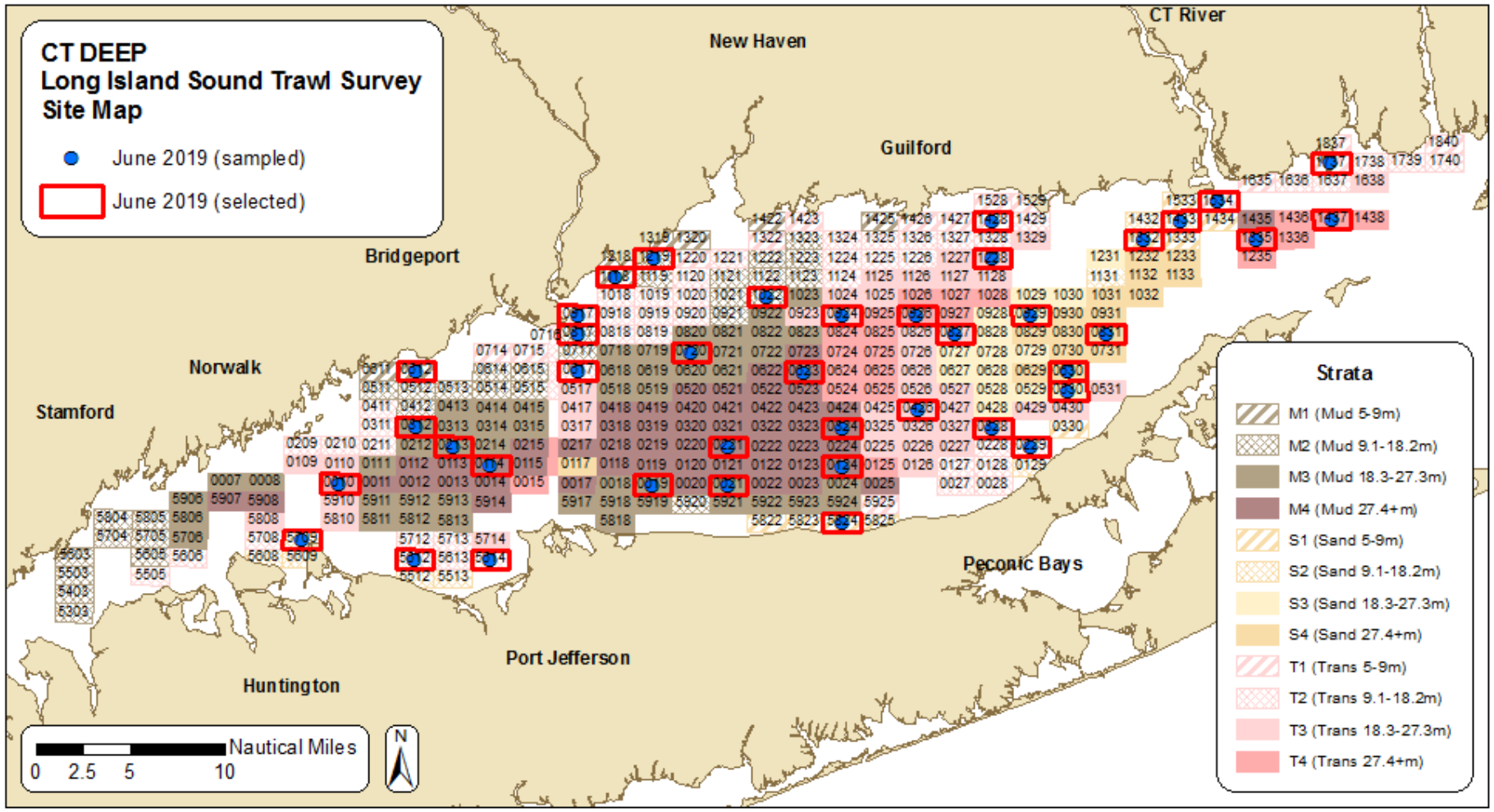
Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
					No sites were moved during this cruise

Figure 5.3. May 2019 sites selected and sampled. *The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the "**Notice to Fishermen**" are noted in table below map.*



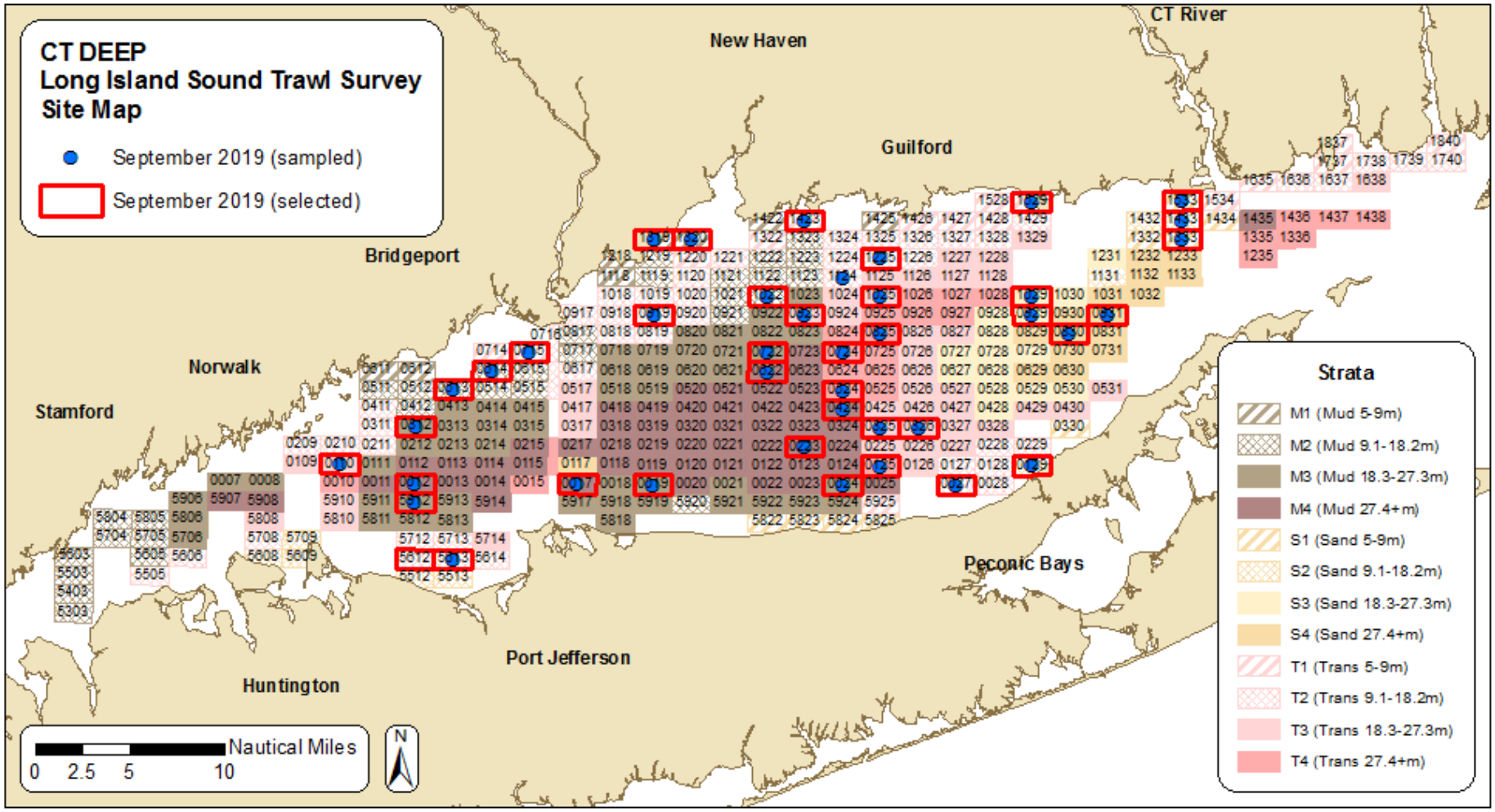
Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
					No sites were moved during this cruise

Figure 5.4. June 2019 sites selected and sampled. *The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the "**Notice to Fishermen**" are noted in table below map.*



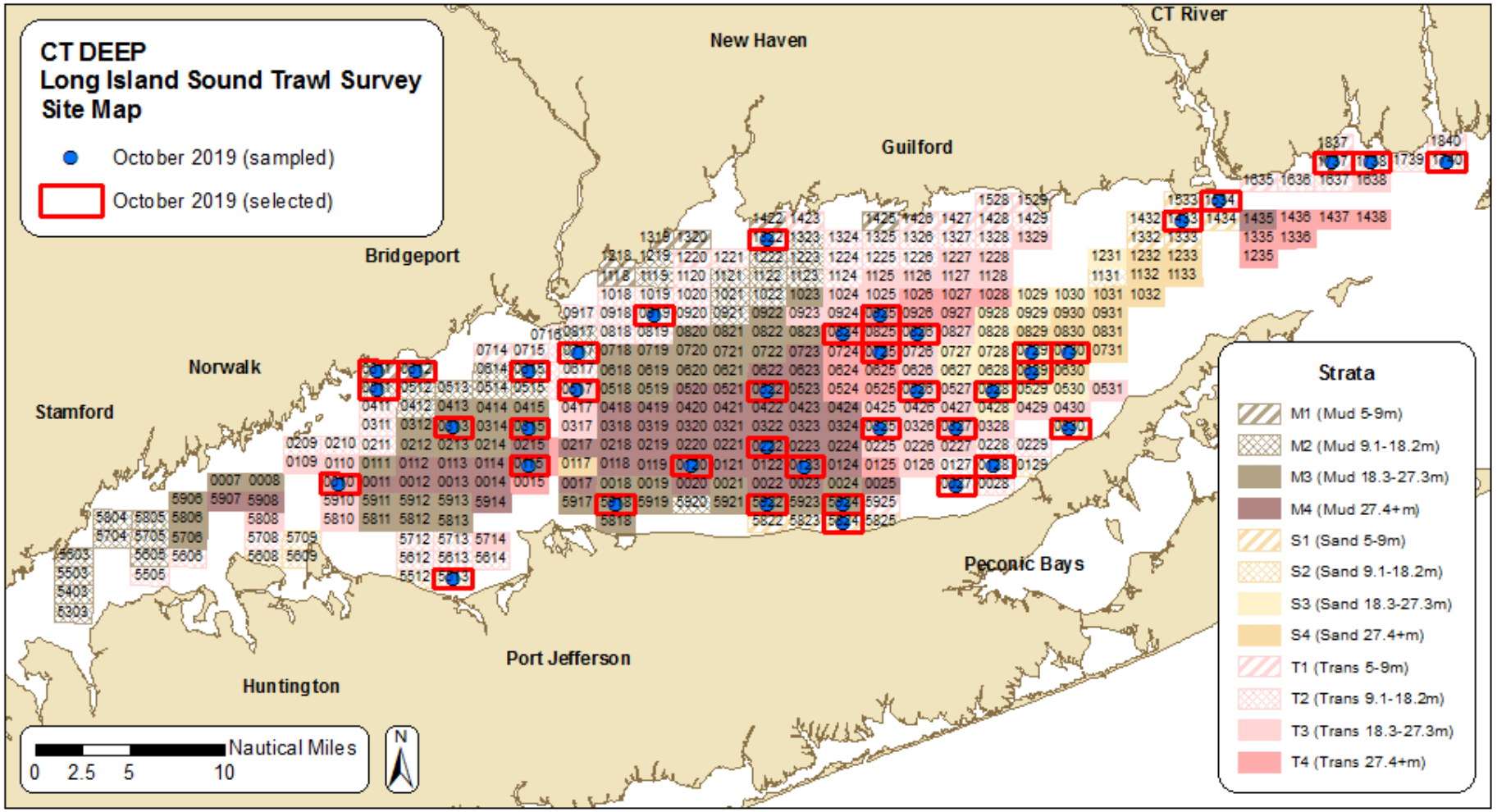
Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
					No sites were moved during this cruise

Figure 5.5. September 2019 sites selected and sampled. *The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the "**Notice to Fishermen**" are noted in table below map.*



Sample	Site Sampled	Sampled Strata	Site Selected	Selected Strata	Reason Moved
FA2019037	1124	T2	5612	T2	Have had trouble with pot gear here in the past

Figure 5.6. October 2019 sites selected and sampled. *The red outlined rectangles are the sites selected for the cruise and the blue dots are the sites sampled. Samples collected from a different site than published in the "**Notice to Fishermen**" are noted in table below map.*



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

Figure 5.7. Number of finfish species observed annually, 1984-2019. *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 57.4 for the time-series*

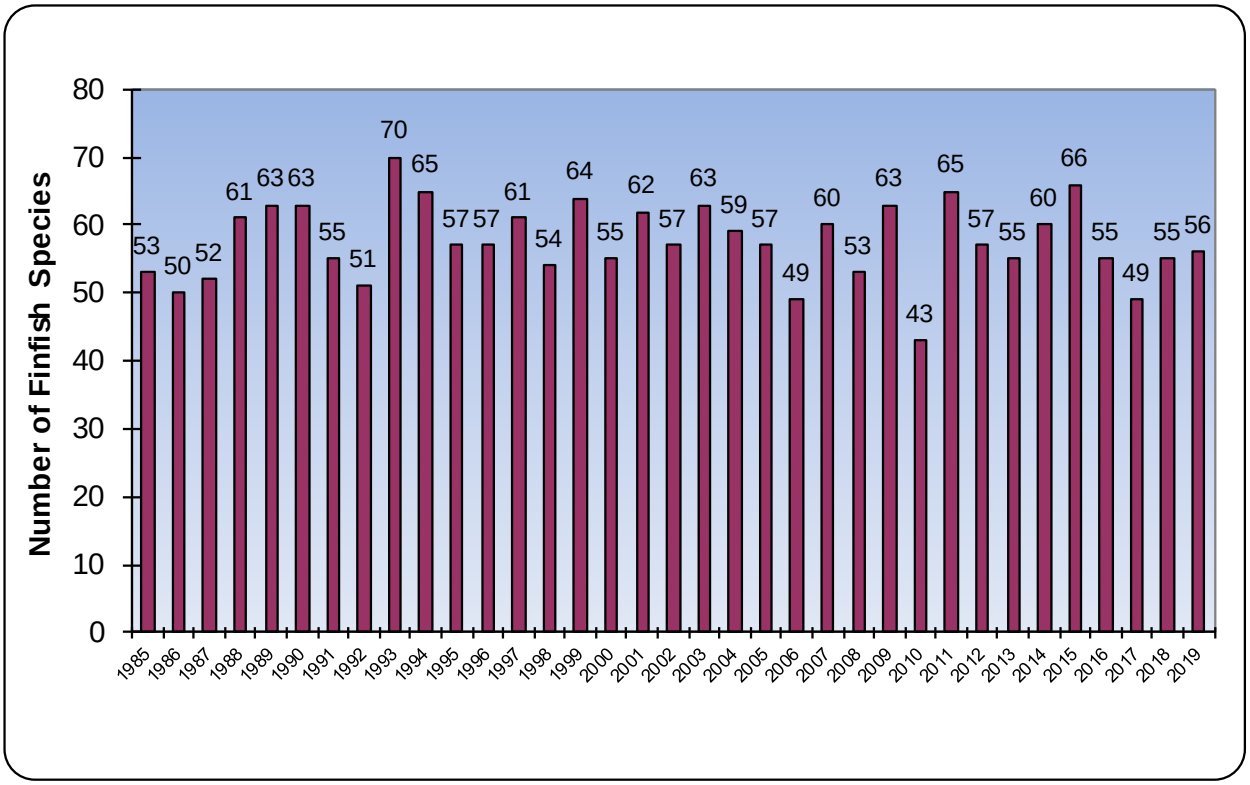
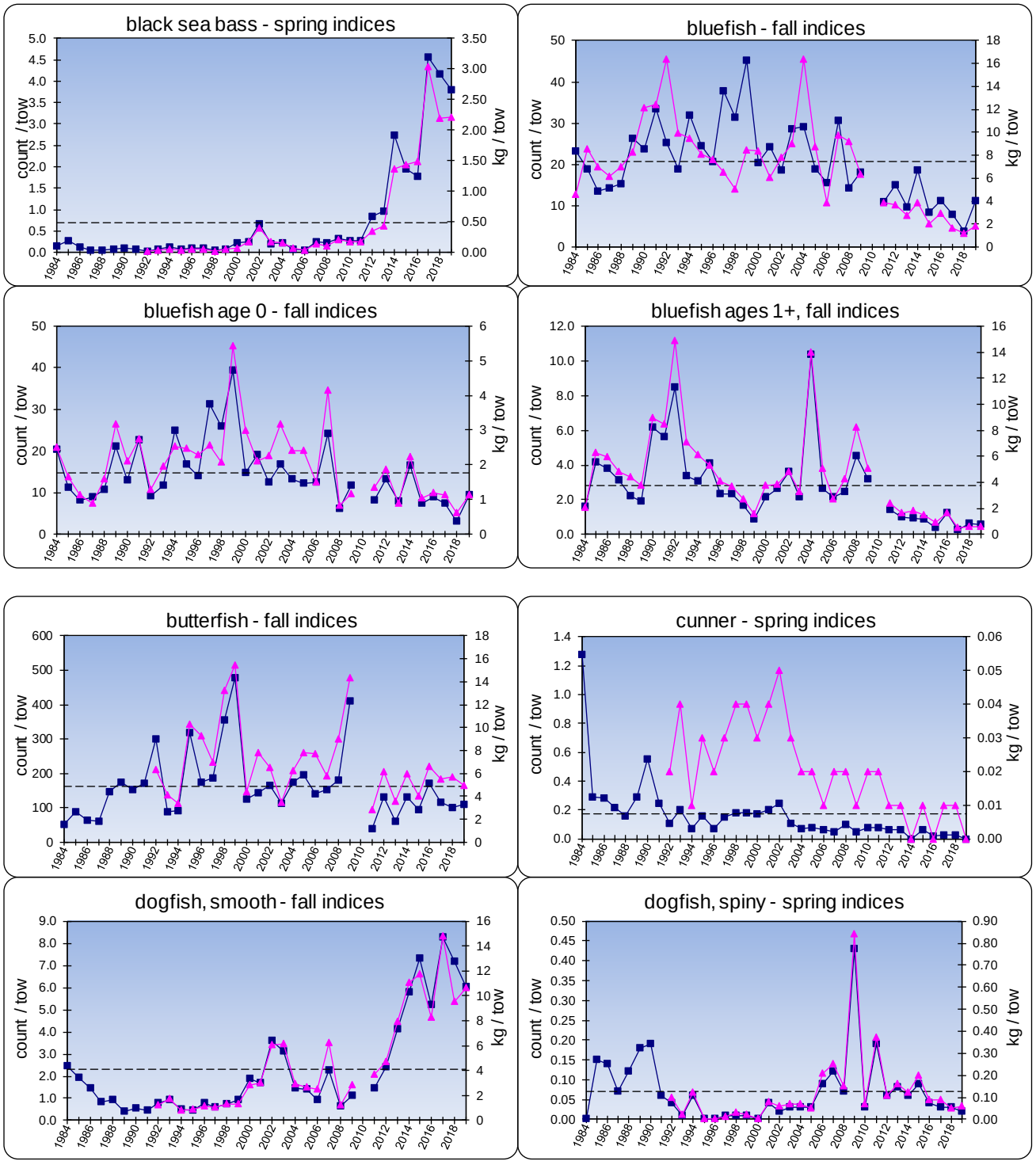


Figure 5.8. Plots of abundance indices for: black sea bass, bluefish (total, age 0, and ages 1+), butterfish, cunner, and dogfish (smooth and spiny).



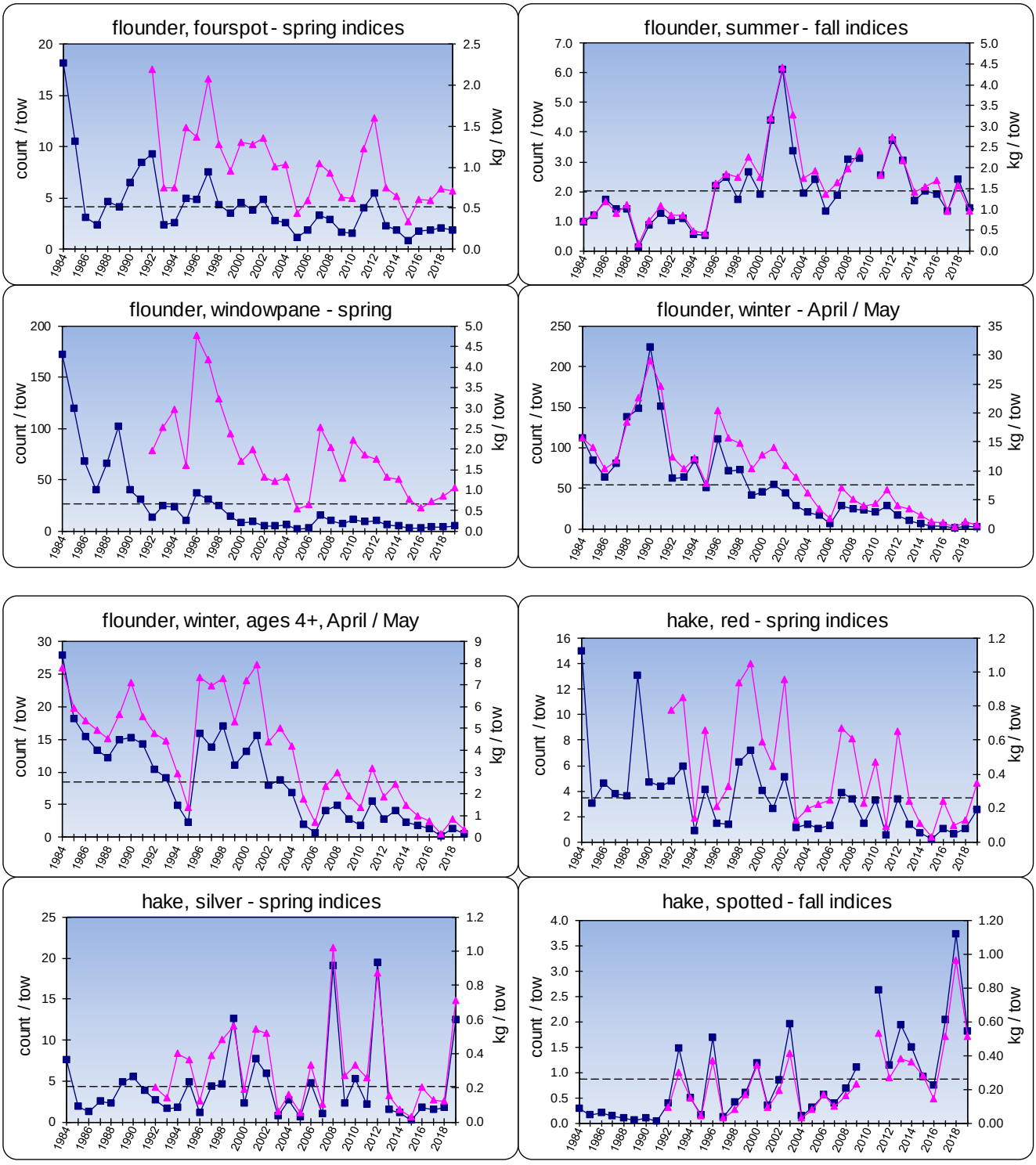
Legend:

■ = count / tow

▲ = kg / tow

---- = mean count / tow

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



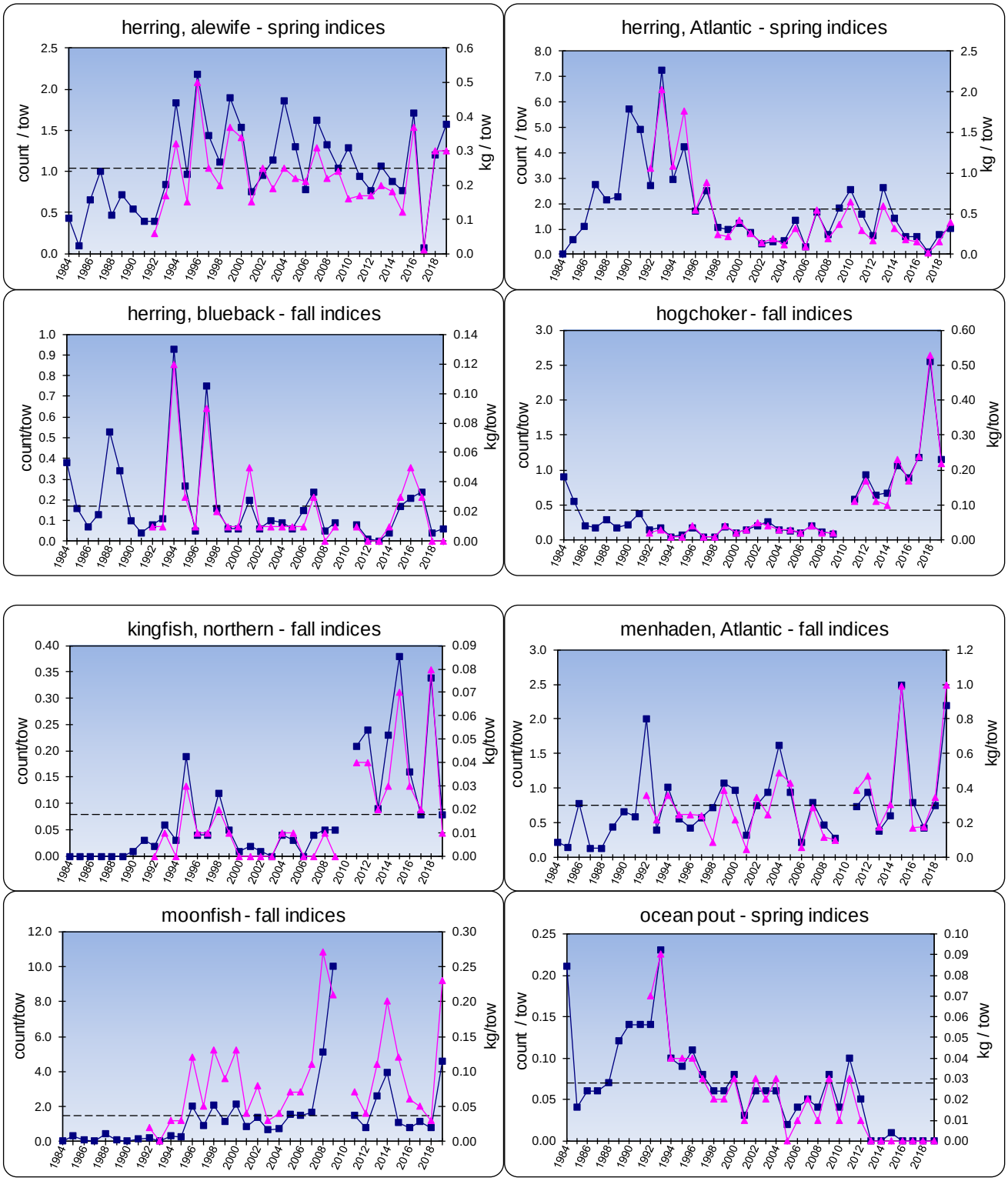
Legend:

■ = count / tow

▲ = kg / tow

---- = mean count / tow

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



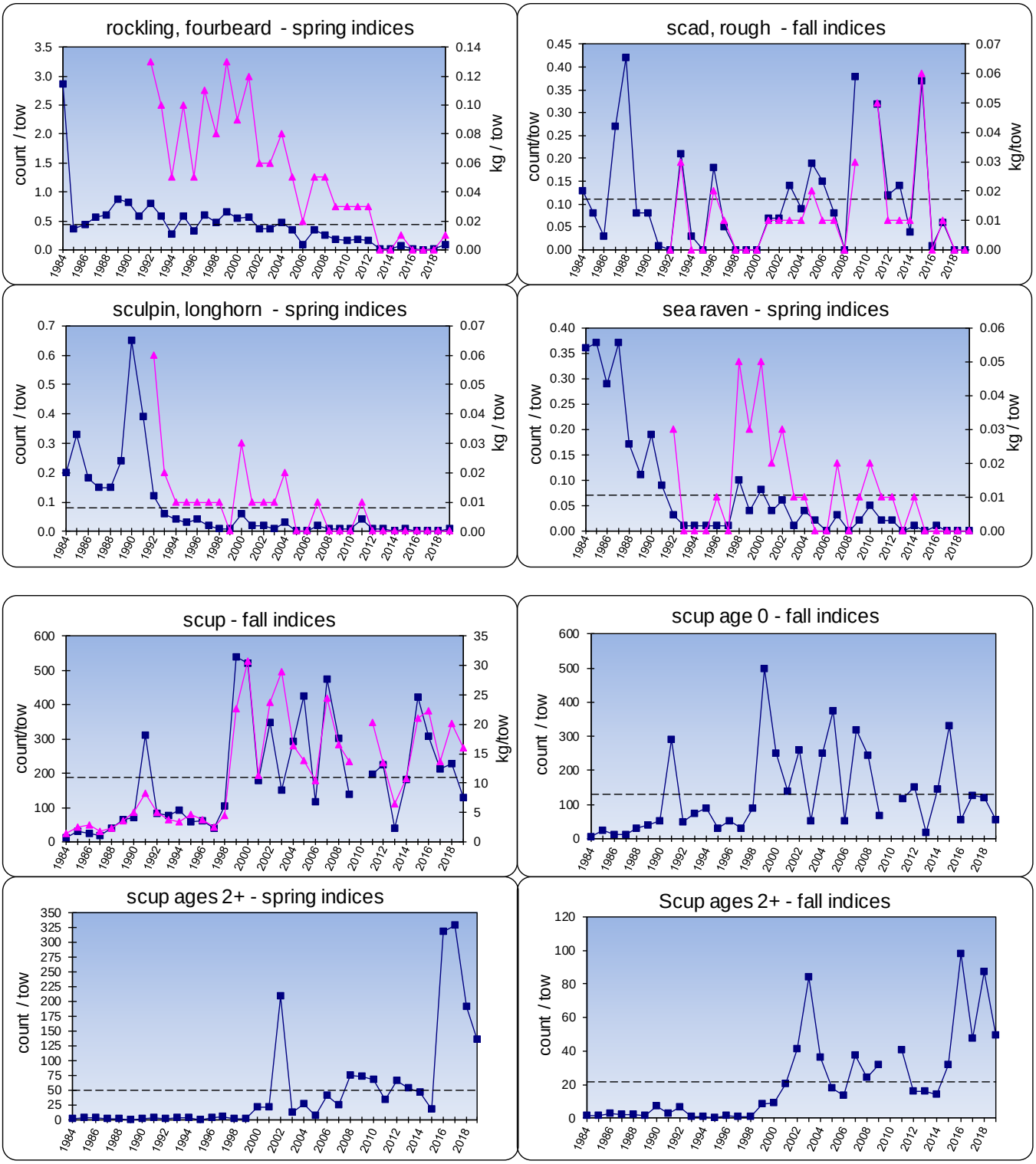
Legend:

■ = count / tow

▲ = kg / tow

---- = mean count / tow

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



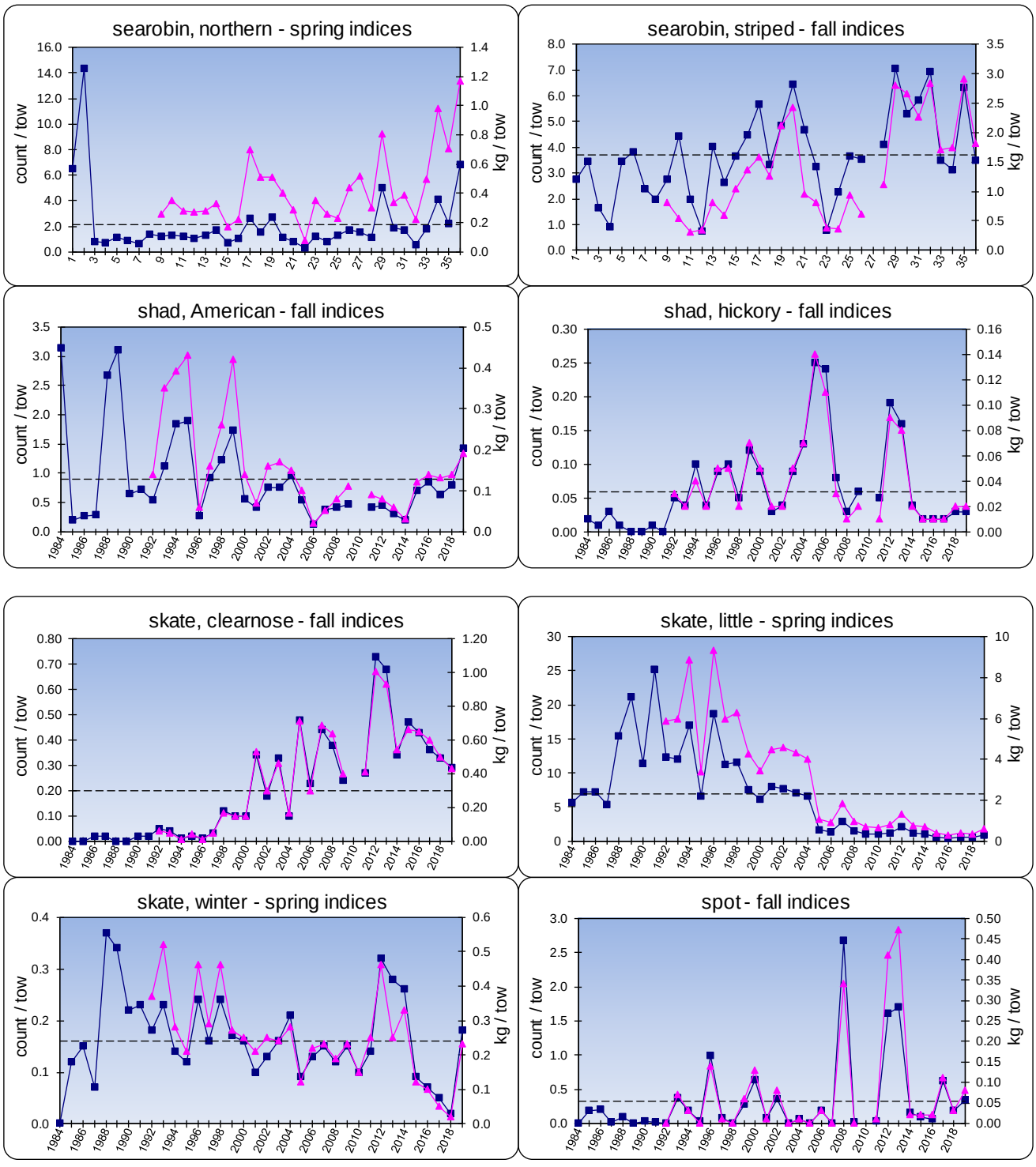
Legend:

■ = count / tow

▲ = kg / tow

---- = mean count / tow

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



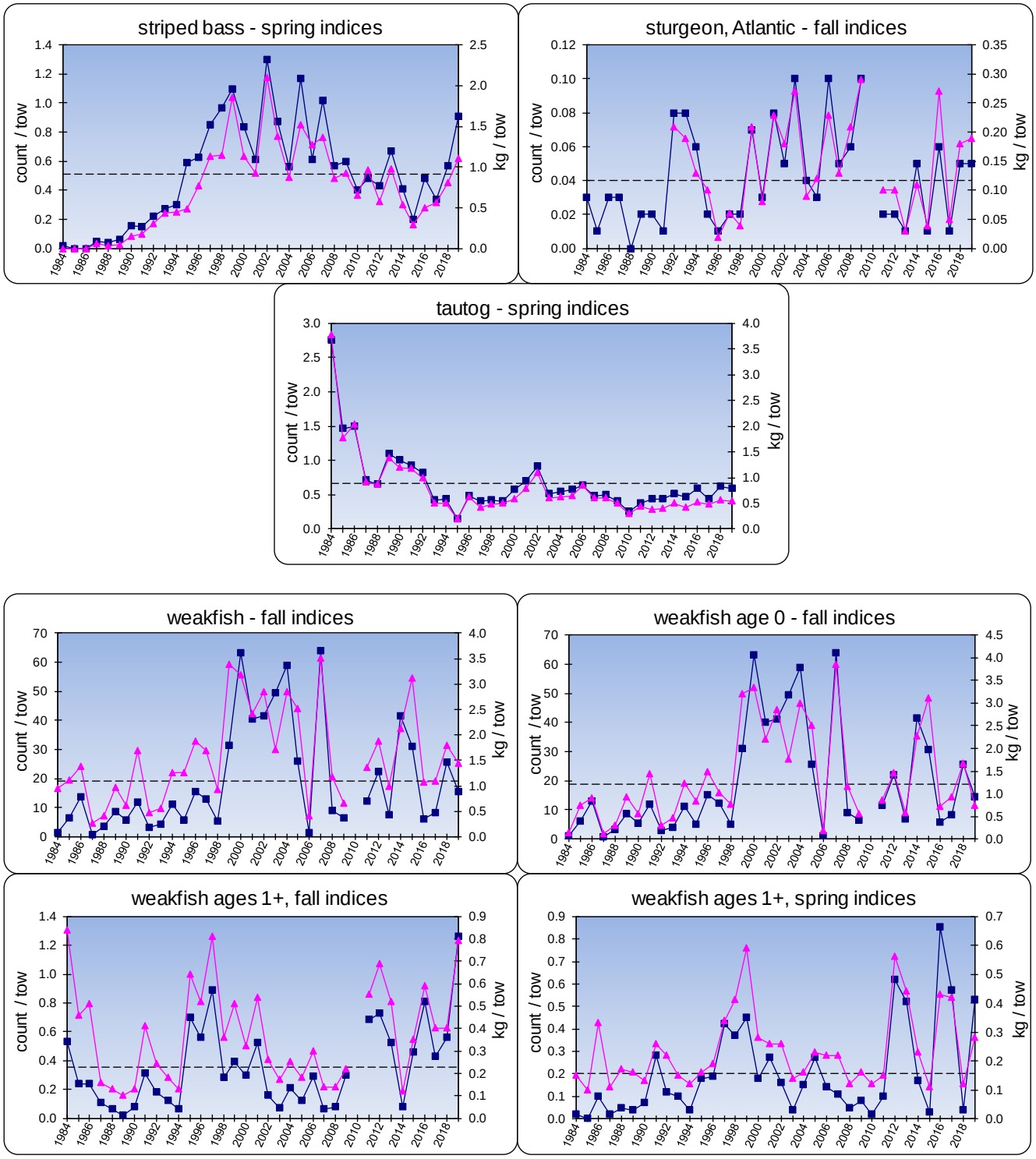
Legend:

■ = count / tow

▲ = kg / tow

---- = mean count / tow

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



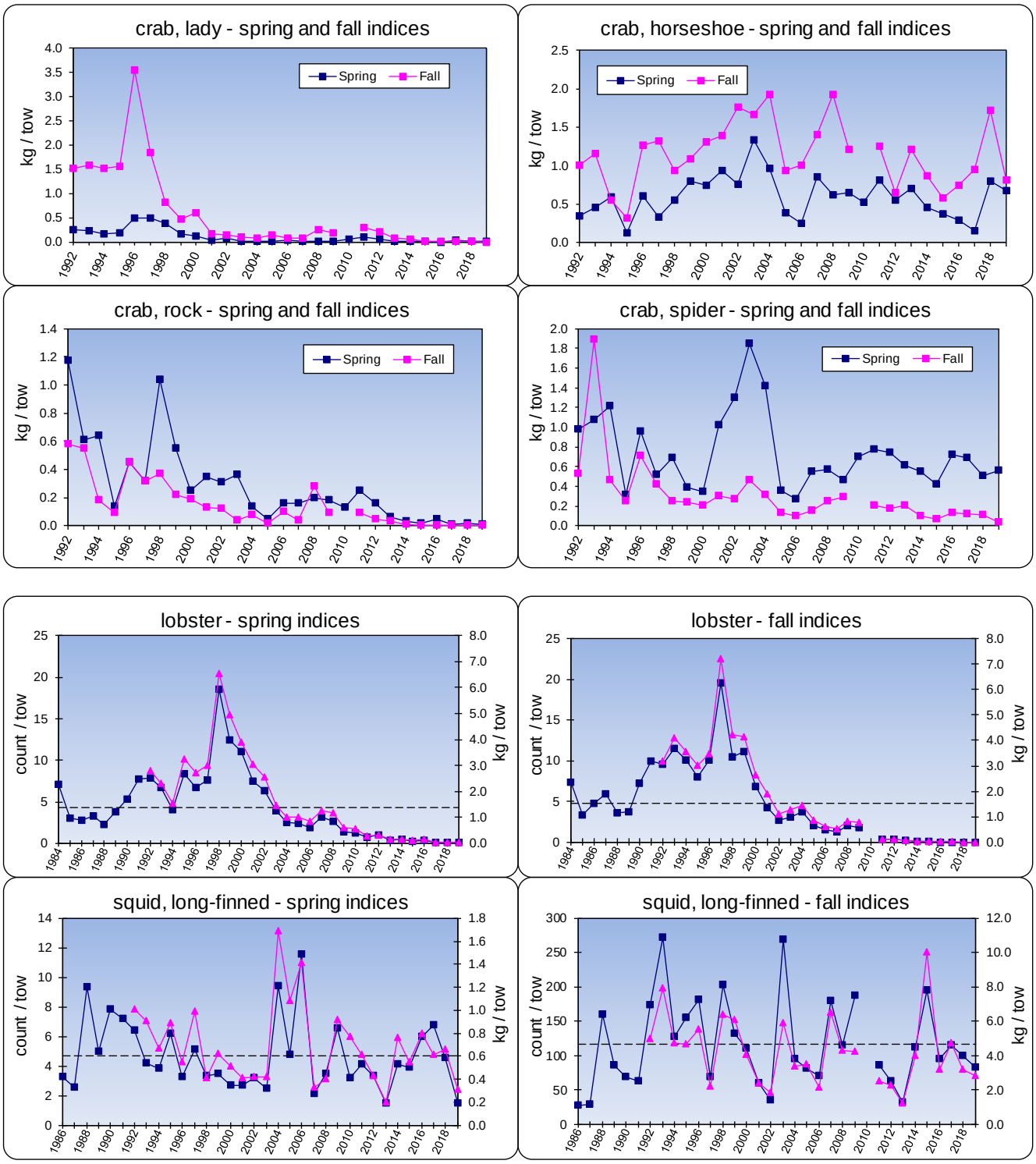
Legend:

■ = count / tow

▲ = kg / tow

---- = mean count / tow

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



Legend for bottom four graphs:

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

Figure 5.15. Mean number of finfish species per sample, spring and fall, 1984-2019. This index measures the diversity of species supported within the Sound's various habitats.

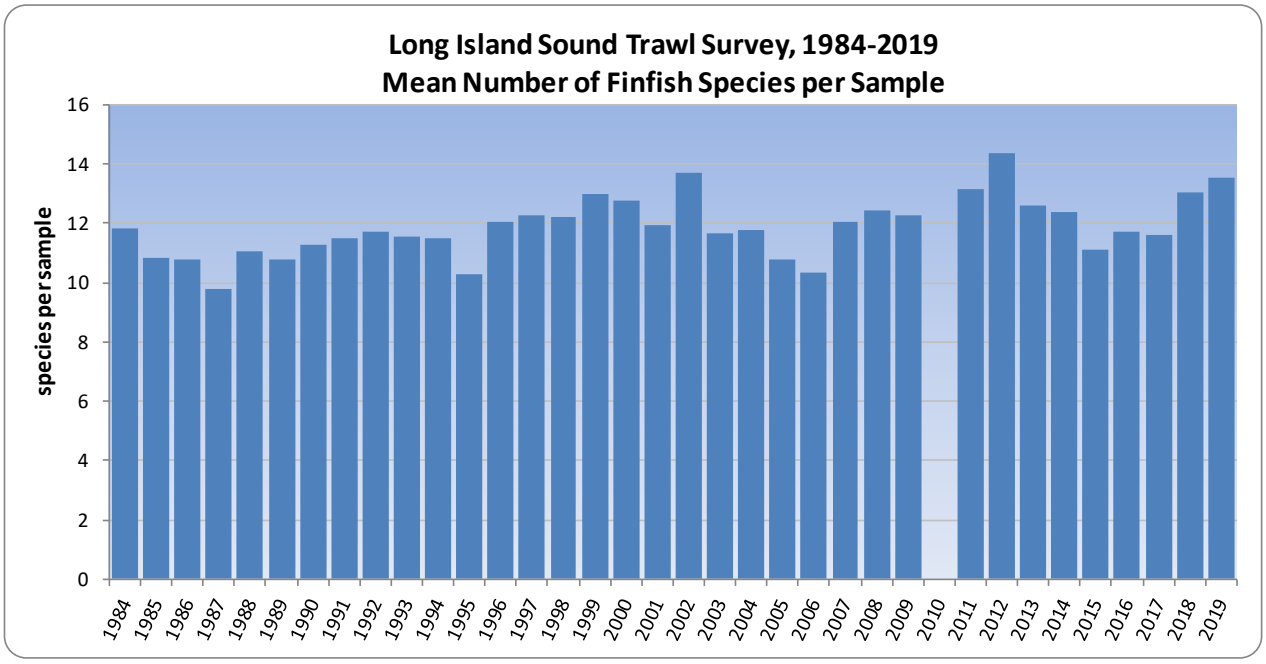


Figure 5.16. Open water forage abundance, 1992-2019. The geometric mean is calculated as the aggregate sample biomass per tow of 14 of the most common forage species sampled in the survey. This index measures the available food base which supports both resident and migratory species. The average since 1992 is 14.41 kg/tow (red line).

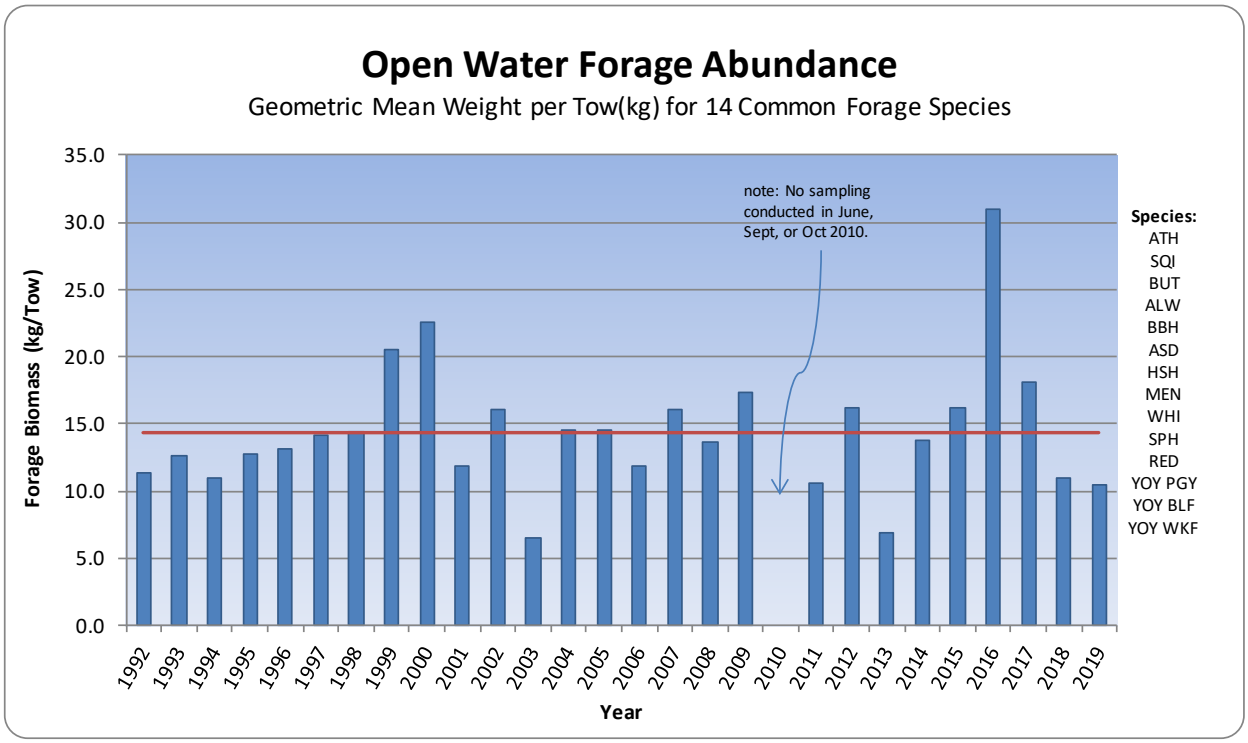
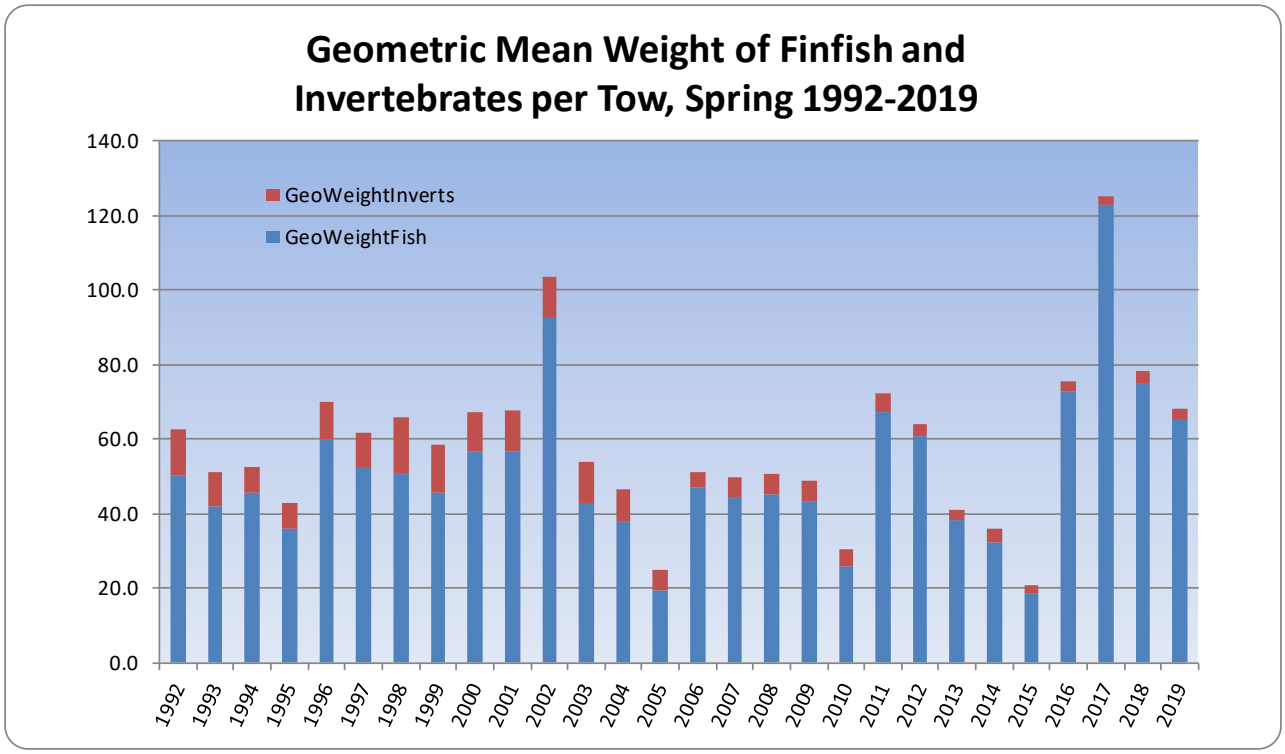


Figure 5.17. Geometric mean biomass of finfish and invertebrates per sample, spring and fall, 1992-2019. This index measures the diversity of species supported within the Sound's various habitats.



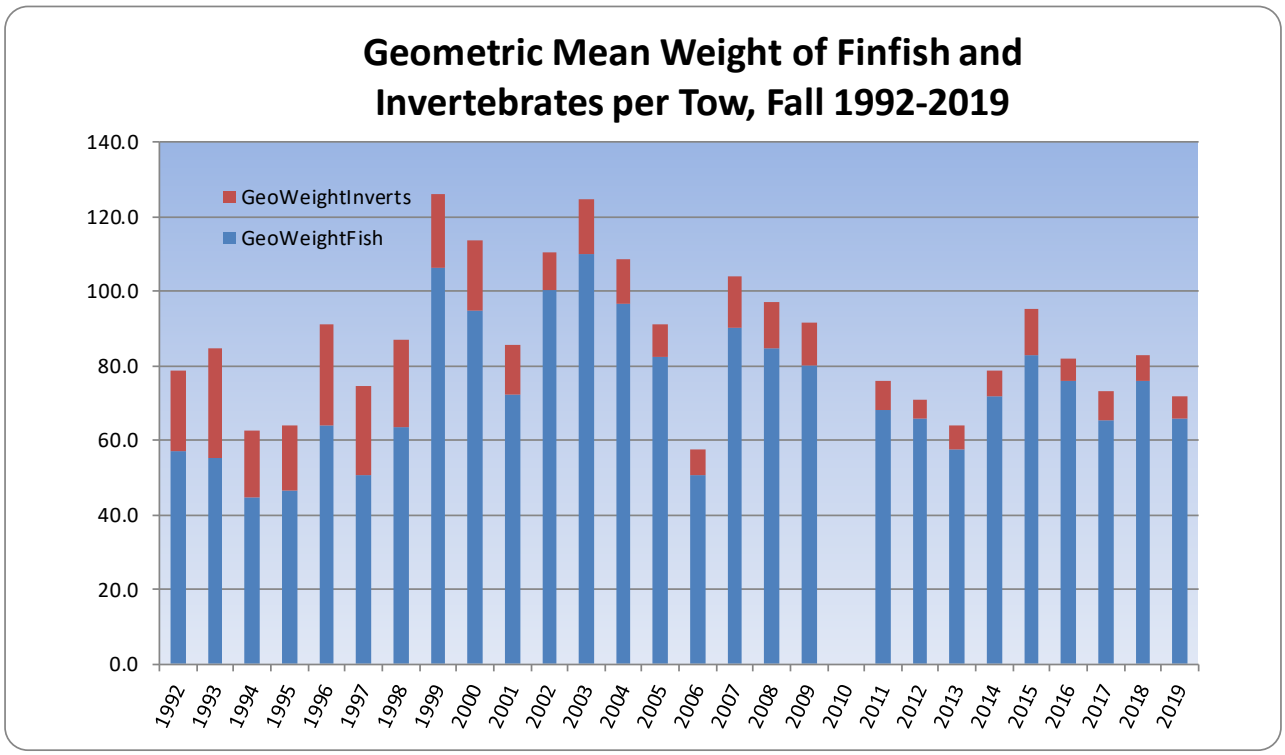
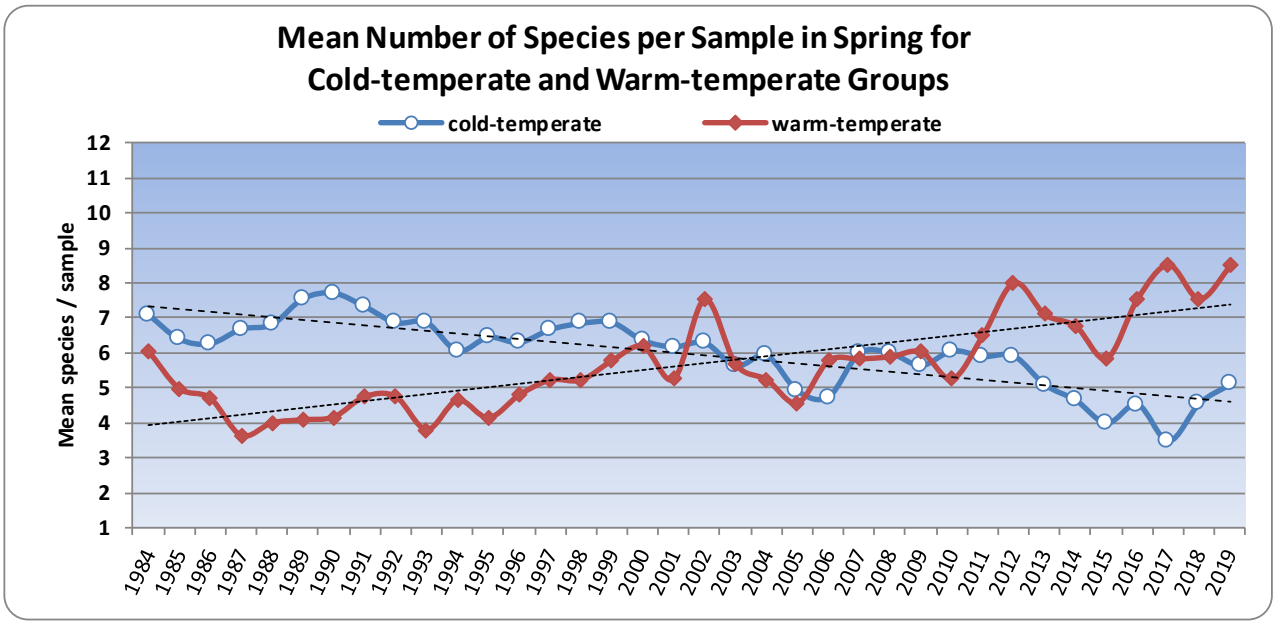
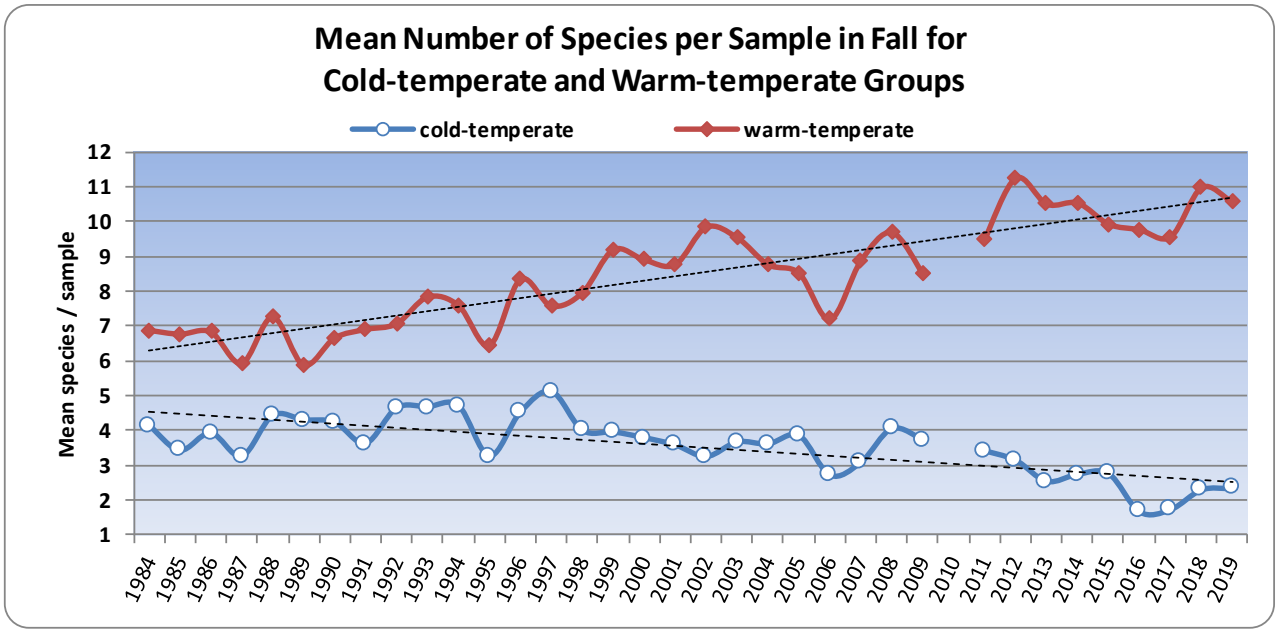


Figure 5.18. Trends in the number of cold temperate versus warm temperate species per sample captured in spring and fall LIS Trawl Surveys. See Appendix 2.5 for list of species included in analysis.





APPENDICES
LISTS

Appendix 5.1. List of finfish species identified by A *Study of Marine Recreational Fisheries in Connecticut* (F54R) and other CT DEEP Marine Fisheries programs. LISTS has collected one hundred-eleven (112) finfish species from 1984-2019.
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	*Anchoa mitchilli*	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC
anchovy, striped	*Anchoa hepsetus*	LISTS;ESS;IS;SS
banded rudderfish	*Seriola zonata*	LISTS;ESS
bass, largemouth	*Micropterus salmoides*	ISS;ESS;TN;CTR
bass, rock	*Ambloplites rupestris*	ISS; TN;CTR
bass, smallmouth	*Micropterus dolomieu*	ISS; TN;CTR
bass, striped	*Morone saxatilis*	LISTS;NRRWS;ESS;ISS; SS;NCA;MISC;EPA;TN;CTR
bigeye	*Priacanthus arenatus*	LISTS;IS
bigeye, short	*Pristigenys alta*	LISTS
black sea bass	*Centropristis striata*	LISTS;NRRWS;ESS;IS; SS;NCA;MISC;EPA
blenny, feather	*Hypsoblennius hentz*	LISTS;ESS
bluefish	*Pomatomus saltatrix*	LISTS;NRRWS;ESS;ISS;SS;MISC;EPA;CTR
bluegill	*Lepomis macrochirus*	TN;CTR
bonefish	*Albula vulpes*	ISS
bonito, Atlantic	*Sarda sarda*	LISTS;EPA
bullhead, brown	*Ameiurus nebulosus*	ISS;NCA;TN;CTR
burrfish, striped	*Chilomycterus schoepfi*	LISTS;ESS
burrfish, web	*Chilomycterus antillarum*	ESS
butterfish	*Peprilus triacanthus*	LISTS;NRRWS;ESS;ISS;IS; SS;NCA;MISC;EPA
butterfly fish, banded	*Chaetodon striatus*	ESS
carp	*Cyprinus carpio*	ISS;NCA;TN;CTR
catfish, channel	*Ictalurus punctatus*	ISS;NCA;TN;CTR
catfish, white	*Ameiurus catus*	NCA;TN;CTR
cod, Atlantic	*Gadus morhua*	LISTS;SS
cornetfish, bluespotted	*Fistularia tabacaria*	LISTS;ESS;IS
cornetfish, red	*Fistularia petimba*	LISTS;IS
crappie, black	*Pomoxis nigromaculatus*	ISS;NCA;TN;CTR
crappie, white	*Pomoxis annularis*	TN;CTR
croaker, Atlantic	*Micropogonias undulates*	LISTS;ISS;IS
cunner	*Tautogolabrus adspersus*	LISTS;NRRWS;ESS;ISS;IS; SS;MISC;EPA
cusk-eel, fawn	*Lepophidium profundorum*	LISTS
cusk-eel, striped	*Ophidion marginatum*	LISTS;SS
dace	*Rhinichthys spp.*	ISS
darter, tessellated	*Etheostoma olmstedi*	ISS
dogfish, smooth	*Mustelus canis*	LISTS;NRRWS;ESS;IS;SS;MISC;EPA
dogfish, spiny	*Squalus acanthias*	LISTS;NRRWS;MISC
drum, black	*Pogonias cromis*	LISTS
eel, American	*Anguilla rostrata*	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;NCA;EPA;TN;CTR
eel, conger	*Conger oceanicus*	LISTS;IS;SS;ESS
fallfish	*Semotilus corporalis*	ISS
filefish, orange	*Aluterus schoepfi*	LISTS;IS;SS
filefish, planehead	*Stephanolepis hispidus*	LISTS;EPA
filefish, scrawled	*Aluterus scriptus*	IS

Appendix 5.1 cont.

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

Appendix 5.1 cont.

Common Name	Scientific Name	Survey
Puffer, smooth	*Lagocephalus laevigatus*	LISTS
pumpkinseed	*Lepomis gibbosus*	ESS;ISS;NCA;TN;CTR
radiated shanny	*Ulvaria subbifurcata*	SNFH
ray, bluntmose stingray	*Dasyatis say*	LISTS
ray, bullnose	*Myliobatis freminvillei*	LISTS
ray, roughtail stingray	*Dasyatis centroura*	LISTS
rockling, fourbeard	*Enchelyopus cimbrius*	LISTS;NRRWS;ESS;IS;SNFH;SS;MISC;EPA
salmon, Atlantic	*Salmo salar*	LISTS;TN
sand lance, American	*Ammodytes americanus*	LISTS;ESS;IS;SNFH;SS
scad, bigeye	*Selar crumenophthalmus*	LISTS;SS;MISC
scad, mackerel	*Decapterus macarellus*	LISTS;SS
scad, rough	*Trachurus lathami*	LISTS;NRRWS;SS;MISC;EPA
scad, round	*Decapterus punctatus*	LISTS;NRRWS;ESS
sculpin, longhorn	*Myoxocephalus octodecemspinosus*	LISTS;NRRWS;ISS;SNFH;MISC
scup	*Stenotomus chrysops*	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA
sea raven	*Hemitripterus americanus*	LISTS;SNFH;MISC;EPA
seahorse, lined	*Hippocampus erectus*	LISTS;ESS;IS
searobin, northern	*Prionotus carolinus*	LISTS;NRRWS;ESS;IS;SNFH;SS;MISC;EPA
searobin, striped	*Prionotus evolans*	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA
seasnail	*Liparis atlanticus*	LISTS;SNFH
sennet, northern	*Sphyraena borealis*	LISTS;ESS
shad, American	*Alosa sapidissima*	LISTS;NRRWS;ESS;ISS;SS;MISC;EPA;TN;CTR
shad, gizzard	*Dorosoma cepedianum*	LISTS;NRRWS;ESS;ISS;TN
shad, hickory	*Alosa mediocris*	LISTS;NRRWS;ISS;SS;MISC;EPA;CTR
shark, sand tiger shark	*Carcharias taurus*	LISTS
shark, sandbar (brown) shark	*Carcharhinus plumbeus*	LISTS
sharksucker	*Echeneis naucrates*	LISTS
shiner, golden	*Notemigonus crysoleucas*	ISS;TN
shiner, spottail	*Notropis hudsonius*	ISS;NCA;TN;CTR
silverside, Atlantic	*Menidia menidia*	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;MISC;EPA
silverside, inland	*Menidia beryllina*	SNFH
skate, barndoor	*Dipturus laevis*	LISTS
skate, clearnose	*Raja eglanteria*	LISTS;NRRWS;IS
skate, little	*Leucoraja erinacea*	LISTS;NRRWS;ESS;IS;SS;NCA;MISC;EPA;CTR
skate, winter	*Leucoraja ocellata*	LISTS;NRRWS;SS;MISC
skilletfish	*Gobiesox strumosus*	ESS
smelt, rainbow	*Osmerus mordax*	LISTS;ESS;IS;SNFH;SS;TN;CTR
snapper, glasseye	*Heteropriacanthus cruentatus*	LISTS
snapper, grey	*Lutjanus griseus*	ESS;IS
snapper, mahogany	*Lutjanus mahogoni*	LISTS
spot	*Leiostomus xanthurus*	LISTS;NRRWS;ESS;ISS;IS;SS;MISC;EPA
stargazer, northern	Astroscopus guttatus	LISTS;ESS
stickleback, blackspotted	*Gasterosteus wheatlandi*	ESS
stickleback, four-spine	*Apeltes quadracus*	ESS;IS
stickleback, nine-spine	*Pungitius pungitius*	ESS;IS
stickleback, three-spine	*Gasterosteus aculeatus*	ESS;IS;TN
sturgeon, Atlantic	*Acipenser oxyrinchus*	LISTS
sucker, white	*Catostomus commersonii*	ISS;NCA;TN;CTR
tautog	*Tautoga onitis*	LISTS;NRRWS;ESS;ISS;IS;SS;NCA;MISC;EPA
tomcod, Atlantic	*Microgadus tomcod*	LISTS;NRRWS;ESS;ISS;IS;SNFH;SS;EPA;CTR
triggerfish, gray	*Balistes capriscus*	LISTS
trout, brook	*Salvelinus fontinalis*	TN;CTR
trout, brown	*Salmo trutta*	CTR;ISS
walleye	*Sander vitreus*	ISS;ESS;TN
weakfish	*Cynoscion regalis*	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, 1984-2019.

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	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	Total
(number of tows)	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	78	172	200	200	199	200	196	144	172	200	7,499
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	**39,177**
anchovy, striped	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	11	0	0	216	0	47	0	2	0	0	0	6	1	5	0	1	3	1	0	2	8	0	222	21	**546**
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	**106,501**
bigeye	0	0	0	1	2	2	1	0	0	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	**15**
bigeye, short	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	1	0	0	0	0	**20**
black sea bass	34	53	44	24	22	21	39	39	5	20	34	12	27	22	18	50	69	134	394	64	124	42	19	116	122	121	37	91	410	449	1,295	1,109	1,181	980	1,434	1,584	**10,241**
blenny, feather	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	**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	**438**
bluefish	9,927	8,946	5,712	3,517	3,857	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	**196,961**
bonito, Atlantic	0	2	0	1	1	1	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**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	1	0	0	0	1	0	0	0	0	0	0	0	0	**2**
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	**2,296,769**
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	0	15	21	109	0	0	5	5	1	4	11	15	**292**
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	36	0	0	0	34	8	17	0	0	5	16	2	0	17	7	**142**
cornetfish, red	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	0	0	1	0	14	0	0	0	0	**17**
cornte fish, 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	1	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	**6,503**
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	1	0	0	1	0	1	2	6	0	0	1	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	20	2	13	4	4	4	0	**2,032**
cusk-eel, fawn	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	2	**6**
cusk-eel, 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	1	0	2	0	0	6	0	3	0	1	0	**15**
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	**23,040**
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	**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	1	0	0	2	0	0	**3**
eel, American	2	0	1	0	0	2	0	0	0	1	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	1	**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	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	**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	2	**22**
eel, conger (yoy/larvae)	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	**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	**4**
filefish, planehead	4	20	1	0	25	13	23	1	0	10	1	0	3	0	0	3	0	1	0	1	0	0	1	0	1	1	0	0	0	0	4	2	0	0	1	1	**117**
flounder, American plaice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	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	**67,769**
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	**2,318**
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	**21,064**
flounder, windowpane	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	**267,049**
flounder, winter	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	3,365	1,912	1,372	1,340	1,108	112	500	422	**435,267**
flounder, yellowtail	0	0	0	0	7	0	1	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	1	1	2	1	0	1	0	0	0	2	0	0	0	0	**20**
glasseye snapper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	4	8	1	6	0	0	0	1	0	2	0	1	0	0	**27**
goatfish, dwarf	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
goatfish, red	1	0	0	0	0	0	2	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	21	1	0	0	0	0	0	**29**
goby, naked	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	1	0	0	**2**
goosefish	1	8	1	1	1	15	3	8	10	4	8	4	1	2	3	2	1	1	3	0	1	2	1	0	0	0	0	0	2	0	0	2	70	0	1	2	**159**
grubby	0	1	1	1	5	9	6	0	0	0	5	1	2	11	5	2	0	0	1	2	0	2	0	1	0	0	0	4	0	0	0	0	0	0	0	0	**59**
gunnel, rock	0	6	0	6	5	10	9	0	0	0	1	0	3	0	0	0	3	1	1	6	2	9	2	1	2	2	29	4	1	0	0	1	0	0	0	0	**105**
haddock	0	0	0	0	0	0	0	0	0	0	0	2	0	1	7	1	0	0	0	26	7	2	0	0	0	0	0	0	0	5	0	0	1	0	1	0	**52**
hake, red	3,696	1,161	3,061	2,258	3,808	7,365	3,300	2,085	1,606	4,183	546	1,977	872	748	3,015	2,973	2,393	1,382	2,103	873	829	585	625	2,788	1,723	897	990	278	1,720	849	398	480	668	152	361	1,215	**63,961**
hake, silver	1,525	724	1,464	1,848	3,427	3,551	4,243	1,537	544	508	2,136	1,941	489	1,973	1,870	5,126	679	3,945	2,013	496	1,417	165	1,267	290	6,587	947	1,747	948	7,519	519	323	100	891	309	450	4,348	**67,865**
hake, spotted	78	69	96	55	255	12	42	73	68	497	184	72	384	77	142	381	1,425	606	798	656	230	234	321	340	1,267	327	665	725	626	927	505	302	2,456	1,253	1,015	2,027	**19,188**
harvestfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	2	1	**6**
herring, alewife	284	37	242	819	415	473	287	103	122	934	1,431	386	1,402	1,194	456	1,393	1,572	638	855	746	859	742	573	1,537	931	1,175	172	512	708	376	555	485	2,811	38	1,052	1,401	**27,715**
herring, Atlantic	112	510	2,536	2,549	2,721	2,560	25,029	4,003	4,565	6,271	3,850	9,135	972	3,455	893	2,511	770	497	365	459	851	1,168	66	1,932	356	6,330	1,318	1,482	571	3,566	1,838	630	340	10	352	1,294	**95,864**
herring, Atlantic (yoy-est)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,540	1,542	1,380	9,046	539	1,007	10,334	12	3,255	47	48	623	11,196	487	587	817	1,341	1,207	952	**45,960**
herring, Atlantic thread	0	0	0	0	0	0	0	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**
herring, blueback	1,722	117	267	104	247	367	124	38	175	106	1,199	255	97	630	211	19	143	279	68	110	218	111	63	156	74	291	101	72	46	68	58	249	448	89	579	124	**9,024**
herring, round	22	15	0	1	0	0	0	0	2	6	2	0	0	0	31	0	0	5	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	**87**
hogchoker	293	282	140	87	113	118	259	104	61	73	37	17	45	15	12	39	40	85	100	92	83	61	22	78	38	39	34	147	340	250	246	255	354	391	811	383	**5,543**
jack, crevalle	0	1	0	1	4	0	0	0	0	6	8	1	0	3	0	8	0	0	1	2	2	2	0	2	0	1	0	4	2	0	2	4	1	1	6	4	**66**
jack, yellow	0	0	0	0	0	41	8	11	2	2	6	32	6	2	6	20	3	3	13	1	1	28	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**186**
kingfish, northern	0	0	0	0	0	1	1	4	2	10	7	25	6	7	15	6	2	2	1	1	5	4	0	4	3	7	0	34	59	14	51	97	31	11	75	14	**499**
lamprey, sea	0	0	0	1	1	0	1	1	0	2	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	**12**
lizardfish, inshore	0	0	0	0	0	2	0	0	0	0	1	0	0	2	1	7	1	21	1	0	0	1	4	2	10	2	0	43	0	0	30	0	4	1	7	2	**142**

Appendix 5.2 cont.

Common name	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	Total
(number of tows)	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	78	172	200	200	199	200	196	144	172	200	7,499
lobster, American	5,995	3,549	4,924	6,923	6,032	7,645	9,696	8,524	8,160	12,583	9,123	9,944	9,490	16,467	16,211	13,922	10,481	5,626	3,880	2,923	1,843	1,389	748	1,648	1,096	853	293	230	349	144	178	92	74	12	15	25	181,086
lookdown	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	7
lumpfish	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
mackerel, Atlantic	68	17	20	29	45	376	46	2	4	17	11	1	5	8	13	21	2	0	5	8	0	37	0	9	0	5	0	0	0	0	2	4	0	3	10	0	768
mackerel, Spanish	0	0	0	0	0	11	0	2	1	233	106	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	65	422
menhaden, Atlantic	161	304	718	600	335	623	407	348	1,115	298	411	318	88	116	306	1,187	492	86	366	799	746	235	28	426	47	69	7	181	426	234	723	1,279	876	239	227	815	15,635
moonfish	7	226	23	7	142	60	10	24	62	6	149	33	921	287	1,188	645	1,817	225	424	133	182	356	361	979	689	2,575	0	640	262	868	2,200	891	265	273	143	2,270	19,343
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	1	1	0	0	0	0	0	0	0	2
ocean pout	26	3	14	14	30	58	39	42	18	66	42	30	26	15	13	17	18	6	13	14	18	3	5	12	9	22	6	27	14	0	0	2	0	0	0	0	621
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	1	0	0	2	0	0	0	0	0	3
perch, white	0	0	0	0	0	2	0	0	0	4	1	0	1	4	0	1	1	0	0	8	2	0	0	0	4	1	0	1	1	0	1	0	0	0	0	2	34
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	2	0	0	0	1	0	0	0	3
pipefish, northern	1	0	1	0	3	0	0	0	5	21	2	2	0	1	0	2	4	4	2	6	2	4	3	2	0	2	4	4	1	2	1	2	0	0	3	5	89
pollock	5	0	3	8	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	18	2	5	0	1	0	0	1	0	0	0	57
pompano, African	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	1
puffer, northern	1	2	6	0	3	2	2	5	1	28	4	1	3	1	28	14	4	8	6	3	5	5	0	8	0	5	0	9	47	3	10	11	5	4	5	9	248
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	1	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	1	0	0	0	1
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	2	0	0	0	0	0	0	0	2
ray, roughtail stingray	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	2	1	13
rockling, fourbeard	376	89	184	312	563	686	393	163	150	242	93	169	109	199	133	233	185	251	106	113	173	106	14	87	81	47	35	43	43	3	4	20	3	0	1	20	5,429
rudderfish, banded	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	0	0	0	0	2
salmon, Atlantic	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	1
sand lance, American	nc	nc	nc	nc	nc	nc	nc	nc	nc	3	25	95	0	2	4	178	4	4	3	19	70	6	0	30	7,495	1,227	13,061	9,535	2	7	12	4	0	7	0	0	31,793
sand lance, (yoy-est)	nc	nc	nc	nc	nc	nc	nc	nc	nc	0	1,000	5	0	0	100	1,075	0	430	0	0	0	0	5,444	2	3,750	7,932	0	15,600	0	0	0	0	0	0	0	0	35,338
scad, bigeye	0	0	0	0	15	63	1	1	0	0	3	0	2	1	1	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	111
scad, mackerel	0	0	0	0	0	0	1	2	6	0	4	1	3	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	21
scad, rough	34	32	19	89	180	81	41	1	0	100	13	0	35	65	0	0	0	10	10	12	14	62	14	13	0	59	0	150	19	28	5	144	1	7	0	0	1,239
scad, round	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	1	2	0	0	4	11	12	0	3	0	1	0	1	0	1	1	1	0	0	0	0	44
sculpin, longhorn	14	82	51	32	107	107	263	139	31	11	7	5	7	4	2	2	14	5	3	5	5	0	0	3	2	2	1	9	1	1	0	2	0	0	0	1	918
scup	8,806	18,054	16,449	9,761	12,566	37,642	21,193	45,790	13,646	32,218	38,456	13,985	16,087	9,582	23,742	101,095	101,464	58,325	100,481	26,926	61,521	52,642	28,829	75,681	53,560	46,991	7,157	34,457	53,119	24,961	45,705	80,534	175,632	75,763	81,228	53,617	1,657,665
sea raven	57	59	70	88	52	34	44	19	4	1	1	2	2	3	30	9	19	7	11	3	7	3	0	5	0	5	6	3	5	0	1	0	1	0	0	0	551
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	1	0	0	0	0	1
seahorse, lined	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	1
searobin, northern	585	2,267	546	280	605	381	357	609	313	951	878	1,317	672	579	360	547	2,014	1,594	2,123	1,632	784	265	630	691	809	2,012	1,128	803	3,642	1,934	2,584	805	3,178	1,430	2,949	3,112	45,366
searobin, striped	1,434	2,295	2,035	1,482	2,086	2,211	2,353	865	857	1,491	1,298	682	1,008	819	1,321	1,690	3,129	2,061	2,394	2,235	1,308	757	366	755	612	1,507	141	1,630	2,973	2,724	2,544	2,728	5,886	3,942	4,223	3,181	69,023
seasnail	0	0	0	0	1	0	8	0	0	0	0	0	0	0	0	0	0	4	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
sennet, northern	1	0	0	0	0	1	0	0	0	2	0	0	0	0	0	6	0	1	2	0	0	8	0	2	0	5	0	1	3	0	0	0	2	0	0	1	35
shad, American	1,852	425	642	1,036	3,208	4,007	550	361	380	1,142	1,723	755	501	922	901	987	316	109	593	689	356	177	68	236	405	422	165	271	321	222	162	275	944	230	230	512	26,093
shad, gizzard	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	9
shad, hickory	71	4	7	6	4	40	2	1	12	10	31	6	29	25	40	56	42	14	45	41	39	136	75	37	5	13	2	8	42	33	30	12	18	4	6	11	957
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	1	0	0	0	1
shark, sandbar (brown)	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	1
sharksucker	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	1
silverside, Atlantic	0	0	0	0	0	0	0	0	1	54	3	39	0	2	0	1	2	1	0	1	0	0	0	1	2	3	1	0	0	3	1	5	3	0	0	0	123
skate, barndoor	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	1
skate, clearnose	0	0	3	2	1	1	3	2	8	8	1	4	1	4	20	22	18	65	59	68	22	102	36	97	37	69	1	56	280	218	104	131	134	73	81	113	1,842
skate, little	2,751	4,614	4,303	3,847	9,471	9,349	11,902	6,479	3,495	6,051	6,714	2,372	6,203	4,068	4,305	3,686	3,340	4,311	4,242	4,071	3,044	1,317	593	1,277	682	709	281	674	1,406	583	770	387	377	113	151	418	118,353
skate, winter	1	20	34	17	114	120	85	50	31	62	51	41	88	48	62	41	31	38	45	82	53	31	23	44	51	44	16	37	97	91	82	30	17	19	3	41	1,739
smelt, rainbow	0	0	0	0	5	4	2	2	0	9	9	4	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
snapper, mahogany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
spot	0	34	38	10	29	0	8	2	0	124	53	3	195	10	0	45	204	13	52	1	8	0	14	0	308	1	0	5	858	1,917	20	14	12	114	36	66	4,192
squid, long-finned	0	0	11,018	15,135	33,400	21,304	23,789	12,322	32,780	58,312	25,396	23,974	22,720	13,048	27,443	21,580	16,585	9,080	8,034	21,350	23,022	17,542	7,802	24,212	10,490	24,130	1,906	13,020	9,767	5,393	13,436	28,266	12,424	14,186	13,146	10,934	626,946
stargazer, northern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	3
striped bass	10	13	12	30	31	59	117	38	42	81	81	165	232	319	400	397	293	214	469	383	378	469	144	422	199	466	71	243	170	200	255	187	167	73	269	535	7,631
sturgeon, Atlantic	11	3	6	6	7	13	9	3	30	60	60	6	3	5	17	39	7	18	18	29	8	9	21	18	7	18	1	5	7	4	13	1	12	1	7	9	491
tautog	734	773	796	624	629	791	693	501	265	164	224	61	136	190	194	217	287	319	565	225	232	179	186	280	179	163	53	106	135	161	194	308	306	77	230	373	11,548
toadfish, oyster	3	4	9	0	0	3	4	1	0	2	0	1	0	0	3	2	6	2	8	9	1	0	1	5	3	3	0	1	0	5	2	2	4	1	2	4	91
tomcod, Atlantic	2	1	0	8	2	3	3	4	8	5	2	4	2	1	0	1	0	0	0	0	2	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	51
triggerfish, gray	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
weakfish	366	2,740	7,751	327	1,341	5,914	2,246	4,320	1,317	2,060	8,156	2,881	6,375	3,904	3,495	12,416	23,595	12,739	10,713	8,183	17,505	9,191	241	17,386	2,531	2,604	1	2,583	6,785	1,964	10,477	10,077	4,689	5,904	7,544	3,766	224,086
Total	122,527	152,574	153,383	136,139	216,479	294,026	277,183	174,235	186,975	230,301	204,795	163,532	165,756	170,761	258,082	392,831	271,608	172,622	229,284	131,812	250,439	200,991	109,330	215,638	164,948	239,154	39,340	146,254	170,798	102,413	177,250	211,566	293,181	162,833	169,361	146,967	6,905,368

Appendix 5.2 cont.

Total count of finfish, lobster, horseshoe crab and squid taken in the LISTS, 1984-2019.

Year	Tows	Total Count
1984	200	122,527
1985	246	152,574
1986	316	153,383
1987	320	136,139
1988	320	216,479
1989	320	294,026
1990	297	277,183
1991	200	174,235
1992	160	186,975
1993	240	230,301
1994	240	204,795
1995	200	163,532
1996	200	165,756
1997	200	170,761
1998	200	258,082
1999	200	392,831
2000	200	271,608
2001	200	172,622
2002	200	229,284
2003	200	131,812
2004	199	250,439
2005	200	200,991
2006	120	109,330
2007	200	215,638
2008	160	164,948
2009	200	239,154
2010	78	39,340
2011	172	146,254
2012	200	170,798
2013	200	102,413
2014	199	177,250
2015	200	211,566
2016	196	293,181
2017	144	162,833
2018	172	169,361
2019	200	146,966
	7,499	6,905,367

Appendix 5.3. Annual total weight (kg) of finfish, lobster, horseshoe crab and squid taken in LISTS, 1992-2019.

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

Common name	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	Total
(number of tows)	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	5,280
anchovy, bay	nw	nw	nw	nw	nw	nw	nw	5.6	12.2	3.6	6.6	13.3	10.3	5.8	8.3	14.5	7.7	35.3	2.8	10.5	8.6	6.8	9.4	3.1	8.7	7.7	3.3	6.6	**190.7**
anchovy, striped	nw	nw	nw	nw	0.2	0.0	0.0	6.1	0.0	1.2	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.0	0.1	0.2	0.1	0.0	0.1	0.5	0.0	4.1	0.4	**13.7**
Anchovy, spp (yoy-est)	nw	nw	nw	nw	nw	nw	nw	0.5	4.5	0.8	1.5	2.0	3.0	1.5	0.6	0.8	5.1	0.7	0.0	1.0	0.4	1.3	2.6	3.3	3.1	7.9	1.7	1.4	**43.7**
bigeye	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	**0.8**
bigeye, short	0.0	0.1	0.1	0.0	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	**1.1**
black sea bass	1.8	6.4	11.0	4.7	12.1	10.5	10.6	17.2	22.6	74.8	188.3	49.6	40.5	26.4	9.3	46.8	29.8	59.5	20.1	54.2	141.0	181.2	543.3	678.0	823.4	714.8	690.7	816.7	**5,285.3**
blenny, feather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.2**
blue runner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	2.3	0.0	1.7	2.7	0.0	0.9	6.7	1.5	0.1	19.9	3.8	**40.0**
bluefish	2,462.9	2,226.1	2,341.7	1,156.1	1,118.2	977.6	899.0	1,218.0	1,408.0	751.2	1,099.7	791.6	2,140.6	1,333.8	358.6	1,801.3	641.4	1,157.4	6.1	584.7	532.7	517.7	522.7	324.4	1,118.7	263.6	161.4	224.5	**28,139.7**
bonito, Atlantic	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**12.0**
burrfish, striped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.0**
butterfish	1,357.3	1,450.1	1,202.2	1,664.5	1,844.7	2,017.2	3,661.1	4,171.6	1,458.3	1,834.0	1,924.2	682.8	1,842.7	2,097.3	1,631.4	1,446.2	1,442.0	3,186.9	166.9	1,600.8	1,891.3	1,252.5	1,707.6	1,011.2	2,036.1	1,426.0	1,412.7	1,114.1	**48,533.7**
cod, Atlantic	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.1	0.0	0.0	2.8	4.7	0.9	0.0	0.0	0.0	1.0	2.1	9.2	0.0	0.0	0.3	4.7	4.9	0.1	3.2	5.1	**39.5**
Gadus spp. (yoy/larvae)	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	1.5	0	0	0	1.8	0.3	0.4	0	0	0.4	1.1	0.2	0	0.4	0.2	**6.3**
cornetfish, red	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0	**0.8**
corntefish, blue spotted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	**0.1**
crab, horseshoe	514.1	807.9	463.1	116.8	717	472.4	489.4	634.1	689.4	870.7	862.9	751	873.4	304.2	205.8	596.4	496.8	645.8	112.2	505.2	385.8	531.8	497.3	288.3	315.5	224.4	512.3	391.9	**14,275.9**
croaker, Atlantic	0.0	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.2	1.5	0.0	0.0	0.1	0.0	**5.0**
cunner	3.7	6.2	2.1	4.4	2.6	4.1	8.1	5.9	5.3	5.9	7.2	6.7	3.7	4.1	1.3	3.0	3.6	1.8	1.3	1.9	2.8	1.8	0.2	1.8	0.5	0.5	0.5	0.0	**91.0**
cusk-eel, fawn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	**0.3**
cusk-eel, striped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.6	0.0	0.1	0.0	0.1	0.0	**1.2**
dogfish, smooth	863.2	1,339.1	934.6	566.8	862.8	527.3	989.8	923.0	1,038.5	1,407.6	2,814.3	1,527.4	1,435.3	1,421.7	1,176.6	2,110.2	1,134.2	2,213.3	34.4	2,031.7	1,833.3	2,162.3	2,799.2	2,804.1	2,785.6	3,391.3	3,024.9	2,957.2	**47,109.7**
dogfish, spiny	30.7	58.4	199.6	0.0	2.1	13.7	44.5	51.1	9.9	128.6	48.0	239.5	104.7	102.0	47.0	122.3	127.7	545.7	16.2	203.5	62.8	91.5	62.2	80.8	43.6	15.6	16.7	23.8	**2,492.2**
drum, black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.2	0	0	**0.3**
eel, American	0.0	1.6	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	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	**3.7**
eel, American (yoy)	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	**0.3**
eel, conger	0.1	0.2	0.0	1.2	0.1	0.0	0.0	0.5	0.0	0.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	1.2	0.0	0.3	0.0	0.0	0.0	0.3	**6.7**
eel, conger (yoy)	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	nw	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	**0.3**
filefish, orange	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.2**
filefish, planehead	0.0	0.8	0.1	0.0	0.3	0.0	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.1	0.1	**2.8**
flounder, American plaice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.3**
flounder, fourspot	382.4	193.6	202.4	402.9	407.2	615.3	306.0	203.9	398.6	362.7	326.9	350.1	309.3	125.9	88.1	224.9	186.3	169.8	92.0	224.2	454.5	203.4	145.0	76.3	175.3	67.9	147.6	147.8	**6,990.3**
flounder, smallmouth	0.6	2.6	1.5	1.2	2.3	2.4	6.4	5.2	2.7	3.8	4.9	3.0	2.8	2.4	0.6	2.6	3.2	4.7	1.4	3.5	7.5	5.2	6.0	3.6	4.2	2.0	2.9	4.1	**93.3**
flounder, summer	142.1	193.1	173.0	79.6	266.4	326.0	431.3	459.8	471.3	628.1	989.3	845.7	627.2	406.1	180.5	590.9	398.0	694.4	229.6	713.0	718.5	726.6	567.4	449.3	386.4	244.0	397.0	464.3	**12,798.9**
flounder, windowpane	286.1	578.9	597.2	356.2	1,223.6	986.1	741.1	594.2	368.8	475.5	343.3	378.8	333.7	177.5	128.9	510.8	524.0	342.8	449.3	395.9	501.1	326.6	365.6	191.1	154.7	127.1	189.6	242.5	**11,891.0**
flounder, winter	1,344.8	1,898.0	2,060.9	1,614.7	3,335.0	2,439.4	2,450.3	2,011.7	1,921.4	1,993.6	1,584.1	1,421.9	839.9	566.1	271.2	951.3	751.9	524.0	450.5	613.8	604.9	576.8	459.7	319.7	261.0	27.7	132.2	103.1	**31,529.6**
flounder, yellowtail	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.4	1.0	0.4	0.2	0.0	0.3	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	**3.7**
glasseye snapper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.7	0.1	0.6	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	**2.0**
goatfish, red	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	**0.9**
goby, naked	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	**0.2**
goosefish	2.5	0.5	2.0	3.3	0.1	1.6	3.2	0.3	0.2	0.4	0.6	0.0	0.1	0.7	1.2	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.1	23.3	0.0	0.9	0.8	**42.6**
grubby	0.0	0.0	0.3	0.1	0.2	0.7	0.3	0.2	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.4**
gunnel, rock	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.2	0.6	0.1	0.1	0.2	0.2	0.5	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	**3.4**
haddock	0.0	0.0	0.0	0.2	0.0	0.1	0.5	0.1	0.0	0.0	0.0	1.3	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.1	0.0	1.6	0.0	**5.1**
hake, red	127.7	254.4	63.9	145.6	95.5	80.5	217.5	226.5	162.6	109.7	206.6	73.4	51.6	56.0	37.4	200.4	141.3	59.5	64.3	25.1	148.6	61.1	33.5	44.5	50.3	11.9	25.8	77.5	**2,852.7**
hake, silver	22.0	21.9	127.6	61.6	20.0	70.8	88.3	99.6	28.8	152.2	89.6	13.9	27.3	7.1	37.7	14.6	208.5	50.0	35.4	40.3	171.0	23.6	10.6	6.5	32.9	12.3	18.3	126.1	**1,618.5**
hake, spotted	10.3	55.9	32.4	6.5	42.6	19.0	12.2	38.8	92.3	34.9	48.2	70.4	37.8	17.4	24.3	23.9	65.8	32.1	15.8	76.8	64.2	66.8	59.5	40.1	113.8	111.2	151.7	178.3	**1,543.0**
harvestfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.2	0.1	**0.6**
herring, Atlantic	797.5	1,120.0	769.3	1,631.7	189.8	515.1	74.6	45.4	124.1	72.6	63.9	89.1	58.3	131.1	10.3	234.2	52.1	239.2	179.0	199.4	61.5	321.2	91.2	71.8	37.1	1.1	45.0	302.7	**7,528.3**
herring, Atlantic (yoy-est)	nw	nw	nw	nw	nw	nw	nw	nw	nw	1.5	1.9	2.8	2.4	1.2	0.2	4.2	0.4	1.9	0.3	0.5	1.2	7.3	0.5	1.3	1.3	0.7	1.5	0.9	**32.0**
herring, Atlantic thread	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0	0	0	0	**0.1**
herring, alewife	9.2	54.5	83.2	24.6	134.6	81.3	35.1	107.6	96.0	41.7	70.2	55.3	56.1	47.6	49.5	101.3	51.1	96.0	14.3	29.8	47.0	34.1	43.2	30.5	132.0	2.0	87.5	86.1	**1,701.4**
herring, blueback	8.5	4.7	31.2	7.5	6.2	16.5	5.1	1.1	6.8	11.1	2.4	4.0	6.5	5.4	2.5	9.1	3.2	14.6	3.4	3.2	1.6	4.3	4.2	7.1	12.2	3.5	36.5	6.0	**228.4**
herring, round	0.2	0.3	0.2	0.0	0.0	0.0	0.6	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	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	**1.6**
hogchoker	5.6	7.3	3.9	1.7	5.4	1.8	1.9	5.0	5.9	10.5	13.3	8.6	9.5	8.7	3.2	11.4	5.6	4.5	4.4	16.8	30.7	27.2	27.8	31.2	41.8	50.1	98.9	50.8	**493.5**
jack, crevalle	0.0	0.5	0.5	0.1	0.0	0.6	0.0	0.7	0.0	0.0	0.1	0.2	0.2	0.2	0.0	0.1	0.0	0.1	0.0	0.4	0.2	0.0	0.2	0.4	0.1	0.1	0.5	0.2	**5.4**
jack, yellow	0.2	0.2	0.4	2.1	0.5	0.2	0.7	1.9	0.2	0.3	1.4	0.1	0.1	3.0	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	**11.4**
kingfish, northern	0.2	1.0	0.5	2.5	0.6	0.9	1.3	0.6	0.3	0.2	0.2	0.6	0.5	0.6	0.0	0.4	0.4	0.4	0.0	3.7	8.4	2.3	3.2	7.1	4.8	2.3	9.9	1.9	**54.8**
lamprey, sea	0.0	1.0	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	**5.2**
lizardfish, inshore	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.5	0.1	2.2	0.1	0.0	0.0	0.1	0.4	0.2	0.5	0.2	0.0	4.6	0.0	0.0	2.8	0.0	0.3	0.1	0.5	0.1	**13.1**
lobster, American	1,537.9	2,700.3	1,956.1	2,141.9	2,113.5	3,800.9	3,873.9	3,397.9	2,184.5	1,531.2	1,005.7	690.9	481.5	364.3	197.9	396.5	314.1	244.0	83.6	52.0	70.0	37.3	31.5	24.0	25.2	4.0	3.8	7.6	**29,272.0**
lookdown	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	0.1	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	**0.5**
lumpfish	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.2**
mackerel, Atlantic	1.0	1.3	0.9	0.1	0.5	1.7	1.1	3.1	0.8	0.0	2.5	1.9	0.0	5.7	0.0	0.8	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.4	0.0	1.3	0.7	0.0	**24.4**

Appendix 5.3 cont.

Common name	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	Total
(number of tows)	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	5,280
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	0.0	0.1	0.1	3.7	**19.4**
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	**2,673.8**
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	**226.1**
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	**0.2**
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	**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	**0.3**
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	**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	**0.3**
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	**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	**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	**0.1**
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	**16.5**
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	**0.6**
ray, bullnose ray	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	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	**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	**227.7**
rudderfish, banded	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	**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	**0.1**
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	**26.2**
sand lance, (yoy - est)	nw	0.0	0.8	0.1	0.0	0.0	0.1	0.4	0.0	0.6	0.0	0.0	0.0	0.0	2.9	0.1	0.2	2.3	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.3**
scad, bigeye	0.0	0.0	0.3	0.0	0.1	0.1	0.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	**2.3**
scad, mackerel	0.2	0.0	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	**1.1**
scad, rough	0.0	4.4	0.2	0.0	1.5	2.0	0.0	0.0	0.0	0.7	0.7	0.5	0.7	1.9	0.5	0.7	0.0	2.8	0.0	6.8	1.1	1.3	0.5	7.1	0.1	0.6	0.0	0.0	**34.1**
scad, round	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.2	0.0	0.0	0.3	0.3	0.3	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	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	**37.3**
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	**155,035.2**
sea raven	3.9	0.6	0.2	0.7	1.5	0.4	11.3	4.9	9.2	4.1	4.1	1.6	2.4	0.5	0.0	3.6	0.0	1.7	1.6	0.9	1.1	0.0	1.5	0.0	0.2	0.0	0.0	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	**3.8**
seahorse, lined	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**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	**4,825.4**
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	**19,163.1**
seasnail	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	**0.7**
sennet, northern	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.2	0.0	0.0	0.7	0.0	0.2	0.0	0.4	0.0	0.1	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.1	**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	**1,180.6**
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	**0.9**
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	**282.6**
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	21.8	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	**0.3**
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	**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	**0.4**
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	**3,400.8**
skate, little	1,389.0	2,534.8	3,091.5	1,055.3	2,801.8	1,945.8	2,085.5	1,829.6	1,604.7	2,022.6	2,121.9	2,187.3	1,689.8	682.5	310.6	697.0	327.4	390.0	148.3	359.4	657.9	317.8	428.2	192.0	193.1	63.0	82.4	220.9	**31,430.1**
skate, winter	105.3	220.9	139.2	89.2	212.7	109.7	180.7	89.8	66.5	112.2	133.5	162.1	100.3	59.9	60.0	117.8	140.8	108.5	37.7	101.2	179.8	111.2	133.8	51.8	31.6	34.1	4.1	72.7	**2,967.1**
smelt, rainbow	0.0	0.6	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.7**
snapper, mahogany	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	**0.1**
spot	0.0	10.6	4.3	0.3	14.1	1.1	0.0	5.7	17.8	1.3	7.2	0.1	0.9	0.0	1.2	0.0	21.3	0.2	0.0	0.7	107.5	195.4	1.8	1.7	1.7	10.5	3.8	8.2	**417.4**
squid, long-finned	844.9	1,629.1	965.4	796.4	720.4	515.2	767.0	826.4	582.3	346.2	279.9	573.2	953.4	683.5	326.0	773.6	330.1	648.4	161.4	370.7	333.9	170.8	582.3	1,366.2	464.4	584.5	408.8	368.4	**17,372.8**
stargazer, northern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	**0.4**
striped bass	89.4	210.3	198.6	185.3	373.5	509.9	484.2	815.4	602.6	472.5	855.2	770.3	811.8	675.1	418.7	888.0	456.3	897.4	173.2	721.9	278.0	421.0	407.5	405.2	261.9	186.8	457.4	773.6	**13,801.0**
sturgeon, Atlantic	244.8	633.6	848.6	145.5	19.9	37.8	189.7	498.6	79.0	270.6	275.3	550.2	117.6	152.7	368.7	336.4	111.3	286.6	5.6	181.9	154.2	98.0	272.4	15.8	318.3	60.9	98.6	104.7	**6,477.3**
tautog	508.3	320.0	373.9	95.1	225.9	271.8	347.1	326.6	463.5	491.2	921.1	346.0	353.7	269.2	301.4	551.4	309.4	285.4	83.1	151.7	128.9	160.8	192.5	339.7	288.5	99.0	209.0	351.9	**8,766.1**
toadfish, oyster	0.0	1.2	0.0	0.5	0.0	0.0	0.9	1.8	2.5	0.4	4.7	5.0	0.8	0.0	1.2	2.0	1.9	0.8	0.0	0.2	0.0	0.9	0.6	0.9	1.7	0.3	0.8	1.1	**30.2**
tomcod, Atlantic	1.3	0.8	0.3	0.8	0.3	0.1	0.0	0.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.8**
triggerfish, gray	0.0	0.9	0.0	0.0	0.0	0.0	2.3	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	**3.2**
weakfish	94.8	121.2	344.5	275.7	414.9	362.0	268.2	771.3	554.5	415.0	442.0	194.8	426.9	449.9	52.2	584.8	116.1	108.7	1.0	192.6	409.2	203.7	334.8	530.4	297.6	311.2	270.2	245.5	**8,793.7**
Total	**14,545.1**	**20,214.3**	**18,679.6**	**14,022.0**	**18,386.1**	**17,763.5**	**20,136.1**	**23,914.0**	**22,617.2**	**21,748.8**	**32,213.8**	**19,710.6**	**21,370.3**	**13,830.5**	**11,233.6**	**19,312.0**	**15,386.5**	**20,294.8**	**4,812.3**	**17,144.4**	**18,361.7**	**16,592.2**	**17,288.4**	**17,313.4**	**29,304.2**	**19,532.4**	**24,002.8**	**22,955.1**	**532,685.7**

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.

species	count	%	weight	%	species	count	%	weight	%
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	.	.	**Total**	**60,230**			
summer flounder	150	0.2	.	.					
alewife	108	0.2	.	.	**Invertebrates**				
hickory shad	71	0.1	.	.	American lobster	2865	100	.	.
Atlantic menhaden	67	0.1	.	.	**Total**	**2,865**		-	

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

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

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.

species	count	%	weight	%	species	count	%	weight	%
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	.	.	**Total**	**90,031**		-	
fourbeard rockling	123	0.1	.	.					
cunner	76	0.1	.	.					
sea raven	70	0.1	.	.	**Invertebrates**				
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	.	.	**Total**	**9,090**		-	

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.

species	count	%	weight	%	species	count	%	weight	%
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	.	.	**Total**	**60,862**		-	
sea raven	86	0.1	.	.					
blueback herring	79	0.1	.	.	**Invertebrates**				
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	.	.	**Total**	**14,096**		-	

Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1988.
Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.

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

Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1989.
Finfish species are in order of descending count. Invertebrate species are in order of descending weight. Number of tows (sample size)=200.

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

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.

species	count	%	weight	%	species	count	%	weight	%
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	.	.	**Total**	**151,600**		-	
sea raven	42	0	.	.					
ocean pout	39	0	.	.					
black sea bass	27	0	.	.	**Invertebrates**				
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	.	.	**Total**	**19,907**		-	

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.

species	count	%	weight	%	species	count	%	weight	%
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	.	.	**Total**	**153,389**		-	
winter skate	50	0	.	.					
ocean pout	42	0	.	.	**Invertebrates**				
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	.	.	**Total**	**20,846**		-	

Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in LISTS in 1992.
Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Number of tows (sample size)=160.

species	count	%	weight	%	species	count	%	weight	%
butterfish	95,961	65.7	1,357.3	11.7	black sea bass	5	0	1.8	0
scup	13,646	9.3	837.7	7.2	northern pipefish	5	0	0.4	0
winter flounder	9,548	6.5	1,344.8	11.5	Atlantic mackerel	4	0	1.0	0
bluefish	5,269	3.6	2,462.9	21.1	sea raven	4	0	3.9	0
Atlantic herring	4,565	3.1	797.5	6.8	northern kingfish	2	0	0.2	0
little skate	3,495	2.4	1,389.0	11.9	round herring	2	0	0.2	0
windowpane flounder	2,980	2.0	286.1	2.5	yellow jack	2	0	0.2	0
fourspot flounder	2,774	1.9	382.4	3.3	Atlantic silverside	1	0	0.1	0
red hake	1,606	1.1	127.7	1.1	conger eel	1	0	0.1	0
weakfish	1,317	0.9	94.8	0.8	northern puffer	1	0	0.1	0
Atlantic menhaden	1,115	0.8	60.6	0.5	Spanish mackerel	1	0	1.5	0
striped searobin	857	0.6	305.1	2.6	**Total**	**146,035**		**11,648.2**	
silver hake	544	0.4	22.0	0.2					
American shad	380	0.3	63.3	0.5	**Invertebrates**				
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	**Total**	**40,940**		**5,372**	

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

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	**Total**	**117,002**		**12,284.5**	
Atlantic menhaden	276	0.2	61.4	0.5					
summer flounder	242	0.2	141.6	1.2	**Invertebrates**				
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	**Total**	**22,356**		**3,972**	

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	**Total**	**129,609**		**10,966.8**	
Atlantic menhaden	318	0.2	41.9	0.4					
blueback herring	255	0.2	7.5	0.1	**Invertebrates**				
fourbeard rockling	169	0.1	14.7	0.1	American lobster	9,944	29.3	2,141.9	55.1
smooth dogfish	168	0.1	566.8	5.2	long-finned squid	23,974	70.7	796.4	20.5
striped bass	165	0.1	185.3	1.7	lady crab	nc	nc	535.0	13.8
summer flounder	121	0.1	79.6	0.7	horseshoe crab	nc	nc	116.8	3
American sand lance	95	0.1	0.4	0	spider crab	nc	nc	95.4	2.5
spotted hake	72	0.1	6.5	0.1	lion's mane jellyfish	nc	nc	78.3	2
tautog	61	0	95.1	0.9	rock crab	nc	nc	47.0	1.2
cunner	41	0	4.4	0	blue mussel	nc	nc	14.0	0.4
winter skate	41	0	89.2	0.8	flat claw hermit crab	nc	nc	12.8	0.3
Atlantic silverside	39	0	0.9	0	boring sponge	nc	nc	11.2	0.3
moonfish	33	0	2.1	0	whelks	nc	nc	10.8	0.3
yellow jack	32	0	2.1	0	mantis shrimp	nc	nc	8.1	0.2
ocean pout	30	0	6.5	0.1	bluecrab	nc	nc	6.0	0.2
northern kingfish	25	0	2.5	0	northern moon snail	nc	nc	5.8	0.1
smallmouth flounder	19	0	1.2	0	starfish spp.	nc	nc	4.7	0.1
hogchoker	17	0	1.7	0	arks	nc	nc	1.4	0
black sea bass	12	0	4.7	0	hard clams	nc	nc	0.7	0
hickory shad	6	0	2.5	0	purple sea urchin	nc	nc	0.7	0
Atlantic sturgeon	6	0	145.5	1.3	sand shrimp	nc	nc	0.4	0
longhorn sculpin	5	0	1.3	0	ghost shrimp	nc	nc	0.3	0
clearnose skate	4	0	11.0	0.1	mud crabs	nc	nc	0.2	0
goosefish	4	0	3.3	0	common razor clam	nc	nc	0.1	0
rainbow smelt	4	0	0.3	0	shore shrimp	nc	nc	0.1	0
Atlantic tomcod	4	0	0.8	0	**Total**	**33,918**		**3,888**	

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	**Total**	**133,546**		**14,835.2**	
summer flounder	434	0.3	266.4	1.8					
spotted hake	384	0.3	42.6	0.3	**Invertebrates**				
smooth dogfish	275	0.2	862.8	5.8	American lobster	9,490	29.5	2,113.5	39.1
striped bass	232	0.2	373.5	2.5	lady crab	nc	nc	1,160.4	21.5
spot	195	0.1	14.1	0.1	long-finned squid	22,720	70.5	720.4	13.3
tautog	136	0.1	225.9	1.5	horseshoe crab	nc	nc	717.0	13.3
fourbeard rockling	109	0.1	8.6	0.1	spider crab	nc	nc	293.9	5.4
blueback herring	97	0.1	6.2	0	rock crab	nc	nc	162.7	3.0
Atlantic menhaden	88	0.1	40.5	0.3	lion's mane jellyfish	nc	nc	42.7	0.8
winter skate	88	0.1	212.7	1.4	blue mussel	nc	nc	42.5	0.8
hogchoker	45	0	5.4	0	flat claw hermit crab	nc	nc	39.4	0.7
smallmouth flounder	41	0	2.3	0	whelks	nc	nc	33.0	0.6
rough scad	35	0	1.5	0	mantis shrimp	nc	nc	20.9	0.4
hickory shad	29	0	10.2	0.1	boring sponge	nc	nc	19.2	0.4
black sea bass	27	0	12.1	0.1	bushy bryozoan	nc	nc	15.2	0.3
ocean pout	26	0	7.2	0	starfish spp.	nc	nc	6.2	0.1
cunner	17	0	2.6	0	arks	nc	nc	4.3	0.1
striped anchovy	11	0	0.2	0	northern moon snail	nc	nc	4.3	0.1
longhorn sculpin	7	0	2.1	0	bluecrab	nc	nc	4.0	0.1
northern kingfish	6	0	0.6	0	hard clams	nc	nc	3.2	0.1
yellow jack	6	0	0.5	0	surf clam	nc	nc	1.4	0
Atlantic mackerel	5	0	0.5	0	mud crabs	nc	nc	0.3	0
planehead filefish	3	0	0.3	0	purple sea urchin	nc	nc	0.1	0
mackerel scad	3	0	0.1	0	**Total**	**32,210**		**5,405**	

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	%
butterfish	70,985	50.3	2,017.2	15.5
winter flounder	14,701	10.4	2,439.4	18.8
bluefish	10,815	7.7	977.6	7.5
windowpane flounder	10,324	7.3	986.1	7.6
scup	9,582	6.8	530.5	4.1
fourspot flounder	4,122	2.9	615.3	4.7
little skate	4,068	2.9	1,945.8	15.0
weakfish	3,904	2.8	362.0	2.8
Atlantic herring	3,455	2.4	515.1	4.0
silver hake	1,973	1.4	70.8	0.5
alewife	1,194	0.8	81.3	0.6
American shad	922	0.7	66.8	0.5
striped searobin	819	0.6	230.5	1.8
red hake	748	0.5	80.5	0.6
blueback herring	630	0.4	16.5	0.1
northern searobin	579	0.4	60.4	0.5
summer flounder	486	0.3	326.0	2.5
striped bass	319	0.2	509.9	3.9
moonfish	287	0.2	4.6	0
fourbeard rockling	199	0.1	17.3	0.1
tautog	190	0.1	271.8	2.1
smooth dogfish	167	0.1	527.3	4.1
Atlantic menhaden	116	0.1	38.5	0.3
spotted hake	77	0.1	19.0	0.1
rough scad	65	0	2.0	0
smallmouth flounder	58	0	2.4	0
winter skate	48	0	109.7	0.8
cunner	43	0	4.1	0
hickory shad	25	0	9.1	0.1
black sea bass	22	0	10.5	0.1
hogchoker	15	0	1.8	0
ocean pout	15	0	4.8	0
grubby	11	0	0.7	0
spot	10	0	1.1	0
Atlantic mackerel	8	0	1.7	0
northern kingfish	7	0	0.9	0
spiny dogfish	7	0	13.7	0.1
Atlantic sturgeon	5	0	37.8	0.3
clearnose skate	4	0	7.4	0.1
longhorn sculpin	4	0	0.8	0
white perch	4	0	0.9	0
crevalle jack	3	0	0.6	0
sea raven	3	0	0.4	0
Atlantic silverside	2	0	0.1	0
goosefish	2	0	1.6	0
inshore lizardfish	2	0	0.2	0
round scad	2	0	0.2	0

species	count	%	weight	%
American sand lance	2	0	0.1	0
short bigeye	2	0	0.2	0
yellow jack	2	0	0.2	0
bigeye scad	1	0	0.1	0
Atlantic cod	1	0	0.3	0
haddock	1	0	0.1	0
northern pipefish	1	0	0.1	0
northern puffer	1	0	0.1	0
roughtail stingray	1	0	50.6	0.4
sea lamprey	1	0	0.1	0
Atlantic tomcod	1	0	0.1	0
yellowtail flounder	1	0	0.3	0
Total	**141,040**		**12,974.6**	
Invertebrates				
American lobster	16,467	55.3	3,800.9	64.6
lady crab	nc	nc	592.5	10.1
long-finned squid	13,048	43.8	515.2	8.8
horseshoe crab	204	0.7	472.4	8.0
spider crab	nc	nc	188.3	3.2
rock crab	nc	nc	94.1	1.6
lion's mane jellyfish	nc	nc	88.0	1.5
bushy bryozoan	nc	nc	28.0	0.5
flat claw hermit crab	nc	nc	21.7	0.4
boring sponge	nc	nc	16.5	0.3
whelks	22	0.1	14.8	0.3
bluecrab	33	0.1	13.6	0.2
mantis shrimp	nc	nc	9.3	0.2
starfish spp.	nc	nc	7.3	0.1
hard clams	nc	nc	3.8	0.1
blue mussel	nc	nc	3.5	0.1
northern moon snail	nc	nc	3.3	0.1
northern comb jelly	nc	nc	2.0	0
arks	nc	nc	1.8	0
common oyster	nc	nc	1.8	0
surf clam	nc	nc	0.9	0
common slipper shell	nc	nc	0.7	0
mud crabs	nc	nc	0.6	0
sand shrimp	nc	nc	0.2	0
common razor clam	nc	nc	0.2	0
blood star	nc	nc	0.1	0
star coral	nc	nc	0.1	0
northern red shrimp	nc	nc	0.1	0
shore shrimp	nc	nc	0.1	0
purple sea urchin	nc	nc	0.1	0
Total	**29,774**		**5,882**	

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

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.

species	count	%	weight	%
butterfish	191,100	54.1	4,171.6	21.9
scup	101,095	28.6	3,641.3	19.1
weakfish	12,416	3.5	771.3	4.0
winter flounder	10,288	2.9	2,011.7	10.6
bluefish	7,843	2.2	1,218.0	6.4
silver hake	5,126	1.5	99.6	0.5
windowpane flounder	4,643	1.3	594.2	3.1
little skate	3,686	1.0	1,829.6	9.6
red hake	2,973	0.8	226.5	1.2
Atlantic herring	2,511	0.7	45.4	0.2
striped searobin	1,690	0.5	497.0	2.6
alewife	1,393	0.4	107.6	0.6
fourspot flounder	1,393	0.4	203.9	1.1
Atlantic menhaden	1,187	0.3	90.9	0.5
American shad	987	0.3	117.3	0.6
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
northern searobin	547	0.2	52.0	0.3
striped bass	397	0.1	815.4	4.3
spotted hake	381	0.1	38.8	0.2
smooth dogfish	305	0.1	923.0	4.8
fourbeard rockling	233	0.1	28.8	0.2
tautog	217	0.1	326.6	1.7
striped anchovy	216	0.1	6.1	0
American sand lance	178	0.1	0.3	0
smallmouth flounder	96	0	5.2	0
hickory shad	56	0	19.4	0.1
cunner	51	0	5.9	0
black sea bass	50	0	17.2	0.1
spot	45	0	5.7	0
winter skate	41	0	89.8	0.5
hogchoker	39	0	5.0	0
Atlantic sturgeon	39	0	498.6	2.6
clearnose skate	22	0	39.4	0.2
bigeye scad	21	0	1.4	0
Atlantic mackerel	21	0	3.1	0
yellow jack	20	0	1.9	0
blueback herring	19	0	1.1	0
ocean pout	17	0	3.9	0
northern puffer	14	0	1.1	0
spiny dogfish	10	0	51.1	0.3
sea raven	9	0	4.9	0
crevalle jack	8	0	0.7	0
inshore lizardfish	7	0	0.5	0
northern kingfish	6	0	0.6	0
northern sennet	6	0	0.5	0
planehead filefish	3	0	0.3	0
bigeye	2	0	0.2	0
conger eel	2	0	0.5	0

species	count	%	weight	%
goosefish	2	0	0.3	0
grubby	2	0	0.2	0
northern pipefish	2	0	0.1	0
longhorn sculpin	2	0	0.3	0
oyster toadfish	2	0	1.8	0
Atlantic silverside	1	0	0.1	0
gizzard shad	1	0	0.1	0
haddock	1	0	0.1	0
round scad	1	0	0.1	0
striped cusk-eel	1	0	0.1	0
sharksucker	1	0	0.3	0
Spanish mackerel	1	0	0.2	0
Atlantic tomcod	1	0	0.7	0
white perch	1	0	0.4	0
Total	**353,203**		**19,054.7**	
Invertebrates				
American lobster	13,922	38.1	3,397.9	61.6
long-finned squid	21,580	59.0	826.4	15.0
horseshoe crab	384	1.1	634.1	11.5
lady crab	nc	nc	159.7	2.9
rock crab	nc	nc	118.6	2.2
spider crab	nc	nc	95.4	1.7
bushy bryozoan	nc	nc	78.0	1.4
flat claw hermit crab	nc	nc	32.5	0.6
knobbed whelk	61	0.2	24.8	0.4
bluecrab	89	0.2	21.3	0.4
channeled whelk	81	0.2	21.1	0.4
mantis shrimp	376	1.0	19.3	0.4
boring sponge	nc	nc	19.3	0.4
lion's mane jellyfish	61	0.2	16.7	0.3
blue mussel	nc	nc	14.1	0.3
northern moon snail	nc	nc	9.1	0.2
starfish spp.	nc	nc	8.8	0.2
common oyster	nc	nc	4.7	0.1
arks	nc	nc	2.8	0.1
common slipper shell	nc	nc	1.8	0
mud crabs	nc	nc	1.7	0
hard clams	nc	nc	1.5	0
sand shrimp	nc	nc	1.0	0
purple sea urchin	nc	nc	1.0	0
northern red shrimp	nc	nc	0.9	0
surf clam	nc	nc	0.4	0
sea grape	nc	nc	0.2	0
star coral	nc	nc	0.1	0
common razor clam	nc	nc	0.1	0
moon jelly	nc	nc	0.1	0
nemerteans	nc	nc	0.1	0
Total	**36,554**		**5,514**	

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	**Total**	**228,425**		**19,156.5**	
bay anchovy	2,303	1.0	12.2	0.1					
northern searobin	2,014	0.9	251.2	1.3	**Invertebrates**				
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	**Total**	**29,113**		**4,374**	

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

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

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	%
butterfish	25,483	34.4	524.6	3.7
scup	17,552	23.7	4,389.3	30.6
weakfish	5,596	7.6	131.9	0.9
winter flounder	4,245	5.7	1,276.5	8.9
bluefish	3,717	5.0	655.0	4.6
little skate	2,867	3.9	1,554.1	10.8
bay anchovy	2,254	3.0	12.5	0.1
windowpane flounder	1,858	2.5	333.9	2.3
fourspot flounder	1,658	2.2	327.7	2.3
striped searobin	1,529	2.1	687.0	4.8
northern searobin	1,468	2.0	240.7	1.7
summer flounder	1,151	1.6	825.0	5.8
red hake	681	0.9	31.1	0.2
alewife	608	0.8	49.4	0.3
smooth dogfish	552	0.7	1,508.8	10.5
spotted hake	527	0.7	41.6	0.3
Atlantic herring	448	0.6	87.8	0.6
American shad	305	0.4	23.5	0.2
silver hake	217	0.3	8.3	0.1
striped bass	215	0.3	542.1	3.8
tautog	210	0.3	325.4	2.3
Atlantic menhaden	121	0.2	16.1	0.1
fourbeard rockling	111	0.1	9.0	0.1
blueback herring	98	0.1	3.4	0
moonfish	97	0.1	1.3	0
hogchoker	89	0.1	8.3	0.1
black sea bass	57	0.1	45.7	0.3
Atlantic cod	57	0.1	2.7	0
clearnose skate	55	0.1	105.9	0.7
smallmouth flounder	38	0.1	2.4	0
winter skate	38	0.1	90.6	0.6
cunner	36	0	5.9	0
haddock	26	0	1.3	0
Atlantic sturgeon	23	0	391.9	2.7
hickory shad	22	0	10.3	0.1
American sand lance	19	0	0.2	0
ocean pout	14	0	2.9	0
rough scad	12	0	0.5	0
oyster toadfish	9	0	5.0	0
spiny dogfish	7	0	34.8	0.2
rock gunnel	6	0	0.4	0
round scad	4	0	0.3	0
glasseye snapper	3	0	0.1	0
conger eel	3	0	1.1	0
Atlantic mackerel	3	0	0.3	0
crevalle jack	2	0	0.2	0
northern pipefish	2	0	0.2	0
northern puffer	2	0	0.2	0
longhorn sculpin	2	0	0.9	0
sea raven	2	0	1.3	0
striped anchovy	2	0	0.1	0
Atlantic silverside	1	0	0.1	0

Species	count	%	weight	%
barndoor skate	1	0	0.4	0
Planehead filefish	1	0	0.1	0
rainbow smelt	1	0	0.1	0
sea lamprey	1	0	1.3	0
Spanish mackerel	1	0	2.1	0
Total	**74,107**		**14,323.6**	
Finfish not ranked				
anchovy spp, yoy				
Atlantic herring, yoy				
Invertebrates				
Horseshoe crab	399	1.7	670.5	23.2
spider crab	nc	nc	640.6	22.2
American lobster	1,958	8.3	479.7	16.6
long-finned squid	19,231	81.9	421.3	14.6
boring sponge	nc	nc	107.5	3.7
rock crab	nc	nc	80.9	2.8
starfish spp.	nc	nc	73.7	2.6
flat claw hermit crab	nc	nc	61.3	2.1
channeled whelk	334	1.4	58.8	2.0
bushy bryozoan	nc	nc	54.3	1.9
lion's mane jellyfish	1,307	5.6	40.6	1.4
knobbed whelk	96	0.4	35.1	1.2
sea grape	nc	nc	31.1	1.1
northern moon snail	nc	nc	20.9	0.7
blue mussel	nc	nc	19.7	0.7
common slipper shell	nc	nc	16.8	0.6
lady crab	nc	nc	12.0	0.4
hydroid spp.	nc	nc	9.6	0.3
ribbed mussel	nc	nc	8.8	0.3
sand shrimp	nc	nc	6.8	0.2
arks	nc	nc	6.5	0.2
mud crabs	nc	nc	6.5	0.2
rubbery bryzoan	nc	nc	6.0	0.2
mantis shrimp	110	0.5	4.9	0.2
bluecrab	24	0.1	4.3	0.1
hard clams	nc	nc	3.9	0.1
star coral	nc	nc	1.9	0.1
coastal mud shrimp	4	0	0.7	0
purple sea urchin	nc	nc	0.6	0
blood star	nc	nc	0.4	0
northern red shrimp	2	0	0.4	0
Japanese shore crab	4	0	0.3	0
anemones	nc	nc	0.1	0
sand dollar	1	0	0.1	0
common razor clam	1	0	0.1	0
moon jelly	nc	nc	0.1	0
northern cyclocardia	nc	nc	0.1	0
mixed sponge species	nc	nc	0.1	0
Total	**23,471**		**2,887**	

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	%
butterfish	94,735	46.7	1,842.7	9.7
scup	61,521	30.3	6,801.1	35.7
weakfish	17,505	8.6	426.9	2.2
bluefish	6,504	3.2	2,140.6	11.2
winter flounder	4,021	2.0	839.9	4.4
little skate	3,044	1.5	1,689.8	8.9
windowpane flounder	2,275	1.1	333.7	1.8
bay anchovy	1,523	0.8	10.3	0.1
silver hake	1,417	0.7	27.3	0.1
fourspot flounder	1,406	0.7	309.3	1.6
striped searobin	1,308	0.6	465.4	2.4
alewife	859	0.4	56.1	0.3
Atlantic herring	851	0.4	58.3	0.3
red hake	829	0.4	51.6	0.3
northern searobin	784	0.4	112.0	0.6
Atlantic menhaden	746	0.4	110.7	0.6
summer flounder	644	0.3	627.2	3.3
smooth dogfish	503	0.2	1,435.3	7.5
striped bass	378	0.2	811.8	4.3
American shad	356	0.2	24.2	0.1
tautog	232	0.1	353.7	1.9
spotted hake	230	0.1	37.8	0.2
blueback herring	218	0.1	6.5	0
moonfish	182	0.1	3.4	0
fourbeard rockling	173	0.1	13.0	0.1
black sea bass	124	0.1	40.5	0.2
hogchoker	83	0	9.5	0
American sand lance	70	0	0.2	0
winter skate	53	0	100.3	0.5
smallmouth flounder	50	0	2.8	0
hickory shad	39	0	14.2	0.1
spiny dogfish	38	0	104.7	0.5
Atlantic cod	33	0	4.7	0
clearnose skate	22	0	48.2	0.3
cunner	21	0	3.7	0
ocean pout	18	0	5.4	0
rough scad	14	0	0.7	0
round scad	11	0	0.3	0
spot	8	0	0.9	0
Atlantic sturgeon	8	0	117.6	0.6
haddock	7	0	0.6	0
sea raven	7	0	2.4	0
northern kingfish	5	0	0.5	0
northern puffer	5	0	0.4	0
longhorn sculpin	5	0	3.4	0
seasnail	4	0	0.2	0
crevalle jack	2	0	0.2	0
northern pipefish	2	0	0.2	0
rock gunnel	2	0	0.2	0
Atlantic tomcod	2	0	0.2	0
white perch	2	0	0.5	0

species	count	%	weight	%
American plaice	1	0	0.1	0
conger eel	1	0	0.1	0
gizzard shad	1	0	0.1	0
goosefish	1	0	0.1	0
pollock	1	0	0.1	0
roughtail stingray	1	0	4.1	0
oyster toadfish	1	0	0.8	0
yellow jack	1	0	0.1	0
Total	**202,887**		**19,056.6**	
Finfish not ranked				
anchovy spp, yoy				
Atlantic herring, yoy				
Invertebrates				
long-finned squid	23,022	86.5	953.4	28.8
horseshoe crab	534	2.0	873.4	26.4
American lobster	1,843	6.9	481.5	14.5
spider crab	nc	nc	355.5	10.7
blue mussel	nc	nc	250.2	7.6
bushy bryozoan	nc	nc	50.9	1.5
flat claw hermit crab	nc	nc	42.4	1.3
channeled whelk	199	0.7	42.3	1.3
starfish spp.	nc	nc	41.7	1.3
boring sponge	nc	nc	41.7	1.3
rock crab	1	0.0	35.2	1.1
lion's mane jellyfish	803	3.0	34.0	1.0
common slipper shell	nc	nc	22.9	0.7
sea grape	nc	nc	16.4	0.5
lady crab	nc	nc	14.5	0.4
northern moon snail	nc	nc	11.5	0.3
knobbed whelk	21	0.1	7.7	0.2
mantis shrimp	159	0.6	7.0	0.2
arks	nc	nc	7.0	0.2
mud crabs	nc	nc	5.4	0.2
sand shrimp	nc	nc	4.7	0.1
bluecrab	13	0	2.8	0.1
hard clams	nc	nc	2.3	0.1
surf clam	5	0	1.0	0
purple sea urchin	nc	nc	0.8	0
mixed sponge species	nc	nc	0.6	0
hydroid spp.	nc	nc	0.6	0
deadman's fingers sponge	nc	nc	0.5	0
rubbery bryozoan	nc	nc	0.4	0
star coral	nc	nc	0.3	0
northern red shrimp	nc	nc	0.3	0
northern cyclocardia	nc	nc	0.2	0
blood star	nc	nc	0.1	0
coastal mud shrimp	1	0	0.1	0
sea cucumber	2	0	0.1	0
Total	**26,603**		**3,309.4**	

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.

species	count	%	weight	%	species	count	%	weight	%
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	**Total**	**178,073**		**12,474.3**	
Atlantic herring	1,168	0.7	131.1	1.1					
bay anchovy	814	0.5	5.8	0	**Finfish not ranked**				
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	**Invertebrates**				
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 bryzoan	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	**Total**	**21,096**		**2,982.1**	

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.

species	count	%	weight	%	species	count	%	weight	%
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	**Finfish not ranked**				
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	**Invertebrates**				
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 bryzoan	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
Total	**92,042**		**10,500.2**		**Total**	**9,352**		**1,002.6**	

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	**Finfish not ranked**				
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	**Invertebrates**				
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 bryzoan	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
Total	**177,841**		**17,540.3**		**Total**	**27,441**		**2,512.7**	

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

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	%
butterfish	108,087	53.6	3,186.9	17
scup	46,991	23.3	6,332.1	33.8
bay anchovy	11,128	5.5	35.3	0.2
Atlantic herring	6,330	3.1	239.2	1.3
winter flounder	4,068	2	524.0	2.8
bluefish	3,657	1.8	1,157.4	6.2
weakfish	2,604	1.3	108.7	0.6
moonfish	2,575	1.3	19.5	0.1
windowpane flounder	2,496	1.2	342.8	1.8
northern searobin	2,012	1	194.3	1
striped searobin	1,507	0.7	471.8	2.5
American sand lance	1,227	0.6	2.0	0
alewife	1,175	0.6	96.0	0.5
fourspot flounder	1,036	0.5	169.8	0.9
silver hake	947	0.5	50.0	0.3
red hake	897	0.4	59.5	0.3
summer flounder	881	0.4	694.4	3.7
little skate	709	0.4	390.0	2.1
smooth dogfish	588	0.3	2,213.3	11.8
striped bass	466	0.2	897.4	4.8
American shad	422	0.2	28.9	0.2
spotted hake	327	0.2	32.1	0.2
blueback herring	291	0.1	14.6	0.1
tautog	163	0.1	285.4	1.5
spiny dogfish	148	0.1	545.7	2.9
black sea bass	121	0.1	59.5	0.3
smallmouth flounder	96	0	4.7	0
clearnose skate	69	0	148.5	0.8
Atlantic menhaden	69	0	18.0	0.1
rough scad	59	0	2.8	0
fourbeard rockling	47	0	3.9	0
winter skate	44	0	108.5	0.6
hogchoker	39	0	4.5	0
blue runner	34	0	2.3	0
ocean pout	22	0	4.8	0
Atlantic sturgeon	18	0	286.6	1.5
cunner	18	0	1.8	0
pollock	18	0	0.8	0
Atlantic cod	15	0	1.0	0
hickory shad	13	0	3.6	0
northern kingfish	7	0	0.4	0
glasseye snapper	6	0	0.6	0
Atlantic mackerel	5	0	0.4	0
northern sennet	5	0	0.4	0
northern puffer	5	0	0.4	0
sea raven	5	0	1.7	0
striped anchovy	5	0	0.4	0
Atlantic silverside	3	0	0.3	0
oyster toadfish	3	0	0.8	0
inshore lizardfish	2	0	0.2	0
northern pipefish	2	0	0.2	0
rock gunnel	2	0	0.2	0
longhorn sculpin	2	0	0.3	0
crevalle jack	1	0	0.1	0
planehead filefish	1	0	0.1	0
round scad	1	0	0.1	0
striped cusk-eel	1	0	0.1	0
spot	1	0	0.2	0
northern stargazer	1	0	0.1	0
Atlantic tomcod	1	0	0.1	0
white perch	1	0	0.1	0
yellow jack	1	0	0.1	0
yellowtail flounder	1	0	0.2	0
Total	**201,476**		**18,750**	

Finfish not ranked

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

Invertebrates				
long-finned squid	24,130	91.4	648.4	30.2
horseshoe crab	340	1.3	645.8	30
American lobster	853	3.2	244	11.3
spider crab	.	.	144.1	6.7
lion's mane jellyfish	641	2.4	89.3	4.2
lady crab	.	.	63.6	3
rock crab	.	.	42.4	2
common slipper shell	.	.	37	1.7
flat claw hermit crab	.	.	33.8	1.6
bushy bryozoan	.	.	33.3	1.5
starfish spp.	.	.	26.6	1.2
channeled whelk	127	0.5	26	1.2
hydroid spp.	.	.	25.7	1.2
knobbed whelk	39	0.1	11.6	0.5
mantis shrimp	215	0.8	10.7	0.5
Tubularia, spp.	.	.	9	0.4
northern moon snail	.	.	7.2	0.3
anemones	.	.	5.6	0.3
mixed sponge species	.	.	5.4	0.3
sea grape	.	.	5.0	0.2
boring sponge	.	.	4.2	0.2
blue crab	19	0.1	4.1	0.2
sand shrimp	.	.	3.8	0.2
deadman's fingers sponge	.	.	3.5	0.2
blue mussel	8	0	3.5	0.2
mud crabs	.	.	3.1	0.1
common oyster	1	0	3.1	0.1
arks	2	0	2.5	0.1
surf clam	18	0.1	1.7	0.1
hard clams	4	0	1.1	0.1
red bearded sponge	.	.	0.8	0
purple sea urchin	4	0	0.8	0
rubbery bryzoan	.	.	0.6	0
star coral	.	.	0.2	0
ghost shrimp	2	0	0.2	0
coastal mud shrimp	2	0	0.1	0
northern cyclocardia	1	0	0.1	0
northern red shrimp	1	0	0.1	0
sea cucumber	1	0	0.1	0
tunicates, misc	1	0	0.1	0
Total	**26,409**		**2,148.2**	

Note: nc= not counted

Appendix 5.4. cont. Total number and weight (kg) of finfish and invertebrates caught in 2010.
Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=78.

species	count	%	weight	%
American sand lance	13,061	35.3	5.2	0.1
scup	7,157	19.3	1,971.6	44.3
butterfish	2,894	7.8	166.9	3.7
windowpane flounder	2,850	7.7	449.3	10.1
winter flounder	2,579	7.0	450.5	10.1
silver hake	1,747	4.7	35.4	0.8
Atlantic herring	1,318	3.6	179.0	4
northern searobin	1,128	3	149.5	3.4
red hake	990	2.7	64.3	1.4
spotted hake	665	1.8	15.8	0.4
summer flounder	517	1.4	229.6	5.2
bay anchovy	475	1.3	2.8	0.1
fourspot flounder	402	1.1	92.0	2.1
little skate	281	0.8	148.3	3.3
alewife	172	0.5	14.3	0.3
American shad	165	0.4	8.6	0.2
striped searobin	141	0.4	66.4	1.5
blueback herring	101	0.3	3.4	0.1
striped bass	71	0.2	173.2	3.9
tautog	53	0.1	83.1	1.9
black sea bass	37	0.1	20.1	0.5
fourbeard rockling	35	0.1	2.9	0.1
hogchoker	34	0.1	4.4	0.1
smallmouth flounder	31	0.1	1.4	0
rock gunnel	29	0.1	0.5	0
Atlantic cod	21	0.1	2.1	0
winter skate	16	0	37.7	0.8
cunner	11	0	1.3	0
smooth dogfish	10	0	34.4	0.8
Atlantic menhaden	7	0	2.7	0.1
ocean pout	6	0	1.4	0
sea raven	6	0	1.6	0
northern pipefish	4	0	0.3	0
spiny dogfish	3	0	16.2	0.4
bluefish	2	0	6.1	0.1
hickory shad	2	0	0.4	0
pollock	2	0	0.1	0
American plaice	1	0	0.1	0
Atlantic silverside	1	0	0.1	0
Atlantic sturgeon	1	0	5.6	0.1
clearnose skate	1	0	4.5	0.1
longhorn sculpin	1	0	0.4	0
weakfish	1	0	1.0	0
Total	**37,029**		**4,455**	

species	count	%	weight	%
Invertebrates				
long-finned squid	1,906	62.9	161.4	28.4
horseshoe crab	58	1.9	112.2	19.8
American lobster	293	9.7	83.6	14.7
spider crab	.		81.6	14.4
bushy bryozoan	.		23.1	4.1
rock crab	.		16.7	2.9
starfish spp.	.		15.1	2.7
common slipper shell	.		11.2	2
lion's mane jellyfish	401	13.2	7.8	1.4
lady crab	.		7.7	1.4
flat claw hermit crab	.		6.8	1.2
hydroid spp.	.		6.7	1.2
channeled whelk	33	1.1	4.5	0.8
northern moon snail	.		4.1	0.7
blue mussel	.		3.1	0.5
common oyster	.		2.9	0.5
sea grape	.		2.7	0.5
sand shrimp	.		2.3	0.4
deadman's fingers sponge	.		2.3	0.4
blue crab	10	0.3	2.0	0.4
arks	.		1.6	0.3
mud crabs	.		1.6	0.3
rubbery bryzoan	.		1.2	0.2
mantis shrimp	19	0.6	1.1	0.2
Unknown Jellyfish	300	9.9	0.8	0.1
Tubularia, spp.	.		0.5	0.1
anemones	5	0.1	0.4	0.1
surf clam	2	0.1	0.4	0.1
knobbed whelk	1	0	0.3	0.1
mixed sponge species	.		0.3	0.1
northern comb jelly	1	0	0.2	0
purple sea urchin	4	0.1	0.2	0
boring sponge	.		0.1	0
red bearded sponge	.		0.1	0
coastal mud shrimp	.		0.1	0
star coral	.		0.1	0
hard clams	.		0.1	0
sea cucumber	.		0.1	0
Total	**3,033**		**567.0**	

Note: nc= not counted

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	%
butterfish	42,141	36.7	1,600.8	9.9
scup	34,458	30.0	6,759.0	41.7
American sand lance	9,535	8.3	7.5	0.0
bay anchovy	4,693	4.1	10.5	0.1
winter flounder	3,092	2.7	613.8	3.8
windowpane flounder	2,831	2.5	395.9	2.4
bluefish	2,765	2.4	584.7	3.6
weakfish	2,583	2.3	192.6	1.2
striped searobin	1,630	1.4	558.7	3.4
Atlantic herring	1,482	1.3	199.4	1.2
fourspot flounder	1,400	1.2	224.2	1.4
summer flounder	1,051	0.9	713.0	4.4
silver hake	948	0.8	40.3	0.2
northern searobin	803	0.7	85.5	0.5
spotted hake	725	0.6	76.8	0.5
little skate	674	0.6	359.4	2.2
moonfish	640	0.6	6.3	0
smooth dogfish	613	0.5	2,031.7	12.5
alewife	512	0.4	29.8	0.2
red hake	278	0.2	25.1	0.2
American shad	271	0.2	17.5	0.1
striped bass	243	0.2	721.9	4.5
Atlantic menhaden	181	0.2	69.8	0.4
rough scad	150	0.1	6.8	0
hogchoker	147	0.1	16.8	0.1
Atlantic cod	109	0.1	9.2	0.1
tautog	106	0.1	151.7	0.9
black sea bass	91	0.1	54.2	0.3
blueback herring	72	0.1	3.2	0
smallmouth flounder	67	0.1	3.5	0
spiny dogfish	58	0.1	203.5	1.3
clearnose skate	56	0	109.8	0.7
inshore lizardfish	43	0	4.6	0
fourbeard rockling	43	0	4.0	0
winter skate	37	0	101.2	0.6
northern kingfish	34	0	3.7	0
ocean pout	27	0	4.5	0
blue runner	24	0	1.7	0
cunner	14	0	1.9	0
northern puffer	9	0	0.9	0
longhorn sculpin	9	0	2.0	0
hickory shad	8	0	1.5	0
Atlantic sturgeon	5	0	181.9	1.1
pollock	5	0	0.5	0
spot	5	0	0.7	0
crevalle jack	4	0	0.4	0
grubby	4	0	0.1	0
northern pipefish	4	0	0.3	0
rock gunnel	4	0	0.2	0
conger eel	3	0	1.1	0
sea raven	3	0	0.9	0
striped cusk-eel	2	0	0.2	0
Atlantic tomcod	2	0	0.2	0
American plaice	1	0	0.1	0
Atlantic croaker	1	0	0.2	0
northern sennet	1	0	0.1	0
round scad	1	0	0.1	0
roughtail stingray	1	0	13.0	0.1
striped burrfish	1	0	0.5	0
striped anchovy	1	0	0.1	0
silver perch	1	0	0.1	0
oyster toadfish	1	0	0.2	0
white perch	1	0	0.1	0
white mullet	1	0	0.1	0
yellowtail flounder	1	0	0.3	0
Total	**114,706**		**16,210.3**	

Finfish not ranked

anchovy spp, yoy

Atlantic herring, yoy

American sand lance (yoy)

Invertebrates

horseshoe crab	257	1.7	505.2	33.5
long-finned squid	13,020	86.4	370.7	24.6
spider crab	.	.	151.8	10.1
lady crab	.	.	132.4	8.8
American lobster	230	1.5	52.0	3.4
rock crab	.	.	45.5	3.0
hydroid spp.	.	.	30.5	2.0
mantis shrimp	971	6.4	29.6	2.0
bushy bryozoan	.	.	24.9	1.7
knobbed whelk	62	0.4	23.8	1.6
flat claw hermit crab	.	.	22.1	1.5
channeled whelk	99	0.7	19.0	1.3
starfish spp.	.	.	14.4	1.0
blue crab	69	0.5	12.4	0.8
lion's mane jellyfish	345	2.3	11.3	0.7
mixed sponge species	.	.	11.0	0.7
blue mussel	1	0	6.7	0.4
northern moon snail	.	.	5.6	0.4
boring sponge	.	.	5.5	0.4
hard clams	.	.	5.3	0.4
common slipper shell	.	.	5.2	0.3
sand shrimp	.	.	4.5	0.3
Tubularia, spp.	.	.	3.5	0.2
mud crabs	.	.	2.6	0.2
rubbery bryzoan	.	.	1.7	0.1
common oyster	1	0	1.6	0.1
sea grape	.	.	1.5	0.1
arks	.	.	1.4	0.1
surf clam	7	0	1.0	0.1
purple sea urchin	3	0	0.6	0
red bearded sponge	.	.	0.3	0
northern comb jelly	.	.	0.3	0
anemones	6	0	0.2	0
star coral	.	.	0.2	0
coastal mud shrimp	1	0	0.1	0
common razor clam	1	0	0.1	0
ghost shrimp	1	0	0.1	0
northern red shrimp	1	0	0.1	0
polychaetes	.	.	0.1	0
tunicates, misc	.	.	0.1	0
water jelly	1	0	0.1	0
Total	**15,076**		**1,505.0**	

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	%
butterfish	60,539	37.9	1,891.3	10.8
scup	53,119	33.2	6,170.2	35.1
silver hake	7,519	4.7	171.0	1.0
weakfish	6,785	4.2	409.2	2.3
bluefish	3,851	2.4	532.7	3.0
northern searobin	3,642	2.3	405.2	2.3
windowpane flounder	3,536	2.2	501.1	2.9
winter flounder	3,365	2.1	604.9	3.4
striped searobin	2,973	1.9	1,086.4	6.2
fourspot flounder	2,597	1.6	454.5	2.6
red hake	1,720	1.1	148.6	0.8
little skate	1,406	0.9	657.9	3.7
bay anchovy	1,296	0.8	8.6	0.0
summer flounder	980	0.6	718.5	4.1
spot	858	0.5	107.5	0.6
alewife	708	0.4	47.0	0.3
spotted hake	626	0.4	64.2	0
smooth dogfish	610	0.4	1,833.3	10.4
Atlantic herring	571	0.4	61.5	0.4
Atlantic menhaden	426	0.3	144.6	0.8
black sea bass	410	0.3	141.0	0.8
hogchoker	340	0.2	30.7	0.2
American shad	321	0.2	25.3	0.1
clearnose skate	280	0.2	491.7	3
moonfish	262	0.2	3.6	0.0
smallmouth flounder	258	0.2	7.5	0.0
striped bass	170	0.1	278.0	1.6
tautog	135	0.1	128.9	0.7
winter skate	97	0.1	179.8	1
northern kingfish	59	0.0	8.4	0
northern puffer	47	0.0	3.1	0.0
blueback herring	46	0	1.6	0.0
fourbeard rockling	43	0	3.5	0
hickory shad	42	0	14.1	0
blue runner	27	0	2.7	0.0
cunner	20	0	2.8	0
rough scad	19	0	1.1	0
spiny dogfish	16	0	62.8	0
ocean pout	14	0	2.0	0
Atlantic sturgeon	7	0	154.2	1
sea raven	5	0	1.1	0
northern sennet	3	0	0.3	0
striped anchovy	3	0	0.2	0.0
crevalle jack	2	0	0.2	0
goosefish	2	0	0.8	0
pinfish	2	0	0.2	0
round herring	2	0	0.1	0
American sand lance	2	0	0.2	0
African pompano	1	0	0.1	0
conger eel	1	0	0.3	0
gizzard shad	1	0	0.1	0
northern pipefish	1	0	0.1	0
rock gunnel	1	0	0.1	0
roughtail stingray	1	0	5.0	0

species	count	%	weight	%
longhorn sculpin	1	0	0.2	0
white perch	1	0	0.2	0
white mullet	1	0	0.1	0
Total	**159,770**		**17,570.3**	
Finfish not ranked				
anchovy spp, yoy				
Atlantic herring, yoy				
American sand lance (yoy)				
Invertebrates				
horseshoe crab	199	1.7	385.8	30.6
long-finned squid	9,767	84.5	333.9	26.5
spider crab	.	.	162.4	12.9
American lobster	349	3.0	70.0	5.6
boring sponge	.	.	47.9	3.8
lady crab	.	.	45.3	3.6
rock crab	.	.	40.7	3.2
mantis shrimp	846	7.3	26.6	2.1
bushy bryozoan	.	.	20.4	1.6
flat claw hermit crab	.	.	18.3	1.5
blue crab	72	0.6	14.5	1.2
knobbed whelk	36	0.3	13.8	1.1
channeled whelk	76	0.7	13.7	1.1
blue mussel	1	0.0	9.4	0.7
common slipper shell	.	.	9.4	0.7
mixed sponge species	.	.	7.4	0.6
Tubularia, spp.	.	.	5.0	0.4
hydroid spp.	.	.	4.8	0.4
lion's mane jellyfish	50	0.4	4.4	0.3
mud crabs	.	.	3.9	0.3
starfish spp.	.	.	3.3	0.3
northern red shrimp	118	1.0	3.0	0.2
northern moon snail	.	.	1.8	0.1
sand shrimp	.	.	1.7	0.1
arks	.	.	1.4	0.1
hard clams	3	0	1.3	0.1
red bearded sponge	.	.	1.2	0.1
sea grape	.	.	1.1	0.1
deadman's fingers sponge	.	.	0.8	0.1
purple sea urchin	7	0	0.8	0
common oyster	.	.	0.8	0
surf clam	10	0.1	0.8	0
star coral	.	.	0.4	0
rubbery bryzoan	.	.	0.4	0
sea cucumber	3	0	0.4	0
tunicates, misc	16	0	0.4	0
water jelly	4	0	0.3	0
coastal mud shrimp	1	0	0.2	0
northern comb jelly	.	.	0.1	0
moon jelly	.	.	0.1	0
Total	**11,558**		**1,257.9**	

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	%
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
Total	**83,413**		**15,843.7**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
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 bryzoan	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
Total	**7,750**		**1,947.4**	

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	%
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
Total	**153,100**		**16,173.8**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
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
Total	**15,571**		**1,529.2**	

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

Note: nc= not counted

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	%
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
weakfish	4,689	1.7	297.6	1.0
northern searobin	3,178	1.1	452.1	1.6
alewife	2,811	1.0	132.0	0.5
bluefish	2,793	1.0	1,118.7	3.9
spotted hake	2,456	0.9	113.8	0.4
windowpane flounder	1,593	0.6	154.7	0.5
smooth dogfish	1,338	0.5	2,785.6	9.8
bay anchovy	1,239	0.4	8.7	0.0
black sea bass	1,181	0.4	823.4	2.9
winter flounder	1,108	0.4	261.0	0.9
fourspot flounder	1,056	0.4	175.3	0.6
American shad	944	0.3	46.2	0.2
silver hake	891	0.3	32.9	0.1
Atlantic menhaden	876	0.3	69.4	0.2
red hake	668	0.2	50.3	0.2
summer flounder	462	0.2	386.4	1.4
blueback herring	448	0.2	12.2	0.0
little skate	377	0.1	193.1	0.7
hogchoker	354	0.1	41.8	0.1
Atlantic herring	340	0.1	37.1	0.1
tautog	306	0.1	288.5	1.0
moonfish	265	0.1	5.2	0.0
striped bass	167	0.1	261.9	0.9
smallmouth flounder	148	0.1	4.2	0.0
clearnose skate	134	0.0	228.7	0.8
goosefish	70	0.0	23.3	0.1
northern kingfish	31	0.0	4.8	0.0
hickory shad	18	0.0	4.2	0.0
winter skate	17	0.0	31.6	0.1
blue runner	15	0.0	1.5	0.0
Atlantic sturgeon	12	0.0	318.3	1.1
spot	12	0.0	1.7	0.0
spiny dogfish	9	0.0	43.6	0.2
striped anchovy	8	0.0	0.5	0.0
northern puffer	5	0.0	0.9	0.0
cunner	4	0.0	0.5	0.0
inshore lizardfish	4	0.0	0.3	0.0
oyster toadfish	4	0.0	1.7	0.0
Atlantic silverside	3	0.0	0.3	0.0
fourbeard rockling	3	0.0	0.3	0.0
striped cusk-eel	3	0.0	0.1	0.0
northern sennet	2	0.0	0.2	0.0
bluntnose stingray	1	0.0	0.6	0.0
Atlantic cod	1	0.0	4.9	0.0
crevalle jack	1	0.0	0.1	0.0
haddock	1	0.0	0.1	0.0
pinfish	1	0.0	0.1	0.0
pollock	1	0.0	0.1	0.0
roughtail 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
Total	**277,166**		**28,495**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
longfin inshore squid	12,424	94.1	464.4	41.1
horseshoe crab	164	1.2	315.5	28.0
spider crab	nc		140.6	12.5
lion's mane jellyfish	221	1.7	72.1	6.4
American lobster	74	0.6	25.2	2.2
common slipper shell	nc		19.2	1.7
bushy bryozoan	nc		11.2	1.0
mantis shrimp	206	1.6	9.5	0.8
knobbed whelk	23	0.2	8.8	0.8
flat claw hermit crab	nc		8.7	0.8
boring sponge	nc		7.4	0.7
rock crab	nc		6.8	0.6
channeled whelk	29	0.2	6.0	0.5
hydroid spp.	nc		5.9	0.5
blue crab	20	0.1	5.0	0.4
hard clams	22	0.2	3.2	0.3
mud crabs	nc		2.5	0.2
mixed sponge species	nc		1.9	0.2
sand shrimp	nc		1.8	0.2
lady crab	nc		1.7	0.2
Tubularia, spp.	nc		1.5	0.1
northern moon snail	nc		1.3	0.1
arks	3	0.0	1.3	0.1
starfish spp.	1	0.0	0.9	0.1
blue mussel	1	0.0	0.8	0.1
common oyster	5	0.0	0.6	0.1
surf clam	1	0.0	0.5	0.0
comb jelly spp	nc		0.2	0.0
star coral	nc		0.2	0.0
ghost shrimp	1	0.0	0.2	0.0
anemones	nc		0.1	0.0
bobtail squid	1	0.0	0.1	0.0
red bearded sponge	nc		0.1	0.0
common razor clam	1	0.0	0.1	0.0
Japanese shore crab	1	0.0	0.1	0.0
polychaetes	1	0.0	0.1	0.0
tunicates, misc	nc		0.1	0.0
purple sea urchin	nc		0.1	0.0
water jelly	1	0.0	0.1	0.0
Total	**13,200**		**1,125.8**	

Note: nc= not counted

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	%
scup	75,763	56.4	9,616.8	51.4
butterfish	35,814	26.7	1,426.0	7.6
weakfish	5,904	4.4	311.2	1.7
striped searobin	3,942	2.9	1,400.0	7.5
bluefish	2,408	1.8	263.6	1.4
smooth dogfish	1,624	1.2	3,391.3	18.1
northern searobin	1,430	1.1	196.2	1.0
spotted hake	1,253	0.9	111.2	0.6
bay anchovy	1,069	0.8	7.7	0.0
black sea bass	980	0.7	714.8	3.8
windowpane flounder	974	0.7	127.1	0.7
hogchoker	391	0.3	50.1	0.3
fourspot flounder	366	0.3	67.9	0.4
summer flounder	354	0.3	244.0	1.3
silver hake	309	0.2	12.3	0.1
moonfish	273	0.2	4.2	0.0
Atlantic menhaden	239	0.2	72.2	0.4
American shad	230	0.2	21.0	0.1
red hake	152	0.1	11.9	0.1
spot	114	0.1	10.5	0.1
little skate	113	0.1	63.0	0.3
winter flounder	112	0.1	27.7	0.1
blueback herring	89	0.1	3.5	0.0
tautog	77	0.1	99.0	0.5
clearnose skate	73	0.1	147.1	0.8
striped bass	73	0.1	186.8	1.0
smallmouth flounder	44	0.0	2.0	0.0
alewife	38	0.0	2.0	0.0
winter skate	19	0.0	34.1	0.2
northern kingfish	11	0.0	2.3	0.0
Atlantic herring	10	0.0	1.1	0.0
American sand lance	7	0.0	0.1	0.0
rough scad	7	0.0	0.6	0.0
Atlantic cod	4	0.0	0.1	0.0
cunner	4	0.0	0.5	0.0
hickory shad	4	0.0	1.3	0.0
northern puffer	4	0.0	0.7	0.0
Atlantic mackerel	3	0.0	1.3	0.0
spiny dogfish	3	0.0	15.6	0.1
black drum	2	0.0	0.2	0.0
Atlantic sturgeon	1	0.0	60.9	0.3
blue runner	1	0.0	0.1	0.0
bigeye	1	0.0	0.1	0.0
crevalle jack	1	0.0	0.1	0.0
glasseye snapper	1	0.0	0.1	0.0
inshore lizardfish	1	0.0	0.1	0.0
naked goby	1	0.0	0.1	0.0
Spanish mackerel	1	0.0	0.1	0.0
oyster toadfish	1	0.0	0.3	0.0
Total	**134,295**		**18,710.9**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
longfin inshore squid	14,186	96.5	584.5	54.5
horseshoe crab	112	0.8	224.4	20.9
spider crab	nc		129.4	12.1
boring sponge	nc		46.9	4.4
common slipper shell	nc		20.8	1.9
bushy bryozoan	nc		12.1	1.1
flat claw hermit crab	nc		8.3	0.8
knobbed whelk	36	0.2	7.3	0.7
mantis shrimp	173	1.2	7.3	0.7
blue crab	18	0.1	4.1	0.4
American lobster	12	0.1	4.0	0.4
lion's mane jellyfish	102	0.7	3.7	0.3
lady crab	nc		3.5	0.3
blue mussel	nc		2.7	0.3
channeled whelk	18	0.1	2.4	0.2
sand shrimp	nc		1.6	0.1
hard clams	5	0.0	1.2	0.1
comb jelly spp	24	0.2	1.2	0.1
hydroid spp.	nc		1.1	0.1
arks	6	0.0	1.1	0.1
mud crabs	nc		1.1	0.1
northern moon snail	nc		1.0	0.1
rock crab	nc		0.8	0.1
surf clam	10	0.1	0.8	0.1
red bearded sponge	nc		0.5	0.0
purple sea urchin	3	0.0	0.4	0.0
star coral	nc		0.2	0.0
anemones	nc		0.1	0.0
ghost shrimp	1	0.0	0.1	0.0
jingle shell clams	1	0.0	0.1	0.0
common oyster	nc		0.1	0.0
mixed sponge species	nc		0.1	0.0
Total	**14,707**		**1,072.9**	

Note: nc= not counted

Appendix 5.4. cont. . Total number and weight (kg) of finfish and invertebrates caught in 2018.
Finfish species are in order of descending count. Invertebrate species are in order of descending weight (nc = not counted). Young-of-year gadids, bay and striped anchovy are neither separated by species or quantified; young-of-year Atlantic herring and American sand lance are not quantified. Number of tows (sample size)=172.

species	count	%	weight	%
scup	81,228	53.4	12,947.2	56.1
butterfish	42,025	27.6	1,412.7	6.1
weakfish	7,544	5.0	270.2	1.2
striped searobin	4,223	2.8	1,582.6	6.9
northern searobin	2,949	1.9	460.8	2.0
smooth dogfish	1,598	1.0	3,024.9	13.1
black sea bass	1,434	0.9	690.7	3.0
windowpane flounder	1,266	0.8	189.6	0.8
alewife	1,052	0.7	87.5	0.4
spotted hake	1,015	0.7	151.7	0.7
hogchoker	811	0.5	98.9	0.4
summer flounder	753	0.5	397.0	1.7
fourspot flounder	711	0.5	147.6	0.6
bluefish	702	0.5	161.4	0.7
bay anchovy	641	0.4	3.3	0.0
blueback herring	579	0.4	36.5	0.2
winter flounder	500	0.3	132.2	0.6
silver hake	450	0.3	18.3	0.1
red hake	361	0.2	25.8	0.1
Atlantic herring	352	0.2	45.0	0.2
striped bass	269	0.2	457.4	2.0
American shad	230	0.2	17.6	0.1
tautog	230	0.2	209.0	0.9
Atlantic menhaden	227	0.1	80.5	0.3
striped anchovy	222	0.1	4.1	0.0
blue runner	195	0.1	19.9	0.1
little skate	151	0.1	82.4	0.4
moonfish	143	0.1	2.6	0.0
smallmouth flounder	86	0.1	2.9	0.0
clearnose skate	81	0.1	149.8	0.6
northern kingfish	75	0.0	9.9	0.0
spot	36	0.0	3.8	0.0
Atlantic cod	11	0.0	3.2	0.0
Atlantic mackerel	10	0.0	0.7	0.0
Atlantic sturgeon	7	0.0	98.6	0.4
inshore lizardfish	7	0.0	0.5	0.0
crevalle jack	6	0.0	0.5	0.0
hickory shad	6	0.0	2.2	0.0
northern puffer	5	0.0	0.3	0.0
spiny dogfish	5	0.0	16.7	0.1
cunner	4	0.0	0.5	0.0
northern pipefish	3	0.0	0.2	0.0
winter skate	3	0.0	4.1	0.0
harvestfish	2	0.0	0.2	0.0
roughtail stingray	2	0.0	18.9	0.1
oyster toadfish	2	0.0	0.8	0.0
Atlantic croaker	1	0.0	0.1	0.0
planehead filefish	1	0.0	0.1	0.0
goosefish	1	0.0	0.9	0.0
haddock	1	0.0	1.6	0.0
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
Total	**152,220**		**23,074.2**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
horseshoe crab	264	1.9	512.3	44.3
longfin inshore squid	13,146	92.2	408.8	35.3
spider crab	nc		77.1	6.7
bushy bryozoan	nc		39.4	3.4
common slipper shell	nc		29.4	2.5
lion's mane jellyfish	458	3.2	13.8	1.2
mantis shrimp	297	2.1	11.6	1.0
mixed sponge species	nc		10.8	0.9
hydroid spp.	nc		10.2	0.9
flat claw hermit crab	nc		8.7	0.7
knobbed whelk	15	0.1	6.5	0.6
American lobster	15	0.1	3.8	0.3
channeled whelk	23	0.2	3.4	0.3
Tubularia, spp.	nc		3.2	0.3
rock crab	nc		2.7	0.2
blue crab	18	0.1	2.7	0.2
sand shrimp	nc		1.7	0.1
northern moon snail	nc		1.3	0.1
arks	nc		1.2	0.1
hard clams	3	0.0	1.2	0.1
lady crab	nc		1.1	0.1
star coral	nc		0.9	0.1
fan worm tubes	nc		0.8	0.1
mud crabs	nc		0.7	0.1
sea grape	nc		0.6	0.1
surf clam	4	0.0	0.6	0.0
blue mussel	nc		0.4	0.0
Jonah crab	nc		0.4	0.0
comb jelly spp	nc		0.4	0.0
red bearded sponge	nc		0.3	0.0
water jelly	3	0.0	0.2	0.0
purple sea urchin	2	0.0	0.2	0.0
Japanese shore crab	nc		0.2	0.0
boring sponge	nc		0.1	0.0
coastal mud shrimp	1	0.0	0.1	0.0
green sea urchin	1	0.0	0.1	0.0
jingle shell clams	1	0.0	0.1	0.0
green crab	1	0.0	0.1	0.0
polychaetes	nc		0.1	0.0
Total	**14,252**		**1,156.5**	

Note: nc= not counted

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	%
scup	53,617	40.2	11,169.4	50.3
butterfish	43,434	32.5	1,114.1	5.0
silver hake	4,348	3.3	126.1	0.6
weakfish	3,766	2.8	245.5	1.1
striped searobin	3,181	2.4	1,264.4	5.7
northern searobin	3,112	2.3	450.5	2.0
moonfish	2,270	1.7	22.6	0.1
bluefish	2,048	1.5	224.5	1.0
spotted hake	2,027	1.5	178.3	0.8
black sea bass	1,584	1.2	816.7	3.7
windowpane flounder	1,427	1.1	242.5	1.1
alewife	1,401	1.0	86.1	0.4
bay anchovy	1,346	1.0	6.6	0.0
summer flounder	1,309	1.0	464.3	2.1
Atlantic herring	1,294	1.0	302.7	1.4
smooth dogfish	1,243	0.9	2,957.2	13.3
red hake	1,215	0.9	77.5	0.3
Atlantic menhaden	815	0.6	280.7	1.3
fourspot flounder	570	0.4	147.8	0.7
striped bass	535	0.4	773.6	3.5
American shad	512	0.4	32.4	0.1
winter flounder	422	0.3	103.1	0.5
little skate	418	0.3	220.9	1.0
hogchoker	383	0.3	50.8	0.2
tautog	373	0.3	351.9	1.6
smallmouth flounder	186	0.1	4.1	0.0
blueback herring	124	0.1	6.0	0.0
clearnose skate	113	0.1	213.8	1.0
spot	66	0.0	8.2	0.0
Spanish mackerel	65	0.0	3.7	0.0
blue runner	59	0.0	3.8	0.0
winter skate	41	0.0	72.7	0.3
striped anchovy	21	0.0	0.4	0.0
fourbeard rockling	20	0.0	1.3	0.0
Atlantic cod	15	0.0	5.1	0.0
northern kingfish	14	0.0	1.9	0.0
hickory shad	11	0.0	3.1	0.0
Atlantic sturgeon	9	0.0	104.7	0.5
northern puffer	9	0.0	1.4	0.0
northern pipefish	5	0.0	0.2	0.0
crevalle jack	4	0.0	0.2	0.0
spiny dogfish	4	0.0	23.8	0.1
oyster toadfish	4	0.0	1.1	0.0
bigeye	3	0.0	0.2	0.0
conger eel	2	0.0	0.3	0.0
fawn cusk-eel	2	0.0	0.1	0.0
goosefish	2	0.0	0.8	0.0
inshore lizardfish	2	0.0	0.1	0.0
white perch	2	0.0	0.2	0.0
American eel	1	0.0	0.6	0.0
planehead filefish	1	0.0	0.1	0.0
harvestfish	1	0.0	0.1	0.0
northern sennet	1	0.0	0.1	0.0
roughtail stingray	1	0.0	16.8	0.1
longhorn sculpin	1	0.0	0.1	0.0
Total	**133,439**		**22,184.7**	

species	count	%	weight	%
Finfish not ranked				
anchovy spp, (yoy)				
Atlantic herring, (yoy)				
American sand lance (yoy)				
gadid spp, (yoy)				
Invertebrates				
horseshoe crab	218	1.8	391.9	33.3
longfin inshore squid	10,934	92.1	368.4	31.3
spider crab	nc		115.9	9.9
common slipper shell	nc		71.8	6.1
lion's mane jellyfish	386	3.3	67.6	5.8
bushy bryozoan	nc		60.2	5.1
mixed sponge species	nc		43.2	3.7
American lobster	25	0.2	7.6	0.6
mantis shrimp	223	1.9	7.2	0.6
flat claw hermit crab	nc		6.5	0.6
hydroid spp.	nc		5.7	0.5
knobbed whelk	17	0.1	4.8	0.4
blue crab	21	0.2	3.9	0.3
common oyster	nc		3.8	0.3
channeled whelk	22	0.2	3.3	0.3
sand shrimp	nc		2.5	0.2
rock crab	nc		1.7	0.1
hard clams	10	0.1	1.4	0.1
lady crab	nc		1.4	0.1
mud crabs	nc		1.3	0.1
northern moon snail	nc		1.1	0.1
Tubularia, spp.	nc		1.0	0.1
arks	nc		0.8	0.1
deadman's fingers sponge	nc		0.6	0.0
blue mussel	nc		0.4	0.0
fan worm tubes	nc		0.4	0.0
star coral	nc		0.3	0.0
comb jelly spp	nc		0.3	0.0
sea cucumber	2	0.0	0.2	0.0
sea grape	nc		0.2	0.0
green sea urchin	2	0.0	0.1	0.0
red bearded sponge	nc		0.1	0.0
northern red shrimp	1	0.0	0.1	0.0
polychaetes	nc		0.1	0.0
coastal mud shrimp	1	0.0	0.1	0.0
ghost shrimp	1	0.0	0.1	0.0
Japanese shore crab	nc		0.1	0.0
moon jelly	nc		0.1	0.0
starfish spp.	nc		0.1	0.0
surf clam	1	0.0	0.1	0.0
purple sea urchin	1	0.0	0.1	0.0
Total	**11,865**		**1,176.2**	

Note: nc= not counted

Appendix 5.5: Endangered Species Interactions: Nine (9) Atlantic Sturgeon were captured on seven (7) of the 200 tows completed in 2019; an encounter rate (3.5%) comparable to the average for the LISTS time series of tows (2.4%). The captures occurred at seven sites in the deeper mud and transition sites off the North shore of Long Island and central Sound. All encounters were reported to NMFS within 24 hours and all fish were released alive and uninjured. Details are provided below:

Sample	Date	Site	Tow Start	Duration (min)	Species	Total Length (mm)	Fork Length (mm)	Weight (kg)	Left Pec T-bar	Dorsal T-bar	PIT	Tissue Sample	Photo	Release time	Release lat (N)	Release lon (W)
FA2019012	9/10/2019	00-24	13:18	30	ATS	1,524	1,330	19.29			ADDED	YES	YES	14:07	41 00.46	72 46.45
FA2019012	9/10/2019	00-24	13:18	30	ATS	1,052	942	5.63			ADDED	YES	NO	14:11	41 00.82	72 46.02
FA2019018	9/16/2019	01-25	11:04	30	ATS	1,275	1,100	10.77			ADDED	YES	YES	11:49	41 00.79	72 44.87
FA2019018	9/16/2019	01-25	11:04	30	ATS	1,480	1,290	16.80			ADDED	YES	YES	11:55	41 00.79	72 44.87
FA2019046	10/15/2019	07-30	7:59	30	ATS	1,174	1,030	6.72			ADDED	YES	YES	9:19	41 07.554	72 31.24
FA2019058	10/23/2019	08-26	8:46	30	ATS	1,065	1,000	6.79			ADDED	YES	YES	9:33	41 08.38	72 39.54
FA2019067	10/25/2019	59-18	9:11	30	ATS	1,670	1,465	24.64			ADDED	NO	YES	9:57	41 00.02	73 04.98
SP2019052	5/15/2019	05-26	16:13	30	ATS	790	675	2.21			ADDED	YES	YES	16:57	41 05.94	72 38.73
SP2019087	6/5/2019	08-27	12:53	30	ATS	1,320	1,130	11.92			ADDED	YES	YES	13:44	41 08.13	72 40.65

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^{0}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^{0}C; prefers ~11-22^{0}C, and spawns at higher end of temperature tolerance.

Cold Temperate Group	
Common Name	Scientific Name
alewife	*Alosa pseudoharengus*
American plaice	*Hippoglossoides platessoides*
Atlantic herring	*Clupea harengus*
Atlantic cod	*Gadus morhua*
Atlantic mackerel	*Scomber scombrus*
Atlantic salmon	*Salmo salar*
Atlantic seasnail	*Liparis atlanticus*
Atlantic sturgeon	*Acipenser oxyrinchus*
Atlantic tomcod	*Microgadus tomcod*
barndoor skate	*Dipturus laevis*
cunner	*Tautogolabrus adspersus*
fawn cusk-eel	*Lepophidium profundorum*
fourspot flounder	*Hippoglossina oblonga*
grubby	*Myoxocephalus aeneus*
haddock	*Melanogrammus aeglefinus*
little skate	*Leucoraja erinacea*
longhorn sculpin	*Myoxocephalus octodecemspinosus*
lumpfish	*Cyclopterus lumpus*
monkfish (goosefish)	*Lophius americanus*
northern pipefish	*Syngnathus fuscus*
ocean pout	*Zoarces americanus*
pollock	*Pollachius virens*
rainbow smelt	*Osmerus mordax*
red hake	*Urophycis chuss*
rock gunnel	*Pholis gunnellus*
rockling	*Enchelyopus cimbrius*
searaven	*Hemitripterus americanus*
spiny dogfish	*Squalus acanthias*
whiting (silver hake)	*Merluccius bilinearis*
windowpane	*Scophthalmus aquosus*
winter flounder	*Pseudopleuronectes americanus*
winter skate	*Leucoraja ocellata*
yellowtail flounder	*Limanda ferruginea*

Warm Temperate Group	
Common Name	Scientific Name
American eel	*Anguilla rostrata*
American shad	*Alosa sapidissima*
Atlantic bonito	*Sarda sarda*
Atlantic croaker	*Micropogonias undulates*
Atlantic silversides	*Menidia menidia*
black seabass	*Centropristis striata*
blueback herring	*Alosa aestivalis*
bluefish	*Pomatomus saltatrix*
butterfish	*Peprilus triacanthus*
clearnose skate	*Raja eglanteria*
conger eel	*Conger oceanicus*
gizzard shad	*Dorosoma cepedianum*
hickory shad	*Alosa mediocris*
hogchoker	*Trinectes maculates*
lined seahorse	*Hippocampus erectus*
menhaden	*Brevoortia tyrannus*
naked goby	*Gobiosoma bosc*
northern kingfish	*Menticirrhus saxatilis*
northern puffer	*Sphoeroides maculates*
northern searobin	*Prionotus carolinus*
oyster toadfish	*Opsanus tau*
scup (porgy)	*Stenotomus chrysops*
sea lamprey	*Petromyzon marinus*
smallmouth flounder	*Etropus microstomus*
smooth dogfish	*Mustelus canis*
spot	*Leiostomus xanthurus*
spotted hake	*Urophycis regia*
striped bass	*Morone saxatilis*
striped cusk-eel	*Ophidion marginatum*
striped searobin	*Prionotus evolans*
summer flounder	*Paralichthys dentatus*
tautog (blackfish)	*Tautoga onitis*
white pearch	*Morone Americana*
weakfish	*Cynoscion regalis*