NEW YORK AND NEW JERSEY HARBOR DEEPENING PROJECT

AQUATIC BIOLOGICAL SURVEY REPORT
2006

Prepared for:

U.S. Army Corps of Engineers – New York District
Environmental Review Section
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York 10278

TABLE OF CONTENTS

Appendices

LIST OF TABLES

Biological Survey.

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 BACKGROUND

This report presents the results of the 2006 Aquatic Biological Survey conducted in the New York and New Jersey Harbor (Harbor) from January through July 2006. The focus of the program was to collect spatial and temporal distribution data on adult and early life stages of winter flounder in the Harbor and to try to establish links between adult winter flounder occurrences and spawning and nursery habitat utilization.

The 2006 Aquatic Biological Survey supplements data provided in the following reports: 1998–1999 New York and New Jersey Harbor Navigation (NYNJHN) Study, 2000–2001 Supplemental Sampling Program, 2001–2002 Aquatic Biological Sampling Program ("2002 Survey"), the 2002-2003 Aquatic Biological Sampling Program ("2003 Survey"), the 2004 Aquatic Biological Survey Report, and the 2005 Aquatic Biological Survey Report. Collectively, these six studies comprise the biological database for the New York and New Jersey Harbor Deepening Project (NYNJHDP), a United States Army Corps of Engineers (USACE) and Port Authority of New York and New Jersey (PANYNJ) sponsored project to deepen navigation channels to 50-ft to accommodate larger commercial vessels. The primary goal of the Aquatic Biological Survey is to collect data on Harbor finfish, shellfish, macroinvertebrates, and water quality, with a focus on biological community structure, distribution patterns, and seasonal patterns of habitat use. The information collected is used in determining the potential biological impacts of deepening existing Harbor navigation channels, anchorages, and berthing areas.

The NYNJHDP is the culmination of several prior projects. In December 1999, the U.S. Army Corps of Engineers released their Final Feasibility Report and Environmental Impact Statement, a comprehensive report detailing existing conditions of the Harbor, evaluating alternative actions and recommending a plan for channel improvements in the Harbor. In December 2000, the U.S. Congress issued the Water Resources Development

Act allowing the Harbor Navigation Study to commence. In 2002, Congress released the Conference Report on the Energy and Water Appropriations Act of 2002, which ordered the USACE to consolidate each of its dredging projects into the Harbor Deepening Project. In June 2002, a Record of Decision was issued for the Final Environmental Impact Statement for the Harbor Navigation Study.

The 1998–1999 NYNJHN Study found that the Harbor finfish community consists of a variety of resident and migratory fish species typical of large coastal estuaries and inshore waterways along the Middle Atlantic Bight. The Harbor estuary serves as a spawning ground, migratory pathway and nursery/foraging area for many fish and macroinvertebrate species, particularly in its non-channel (i.e. shoal or inter-pier areas). To obtain more information on the use of Harbor habitats by early life stages of fish particularly winter flounder, the NYNJHN Supplemental Sampling Program was conducted during 2000–2001.

Additional data were needed to better understand spatial and temporal occurrence patterns within the Harbor, their use of Harbor navigation channels and non-channel areas, and the role Lower New York Bay plays in winter flounder over-wintering and spawning. Furthermore, data for multiple years are needed to establish whether the use of navigation channels and non-channel areas by winter flounder is consistent from year to year. As a result, the 2001-2002 Aquatic Biological Sampling Program was created to meet this need for additional data.

The 2002 survey provided additional support to the findings of the Supplemental Sampling Program (2000-2001) that winter flounder disperse throughout the Hudson-Raritan Estuary after hatching from the primary spawning areas in the Lower New York Bay. These movement patterns may be important to winter flounder population dynamics, as larvae that move directly to the ocean without using the nursery habitat may be lost to the population (Chant *et al.* 2000).

The Supplemental Sampling (2000-2001) and 2002 Sampling programs showed that winter flounder in the Hudson-Raritan Estuary exhibit movement patterns. Additional sampling conducted during 2002-2006 was used to determine annual variability in the movement patterns and to expand the temporal coverage of the Biological Monitoring Program Database, especially with respect to the Lower Bay for winter flounder. This additional sampling has created a valuable long-term data set whereby fish responses to changing conditions and anthropogenic alterations in the Harbor can be assessed. To allow for direct comparisons among years, the study objectives and sampling gear have remained consistent among sampling years, except where noted[1].

1.2 STUDY OBJECTIVES

During the 2006 Aquatic Biological Survey data were collected on adult and early life stages of finfish in the Harbor with an emphasis on winter flounder – sampling was conducted during the period when winter flounder spawning and early life stages occur in the Harbor. The specific objectives were to:

- Determine the utilization and significance of Harbor areas for adult winter flounder and other Essential Fish Habitat (EFH) species for the months of January through June.
- Determine the utilization and significance of Harbor areas for early life stages (eggs and larvae) of winter flounder and other EFH species from January through July.

To meet program objectives, two sampling methodologies were employed. Bottom trawling was conducted to address the objectives related to adult finfish, and epibenthic sled-mounted plankton net was used to target early life stages.

[1] Bottom trawls were conducted during the night from the 1998 through 2004 sampling programs. In 2005, sampling times were changed to daylight hours due to health and safety considerations.

1.3 REPORT ORGANIZATION

For this report, species were classified into one of three groups: EFH species, Important Non-Managed species (INM), and Other species (Table 2-5). The intent of this re-organization was to broaden the study's focus from primarily winter flounder to other important species in the Harbor's finfish community. The specific attention to each INM species in this report is warranted since they have been the focus of interest by local resource agencies for many years.

Section 2 describes sampling stations and summarizes the sampling methods used; Section 3 presents the results of bottom-trawl and epibenthic-sled sampling; and Section 4 discusses how the data relate to 2006 program objectives, compares these data to previous years of the NYNJHDP sampling, and evaluates these findings on a Harbor-wide scale.

2.0 METHODS

2.1 SAMPLING LOCATIONS

Twenty-four locations were sampled during the 2006 Aquatic Biological Survey (Table 2-1). Twenty-three of these locations were sampled during the 2001–2005 Aquatic Biological Sampling Programs (Table 2-1). AK-1 was not sampled during 2005 or 2006 due to a change in bathymetry (Table 2-1). The Island of Meadows station (AK-7) was added in Arthur Kill during 2006 to replace the Elizabeth Flats South (AK-1) station as a non-channel station. Two other stations sampled during other years were not sampled during 2006: Elizabeth Flats North (NB-7) station and Elizabeth Flats South (AK-1) station (Table 2-1). The South Brooklyn (SB-2) station, which was not sampled during 2005, was sampled during 2006 (Table 2-1).

Of the 24 stations sampled during 2006, 12 were located in non-channel or inter-pier areas, and 12 were located in navigation channels (Table 2-1). For all years combined,

27 stations were sampled; 15 non-channel areas and 12 channel stations (Table 2-1, Figure 2-1).

For data analysis purposes in this and the three previous Biological Sampling Programs, the Harbor was divided into three study areas based on geography: Arthur Kill/Newark Bay, Upper New York Bay, and Lower New York Bay (Figure 2-1). Sampling stations were distributed as follows among the three areas:

- Arthur Kill and Newark Bay

  Nine stations were located in this area. Of these, three were in Arthur Kill non-channel areas (AK-1, AK-4, and AK-7) and two were in channels at the Arthur Kill/Kill Van Kull confluence area (AK-2 and AK-3). Newark Bay stations were also represented by three non-channel stations (NB-3, NB-4, and NB-7) and two stations located in the navigation channel (NB-5 and NB-6). AK-1 was not included in the 2005 trawl survey, and this station along with NB-7 was not included in the 2006 sampling program. AK-7 was added to the sampling program during 2006.

- Upper New York Bay ("Upper Bay")

  In the Upper Bay, which includes South Brooklyn (SB) and Port Jersey (PJ), 11 stations were sampled. Two were in the South Brooklyn inter-pier areas (non-channel stations SB-1 and SB-2) and one was on the Bay Ridge Flats (SB-3). Three stations were located in navigation channels—one in Bay Ridge Channel (SB-4) and two in the Anchorage Channel (SB-5 and SB-6). Three non-channel stations were located in Port Jersey (PJ-l, PJ-2, PJ-3) and two were located in Port Jersey Channel (PJ-4 and PJ-5). SB-2 was not included in the 2005 trawl survey.

- Lower New York Bay ("Lower Bay")

  Six stations were located in this area—three in channels (LB-2, LB-4 and LB-6) and three in non-channel areas (LB-1, LB-3, and LB-5). The Lower Bay sites were added in the 2001–2002 Biological Sampling Program to provide better

spatial coverage for the evaluation of winter flounder and other EFH species in the Harbor.

2.2 BOTTOM TRAWL SAMPLING

Adult and sub-adult finfish were sampled with a bottom trawl from 17 January through 14 June 2006. Trawls were conducted on a stratified schedule bracketing the period when adult winter flounder historically are present in the Harbor to spawn. Bottom trawls were conducted twice a month in January, February and March and once a month during April May and June at 25 sampling stations.

Bottom trawls were conducted using a 30-foot (9.1 m) otter trawl (Table 2-2), the same trawl used during previous years of the NYNJHDP. A minimum ratio of tow cable length to maximum station water depth of 5:1 was maintained to ensure that the trawl was in contact with the bottom throughout each tow.

Bottom trawls were conducted during daylight[2] hours (from one hour after sunrise and one hour before sunset) against the prevailing current at a bottom speed of approximately 5.0 ft/sec (150 cm/sec). Target tow duration was ten minutes, although tow times were adjusted as needed to account for obstructions, limited inter-pier distances, commercial traffic, and several other factors.

A total of 207 bottom trawls were conducted during 2006 —108 at navigation channel stations and 99 at shallow/shoal.

All fish were identified and enumerated on the research vessel immediately following collection. Total length of each winter flounder caught was recorded to the nearest millimeter (mm). When available, up to a total of up to five (5) winter flounder per trawl that measured greater than 250 mm were preserved on ice and returned to the laboratory for sex determination, if sex could not be determined in the field. A 250-mm total length

[2] Bottom trawls were conducted during the night from the 1998 through 2004 sampling programs.

was established to limit the number of immature fish kept for analysis. Winter flounder typically exhibit adult gonad development at 250 mm total length and reach sexual maturity between 280 mm and 300 mm (Witherell 1993).

For all other species collected, total length was measured for a maximum of 25 individuals of each species in each trawl sample. When the number collected of a non-target species exceeded 25 in a trawl sample, a random, unbiased selection of the 25 to be measured was made. Except for winter flounder preserved for laboratory analysis, all fish collected were released after on-board examination.

2.3 ICHTHYOPLANKTON SAMPLING (EPIBENTHIC SLED)

Ichthyoplankton sampling was conducted from 24 January to 7 July 2006. Twenty-five stations were sampled twice a month from February through June and once a month during January and July.

Samples were collected with an epibenthic sled-mounted, 0.5-m mouth diameter plankton net with 0.5-mm mesh (Table 2-3). Typically, a 3:1 ratio of cable length to station depth was maintained and an inclinometer was used to determine the warp angle from the boat to confirm that the sled was on the bottom. The net was fitted with a General Oceanics flowmeter (Model 2030R) to measure sample volume.

All samples were collected during daylight hours (from one hour after sunrise to one hour before sunset). Whenever possible, each tow was conducted against the prevailing current or tide for ten minutes. Tow direction and duration were adjusted as needed to account for obstructions, limited transect distances and commercial traffic.

A total of 283 epibenthic sled tows were conducted—143 at navigation channel stations and 133 at non-channel stations. Each sample was washed from the plankton net into containers and preserved with 5% buffered formalin containing rose bengal stain. Samples were returned to the laboratory for sorting and identification.

All specimens were identified to the lowest taxonomic level practicable, assigned a life stage based on morphometric characteristics (egg, yolk-sac larvae, post yolk-sac larvae, or juvenile) and enumerated. For some larvae, it was not possible to discern between yolk-sac and post yolk-sac life stages because specimens were damaged. Indiscernible larval life stages were combined with the yolk-sac larval life stage during analysis.

Quality control procedures consisted of a continuous sampling plan to assure an average outgoing quality limit (AOQL) of ≥ 90% during sample sorting, enumeration, life-stage designation, and identification.

2.4 WATER QUALITY MEASUREMENTS

Dissolved oxygen (DO), temperature, conductivity, and salinity were measured after each trawl and epibenthic sled tow (Table 2-4). Water quality parameters were recorded one foot (0.3 m) above the substrate using calibrated meters (YSI Model 85 Handheld Oxygen, Conductivity, Salinity and Temperature System).

2.5 DATA ANALYSIS

All finfish were identified to the lowest possible taxonomic level in both trawl and ichthyoplankton sampling. Species were grouped into one of three categories: federally managed EFH species, non-managed but commercially or recreationally important species (INM species), and Other species (Table 2-5).

2.5.1 Bottom Trawl

Catch per unit effort (CPUE), defined as number of fish per 10 minute trawl tow, was determined for each trawl tow based on the time each net sampled on the bottom. Catches were standardized to a 10-minute tow when tow times were less than 10 minutes. Standardization was performed by dividing 10 by the actual number of tow minutes.

$$CPUE = \left(\frac{N}{T} \right) \times 10$$

Where:

N equals the number of fish collected during the tow.

T equals the actual tow time expressed in minutes.

2.5.2 Ichthyoplankton

Ichthyoplankton densities expressed as total number per 1,000 cubic meters (m^3) were computed for each epibenthic sled tow based on the volume of water sampled and using the following formula:

$$Density = \left(\frac{N}{[A \times D]} \right) \times 1{,}000$$

Where:

N equals the total number of organisms collected

A equals the area of the net mouth (m^2) and

D equals the distance traveled (m) calculated as the total flowmeter revolutions multiplied by the flowmeter constant (0.026873).

3.0 RESULTS

Adult finfish and ichthyoplankton data were analyzed for the two general habitat types (navigation channels and non-channel areas) and the three Harbor areas (Arthur Kill/Newark Bay, Upper Bay, and Lower Bay). Species composition and trends in catch rate are described in the following summary using the three groups described above. Detailed station data for adult finfish, ichthyoplankton, and water quality are provided in Appendices A through C, respectively.

Note that the following data-unit definitions apply in the figures accompanying the main report text and in the Appendices:

- Trawl: Catch per unit effort (CPUE), defined as number caught per 10 minute trawl tow.
- Epibenthic sled tow: Ichthyoplankton density (number per 1,000 cubic meters).

3.1 FINFISH

3.1.1 Bottom Trawl Sampling

A total of 23,874 finfish of 42 species were collected during the 2006 bottom trawl survey (Table 2-5). Bay anchovy (12,356 individuals) was the most abundant species in the Harbor during the 2006 sampling program, contributing over half of the catch. Blue crab, was sampled in all three regions during spring. The EFH and INM species represented 7% and 15% of the total catch, respectively. Five of the EFH and INM species comprised a significant portion of the total catch in the Harbor: alewife (2,648 individuals), striped bass (861 individuals), red hake (819 individuals), Atlantic herring (538 individuals) and winter flounder (263 individuals). All remaining EFH and INM species represented less than one percent of the total catch (Appendix A).

Thirty-nine (39) species and 9,679 fish were collected from the navigation channel stations, and 32 species and 14,195 fish were collected from non-channel stations. Alewife (2,545 individuals), spotted hake (1,723 individuals), and white perch (1,721

individuals) dominated channel stations in total abundance. In contrast, bay anchovy comprised 86% of the total fish caught in non-channel stations (12,223 individuals). The next most abundant species at non-channel stations, blueback herring (841 individuals) and Atlantic herring (536 individuals), represented six and four percent of the total catch, respectively.

Species distributions varied temporally and spatially, with channel stations having generally higher CPUE during winter months, while non-channel stations were higher during spring (Figure 3-1). Average monthly CPUE rates were higher in channel stations for all INM species, with February yielding the highest average CPUE for this group (Table 3-1). At non-channel stations, the highest rates were caught during spring 2006, for alewife and striped bass (Table 3-1). May yielded the highest monthly CPUE for EFH species, though catch between channel and non-channel stations was less consistent among these species (Table 3-1). Black sea bass and little skates had the lowest catch rates for EFH species, of 0.05 (February) and 0.04 fish/10 minute trawl (March) at channel stations, respectively. In contrast, Atlantic herring had the highest catch rates of all EFH species, with 53.99 CPUE at non-channel stations during May.

Overall, spring use of the Harbor was dominated by Other species and peaked at non-channel stations during May (Table 3-1). High catch rates of approximately 60 fish / 10 minute trawl occurred at channel stations for Other species during January through April (Table 3-1). For these species, April was a transition month where catch rates between channel and non-channel stations flipped. Range of mean monthly CPUE at non-channel stations for all Other species increased from 1.36 during January to 1,177.99 fish/10 minute trawl during May. Catch of Other species at channel stations was lower, peaking in February at 65.39 and falling to 13.26 CPUE during June 2006.

3.1.1.1 Arthur Kill/Newark Bay

Arthur Kill/Newark Bay had the lowest abundance and diversity of the three Harbor sampling areas. A total of 4,663 fish from 25 species were caught, with white perch (37% catch) and bay anchovy (28% catch) dominating the assemblage. Of the species

caught during 2006, only striped bass, alewife, and red hake represented more than one percent of total catch. Further investigation of temporal patterns among these species reveals a shift in composition from striped bass during January through March to a red hake- and Atlantic herring-dominated assemblage during April through June (Figure 3-2).

Twenty-three (23) species were collected from the navigation channel stations and nine species were collected from the non-channel stations (Table 3-2a and 3-2b). Catches at the channel stations were most diverse in March when 15 species were collected, while May was the most diverse for non-channel stations, with 8 species collected. The two most abundant species were almost exclusively collected at one station type; white perch were found only at channel stations and almost all bay anchovy were caught at non-channel sites.

Trends in CPUE within the Arthur Kill/Newark Bay region followed those of the Harbor, with higher channel catch rates during winter months, followed by still higher rates caught in non-channel stations during the spring. In fact, the mean weekly CPUE in non-channel stations during mid-May of 563 fish/ 10 minute trawl overshadows all other weekly catch rates in this region (Figure 3-1). Catch of EFH and INM species occurred mostly in channel stations, where striped bass had the highest mean monthly CPUE of 25.21 fish/ 10 minute trawl during January (Table 3-2a). Red hake had the highest mean monthly CPUE of EFH species caught, peaking during April with 9.38 fish/10 minute trawl in channel stations (Table 3-2a). Non-channel catch of EFH and INM species peaked during April at 3.5 CPUE for Atlantic herring and during May at 6.5 CPUE for alewife (Table 3-2b).

3.1.1.2 Upper Bay

Species composition in the Upper Bay sampling area was the most diverse of the three Harbor regions, with a total of 38 species collected. Of the 9,400 fish sampled, bay anchovy represented 50% of the catch. Spotted hake represented 12% of the catch, with 1,162 individuals. All other species comprised less than 10% of the total catch. Among the EFH and INM species caught in Upper Bay, striped bass, red hake, and alewife

dominated the catch in January, February, and March, respectively (Figure 3-2). Composition during April through June was more diverse, with 15 EFH and INM species caught (Figure 3-2).

Thirty-seven (37) species were sampled from navigation channel stations and 27 species were collected from non-channel stations (Table 3-2a and 3-2b). Although channel stations had higher diversity, almost two-thirds of the total catch occurred at the non-channel stations. Spotted and red hake dominated channel stations, representing a combined total of 55% of the channel station catch, whereas 77% of non-channel station catch consisted of bay anchovy.

Mean monthly CPUE varied temporally in Upper Bay. During winter months, fish were caught in higher rates at channel stations. Alternately, higher catch rates were seen at non-channel stations during spring months, especially mid-May and June (Figure 3-1). Red hake, the most abundant EFH species collected at channel stations, ranged from 44.33 CPUE during February to 0.4 CPUE during May (Table 3-2a). Atlantic herring had the highest catch rates at non-channel stations, with 44.25 CPUE during May (Table 3-2b). Winter flounder were sampled at channel and non-channel stations during all months, though channel catch rates were consistently higher (Table 3-2a and 3-2b). Similarly, striped bass were abundant in channel and non-channel stations; however, catch rates shifted from high channel CPUE during winter months to high non-channel CPUE during the spring (Table 3-2a and 3-2b).

3.1.1.3 Lower Bay

Collections from the Lower Bay sampling area were generally less diverse than the Upper Bay, although total catch was higher. A total of 29 species and 9,818 individuals were collected from the Lower Bay during 2006. Of the three sampling regions, the highest proportions of bay anchovy and alewife were found in Lower Bay, representing 64% and 22% of the catch, respectively. The 13 EFH and INM species collected during the 2006 sampling period displayed interesting temporal patterns in abundance. Alewife dominated the catch during January through April, representing at least 75% of the

monthly catch. However during May, Lower Bay showed a dramatic rise in the number of EFH and INM species caught (Figure 3-2). During June, butterfish dominated the assemblage of EFH and INM species (32 individuals; Figure 3-2).

Similar to other sampling regions, more species were collected at channel stations than non-channel, with 26 and 16 species, respectively. Nearly two-thirds of all fish were caught at non-channel stations; 98% of which were bay anchovy. Channel stations were dominated by alewife (67% of total individuals), but blueback herring (579 individuals), spotted hake (256 individuals), and Atlantic menhaden (120 individuals) were also common.

Mean CPUE varied temporally in Lower Bay, again repeating the Harbor-wide pattern of higher catch rates in channel stations during winter and higher non-channel catch rates during spring (Figure 3-1). During May, Lower Bay experienced the largest mean weekly CPUE of the regions, with over 2,000 fish/ 10 minute trawl collected (Figure 3-1). These high catch rates were due to bay anchovies, not due to EFH or INM species. Catch rates for EFH and INM species at non-channel stations ranged from 0.14 windowpane / 10 minute trawl during January to 8.00 butterfish/ 10 minute trawl during June (Table 3-2b). Alewife and Atlantic menhaden had the highest catch rates at channel stations for INM species and in Lower Bay (Table 3-2a). Of the EFH species, both red hake and winter flounder had peak catch rates at channel stations during March, with CPUE's of 3.57 and 2.57, respectively (Table 3-2a).

3.1.2 Ichthyoplankton Sampling (Epibenthic Sled)

Finfish eggs, larvae, and juveniles were collected in all sampling regions during the 2006 Aquatic Biological Sampling Program (Tables 3-3a-d). There were no dramatic differences between channel and non-channel station types for any of the life stages, except juveniles. Juvenile fishes were predominantly caught at channel stations (87 %), though relatively few individuals of this life stage were caught in the Harbor ($N = 45$).

Arthur Kill/Newark Bay, Upper Bay, and Lower Bay had increasing total densities of 60,597, 143,810, and 331,623 /1,000 m^3, respectively. Despite Lower Bay having the highest total density of the three regions, more fish and eggs were caught at Upper Bay stations (N = 5,111) than in other regions (AKNB: N = 2,458; LB: N = 4,261). For all life stages combined, the highest density of ichthyoplankton was sampled during July, followed by May, then June. January had the lowest total density for all life stages combined.

A total of 36 species were collected over the seven months. Atlantic herring, Atlantic mackerel, butterfish, summer flounder, windowpane, and winter flounder comprised the EFH species list, while Atlantic menhaden was the only INM species sampled. A full list of ichthyoplankton densities by species and stage can be found in Appendix B.

3.1.2.1 Eggs

Eggs were collected in the Harbor from March through July, and densities peaked during May (Table 3-3a, Figure 3-3). Higher densities of eggs were collected at non-channel stations during July than other months (Table 3-3a). Consistently higher densities of eggs were collected in Lower Bay than the other sampling regions (Table 3-3a, Figure 3-3). Densities in Lower Bay peaked during July with 3,380 and 12,241/1000 m^3 at channel and non-channel stations, respectively (Table 3-3a, Figure 3-3). Within the other sampling regions, egg densities were higher during May at Upper Bay stations and decreased as the season progressed (Figure 3-3). In contrast, Arthur Kill/Newark Bay stations had low densities during May, which increased to peak during July (Figure 3-3).

A total of 14 egg species were collected in the Harbor during 2006. Of these, Atlantic menhaden and bay anchovy represented 67 % of the total catch. Catch of EFH and INM species was dominated by windowpane during March and April at non-channel stations, while May and June were dominated by Atlantic menhaden caught at both channel and non-channel stations (Table 3-3a, Figure 3-4). Atlantic mackerel, one of three EFH species collected, had the lowest density with a mean of 2.19 eggs/1,000m^3 (Table 3-3a). However, Atlantic Mackerel also represented the only late-season EFH species, and was

collected in Arthur Kill/Newark Bay during July (Figure 3-4). Windowpane had the highest densities of EFH species, peaking at non-channel stations with a monthly mean of 556.76 eggs/1,000m^3 during May (Table 3-3a).

3.1.2.2 Yolk-sac Larvae

Catch of yolk-sac larvae in the Harbor occurred primarily during March and April 2006 (Figure 3-5). In general, no difference between channel and non-channel stations occurred, although there were regional differences (Figure 3-5). In Arthur Kill/Newark Bay, yolk-sac larvae were only collected at navigation channel stations; whereas the Upper and Lower Bays had primarily higher densities at non-channel stations (Figure 3-5).

Winter flounder dominated the yolk-sac larval assemblage and represented 71% of the total catch. Winter founder yolk-sac larvae were only present in the catch during March and April (Table 3-3b). Other species were also caught in the Harbor during a small time frame, often less than three months (Table 3-3b). Higher winter flounder densities were collected at non-channel stations, but this pattern did not hold true for all yolk-sac larvae collected (Table 3-3b). One windowpane was collected in May at a channel station in Upper Bay. Atlantic menhaden were collected at non-channel stations in Upper Bay during May and June, with densities of 2.42 and 2.87/1,000 m^3, respectively (Table 3-3b).

3.1.2.3 Post Yolk-sac Larvae

Post yolk-sac larvae were collected during all months (Table 3-3c, Figure 3-7). The three sampling areas had similar densities for the 2006 season, but total abundance differed. Lower Bay collected the most individuals of this life stage (N = 2,328) and Arthur Kill/Newark Bay collected the least (N = 1,034). For all regions combined, the highest densities were collected during July at non-channel stations (Table 3-3c, Figure 3-7). There were also discernable peaks in densities during April at Upper and Lower Bay stations (Figure 3-7).

Twenty-six species were identified during 2006, which is more species caught than other ichthyoplankton stages. Five species were EFH species (i.e., Atlantic herring, butterfish, summer flounder, windowpane, and winter flounder) and one was an INM species (i.e., Atlantic menhaden). Gobiidae and winter flounder post-yolk-sac larvae represented almost 75% of the total catch. Winter flounder dominated the mid-season catch at all sampling areas and station types, peaking at non-channel stations in Lower Bay during April (Table 3-3c, Figure 3-8). For EFH and INM species, windowpane and Atlantic menhaden were collected at the beginning and end of the sampling season, whereas winter flounder were collected predominantly during March, April, and May (Figure 3-8). One each of butterfish and summer flounder were caught at channel stations in Upper Bay (Table 3-3c, Figure 3-8). Atlantic herring were also collected in Upper Bay and Arthur Kill/Newark Bay also at channel stations (Table 3-3c, Figure 3-8).

3.1.2.4 Juveniles

Densities of juvenile finfishes in the Harbor were the lowest of all life stages and the least diverse, with only eight species collected. Juveniles were collected in all months except April (Table, 3-3d, Figure 3-9). Peak densities occurred during January and February, with 18 juveniles /1,000m^3 collected at channel stations in Arthur Kill/Newark Bay (Table 3-3d, Figure 3-9). The only catch of juveniles at non-channel stations occurred during May and June at Upper and Lower Bay (Table 3-3d, Figure 3-9). One butterfish, an EFH species, was collected in Lower Bay at a non-channel station (Table 3-3d, Figure 3-10).

3.2 WINTER FLOUNDER

3.2.1 Bottom Trawl Sampling

3.2.1.1 Catch Per Unit Effort (CPUE)

Winter flounder (WFL) were collected in each of the three Harbor regions by trawling during 2006 (January to June; Tables 3-2a-b). Mean monthly CPUEs, which were

consistently higher at channel stations than non-channel stations, peaked during April (Tables 3-2a-b). The peak CPUE at channel stations occurred in Upper Bay (12.00 WFL/10 minutes), as did the peak at non-channel stations (2.13 WFL/10 minutes; Tables 3-2a-b). Moreover, Upper Bay repeatedly had the highest monthly catch rates, regardless of station type (Tables 3-2a-b). High weekly CPUE was also observed in late February 2006, with 4.19 and 5.75 WFL/10 minutes caught at channel stations in Arthur Kill/Newark Bay and Upper Bay, respectively (Figure 3-11). Few winter flounder were caught at non-channel stations in Arthur Kill/Newark Bay and Lower Bay, with monthly CPUEs less than one (Tables 3-2a-b). During June 2006, no winter flounder were caught at channel or non-channel Arthur Kill/Newark Bay stations (Tables 3-2a-b). Throughout the 2006 season, there was no indication of a temporal shift towards shallower non-channel stations in any region of the Harbor.

3.2.1.2 Size Distribution

Lengths of 263 winter flounder collected in the Harbor during 2006, ranged from 67 to 426 mm. Both the smallest and largest fish were caught at channel stations, although generally smaller fish were sampled at non-channel stations (Figure 3-12). The mean length distribution at channel and non-channels stations was 201.3 mm (± 61.3 SD) and 157.1 mm (± 65.9 SD), respectively. In general, juvenile fish (TL < 250 mm) were caught in trawls during 2006. At channel stations, approximately 76% of fish measured less than 250 mm, whereas 85% of fish measured at non-channel stations were less than 250 mm.

Temporal patterns in size distribution were different among the three Harbor regions. Catch of adult winter flounder (TL ≥ 250 mm) was negligible at Arthur Kill/Newark Bay (N =1) and Lower Bay (N = 11) stations. One adult was sampled in Arthur Kill/Newark Bay during February, whereas 11 adults were caught in Lower Bay from February through June (Figure 3-13 and 3-15). The most adult fish were caught at Upper Bay stations during April 2006 (N = 19), with a total of 31 adults for the year.

The size distribution of winter flounder in Upper Bay progressively increased in size from January through April, peaking at a monthly mean of 218.1 mm (± 7.4 S.D.; Figure 3-14). In contrast, the size distribution in Arthur Kill/Newark Bay remained relatively constant from January through March, with few fish being caught after that (Figure 3-13). In Lower Bay, no distinguishing patterns in size distribution can be determined from the 2006 sampling, except for a wide range of lengths being caught during March (Figure 3-15).

3.2.1.3 Sex Ratio

Although somewhat skewed by small sample size, the adult winter flounder population in the Harbor appears to be female-dominated (Figure 3-16). Winter flounder caught in the Upper Bay during 2006, which had the largest sample size (N = 30), were 70% female. Lower Bay had a 1:1 ratio of males and female (N = 10), whereas the one winter flounder adult sampled in Arthur Kill/Newark Bay was female (Figure 3-16).

3.2.2 Ichthyoplankton Sampling (Epibenthic Sled)

During the 2006 sampling season, winter flounder eggs, yolk-sac and post-yolk sac larvae were collected throughout the Harbor. No early life stages of winter flounder were collected during January or February, and no juveniles were caught during any month. Both eggs and yolk-sac larvae were mostly collected during March and April, with Upper Bay having the highest proportion of eggs (37.5%, N = 30) and Lower Bay having the highest proportion of yolk-sac larvae (30%, N = 21) during March 2006 (Figure 3-17). Overall, post-yolk sac winter flounder were the dominant life stage collected in each region, and were found in samples from March through July. Post-yolk sac larvae represented 100% of the catch during May and June in Arthur Kill/Newark Bay, during May and June in Upper Bay, and during May through July in Lower Bay (Figure 3-17). No juvenile winter flounder were sampled during 2006.

Winter flounder eggs were collected in the Harbor from March through May 2006 (Figure 3-18). The highest egg densities were found at channel stations in the Upper

Bay, with 22.3 and 32.3 eggs/1,000 m^3 collected at the end of March and the end of April, respectively (Figure 3-18). Although eggs were collected at both channel and non-channel stations in Upper Bay, eggs were only collected at non-channel stations in Arthur Kill/Newark Bay and were only collected at channel stations in Lower Bay (Figure 3-18).

Yolk-sac winter flounder larvae were collected at channel and non-channel stations in the Harbor, but catch was limited to March and April 2006 (Figure 3-19). Peak densities were collected at channel stations during late March (36.2/1,000 m^3) and non-channel stations during late April (35.6/1,000 m^3) in Lower Bay. There was a trend in Lower Bay where non-channel stations had progressively higher densities through time. In Upper Bay, there was no difference between channel and non-channel station densities. One yolk-sac larvae was sampled in Arthur Kill/Newark Bay, on 7 March 2006 at a non-channel station.

Post-yolk sac larvae were consistently collected at channel and non-channel stations in each region of the Harbor (Figure 3-20). Densities peaked during late April at channel stations in Upper Bay and non-channel stations in Lower Bay, while peak densities occurred in Arthur Kill/Newark Bay during early May (Figure 3-20). Occurrence of post-yolk sac larvae in the epibenthic sled tapered off by late May in all regions, although winter flounder were sampled in low densities until sampling was stopped in July.

3.2.3 Comparisons among Years

Winter flounder CPUE and early life stage density data were compared for the 2001-2006 Biological Monitoring Programs. Comparisons were made by month and year because the sampling programs were conducted during the same time of year at the same sampling stations using the same gear. Trawl sampling methods changed from night-sampling during 2002 through 2004 to day-sampling during 2005 through 2006, thus the winter flounder trawl data cannot be compared across all years.

Monthly CPUE comparisons among the 2002-2004 programs and among the 2005-2006 programs did not show apparent patterns (Figure 3-21a-b). No sampling year was consistently higher than other years and no region had consistently higher or lower CPUEs (Figure 3-21a-b). However, mean winter CPUEs during 2002 through 2004 tended to be lower at Lower Bay stations than in the other regions (Figure 3-21a).

Peak abundances varied by year, month, and region. During 2002-2004, the highest abundances of winter flounder occurred during June 2002 at Arthur Kill/Newark Bay (11.6 fish/10 min tow) and during January 2004 at Upper Bay (11.3 fish/10 min tow; Figure 3-21a). The June 2002 peak was caused by high recruitment of age-0 winter flounder in the trawl tows (Figure 3-23a), whereas the January 2004 catch was dominated by winter flounder less than 150 mm TL (Figure 3-25a). During 2005 and 2006, the highest abundance occurred during January 2005 at Lower Bay (17.9 fish/10 min tow). The only month throughout the five sampling years in which winter flounder were not collected was June 2006 in Arthur Kill/Newark Bay.

Regardless of whether the sampling was conducted during the night (2002-2004) or during the day (2005-2006), the assemblage in each region was dominated by sexually immature individuals (TL < 250 mm). Nighttime catches during January through March were dominated by individuals between 50-150 mm TL, where as a wide range of length classes were caught during April and May 2002-2004 (Figures 3-22a, 3-23a, 3-24a, 3-25a). The most sexually mature winter flounder were sampled during April and May 2002-2004 (Figures 3-22a). During June 2002-2004, small winter flounder, likely young-of-year, were collected in Arthur Kill/Newark Bay and Upper Bay and are represented by the large fraction of fish close to 50 mm TL (Figures 3-22a, 3-23a, 3-24a, 3-25a).

Few patterns among the regions were distinguishable in the 2005 and 2006 data. During January through March 2005 and 2006, sub-adult winter flounder dominated the catch (Figure 3-22b). During March and April of each year, Upper Bay had a wide range of length classes compared to the other two regions (Figures 3-23b, 3-24b, 3-25b). Few fish were caught in Lower Bay during this time.

Winter flounder eggs were generally collected from February through April (Figure 3-26). Egg densities were typically higher in Upper Bay and Lower Bay than in Arthur Kill/Newark Bay. Densities collected during 2003 remain the highest of any sampling season, with monthly means of 70 eggs/1,000 m^3 in Upper Bay and of 87 and 91 eggs/1,000 m^3 in Lower Bay (Figure 3-26). Monthly egg densities during 2006 were lower than normal in Lower Bay, while hauls in Arthur Kill/Newark Bay and Upper Bay during 2006 yielded similar densities as previous years (Figure 3-26).

Occurrence of winter flounder larvae (yolk-sac and post-yolk sac combined) took place over a protracted time frame, beginning in some years as early as January and continuing through July (Figure 3-27). Generally Lower Bay had the highest winter flounder larval densities, while Arthur Kill/Newark Bay had the lowest. Mean monthly densities in each region consistently reached their five-year peak during April 2004: Arthur Kill/Newark Bay 429; Upper Bay 622; Lower Bay 2,529 larvae/1,000 m^3. The 2003 season also yielded high larval densities. In contrast, some of the lowest densities in the Harbor were collected during 2006.

3.3 WATER QUALITY

Arthur Kill/Newark Bay experienced larger fluctuations in mean bottom temperature than the other regions of the Harbor (Figure 3-28). Mean temperatures were similar among regions from January through March, but deviated during April through July. At the onset of the winter flounder spawning season (January through March), temperatures throughout the Harbor ranged between 4.4 and 6.6 ^oC. During spring and summer 2006, Arthur Kill/Newark Bay had the highest temperatures and Lower Bay had the lowest temperatures. Mean monthly temperatures for the sampling season ranged from a low of 4.4 ^oC in Lower Bay during March to a high of 18.7 ^oC in Arthur Kill/Newark Bay during July.

Mean salinity recorded from near bottom depth ranged between 16.4 ppt and 28.2 ppt over the course of the sampling season (Figure 3-28). Salinities were consistently lower in the Arthur Kill/Newark Bay and higher in the Lower Bay throughout the 2006 sampling season.

Dissolved oxygen concentration in water is largely dependent on water temperature, and to a lesser degree, salinity. As temperature increases, the solubility of oxygen in water solution decreases. Similarly, as salinity increases, the oxygen solubility in water decreases. Trends in mean dissolved oxygen levels were similar across the three Harbor areas, remaining between 9.1 mg/L and 11.4 mg/L from January through March and decreasing in the summer months to between 4.4 mg/L and 8.5 mg/L. Aside from July, dissolved oxygen levels throughout the Harbor were inversely proportional to temperatures within each region. During July, dissolved oxygen levels in the Lower Bay were slighter lower than expected considering the inverse relationship with temperature. All water quality sampling data are presented in Appendix C.

3.3.1 Comparisons among Years

Inter-annual variation in temperature was more pronounced in the Harbor than for salinity and dissolved oxygen concentrations. Winter water temperatures during 2002 and 2006 were warmer in all regions during January and February as compared to temperatures during 2003 and 2004 (Figure 3-29a). Of note, the years with the coldest water temperatures in winter (2003-2005) had the warmest water temperatures in July in all three regions (Figure 3-29a). Although 2006 began as one of the warmest years for water temperatures from January through May, by July mean temperatures were lower than normal by comparison for all regions (Figure 3-29a).

Salinity concentrations in Upper and Lower Bays were relatively consistent among years and among months. In Arthur Kill/Newark Bay, salinities were generally the highest during 2002, the lowest during 2005, and the most consistent across months during 2006 (Figure 3-29b). For all regions, salinity was most variable among years during April,

with the lower concentrations observed during 2003 and 2005 than other years (Figure 3-29b).

Mean dissolved oxygen concentrations were less variably than mean temperatures among years, but displayed more inter-annual variation than salinity concentrations. Dissolved oxygen concentrations varied among years during January, February, and March as compared to other months, which may result from the variations seen in winter temperatures among sampling years (Figure 3-29c).

4.0 DISCUSSION

The water quality and habitat characteristics of the areas sampled may affect the spatial and temporal occurrence of finfish in the Harbor. As previously demonstrated, the Lower Bay is more characteristic of a marine environment than the Arthur Kill/Newark Bay and the Upper Bay which are more characteristic of nearshore, estuarine environments (USACE 2002). The Upper Bay may be more marine than the Arthur Kill/Newark Bay by virtue of the relatively broad connection between Lower Bay and Upper Bay through The Narrows. As identified in previous reports (USACE 2002, USACE 2003), the predominance of fine bottom sediments in the Arthur Kill/Newark Bay area suggests that there is limited tidal exchange resulting in a depositional area with a greater potential for high biological, chemical, and sediment oxygen demand. Because of the limited connections among Arthur Kill/Newark Bay and its surrounding water bodies, water quality parameters undergo large annual fluctuations, whereas temperature, salinity, and dissolved oxygen are relatively more consistent from month to month in Upper Bay and most consistent in Lower Bay.

4.1 ALL SPECIES

Although the dominant species were different from previous years, the adult finfish composition of the 2006 sampling program is typical of Atlantic Coast estuaries. Species richness has remained relatively constant throughout the five-year sampling period, with a peak of 51 finfish species sampled during 2003 followed by a low of 38 species in 2004. Daytime trawl catches during 2005 and 2006 were dominated by bay anchovy and alewife, whereas catches during the 2002-2004 sampling programs were dominated by striped bass, spotted hake, and white perch. In each year, bay anchovy were among the most abundant egg and post-yolk sac larvae caught. Striped bass, spotted hake, and white perch ichthyoplankton were never sampled in high numbers during the five year sampling program. In general, the species collected are common in estuaries and known to rely on the Harbor for spawning, nursery, and foraging habitat (Able and Fahay 1998).

Also, total abundance of trawl catch increased five-fold during 2006 over 2005, making 2006 the highest number of finfish caught during any of the five sampling programs. This high abundance was attributed to the large numbers of small fish caught during May 2006, likely young-of-year. The relatively small changes in species number and diversity are well within what can be expected from natural variation.

There were also temporal and spatial trends evident throughout the Harbor during 2006. Specifically was the transition from higher CPUEs being sampled at channel stations during winter months to non-channel stations having peak CPUEs during spring and summer months. Species will often make mass movements to shallow water for the purpose of spawning and foraging, whereas deeper water can afford stable water temperatures during the winter. Additionally, abundance and diversity varied by region, where Arthur Kill/Newark Bay had the lowest abundance and diversity, Lower Bay had the highest abundances, and Upper Bay was the most diverse region of the Harbor. Much of this variation may be explained by the different physical conditions of the three regions sampled in this program.

Ichthyoplankton densities varied spatially and temporally. Similar to trawl catches, the highest abundance of ichthyoplankton was caught in Lower Bay during 2006. There were no clear differences between channel and non-channel station densities for ichthyoplankton during 2006, except within Arthur Kill/Newark Bay, which had relatively higher egg and post-yolk sac densities at non-channel stations.

Many species use the Harbor during their first year of life, whether through being spawned in the Harbor, or moving into the Harbor from the continental shelf or tributaries. This seasonality and preference for different spawning habitat influences the occurrence and relative density of species collected during the sampling program. Throughout this report, certain species were targeted for discussion based on their importance within the Harbor ecosystem and not on their overall abundance. Thirteen species have been designated EFH species and three were classified as INM species.

4.1.1 Essential Fish Habitat Species

While the importance of the Harbor habitat for spawning and early life histories has been repeatedly stressed, many areas of the Harbor also function as critical feeding and over-wintering habitat. The consistent trawl catch of EFH species occurred in both deeper water and shallow water habitats. For instance, red hake were found in their highest catch rates at channel stations before water temperatures warmed, while Atlantic herring catch rates were highest at non-channel stations during warmer water temperatures.

During the 2005 sampling program, post-yolk sac larvae abundance for windowpane was the largest recorded. However, this did not translate to higher windowpane abundance in 2006 trawls. During the first two years of the survey, windowpane abundance in trawls was high (e.g., approx. 400 individuals). However, trawl catch dropped to 63 individuals during the 2004 sampling program and have remained in that range of abundance. This year's post-yolk sac windowpane abundance was similar to 2004, although it was the lowest of all the years sampled. Throughout the life of this program, the total abundance in trawls of all flatfish species has generally declined. The short time series of five sampling years makes it difficult to judge the extent of the decline. This may be a part of the natural variation in flatfish populations or be influenced by anthropogenic causes.

4.1.2 Important Non-Managed Species

Although there were only three species classified as INM within the Harbor, they have consistently comprised an important part of the trawl and ichthyoplankton catch. Atlantic menhaden have remained a dominant species in all life stages of the ichthyoplankton catch. Similar to red hake, peak alewife, Atlantic menhaden, and striped bass CPUEs occurred in February 2006. These peak catches all occurred at channel stations. Deep water habitat has been hypothesized to serve as a corridor for fish moving to shallower spawning and nursery habitat (Ayvazian *et al.* 1992). Striped bass catch was lower during 2005 and 2006 than previous years. Striped bass was a dominant species through the first three program years, and this decline is most likely due to the change to daytime sampling.

4.2 WINTER FLOUNDER

As demonstrated in previous program years (USACE 2002, USACE 2003, USACE 2004, USACE 2005, and USACE 2006), the spatial and temporal trends observed in winter flounder adults, eggs, and larvae show that winter flounder use different areas of the Harbor during different stages of its life history. Winter flounder larvae and juveniles seek nursery habitat in estuaries of the Middle Atlantic Bight to feed and grow (Able and Fahay 1998).

Sampling conducted as part of NYNJHDP 2001-2006 consistently demonstrated the importance of the Lower Bay of the Harbor as habitat for winter flounder. Although peak winter flounder egg and larvae densities were generally lower than during previous study years, Lower Bay consistently has higher egg and post-yolk sac larval densities than other regions. The predominance of winter flounder eggs in the Lower Bay during the peak spawning period (i.e. February to March) coupled with the relatively high densities of post-yolk sac larvae supported the conclusion that the Lower Bay provides important winter flounder spawning habitat. Although winter flounder spawning does occur in the Upper Bay and Arthur Kill/Newark Bay areas, the intensity is notably less than in the Lower Bay – potentially the result of less preferential habitat (e.g. water quality and sediment quality) in these areas.

The occurrence of adult winter flounder during the peak spawning period and the subsequent occurrence of eggs and larvae were used to identify where and when winter flounder were spawning in the Harbor. The previous sampling programs in the Harbor showed that young winter flounder move from the primary spawning area in the Lower Bay and the lower reaches of the Upper Bay to areas further into the Harbor estuary (USACE 2002, USACE 2003, USACE 2004 and USACE 2005). The 2006 sampling program further confirmed the importance of Arthur Kill/Newark Bay and Upper Bay as nursery areas for winter flounder, with high densities occurring during June. These

young fish remain predominantly within the interior waters of Arthur Kill/Newark Bay and Upper Bay through January, February, and March.

Winter flounder were most common in trawl catches in the Upper Bay during January through March. March was the peak spawning period in the study area (Able and Fahay 1998, USACE 2003, USACE 2004). In previous program years more spawning size (>250 mm) adults were collected in the Lower Bay than in other areas of the Harbor. Winter flounder adults were more abundant at navigation channel habitats, especially from January through March in the Upper Bay and Arthur Kill/Newark Bay. However, no consistent pattern in depth preference of winter flounder adults has been identified during the 2001-2006 NYNJHDP surveys and there is little indication that winter flounder spawn in the channels but are instead likely using the channels as a primary migration route to and from shallow-water spawning areas. The presence of winter flounder in early life stages (eggs and larvae) suggests some spawning may have occurred in the channels, however this may not always be the case as bottom disturbance caused by ship traffic in some areas, which in combination with strong currents, may result in the displacement and transport of eggs and particularly larvae into the channels from adjacent shallow/shoal areas where spawning occurs.

The 2006 Survey recorded the highest abundance of fish (all species combined) caught in trawls. However, winter flounder abundance was the lowest of all previous sampling programs. Winter flounder typically represent between 5-7% of the total catch, but during 2006 this species only represented 1% of the catch (N = 263/23,874). Because winter flounder catch is typically dominated by sub-adults, this decline may have been due to low post-yolk sac larval abundance seen during the 2005 sampling program (USACE 2006). During 2006, post-yolk sac larval abundance was slightly higher than 2005, but it was still less than one-third the amount caught during 2002, 2003, or 2004.

Similar declines have been observed in the Southern New England/Mid-Atlantic stock complex of winter flounder (Vonderweidt *et al.* 2006). Total landings (commercial and recreational) of winter flounder have steadily declined since 1984, and this stock is

currently classified as overfished (Vonderweidt *et al.* 2006). All states are managing this stock through seasonal fishing closures, gear restrictions, and size and creel limits (Vonderweidt *et al.* 2006).

5.0 LITERATURE CITED

Able, K. W. and M. P. Fahey. 1998. The First Year in the Life of Estuarine Fishes in the Middle Atlantic Bight. Rutgers University Press. New Brunswick, NJ.

Ayvazian, S. G., L. A. Deegan, and T. J. Finn. 1992. Comparison of habitat use by estuarine fish assemblages in the Acadian and Virginian zoogeographic provinces. Estuaries 15 (3): 368-383.

Chant, R. J., M. C. Curran, K. W. Able, and S. M. Glenn. 2000. Delivery of winter flounder *(Pseudopleuronectes americanus)* larvae to settlement habitats in cover near tidal inlets. Estuarine Coastal and Shelf Sciences 51: 529-541.

U.S. Army Corps of Engineers – New York District (USACE-NYD). 1999. New York Jersey Harbor Navigation Study. Biological Monitoring Program. December 1999.

U.S. Army Corps of Engineers – New York District (USACE-NYD). 2002. New York and New Jersey Harbor Navigation Program. Supplemental Sampling Program 2000–2001.

U.S. Army Corps of Engineers – New York District (USACE-NYD). 2003. New York and New Jersey Harbor Navigation Program. Aquatic Biological Sampling Program Survey Report 2001–2002.

U.S. Army Corps of Engineers – New York District (USACE-NYD). 2004. New York and New Jersey Harbor Navigation Program. Aquatic Biological Sampling Program Survey Report 2002–2003.

U.S. Army Corps of Engineers – New York District (USACE-NYD). 2005. New York and New Jersey Harbor Deepening Project. Aquatic Biological Survey Report 2004.

U.S. Army Corps of Engineers – New York District (USACE-NYD). 2006. New York and New Jersey Harbor Deepening Project. Aquatic Biological Survey Report 2005.

U.S. Army Corps of Engineers – New York District (USACE-NYD) and the Port Authority of NY & NJ. 1998. Draft species profiles: winter flounder *(Pleuronectes americanus)* and striped bass (*Morone saxatilis*), general life history and model threshold values.

Vonderweidt, C., A. Weber, and S. Sherman. 2006. Review of the Atlantic States Marine Fisheries Commission's interstate fishery management plan for winter flounder. Atlantic States Marine Fisheries Commission.

Witherell, D. B. and J. Burnett. 1993. Growth and maturation of winter flounder, *Pleuronectes americanus,* in Massachusetts. Fishery Bulletin 91:816-820.

Table 2-1. Description of stations sampled during the 1999–2006 Aquatic Biological Sampling Programs

Area	Station Name	Type	Station Location	Average Depth (ft)	GPS Coordinates (deg., min., sec.)			
					Start		End	
					North	West	North	West
South Brooklyn/ Upper Bay	SB–1	Non-channel	Gowanus Bay Inter-pier South	27	40:39.45	74:00.86	40:39.56	74:01.05
	SB–2[a]	Non-channel	Gowanus Bay Inter-pier	30	40:39.60	74:00.48	40:39.75	74:00.75
	SB–3	Non-channel	Bay Ridge Flats	22	40:39.36	74:02.26	40:38.91	74:02.36
	SB–4	Navigation Channel	Bay Ridge Channel	42	40:39.28	74:01.52	40:38.98	74:01.79
	SB–5	Navigation Channel	Anchorage Channel Middle	57	40:39.53	74:03.30	40:39.69	74:03.19
	SB–6	Navigation Channel	Anchorage Channel South	49	40:38.76	74:03.11	40:38.48	74:02.98
Port Jersey	PJ–1	Non-channel	Jersey Flats	12	40:39.91	74:03.57	40:40.17	74:03.45
	PJ–2	Non-channel	Caven Point	10	40:40.62	74:03.44	40:41.02	74:03.35
	PJ–3	Non-channel	Constable Hook	13	40:39.75	74:04.75	40:39.53	74:04.19
	PJ–4	Navigation Channel	Port Jersey Channel	39	40:39.91	74:04.11	40:40.07	74:04.51
	PJ–5	Navigation Channel	Port Jersey Channel East	42	40:39.48	74:03.64	40:39.78	74:03.96
Newark Bay	NB–3	Non-channel	Newark Bay Flats Middle	10	40:41.06	74:07.61	40:41.40	74:07.44
	NB–4	Non-channel	Newark Bay Flats South	16	40:40.72	74:07.76	40:40.38	74:07.92
	NB–5	Navigation Channel	Newark Bay Middle Reach	42	40:40.59	74:07.96	40:40.19	74:08.26
	NB–6	Navigation Channel	Newark Bay South Reach	46	40:39.44	74:08.52	40:39.15	74:08.75
	NB–7[b]	Non-channel	Elizabeth Flats North	13	40:39.62	74:09.29	40:39.51	74:08.99
Lower Bay	LB–1	Non-channel	East Bank	13	40:33.45	74:00.24	40:33.94	74:00.52
	LB–2	Navigation Channel	North End Ambrose Channel	50	40:33.23	74:01.54	40:33.40	74:01.55
	LB–3	Non-channel	Swash Channel Range	17	40:33.34	74:04.46	40 33.00	74 04.44
	LB–4	Navigation Channel	Chapel Hill South Channel	30	40:31.06	74:02.41	40:30.64	74:02.39
	LB–5	Non-channel	Old Orchard Shoals	13	40:30.59	74:04.72	40:30.75	74:05.22
	LB–6	Navigation Channel	Raritan Bay East Reach	41	40:29.41	74:06.39	40:29.53	74:06.90
Arthur Kill	AK-1[a,b]	Non-channel	Elizabeth Flats South	19	40:38.84	74:10.58	40:38.85	74:10.13
	AK-2	Navigation Channel	North of Shooter Island Reach	39	40:38.80	74:10.75	40:38.77	74:10.26
	AK-3	Navigation Channel	Elizabeth Reach	42	40:38.32	74:11.59	40:38.53	74:11.30
	AK-4[b]	Non-channel	Prall's Island	20	40:36.83	74:11.91	40:36.24	74:11.82
	AK-7[c]	Non-channel	Island of Meadows	15	40:34.59	74:12.49	40:34.70	74:12.47

[a] Not sampled with bottom trawls in 2005
[b] Not sampled in 2006
[c] Only sampled during 2006 (AK-7 replaced AK-1 in 2006 due to rapid depth changes at AK-1)

Table 2-2. Specifications of bottom trawl used to collect adult finfish during the 2006 Aquatic Biological Survey.

Part	Specification
Headrope	25.9 ft. (7.9 m)
Footrope	27.9 ft (8.5 m)
Wing height	3.6 ft. (1.1 m)
Total length	35.1 ft (10.7 m)
Wing mesh (square)	2.0-in. (5.1 cm)
Body mesh (square)	2.0-in. (5.1 cm)
Cod end mesh (square)	0.75-in. (1.9 cm)
Cod end liner mesh (square)	0.25-in. (0.6 cm)
Trawl doors	32.0 x 17.0 x 0.75-in (79.2 x 39.6 x 3.1 cm)
Tow line length	5 times maximum station water depth

Table 2-3. Specifications of epibenthic sled and plankton net used to collect early life stages of finfish during the 2006 Aquatic Biological Survey.

Part	Specification
Mouth diameter	0.5 m
Overall length	3.0 m
Mesh size	0.5 mm
Cod-end diameter	10.1 cm
Cod-end mesh	0.5 mm (PVC cod-end bucket)
Epibenthic sled	Constructed of PVC pipe

Table 2-4. Water quality parameters measured during the 2006 Aquatic Biological Survey.

Water Quality Parameter	Units and Accuracy	Sample Depths
Temperature	+/- 0.2	Bottom
Dissolved oxygen	+/- 0.5 mg/L	Bottom
Conductivity	+/- 100 microseimens	Bottom
Salinity	+/- 0.1 ppt	Bottom

Table 2-5. Species identified in trawl and epibenthic sled (ichthyoplankton) samples collected during the 2006 Aquatic Biological Survey.

Group	Common Name	Scientific Name	Sled	Trawl
Essential Fish Habitat Spp.	Atlantic Herring	*Clupea harengus*	x	x
	Atlantic Mackerel	*Scomber scombrus*	x	
	Black Sea Bass	*Centropristis striata*		x
	Bluefish	*Pomatomus saltatrix*		x
	Butterfish	*Peprilus triacanthus*	x	x
	Clearnose Skate	*Raja eglanteria*		x
	Little Skate	*Raja erinacea*		x
	Red Hake	*Urophycis chuss*		x
	Scup	*Stenotomus chrysops*		x
	Summer Flounder	*Paralichthys dentatus*	x	x
	Windowpane Flounder	*Scopthalmus aquosus*	x	x
	Winter Flounder	*Pleuronectes americanus*	x	x
	Winter Skate	*Raja ocellata*	x	x
Commercial/Recreationally Important Species	Alewife	*Alosa pseudoharengus*		x
	Atlantic menhaden	*Brevoortia tyrannus*	x	x
	Striped bass	*Morone saxatilis*		x
Other Species	Shortnose sturgeon	*Acipenser brevirostrum*	x	
	American eel	*Anguilla rostrata*		x
	American shad	*Alosa sapidissima*	x	x
	American sandlace	*Ammodytes americanus*	x	x
	Atlantic Croaker	*Micropogonias undulates*	x	x
	Atlantic Silverside	*Menidia menidia*	x	x
	Atlantic tomcod	*Microgadus tomcod*	x	x
	Bay anchovy	*Anchoa mitchilli*	x	x
	Blueback herring	*Alosa aestivalis*		x
	Blue crab	*Callinectes sapidus*		x
	Conger eel	*Conger oceanicus*	x	
	Cunner	*Tautogolabrus adspersus*	x	x
	Feather blenny	*Hypsoblennius hentzi*	x	
	Fourbeard Rockling	*Enchelyopus cimbrius*	x	x
	Fourspot flounder	*Hippoglossina oblonga*	x	
	Gadidae	*Gadidae spp.*	x	
	Gizzard shad	*Dorosoma cepedianum*		x
	Gobidae	*Gobidae*	x	
	Goosefish	*Lophius americanus*	x	
	Grubby	*Myoxocephalus aenaeus*	x	x
	Hogchoker	*Trinectes maculatus*		x
	Inshore Lizardfish	*Synodus foetens*	x	
	Labridae	*Labridae* sp.	x	
	Lined Seahorse	*Hippocampus erectus*	x	
	Northern pipefish	*Syngnathus fuscus*	x	x
	Northern Searobin	*Prionotus carolinus*	x	x
	Pollock	*Pollachius virens*		x
	Prinotus sp.	*Prionotus sp.*	x	
	Rock gunnel	*Pholis gunnellus*	x	
	Silver hake	*Merluccius bilinearis*		x
	Silver perch	*Diapterus rhombeus*		x
	Smooth Dogfish	*Mustelus canis*		x

Table 2-5 (cont.). Species identified in trawl and epibenthic sled (ichthyoplankton) samples collected during the 2006 Aquatic Biological Survey.

Group	Common Name	Scientific Name	Sled	Trawl
Other Species (cont.)	Spot	*Leiostomus xanthurus*	**x**	
	Spotted hake	*Urophycis regia*	**x**	**x**
	Striped Anchovy	*Anchoa hepsetus*		**x**
	Striped Burrfish	*Chilomycterus schoepfii*		**x**
	Striped Searobin	*Prionotus evolans*		**x**
	Tautog	*Tautoga onitis*	**x**	**x**
	Walleye	*Sander vitreus*	**x**	
	Weakfish	*Cynoscion regalis*	**x**	**x**
	White perch	*Morone Americana*		**x**

Table 3-1. Monthly average trawl CPUE by species for all navigation channel and non-channel stations combined during the 2006 Aquatic Biological Survey.

Species	Station	Jan	Feb	Mar	Apr	May	Jun
Essential Fish Habitat Species							
Atlantic Herring	Channel			0.04		0.10	
	Non-Channel			0.04	1.91	51.95	0.09
Atlantic Mackerel	Channel						
	Non-Channel						
Black Sea Bass	Channel		0.05	0.04	0.08		
	Non-Channel						
Bluefish	Channel						
	Non-Channel						0.18
Butterfish	Channel				0.08	0.50	0.83
	Non-Channel					1.01	3.23
Clearnose Skate	Channel	0.29	0.23			0.08	0.17
	Non-Channel	0.05					0.09
Little Skate	Channel		0.05	0.04		0.08	0.08
	Non-Channel			0.04	0.36	0.09	
Red Hake	Channel	6.31	19.18	4.10	11.96	1.10	0.08
	Non-Channel	0.05					
Scup	Channel	0.04				0.67	0.08
	Non-Channel					0.73	0.59
Summer Flounder	Channel				0.19	0.83	
	Non-Channel				0.09	0.10	0.10
Windowpane Flounder	Channel	0.29	0.68	0.35	0.83	0.83	
	Non-Channel		0.10	0.13	0.41		0.23
Winter Flounder	Channel	1.49	2.08	2.30	5.25	1.75	0.67
	Non-Channel	0.41	0.59	0.27	1.16	0.70	0.18
Winter Skate	Channel		0.14	0.08	0.17		
	Non-Channel		0.24	0.11	0.18		
Important Non-Managed Species							
Alewife	Channel	7.34	72.89	29.52	2.58		
	Non-Channel	0.05	1.05			7.20	
Atlantic menhaden	Channel	0.17	4.64	0.76	0.08		
	Non-Channel			0.05			
Striped bass	Channel	15.51	15.90	5.27	0.52		
	Non-Channel	4.55	2.10		6.14	7.29	
Other Species							
(25 species)	Channel	51.12	65.39	55.20	60.67	39.44	13.26
(17 species)	Non-Channel	1.36	35.37	2.50	4.59	1177.99	369.33

Table 3-2 a. Monthly average CPUE by group for all navigation channel stations in the Arthur Kill/Newark Bay (AKNB), Upper Bay (UB), and Lower Bay (LB) during the 2006 Aquatic Biological Survey.

Species	Site	Jan	Feb	Mar	Apr	May	Jun
Essential Fish Habitat Species							
Atlantic Herring	AK/NB					0.31	
	UB			0.09			
	LB						
Black Sea Bass	AK/NB						
	UB		0.11	0.09	0.20		
	LB						
Bluefish	AK/NB						
	UB						
	LB						
Butterfish	AK/NB						
	UB				0.20	0.60	0.40
	LB					1.00	2.67
Clearnose Skate	AK/NB						
	UB	0.20	0.56				0.40
	LB	0.83				0.33	
Little Skate	AK/NB						
	UB						0.20
	LB		0.20	0.14		0.33	
Red Hake	AK/NB	0.68	1.38	2.27	9.38	1.06	0.25
	UB	14.40	44.33	5.77	21.20	0.40	
	LB	0.33	2.40	3.57		2.33	
Scup	AK/NB						
	UB					1.00	
	LB	0.17				1.00	0.33
Summer Flounder	AK/NB				0.31		
	UB				0.20	0.60	
	LB					2.33	
Windowpane Flounder	AK/NB					0.25	
	UB	0.70	1.67	0.45	2.00	0.20	
	LB			0.57		2.67	
Winter Flounder	AK/NB	1.73	2.35	1.09	0.25		
	UB	2.09	2.67	3.00	12.00	3.20	1.00
	LB	0.17	0.60	2.57	0.67	1.67	1.00
Winter Skate	AK/NB						
	UB			0.18	0.40		
	LB		0.60				
Important Non-Managed Species							
Alewife	AK/NB	0.50	1.73	8.11			
	UB	1.60	15.41	13.79	2.60		
	LB	26.04	290.20	78.71	6.00		
Atlantic menhaden	AK/NB			0.31			
	UB			0.30	0.20		
	LB	0.69	20.40	2.00			
Striped bass	AK/NB	25.21	41.72	14.16	0.56		
	UB	15.93	1.67	2.15	0.60		
	LB	1.87	0.20		0.33		
Other Species							
(15 species)	AK/NB	119.50	93.73	43.55	36.00	49.06	13.94
(23 species)	UB	23.78	37.98	59.17	115.00	19.80	18.69

(14 species)	LB	5.52	69.40	62.29	3.00	59.33	3.33

Table 3-2 b. Monthly average CPUE by group for all non-channel stations combined in the Arthur Kill/Newark Bay (AKNB), Lower Bay (LB), and Upper Bay (UB) during the 2006 Aquatic Biological Survey.

Species	Site	Jan	Feb	Mar	Apr	May	Jun
Essential Fish Habitat Species							
Atlantic Herring	AK/NB				3.50	150.00	
	UB			0.08	2.33	44.25	0.17
	LB					2.00	
Black Sea Bass	AK/NB						
	UB						
	LB						
Bluefish	AK/NB						
	UB						0.33
	LB						
Butterfish	AK/NB					0.50	
	UB					1.69	1.92
	LB						8.00
Clearnose Skate	AK/NB						
	UB						
	LB	0.17					0.33
Little Skate	AK/NB						
	UB				0.67		
	LB			0.14		0.33	
Red Hake	AK/NB						
	UB	0.09					
	LB						
Scup	AK/NB						
	UB					1.33	1.08
	LB						
Summer Flounder	AK/NB						
	UB					0.19	0.19
	LB				0.33		
Windowpane Flounder	AK/NB						
	UB		0.17	0.17	0.75		0.42
	LB			0.14			
Winter Flounder	AK/NB			0.25		0.50	
	UB	0.82	1.03	0.44	2.13	1.11	0.17
	LB						0.33
Winter Skate	AK/NB						
	UB		0.42	0.21			
	LB				0.67		
Important Non-Managed Species							
Alewife	AK/NB					6.50	
	UB					11.04	
	LB	0.17	4.40				
Atlantic menhaden	AK/NB						
	UB			0.10			
	LB						
Striped bass	AK/NB						
	UB	9.09	3.67		11.25	13.36	
	LB						
Other Species							
(5 species)	AK/NB	1.40	13.25	3.50	1.00	405.00	267.00
(14 species)	UB	1.55	57.16	1.62	7.25	979.48	587.60

(7 species)	LB	1.00	0.80	3.29	1.67	2090.33	0.33

Table 3-3 a. Monthly average egg density (number/1000m^3) by group for channel stations and non-channel stations in Arthur Kill/Newark Bay (AKNB), Upper Bay (UB), and Lower Bay (LB) during the 2006 Aquatic Biological Survey.

Channel Stations								
Species	**Site**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Essential Fish Habitat Species								
Atlantic Mackerel	AK/NB							2.19
	UB							
	LB							
Windowpane	AK/NB							
	UB				3.78	14.44	14.10	
	LB				13.44	161.24		
Winter Flounder	AK/NB				1.21			
	UB			7.87				
	LB			1.59				
Important Non-Managed Species								
Atlantic menhaden	AK/NB					73.60	59.76	
	UB				2.59	2967.53	1618.92	
	LB				3.62	14063.09	118.87	
Other Species								
(6 species)	AK/NB			6.24	3.63	459.69	1344.87	327.74
(7 species)	UB			17.70	4.44	882.14	116.30	1077.33
(6 species)	LB			2.80	2.79	3097.54	1798.82	3379.79

Non-Channel Stations								
Species	**Site**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Essential Fish Habitat Species								
Windowpane	AK/NB							
	UB				1.98	1.35		
	LB				38.79	556.76		
Winter Flounder	AK/NB							
	UB			11.66	16.15	0.71		
	LB							
Important Non-Managed Species								
Atlantic menhaden	AK/NB					45.10	24.80	
	UB					1180.09	543.92	
	LB					8384.51	89.48	
Other Species								
(2 species)	AK/NB					975.16	2378.81	9635.58
(7 species)	UB			22.66	43.83	342.59	1218.74	2436.19
(8 species)	LB			3.51	16.33	2214.55	1830.25	12240.62

Table 3-3 b. Monthly average yolk-sac larval density (number/1000m^3) by group for channel stations and non-channel stations in Arthur Kill/Newark Bay (AKNB), Upper Bay (UB), and Lower Bay (LB) during the 2006 Aquatic Biological Survey.

Channel Stations								
Species	**Site**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Essential Fish Habitat Species								
Windowpane	AK/NB							
	UB					0.44		
	LB							
Winter Flounder	AK/NB			3.89				
	UB			4.78	2.51			
	LB			13.57				
Important Non-Managed Species								
Atlantic menhaden	AK/NB							
	UB							
	LB							
Other Species								
(2 species)	AK/NB			1.67	1.21	2.01		
(2 species)	UB			1.15	0.52			
(2 species)	LB				5.13			

Non-Channel Stations								
Species	**Site**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Essential Fish Habitat Species								
Winter Flounder	AK/NB							
	UB			2.21	8.30			
	LB			0.92	27.27			
Important Non-Managed Species								
Atlantic menhaden	AK/NB							
	UB					2.42	2.87	
	LB							
Other Species								
(0 species)	AK/NB							
(2 species)	UB		0.54	3.04		0.79		
(1 species)	LB					0.68		

Table 3-3 c. Monthly average post-yolk sac larval density (number/1000m^3) by group for channel stations and non-channel stations in Arthur Kill/Newark Bay (AKNB), Upper Bay (UB), and Lower Bay (LB) during the 2006 Aquatic Biological Survey.

Channel Stations

Species	Site	Jan	Feb	Mar	Apr	May	Jun	Jul
Essential Fish Habitat Species								
Atlantic Herring	AK/NB				1.32			
	UB			0.28				
	LB							
Butterfish	AK/NB							
	UB							1.21
	LB							
Summer flounder	AK/NB							
	UB		1.09					
	LB							
Windowpane flounder	AK/NB					1.97	1.74	6.55
	UB					15.02	2.02	2.48
	LB					13.42	3.27	
Winter flounder	AK/NB			1.30	17.90	33.36	2.76	
	UB			3.83	152.49	55.96	2.17	
	LB			14.84	338.96	67.91	1.84	3.07
Important Non-Managed Species								
Atlantic menhaden	AK/NB		0.86	1.12			3.12	8.65
	UB		3.09	1.59			1.83	8.30
	LB				0.90			
Other Species								
(12 species)	AK/NB	16.80	4.32	42.51	25.45	2.17	50.79	104.31
(11 species)	UB	3.94	11.87	27.31	28.56	0.65	11.70	192.27
(8 species)	LB		9.22	15.58	113.96	0.65	8.78	822.96

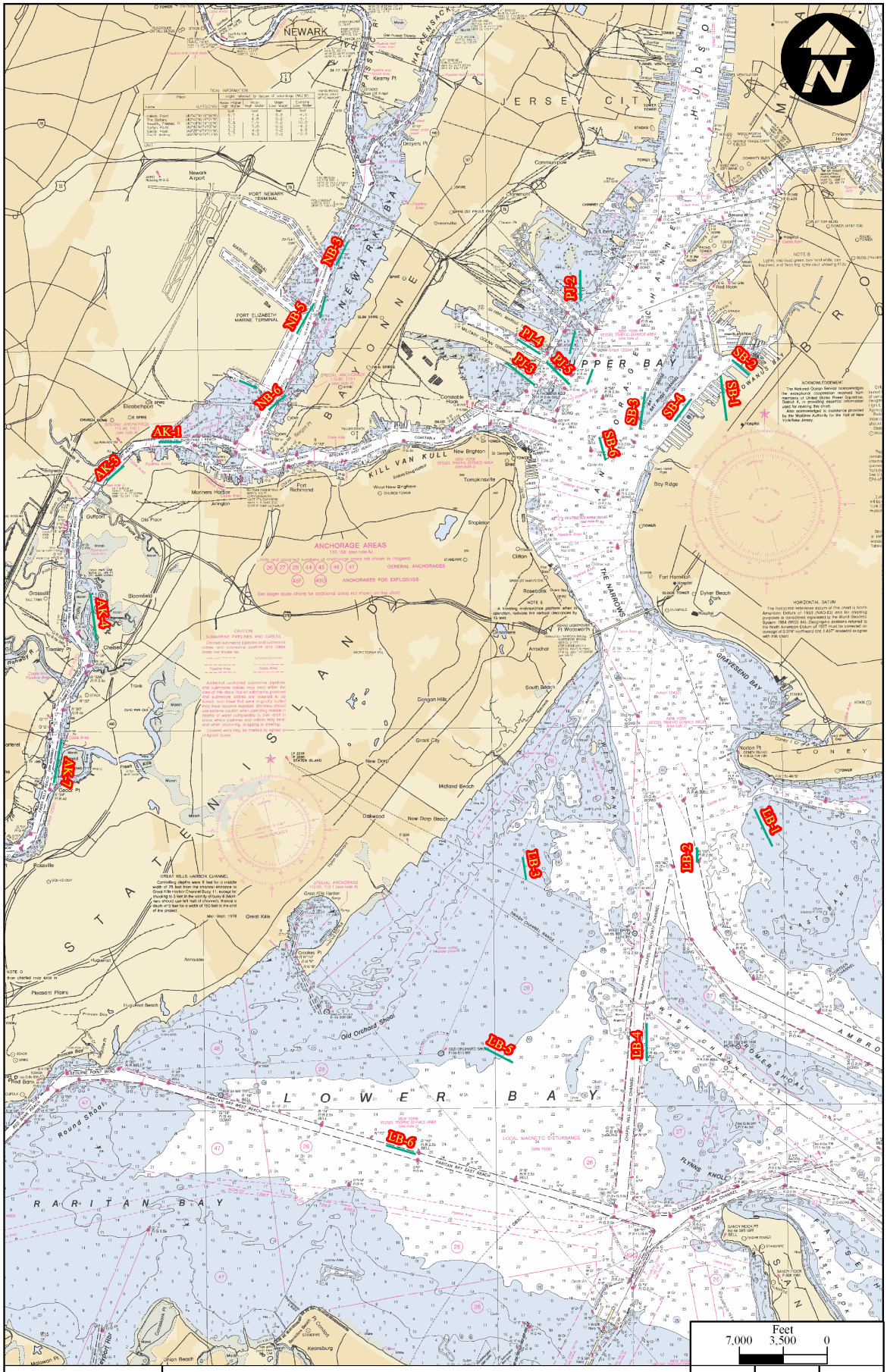
Non-Channel Stations

Species	Site	Jan	Feb	Mar	Apr	May	Jun	Jul
Essential Fish Habitat Species								
Windowpane Flounder	AK/NB							
	UB					5.42	1.17	1.2
	LB					4.30		
Winter Flounder	AK/NB			4.04	25.94	9.75		
	UB			8.95	102.29	32.55		
	LB			19.56	621.10	93.9		
Important Non-Managed Species								
Atlantic menhaden	AK/NB						12.38	
	UB		0.50			0.91	20.09	5.(
	LB		2.93	1.07				
Other Species								
(5 species)	AK/NB		1.64	37.60	11.45	7.45	371.19	6483.57
(6 species)	UB		9.97	30.43	44.48	3.07	15.18	1172.95
(9 species)	LB		5.19	32.39	67.01	2.13	24.60	1353.91

Table 3-3 d. Monthly average juvenile density (number/1000m^3) by group for channel stations and non-channel stations in Arthur Kill/Newark Bay (AKNB), Upper Bay (UB), and Lower Bay (LB) during the 2006 Aquatic Biological Survey.

		Channel Stations						
Species	**Site**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Other Species								
(4 species)	AK/NB	18.26	18.25					4.39
(4 species)	UB	4.74		0.57				5.93
(0 species)	LB							

		Non-Channel Stations						
Species	**Site**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Essential Fish Habitat Species								
Butterfish	AK/NB							
	UB							
	LB						1.90	
Other Species								
(0 species)	AK/NB							
(1 species)	UB					0.45	2.55	
(0 species)	LB							



AQUATIC BIOLOGICAL SAMPLING (1999-2006)

Job No.	Date	Figure No.
38025	2/28/06	2-1

FILE: \\prl-srv2\Projects\10xx-xxx\1040_OFFSHORE - COASTAL TECHNOLOGIES INC\1040-004_AQUATIC BIOLOGICAL SURVEY REPORT\Graphics\GIS\MXDs\AquaticBiologicalSampling1999-2005_11x17P.mxd

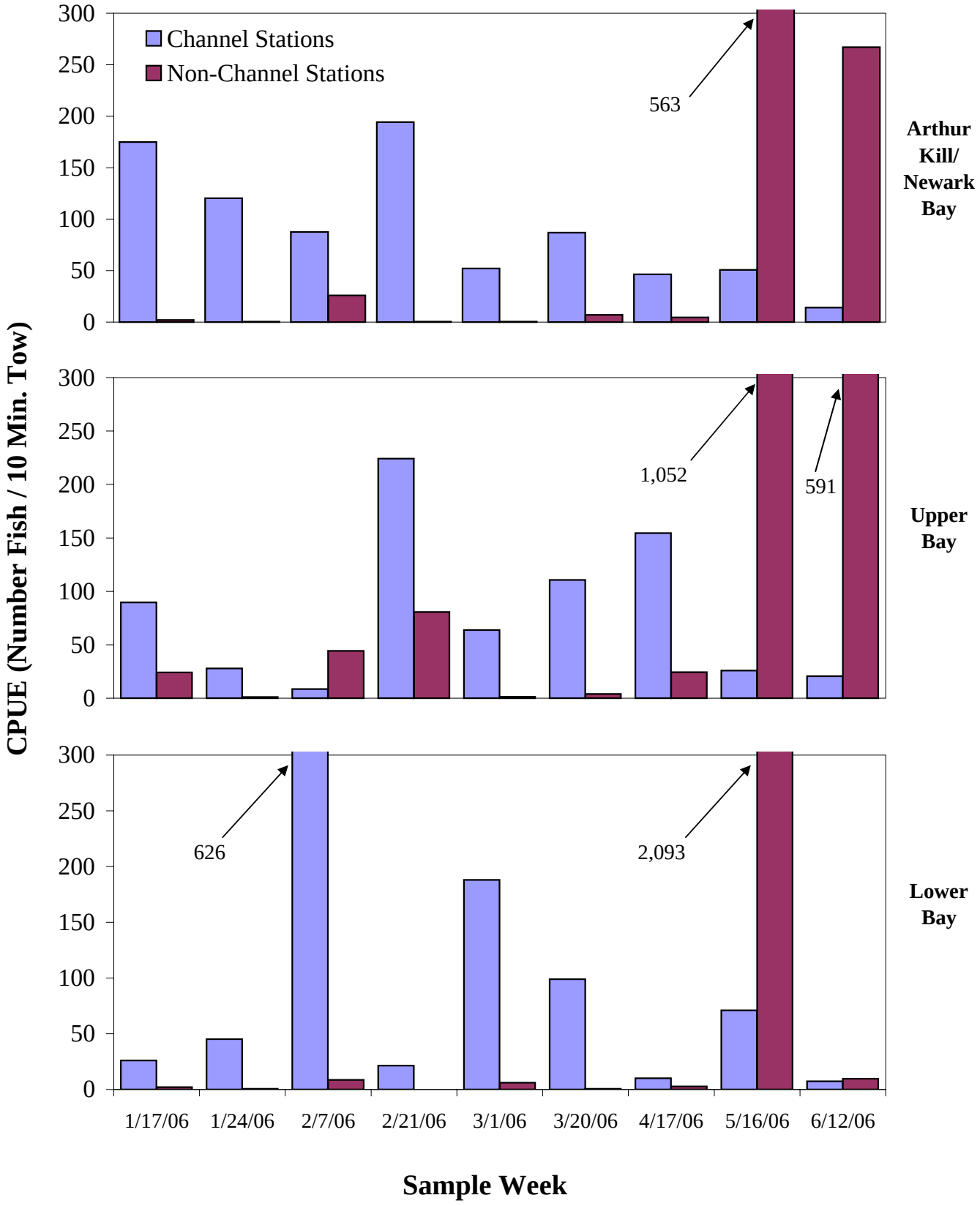


Figure 3-1 **Average weekly trawl CPUE for all species combined at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

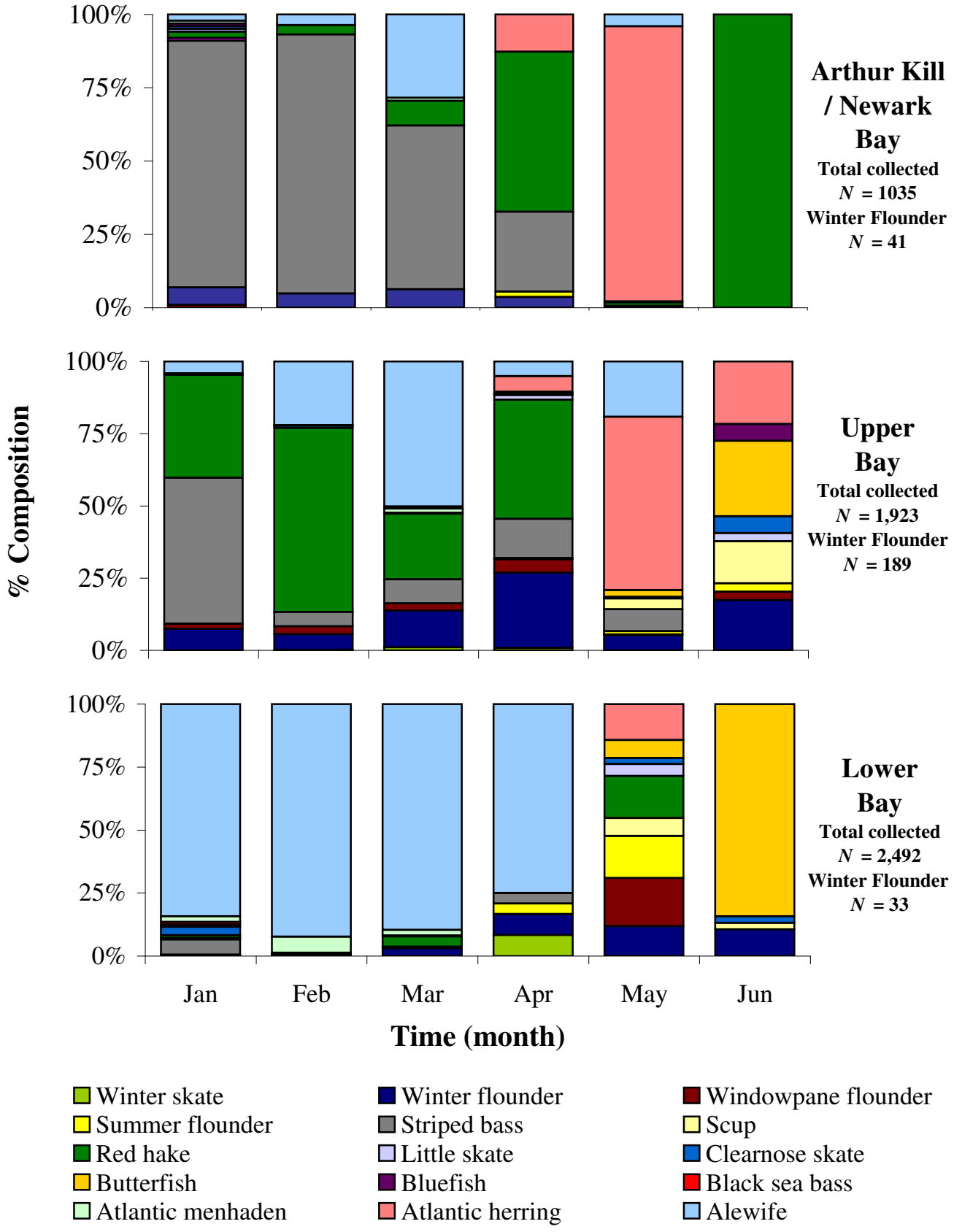


Figure 3-2 **EFH and Important Non-Managed (INM) Species composition of trawl catches from Arthur Kill/Newark Bay, Upper Bay,and Lower Bay stations during the 2006 Aquatic Biological Survey.**

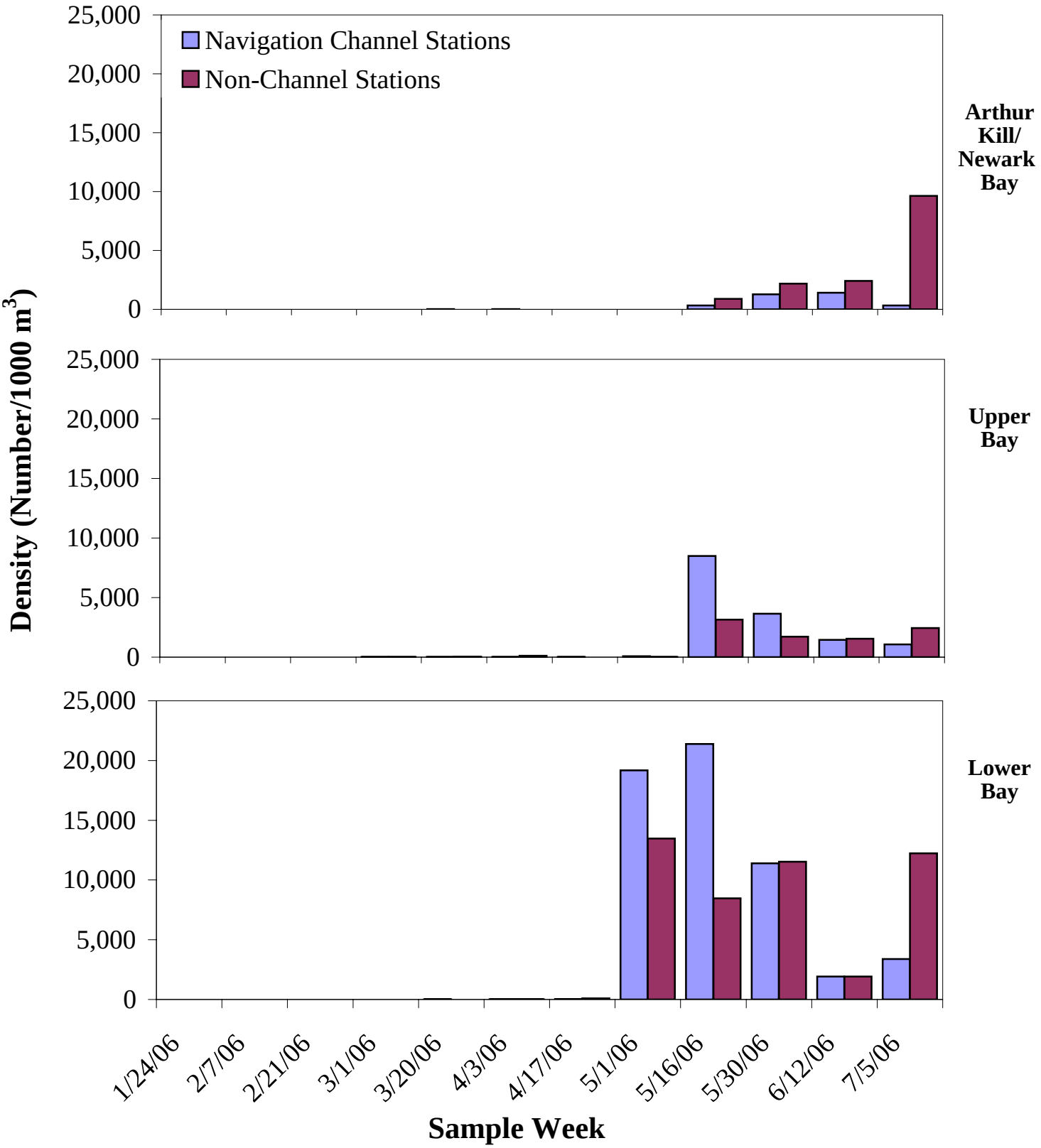


Figure 3-3 **Average weekly egg density of all species combined at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

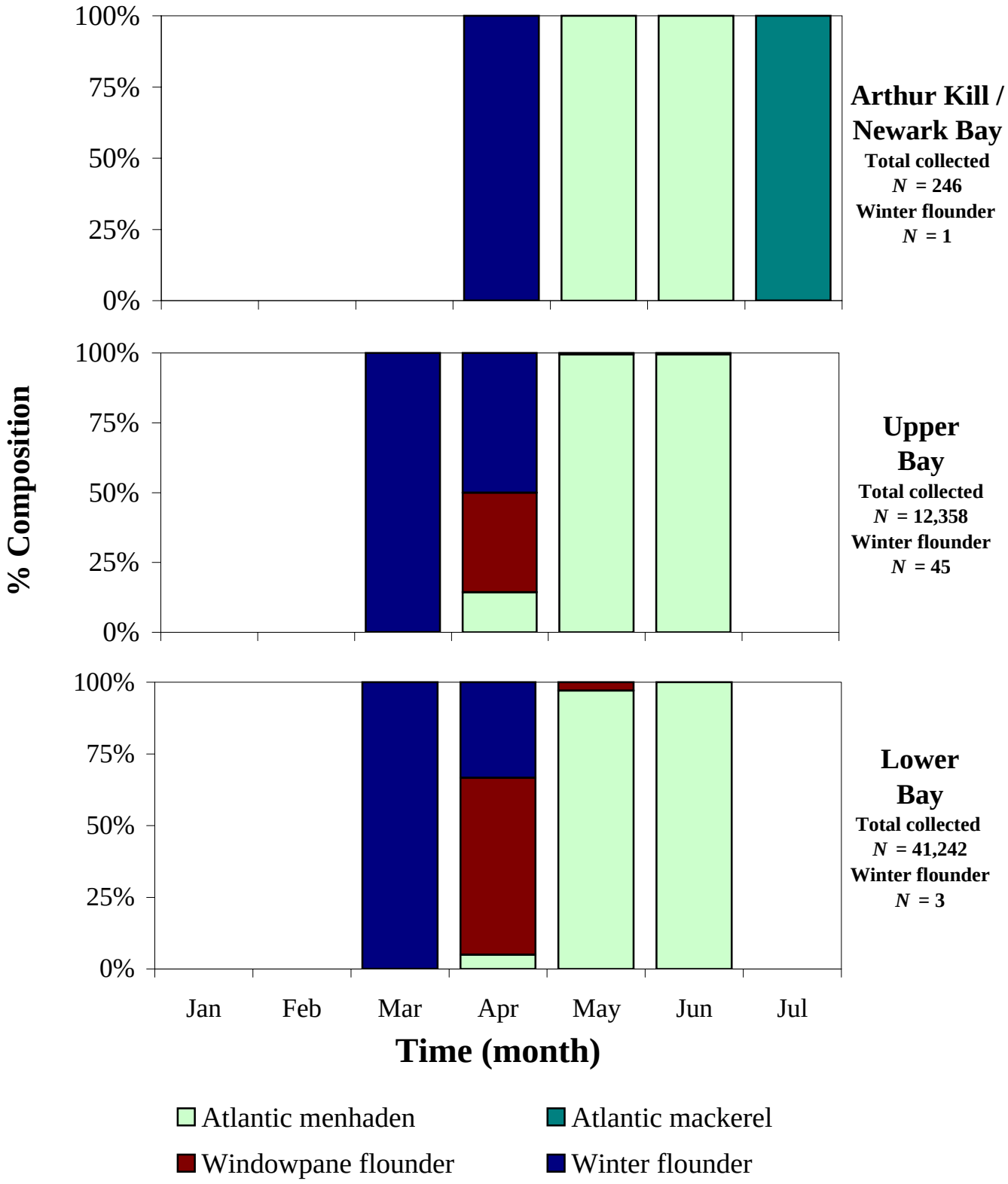


Figure 3-4 **EFH and important Non-Managed species compostion of eggs collected at all stations during the 2006 Aquatic Biological Survey.**

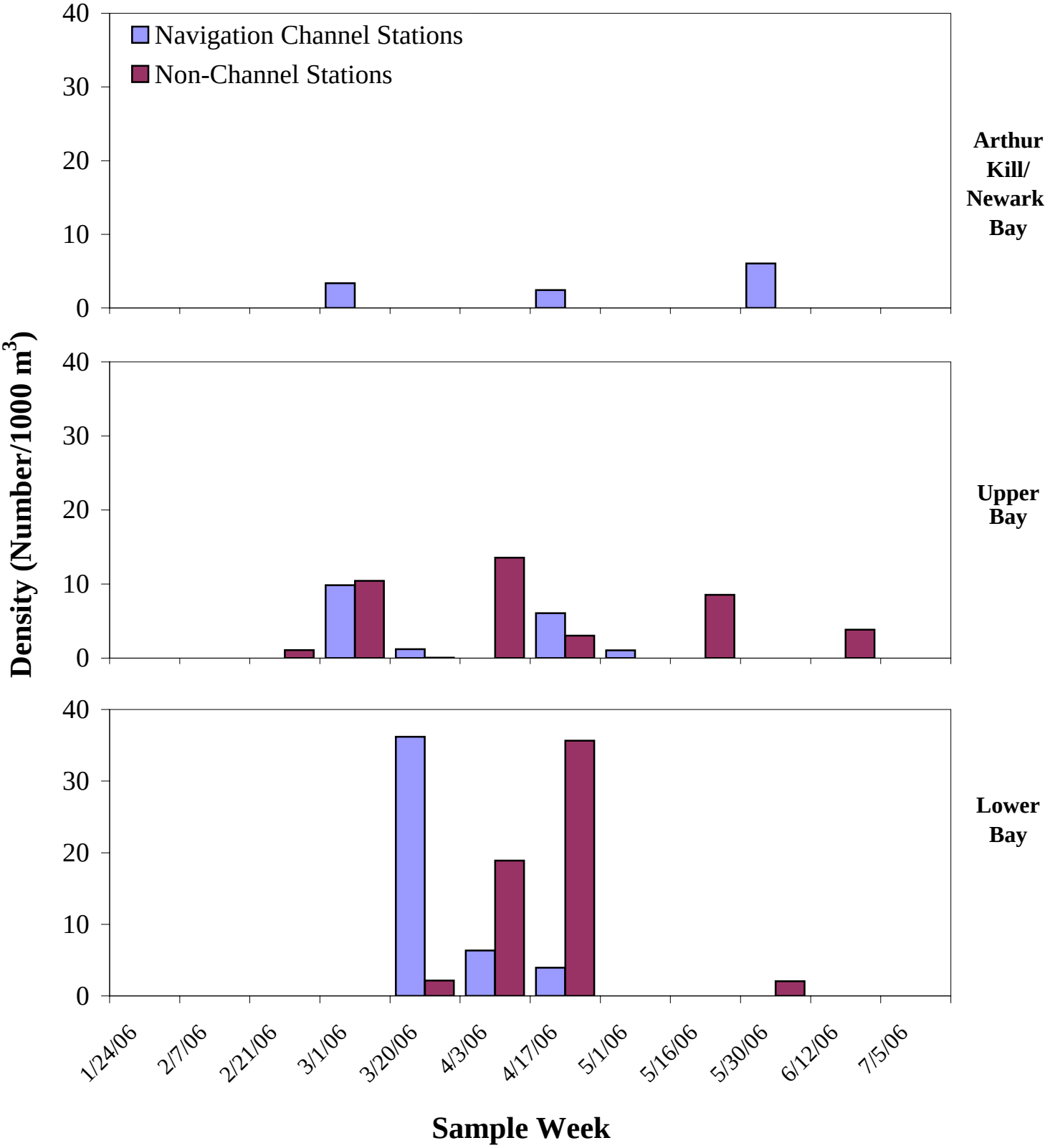


Figure 3-5 **Average weekly yolk-sac larvae density of all species combined at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

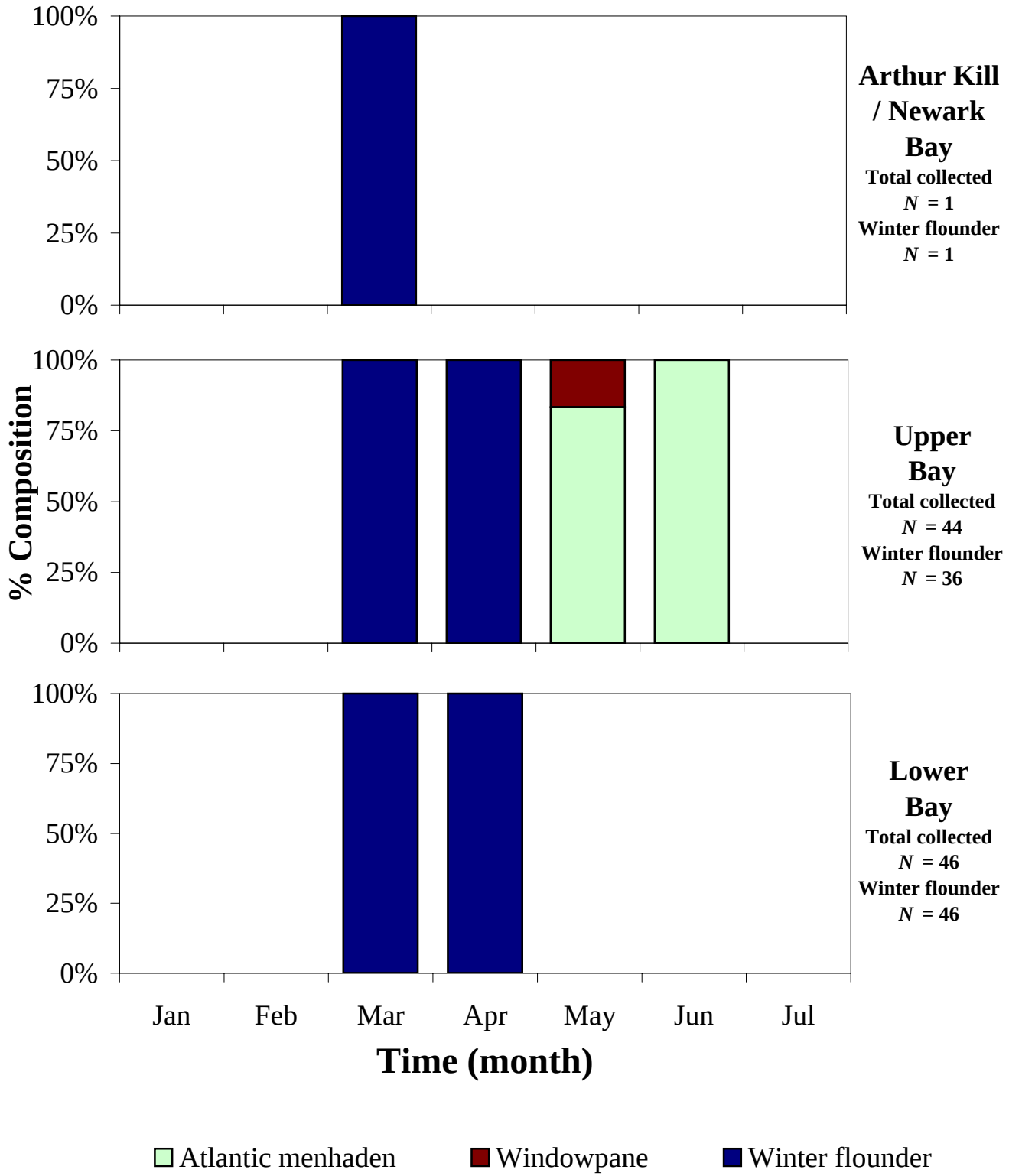


Figure 3-6 **EFH and important Non-Managed species composition of yolk-sac larvae collected at all stations during the 2006 Aquatic Biological Survey.**

.

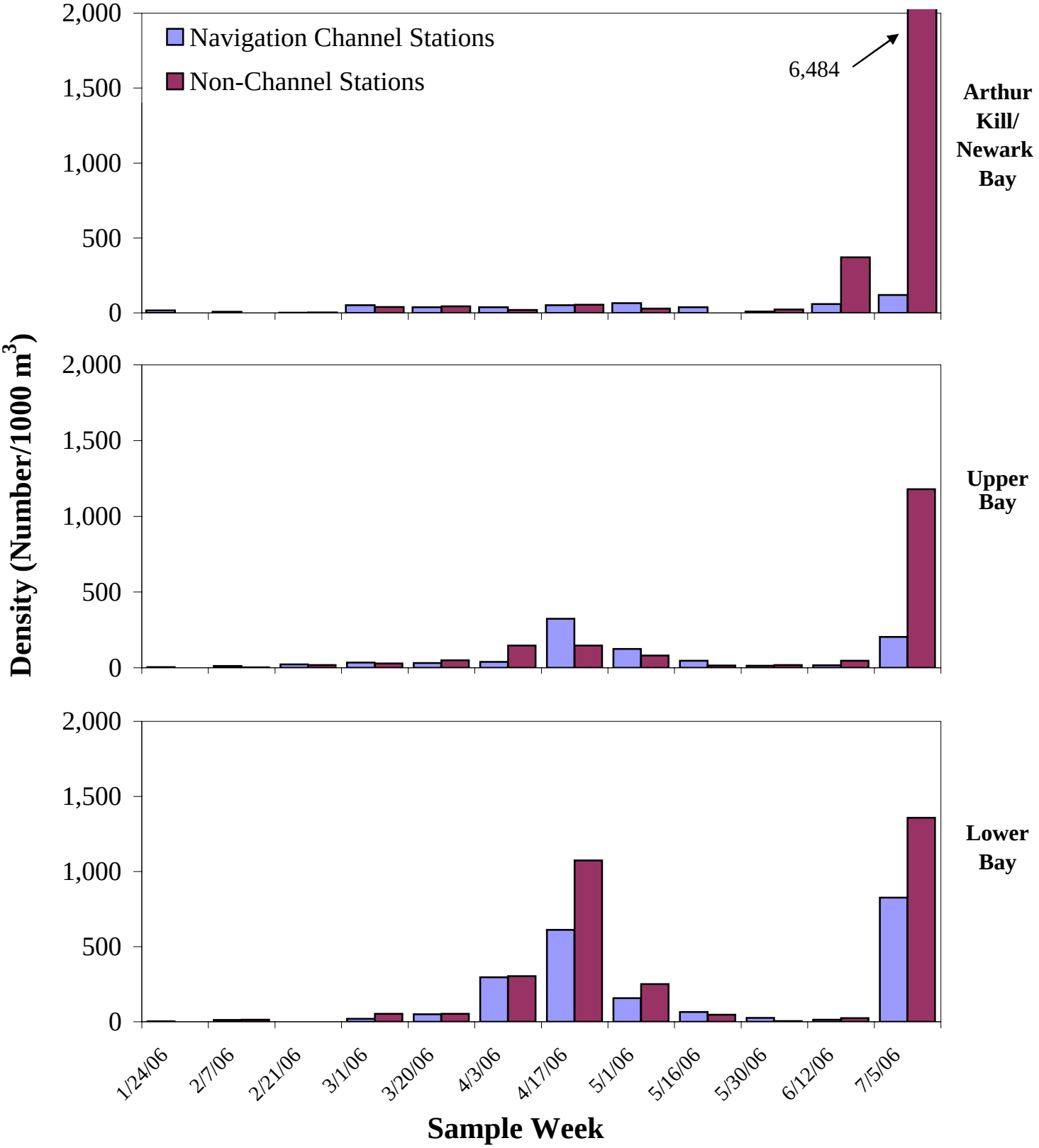


Figure 3-7 **Average weekly post yolk-sac larvae density of all species combined at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

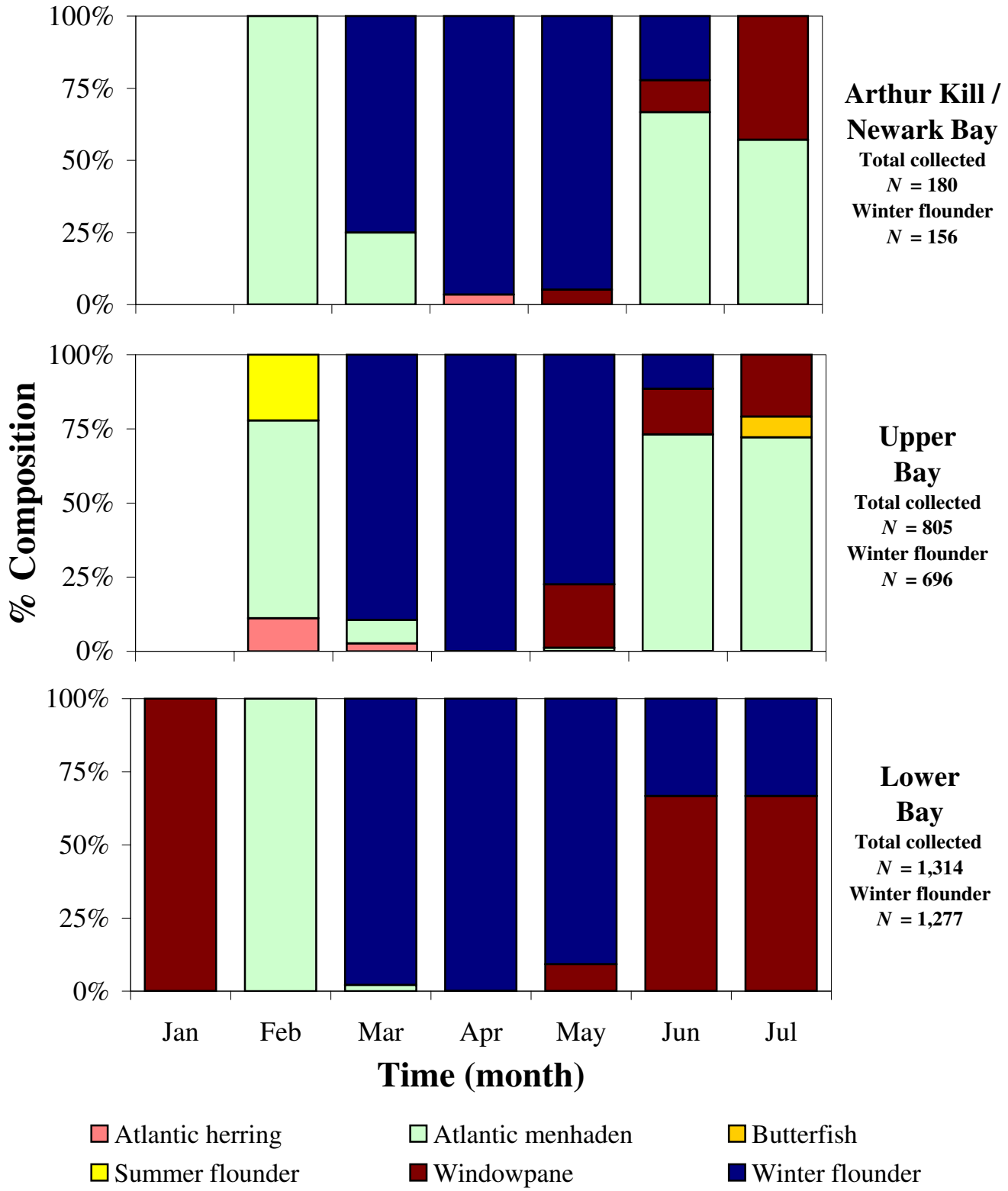


Figure 3-8 **EFH and important Non-Managed species composition of post yolk-sac larvae collected at all stations during the 2006 Aquatic Biological Survey.**

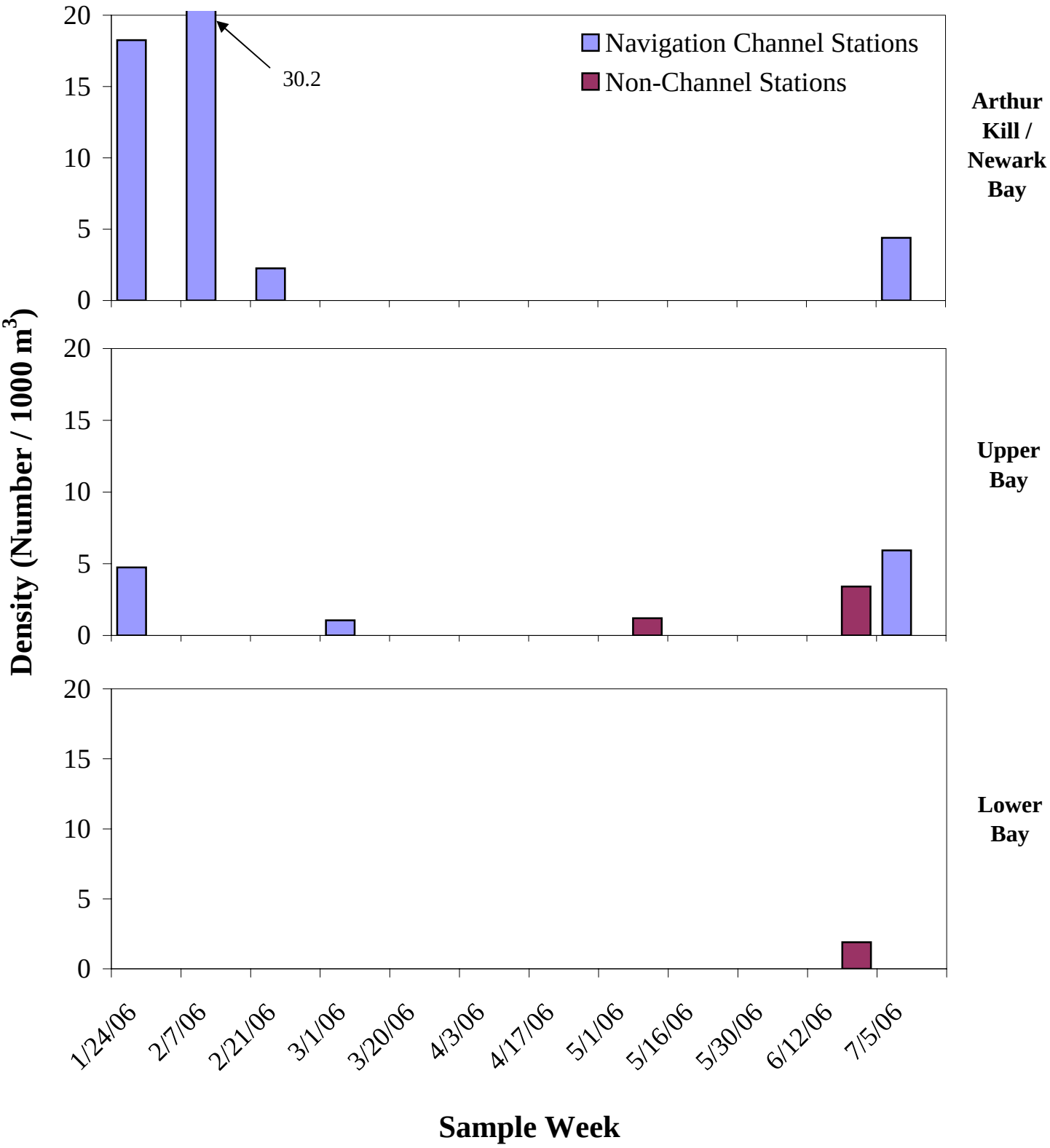


Figure 3-9 **Average weekly juvenile density of all species combined at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

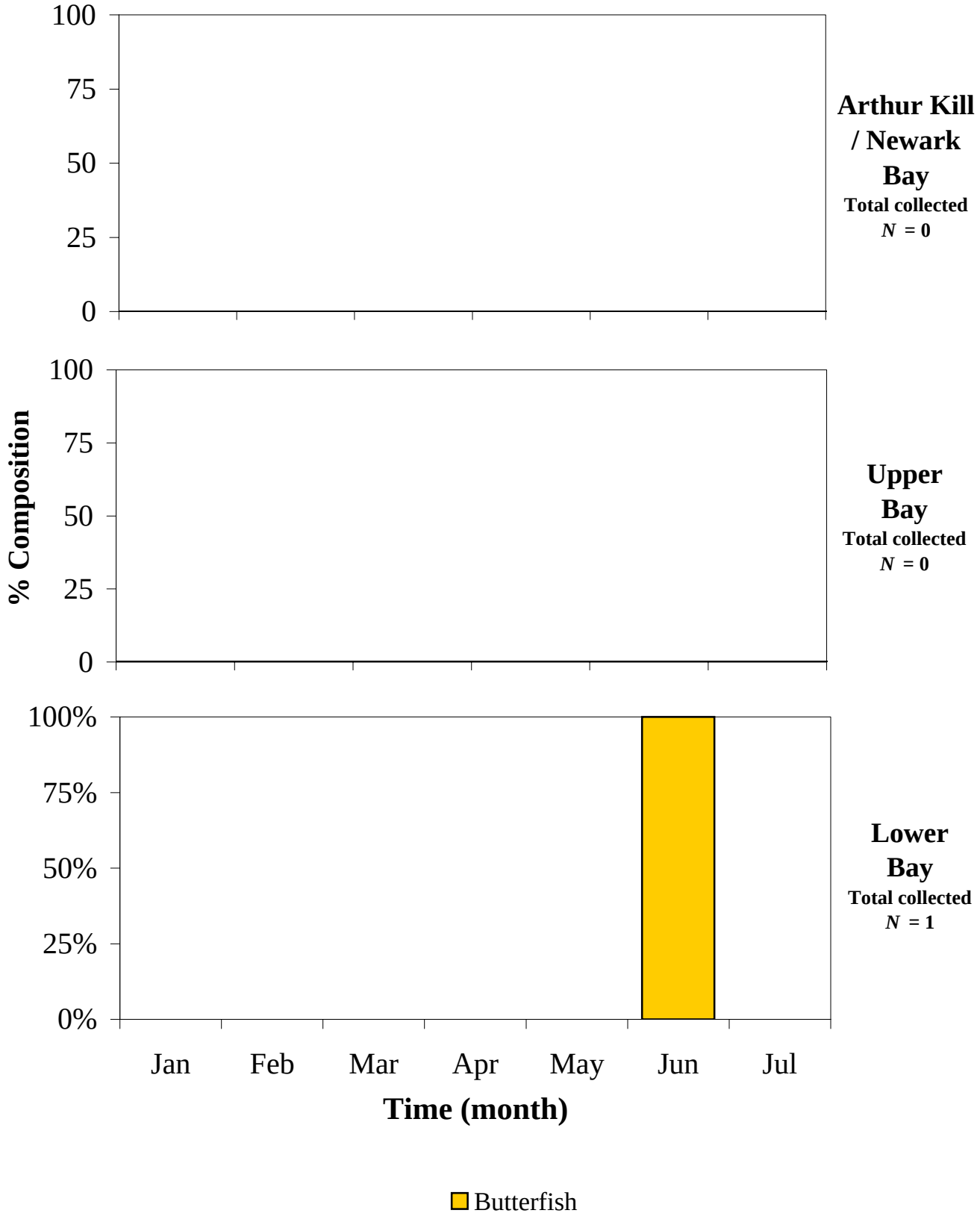


Figure 3-10 **EFH and important Non-Managed Species composition of juveniles collected at all stations during the 2006 Aquatic Biological Survey.**

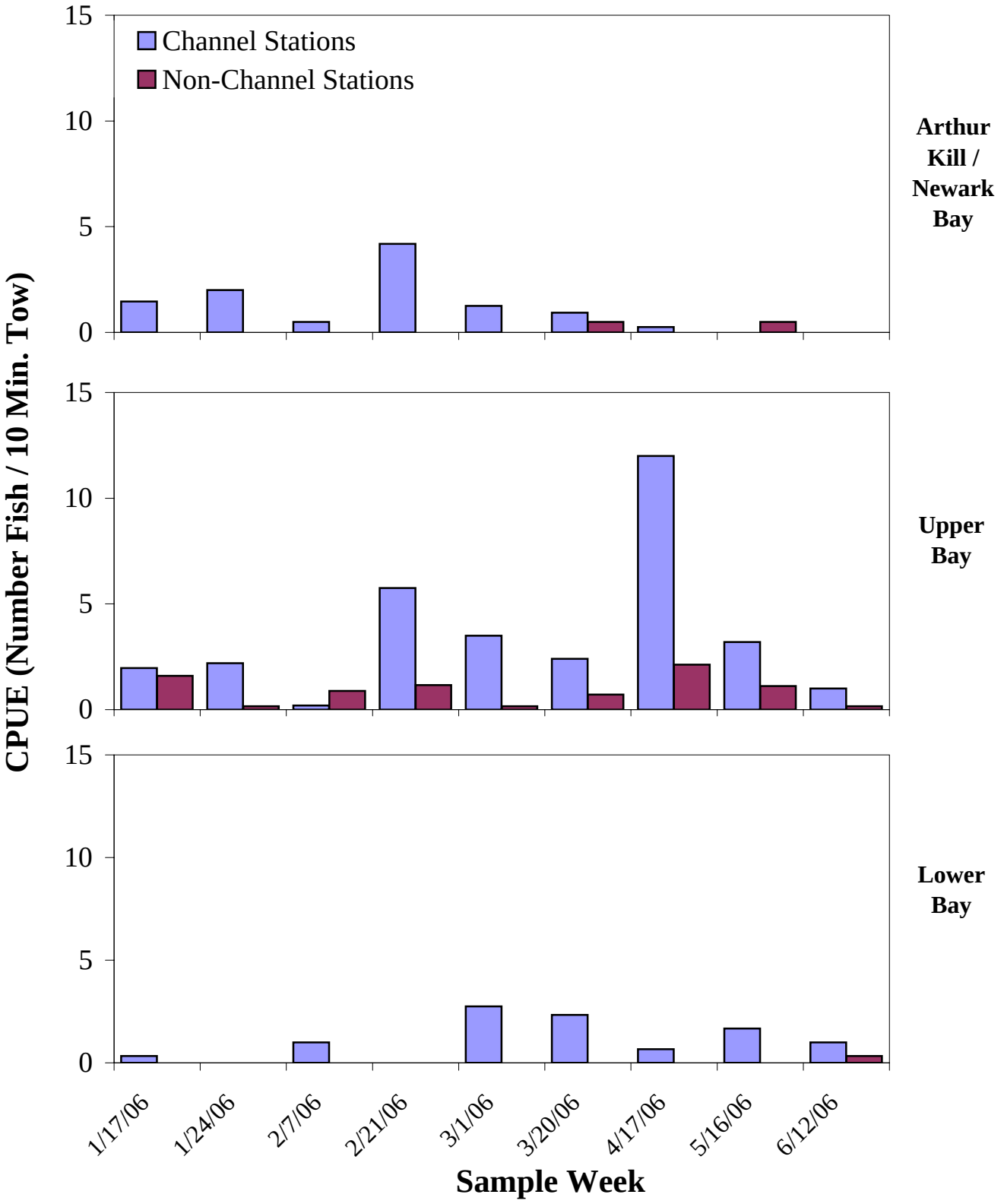


Figure 3-11 **Average weekly winter flounder trawl CPUE at navigation channel and non-channel stations in the three study areas during 2006 Aquatic Biological Survey.**

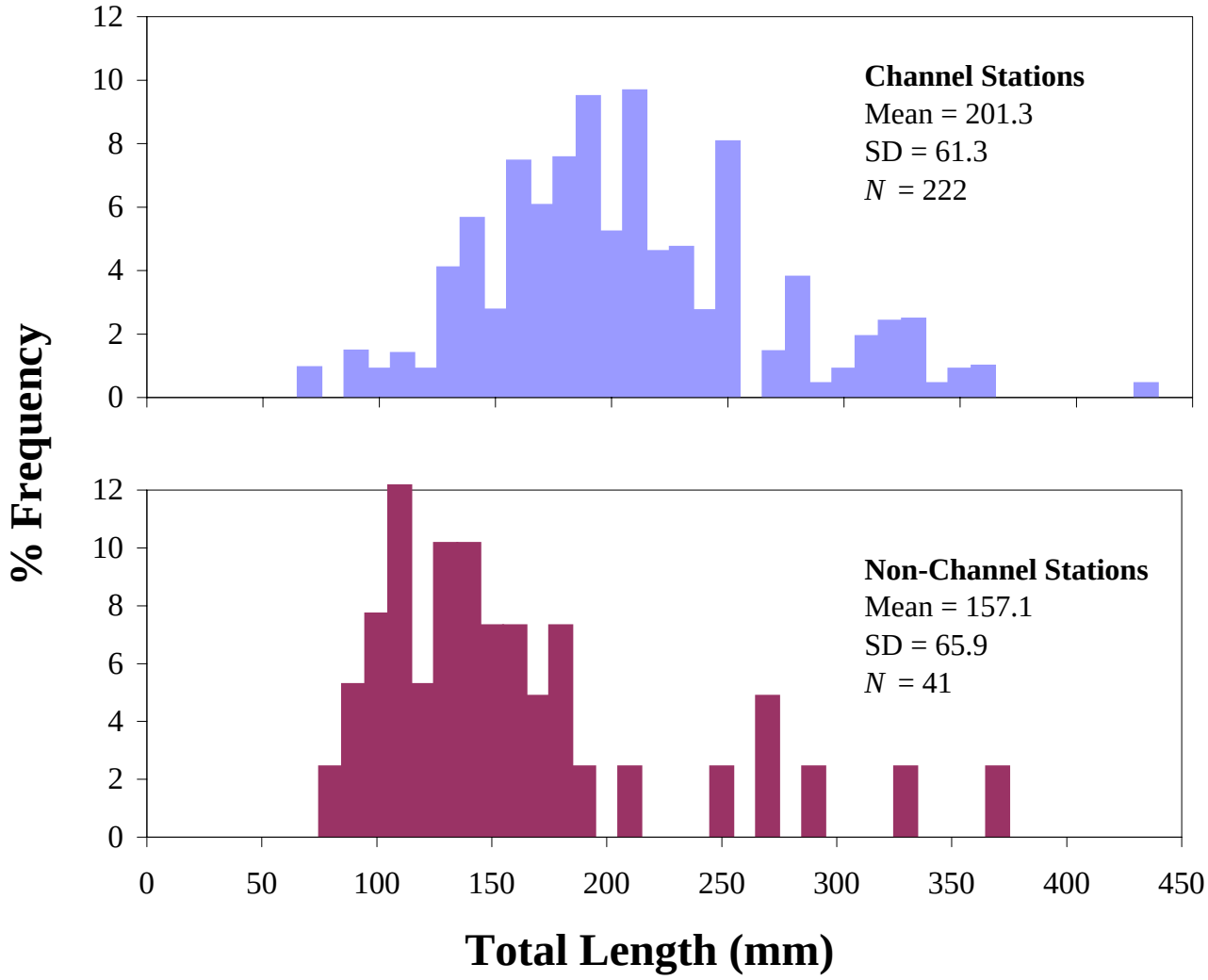


Figure 3-12 **Length frequency distribution (10 mm intervals) of all winter flounder collected during trawl sampling for the 2006 Aquatic Biological Survey. Winter flounder > 250 mm are considered adults, while individuals < 250 mm are juveniles.**

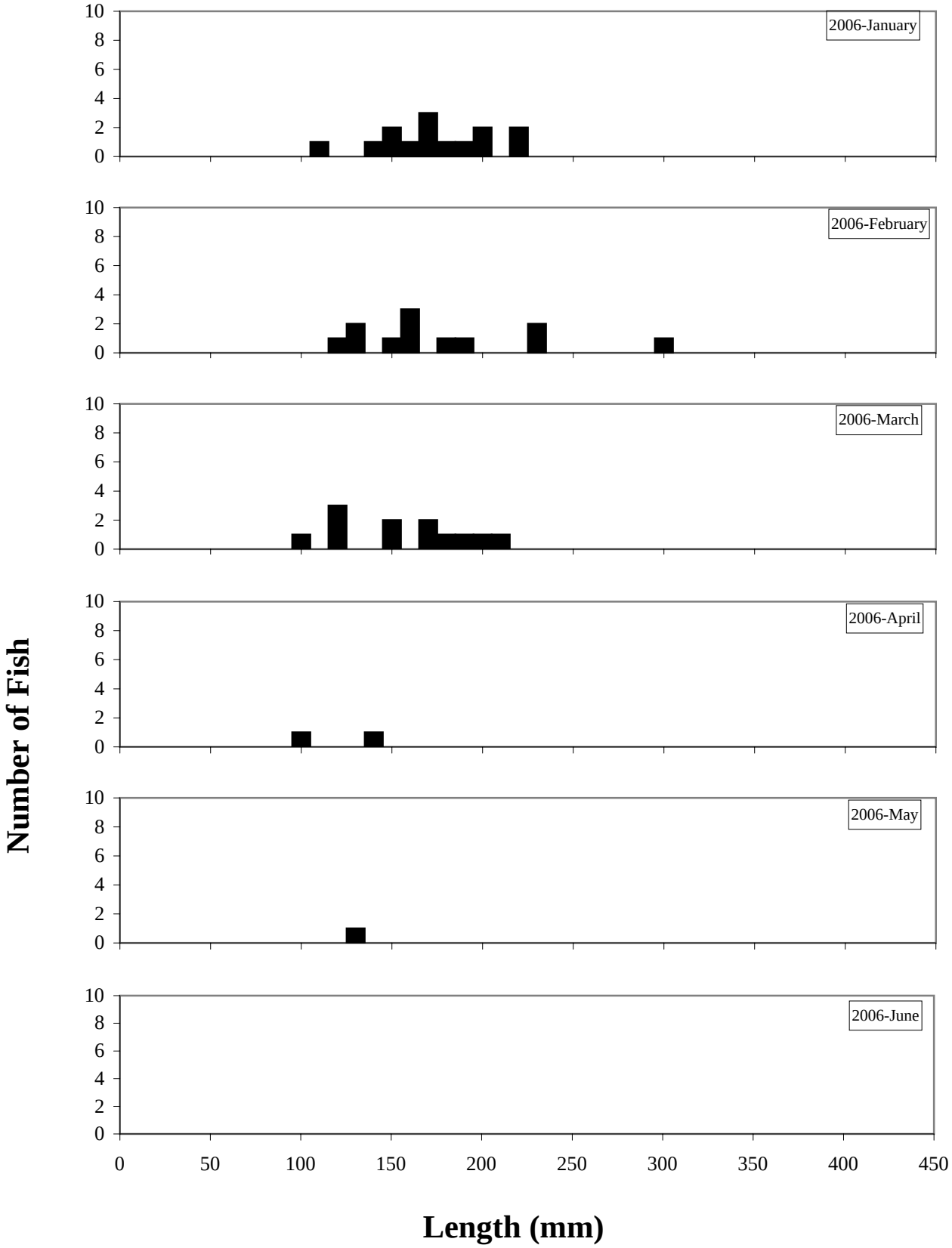


Figure 3-13 **Length frequency distribution of winter flounder collected during trawl sampling at Arthur Kill/Newark Bay stations, 2006 Aquatic Biological Survey.**

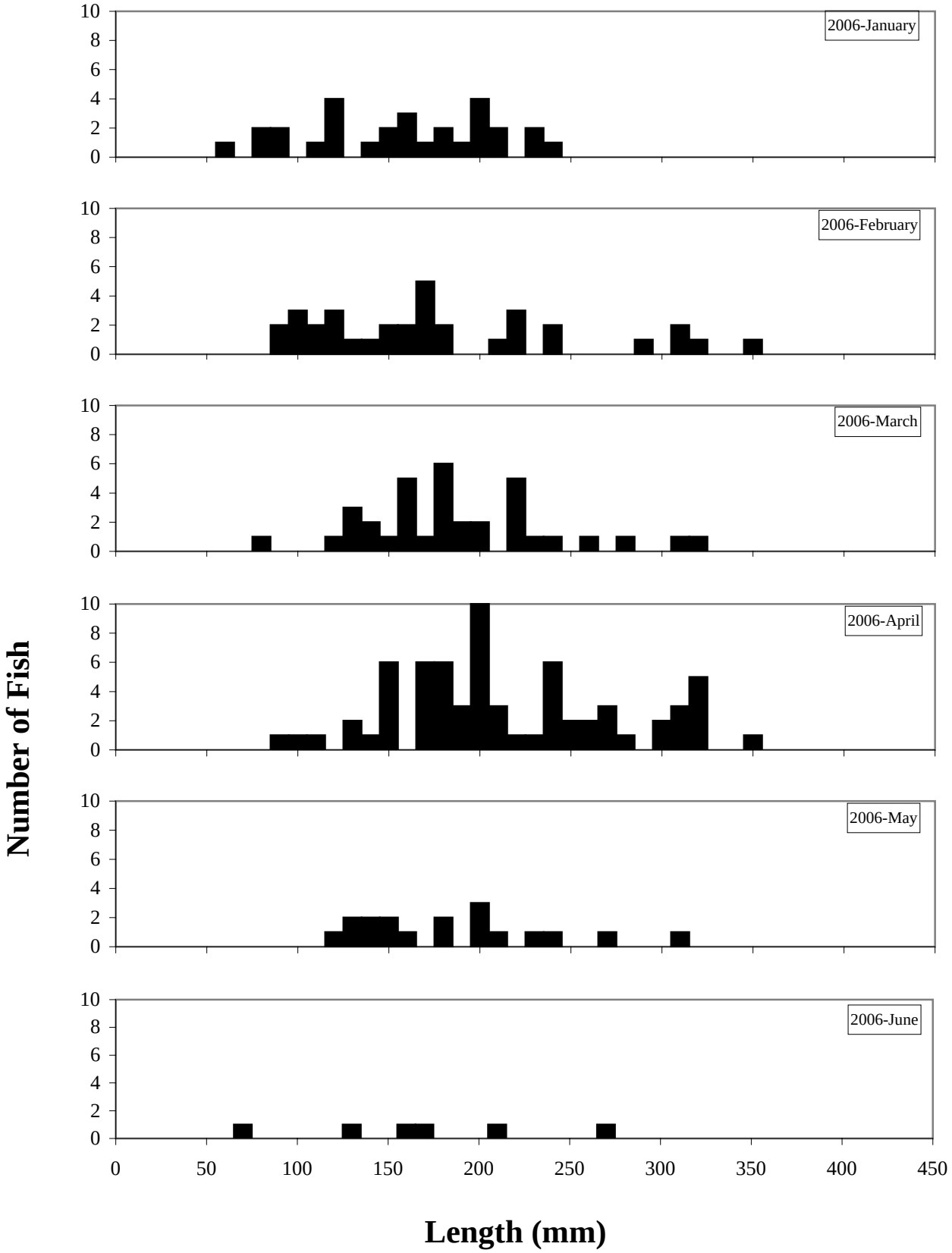


Figure 3-14 **Length frequency distribution of winter flounder collected during trawl sampling at Upper Bay stations, 2006 Aquatic Biological Survey.**

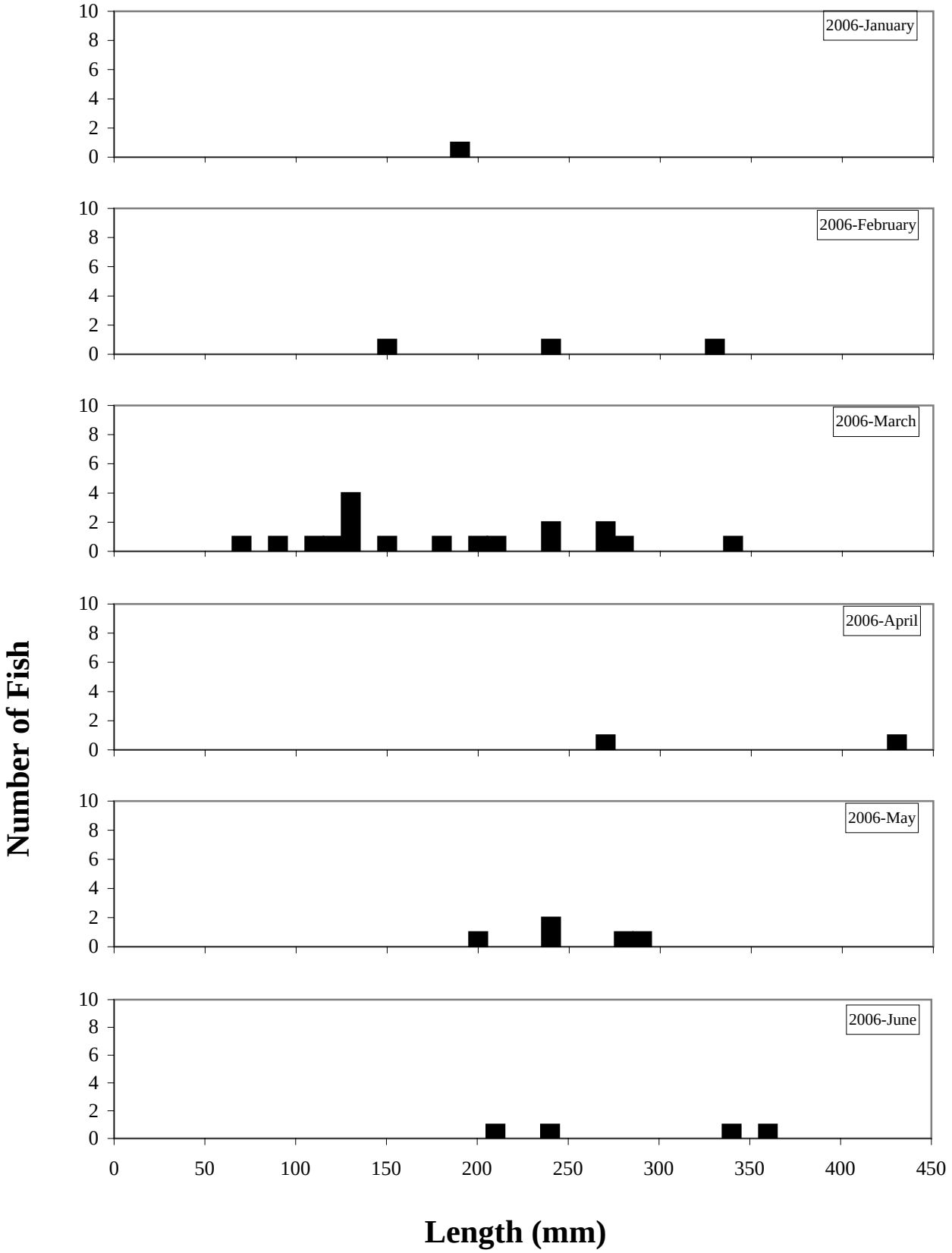


Figure 3-15 **Length frequency distribution of winter flounder collected during trawl sampling at Lower Bay stations, 2006 Aquatic Biological Survey.**

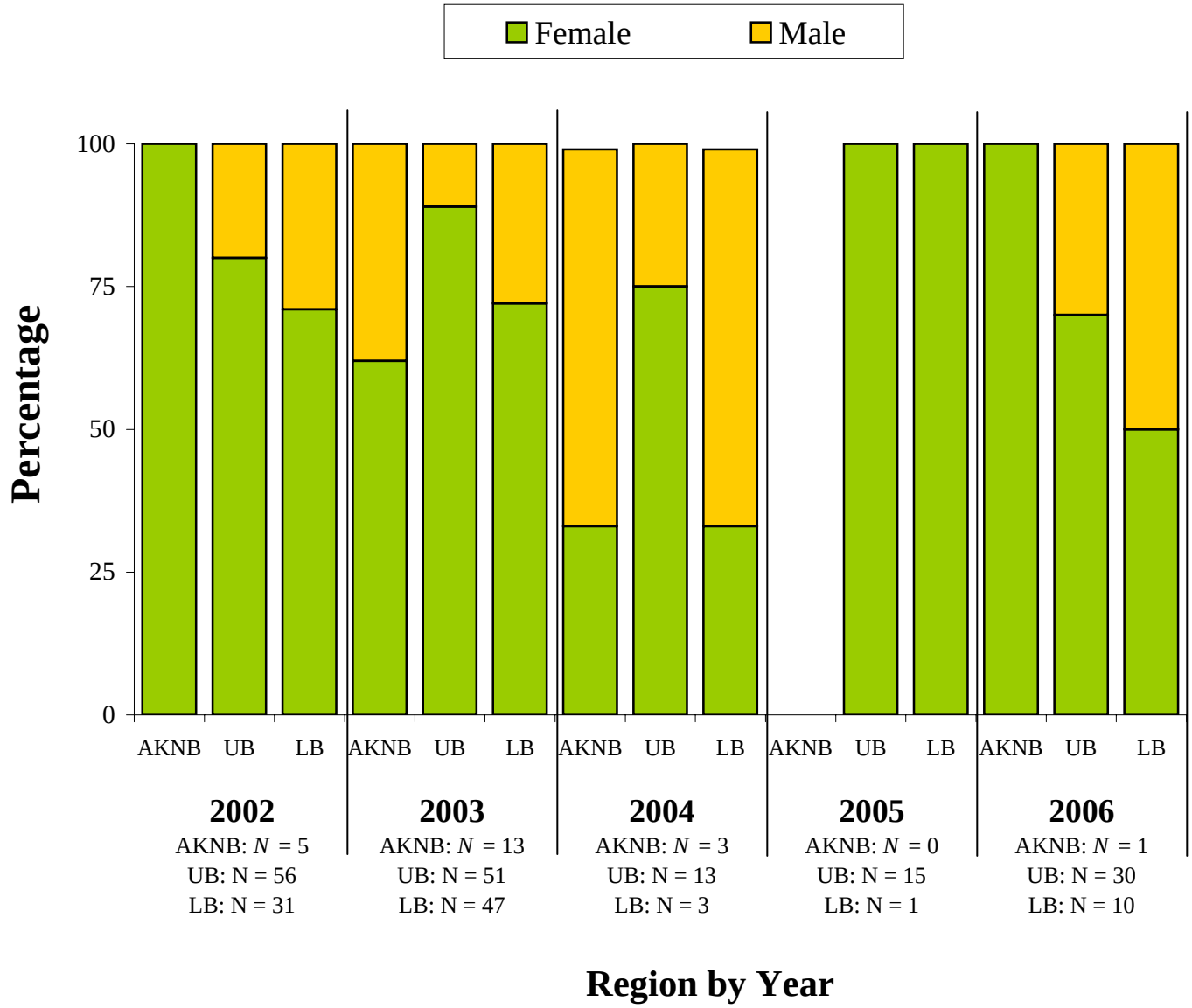


Figure 3-16 **Sex ratio of winter flounder adults (total length > 250 mm) collected at all collected at all stations during the 2006 Aquatic Biological Survey.**

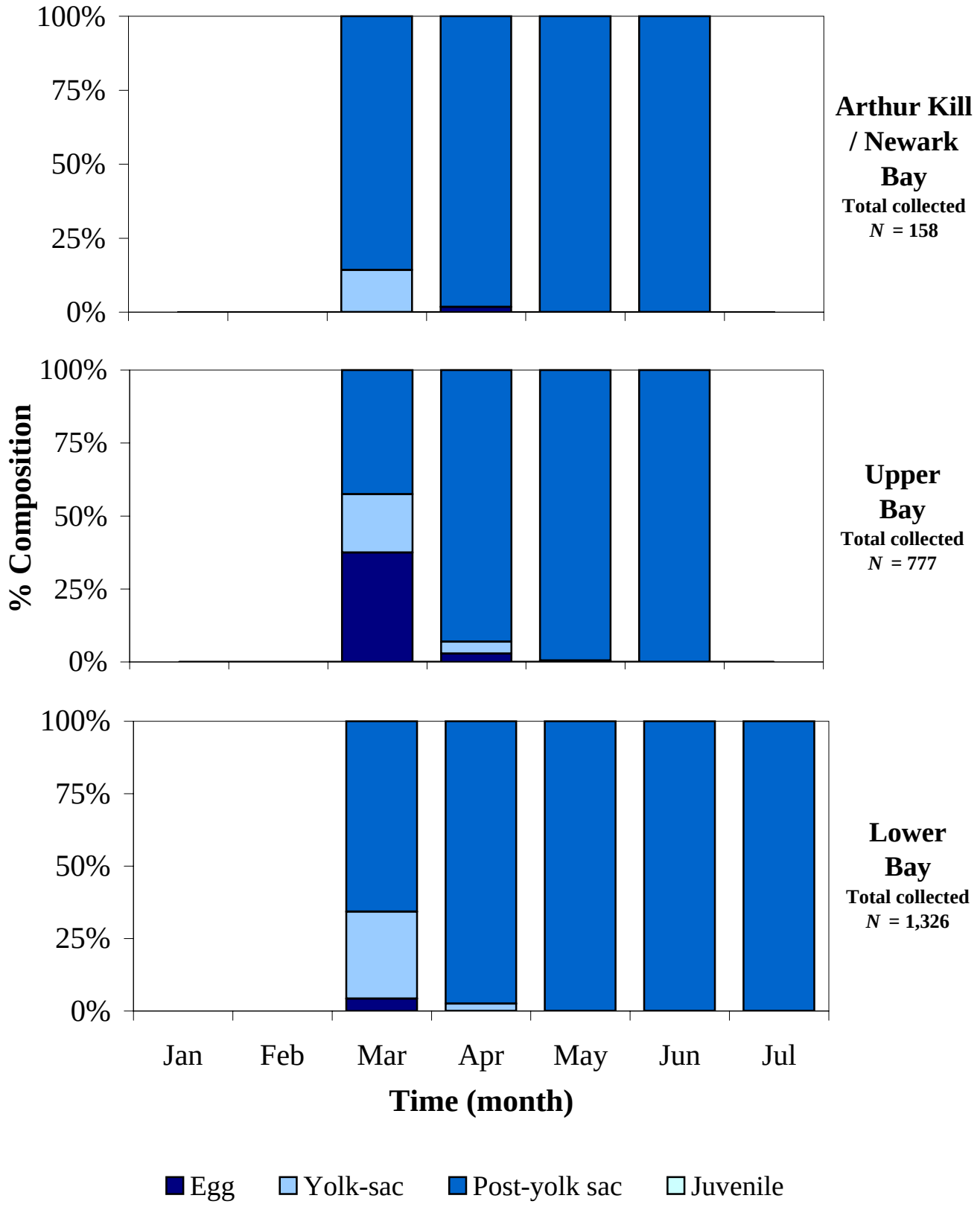


Figure 3-17 **Distribution of winter flounder life stages in the three study regions, 2006 Aquatic Biological Survey.**

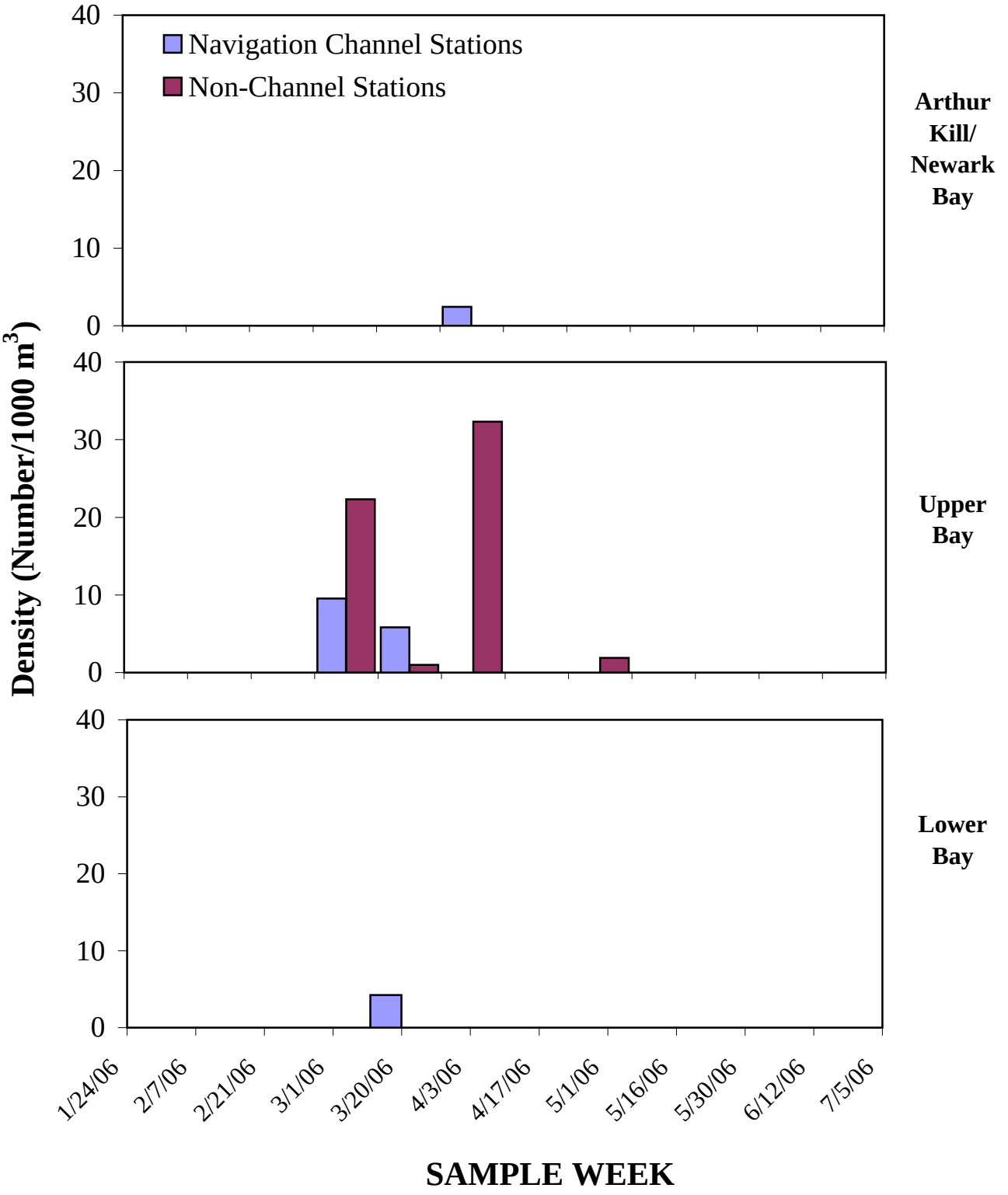


Figure 3-18 **Average weekly winter flounder egg density at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

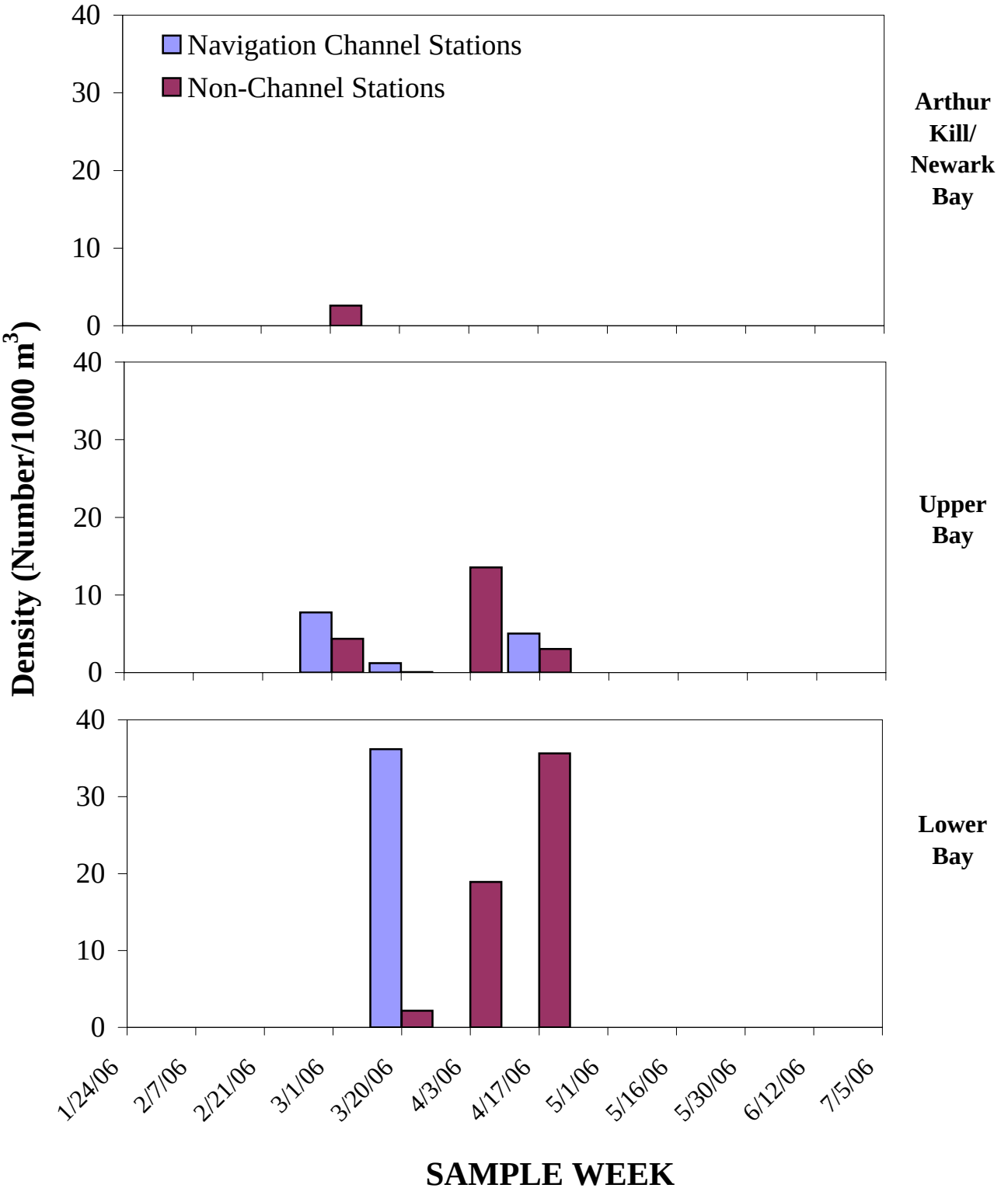


Figure 3-19 **Average weekly winter flounder yolk-sac larval density at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week.

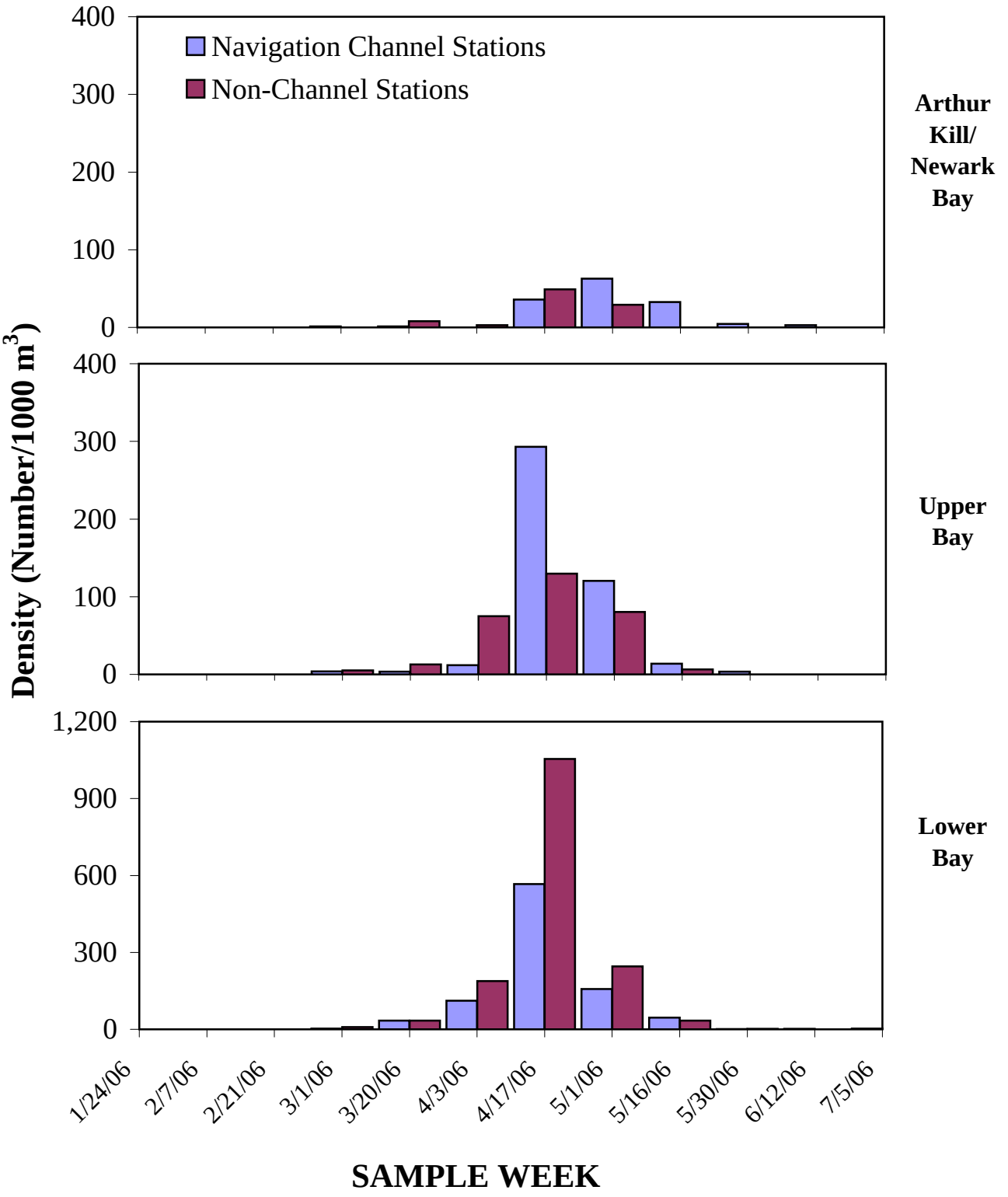


Figure 3-20 **Average weekly winter flounder post-yolk sac larval density at navigation channel and non-channel stations in the three study areas, 2006 Aquatic Biological Survey.**

Note(s): Dates listed indicate the first day of each sample week. Scale change for Lower Bay.

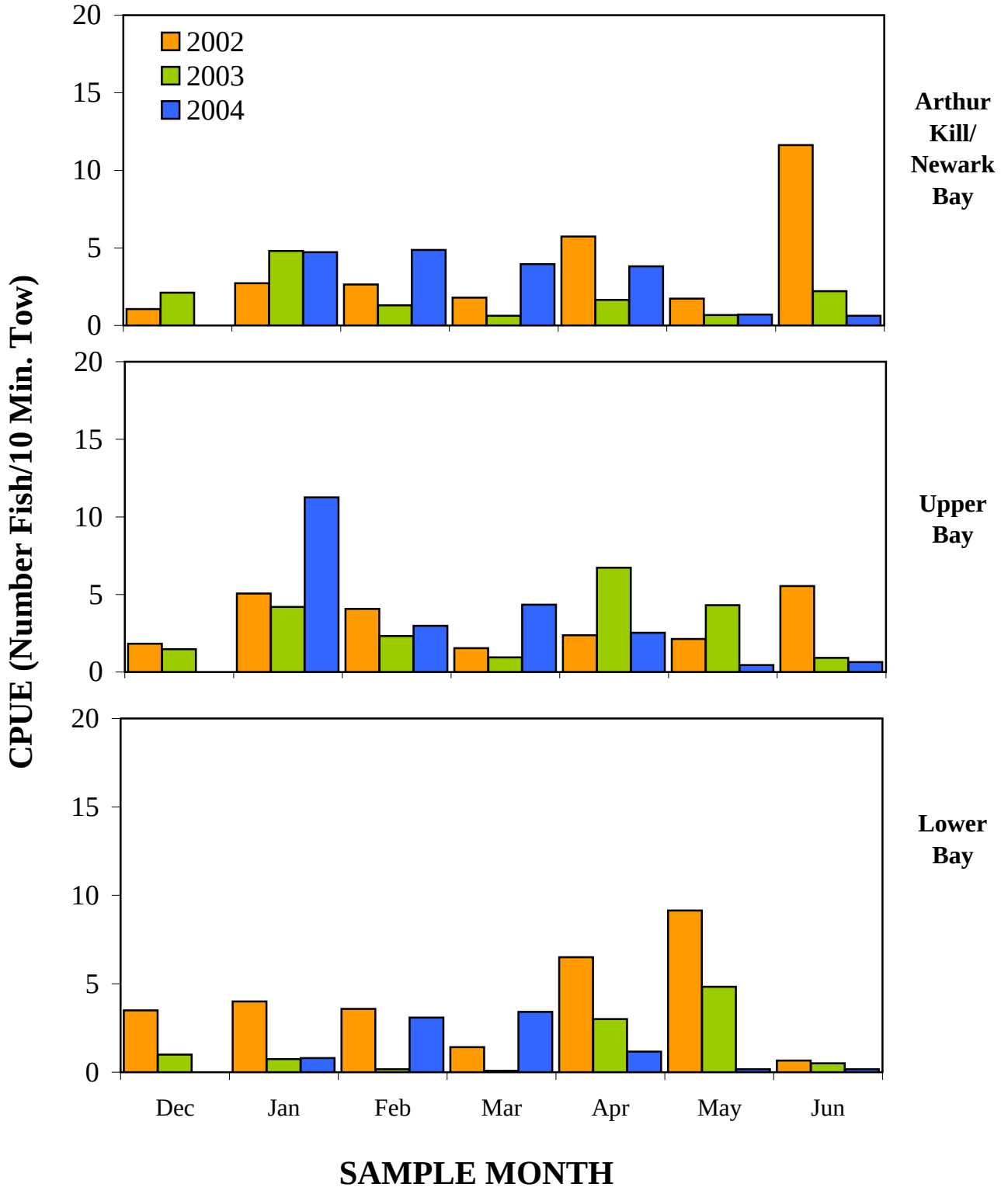


Figure 3-21 a **Average monthly trawl CPUE of winter flounder during the 2002, 2003, and 2004 surveys in the three study regions.**

Note: December was not sampled during 2004.

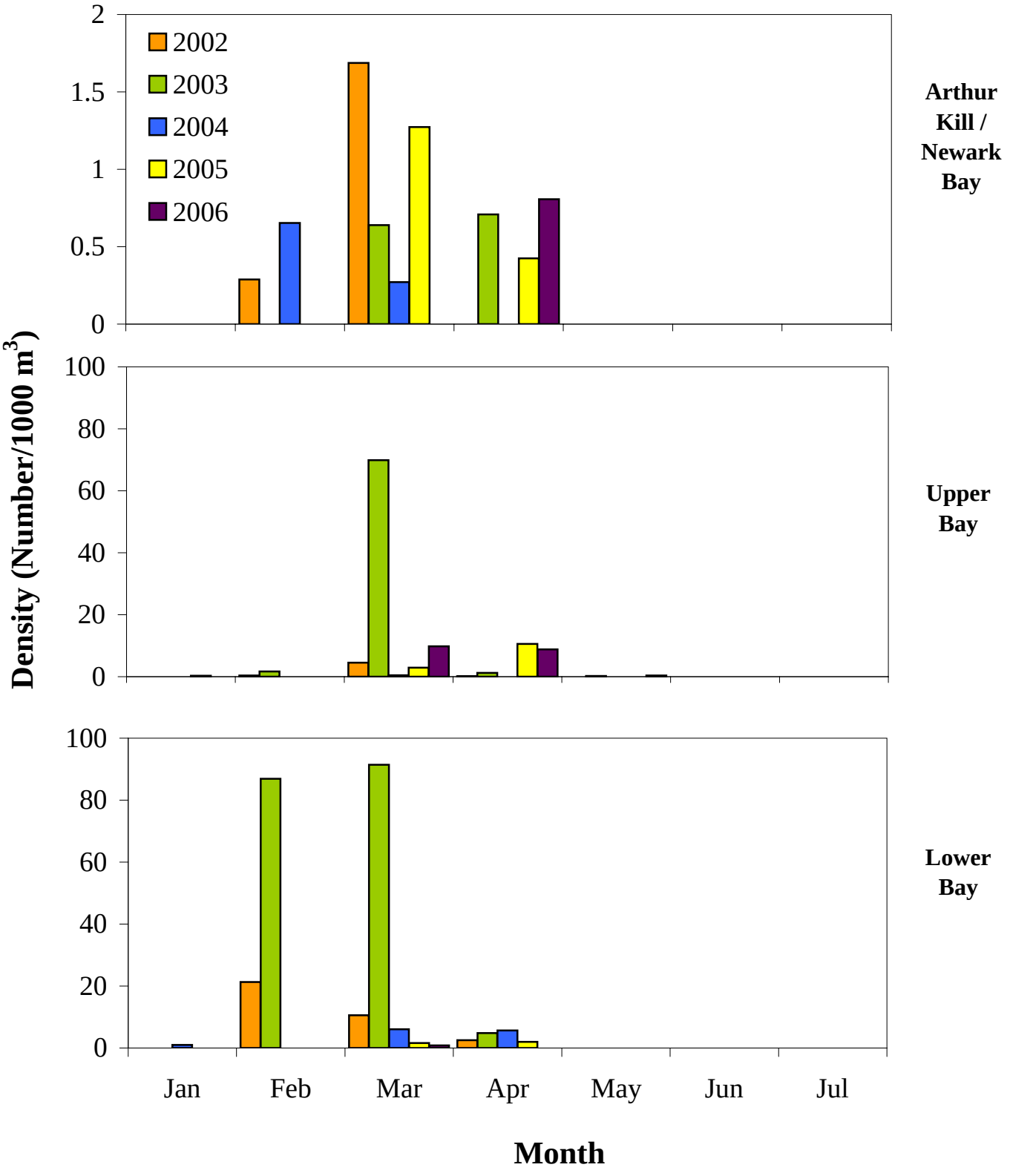


Figure 3-26 **Average monthly winter flounder egg density during the 2002, 2003, 2004, 2005 and 2006 surveys in the three study regions.**

Note(s): Scale change for Arthur Kill/Newark Bay.

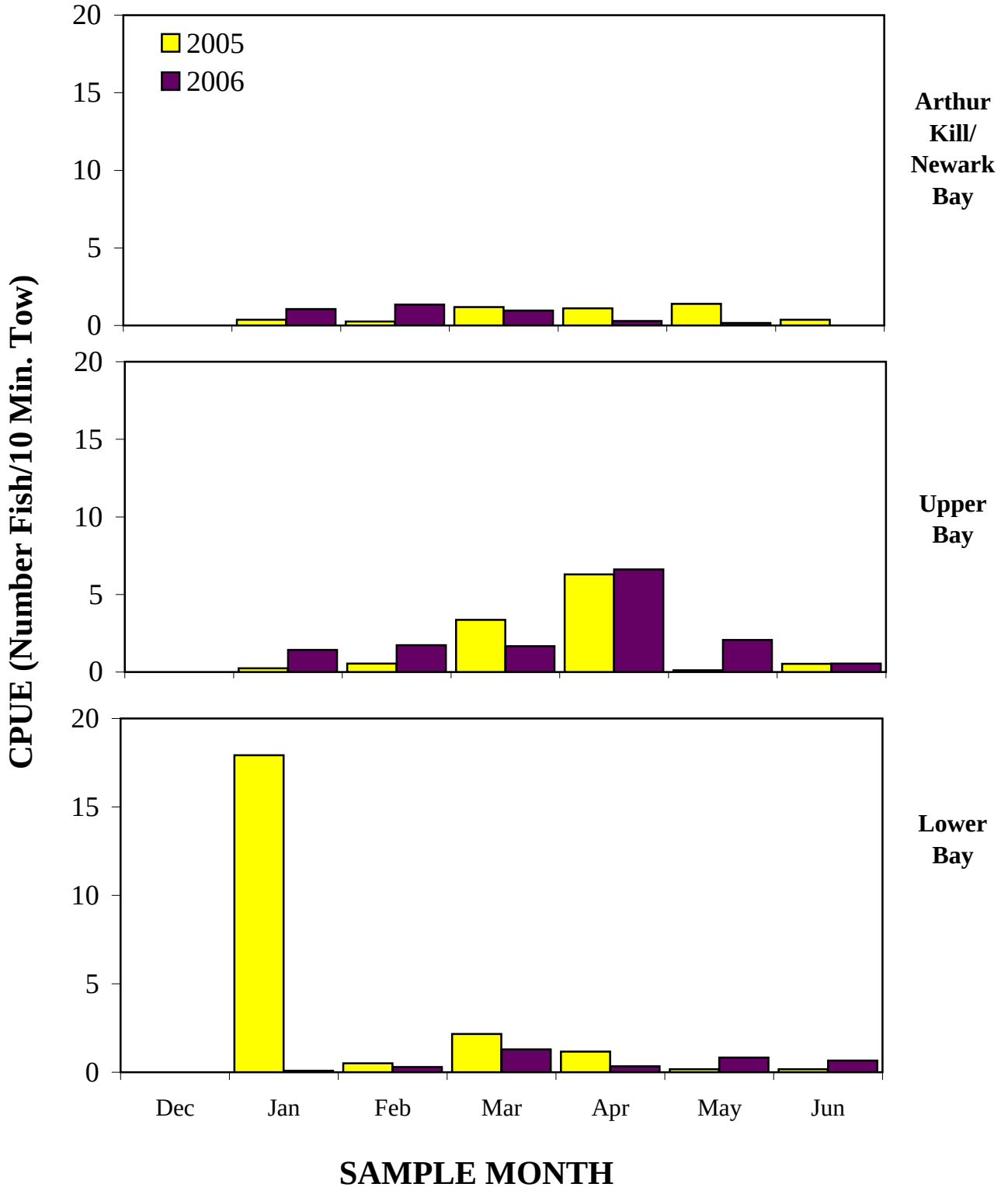


Figure 3-21 b **Average monthly trawl CPUE of winter flounder during the 2005 and 2006 surveys in the three study regions.**

Note: December was not sampled during these years.

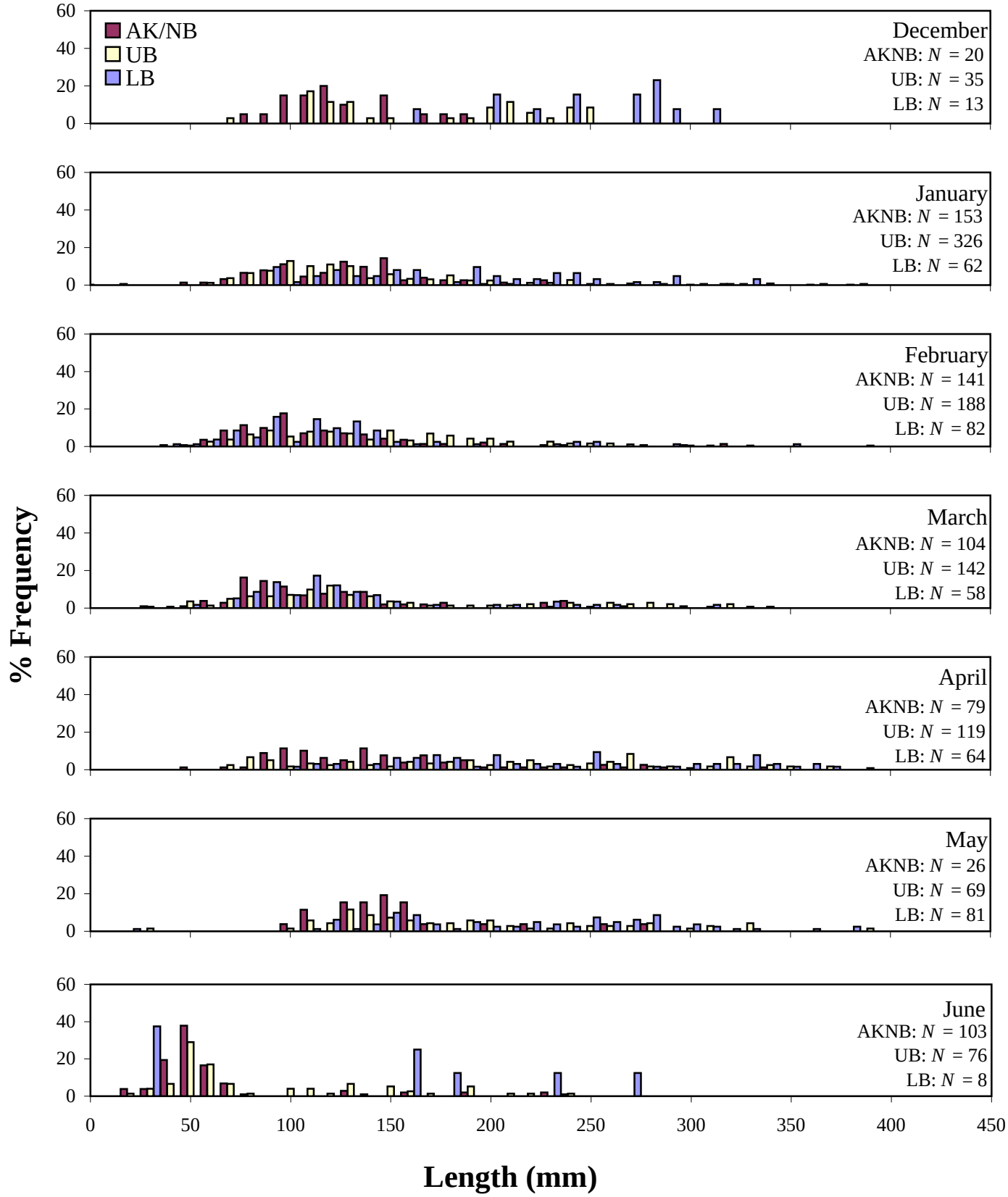


Figure 3-22 a **Length frequency distribution of winter flounder collected during trawl sampling at Arthur Kill/Newark Bay, Upper Bay, and Lower Bay stations, 2002, 2003, and 2004 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December 2003.

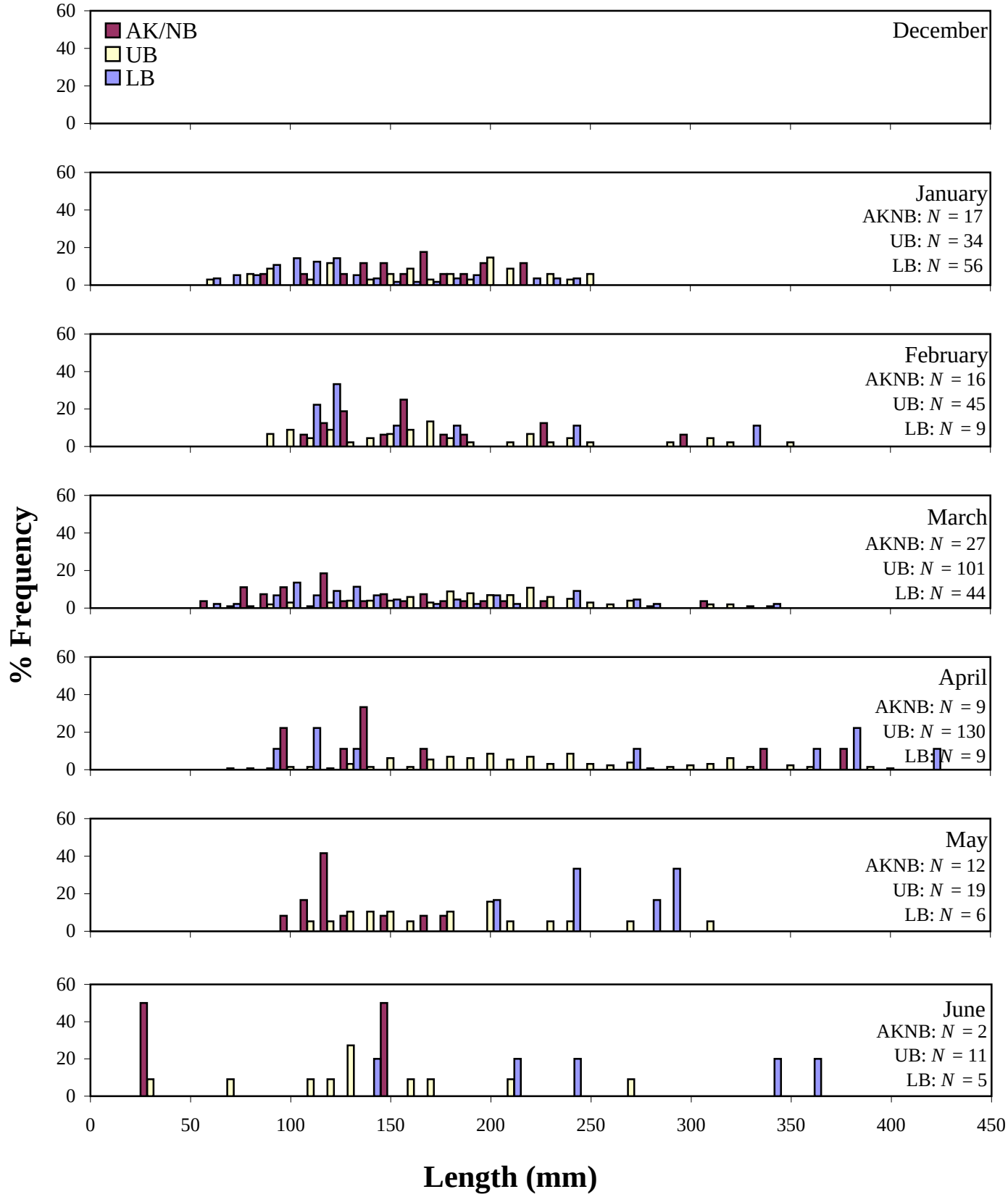


Figure 3-22 b **Length frequency distribution of winter flounder collected during trawl sampling at Arthur Kill/Newark Bay, Upper Bay, and Lower Bay stations, 2005 and 2006 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December.

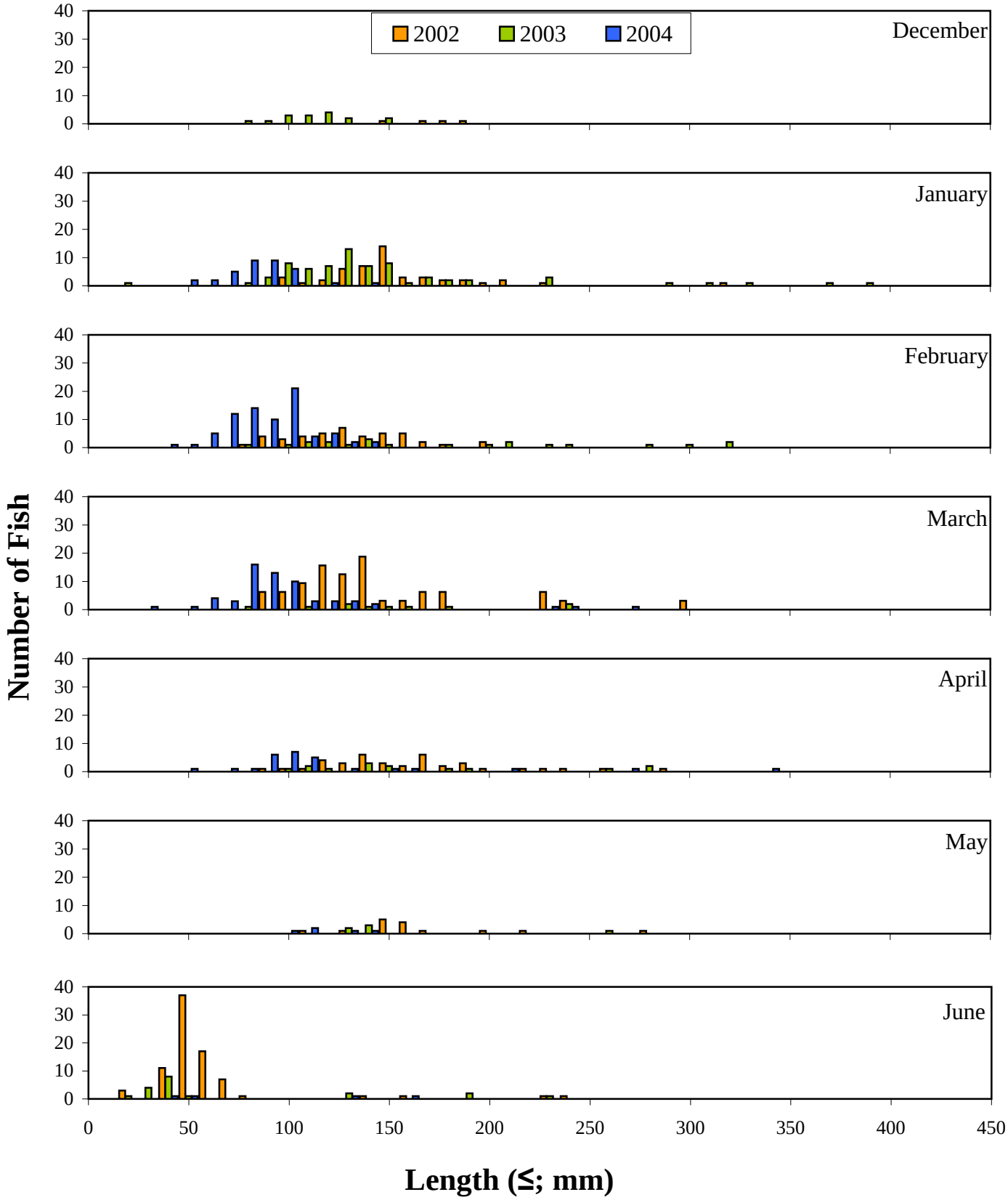


Figure 3-23 a **Length frequency distribution of winter flounder collected during trawl sampling at Arthur Kill/Newark Bay, 2002, 2003, and 2004 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December 2003-2004.

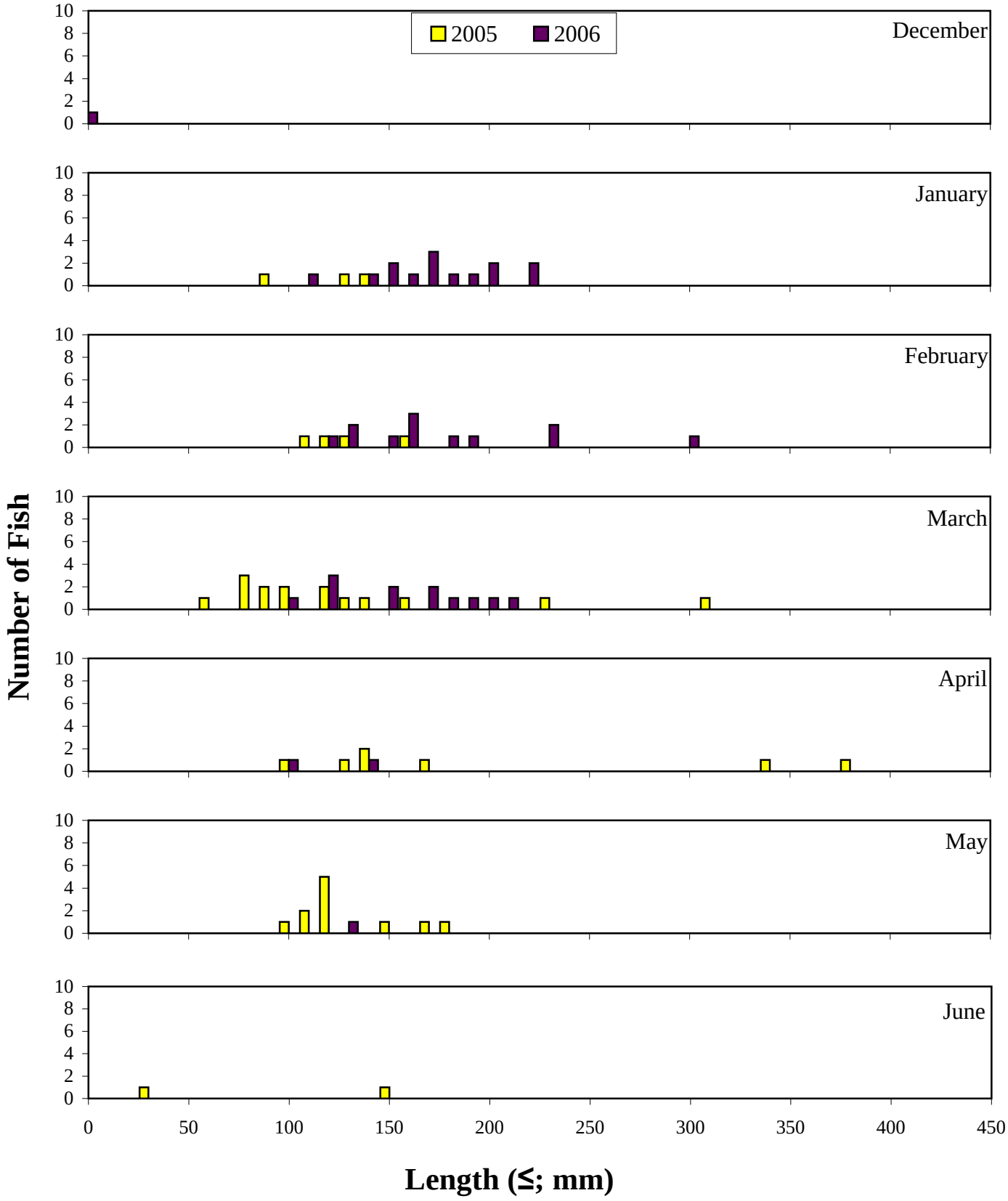


Figure 3-23 b **Length frequency distribution of winter flounder collected during trawl sampling at Arthur Kill/Newark Bay, 2005 and 2006 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December.

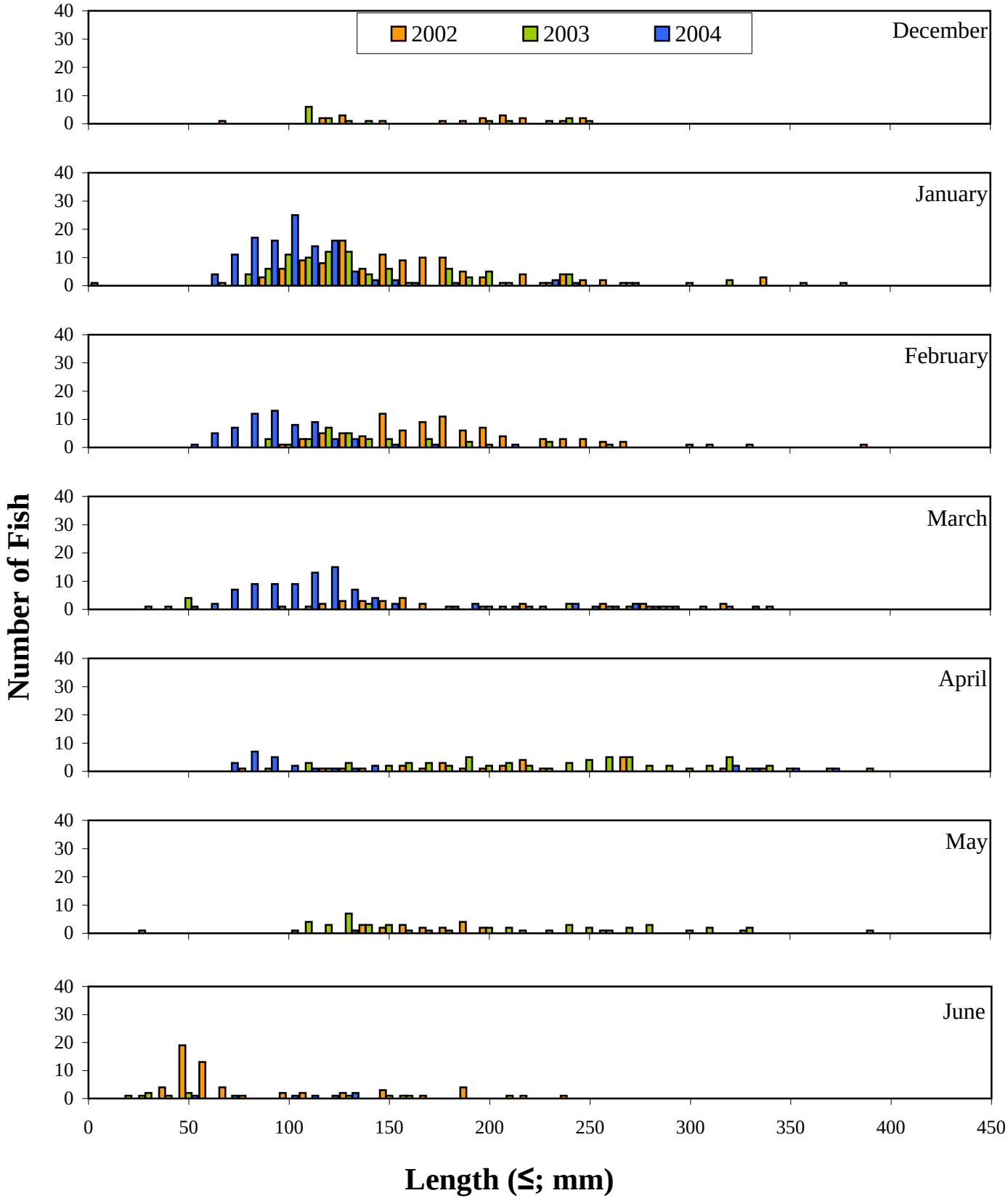


Figure 3-24 a **Length frequency distribution of winter flounder collected during trawl sampling at Upper Bay, 2002, 2003, and 2004 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December 2003-2004.

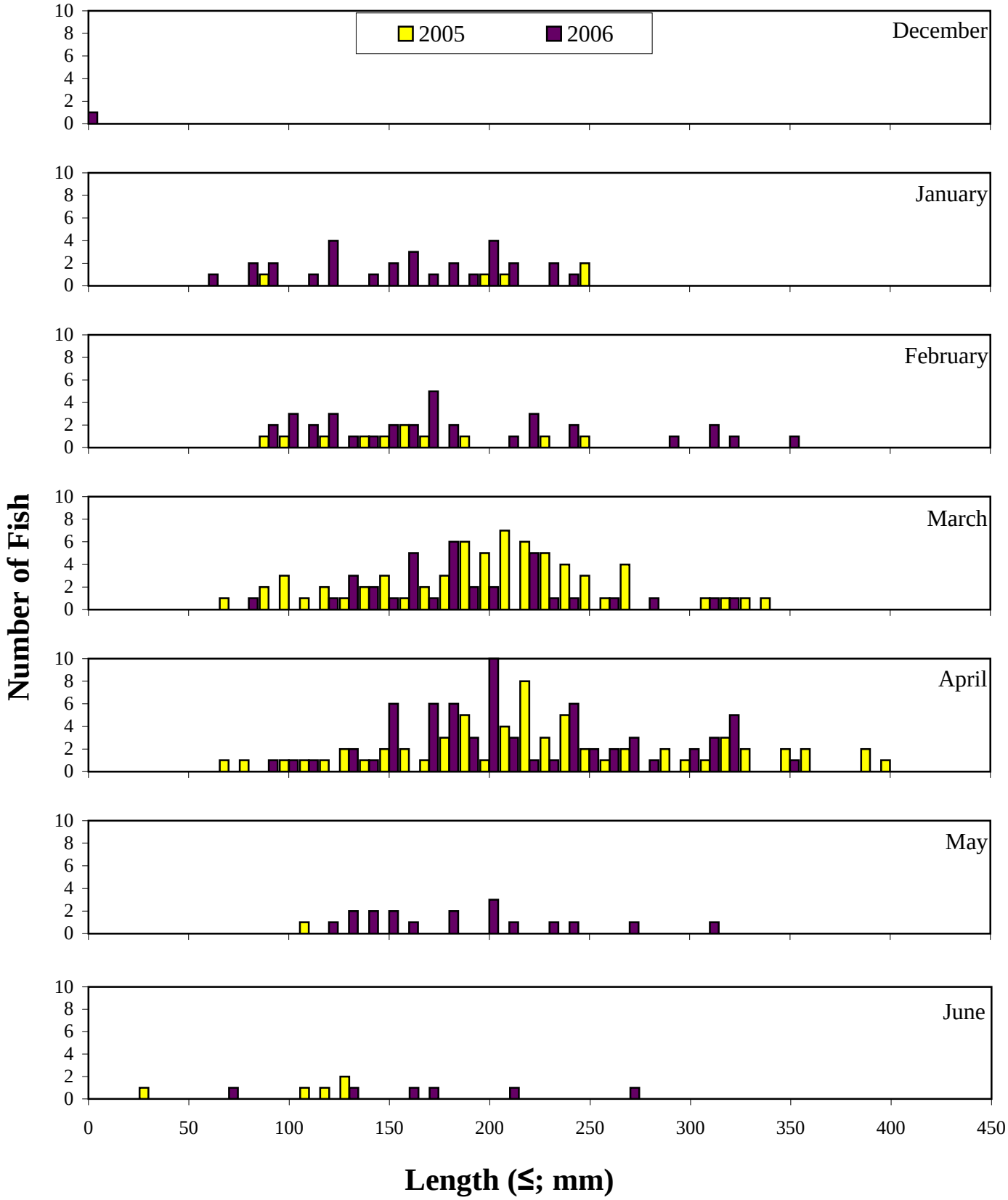


Figure 3-24 b **Length frequency distribution of winter flounder collected during trawl sampling at Upper Bay, 2005 and 2006 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December.

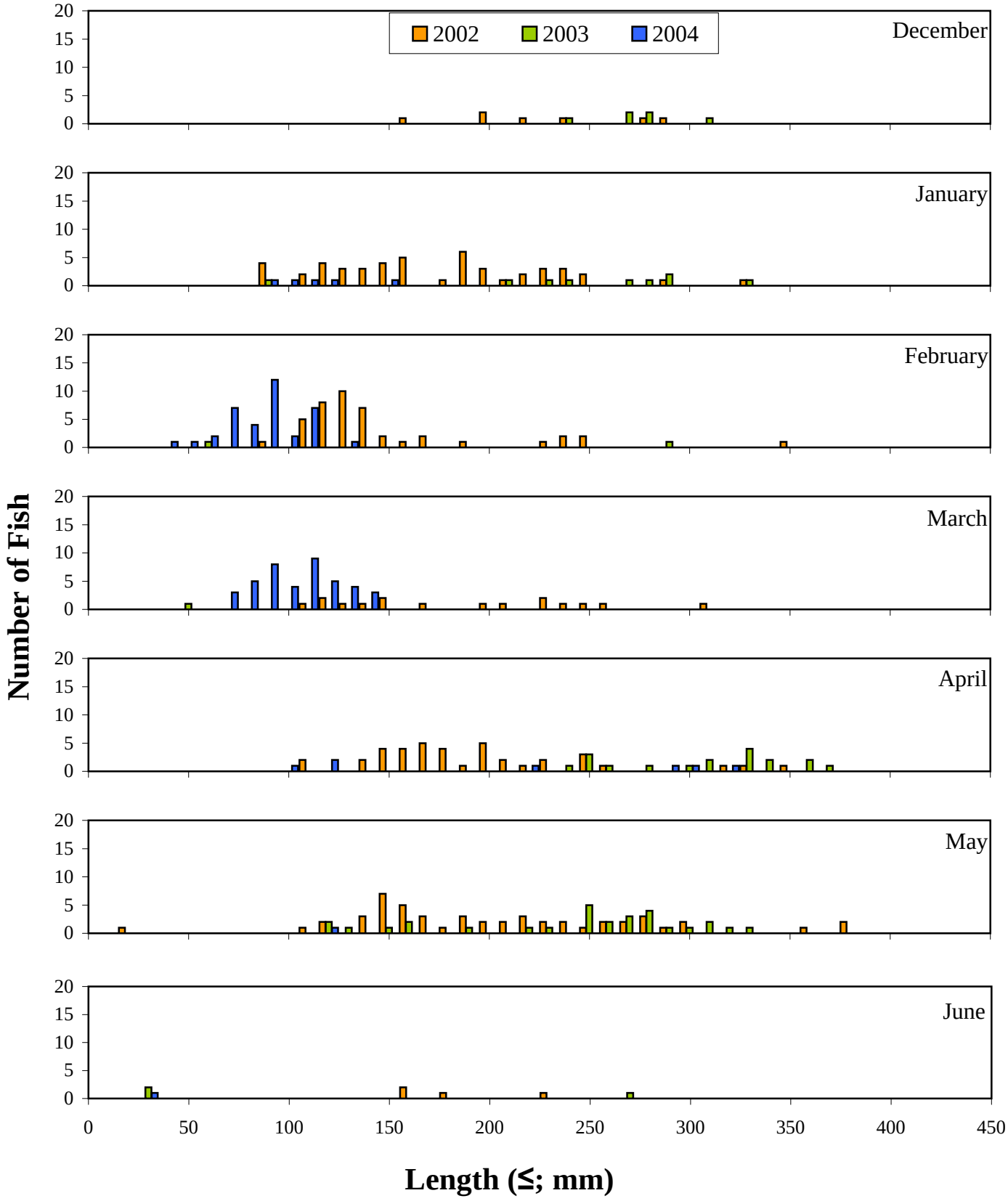


Figure 3-25 a **Length frequency distribution of winter flounder collected during trawl sampling at Lower Bay, 2002, 2003, and 2004 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December 2003-2004.

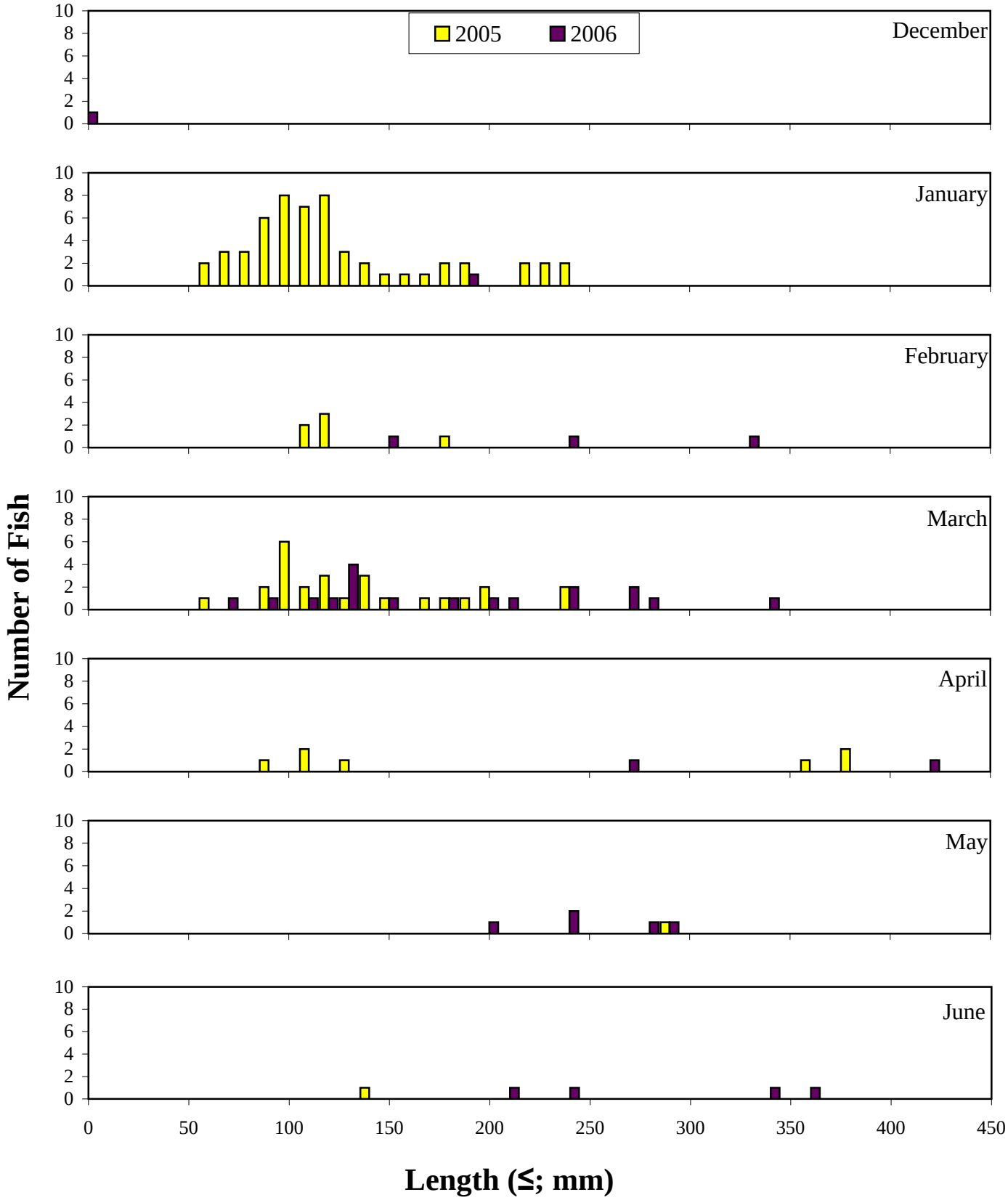


Figure 3-25 b **Length frequency distribution of winter flounder collected during trawl sampling at Lower Bay, 2005 and 2006 Aquatic Biological Sampling Programs.**

Note(s): No sampling in December.

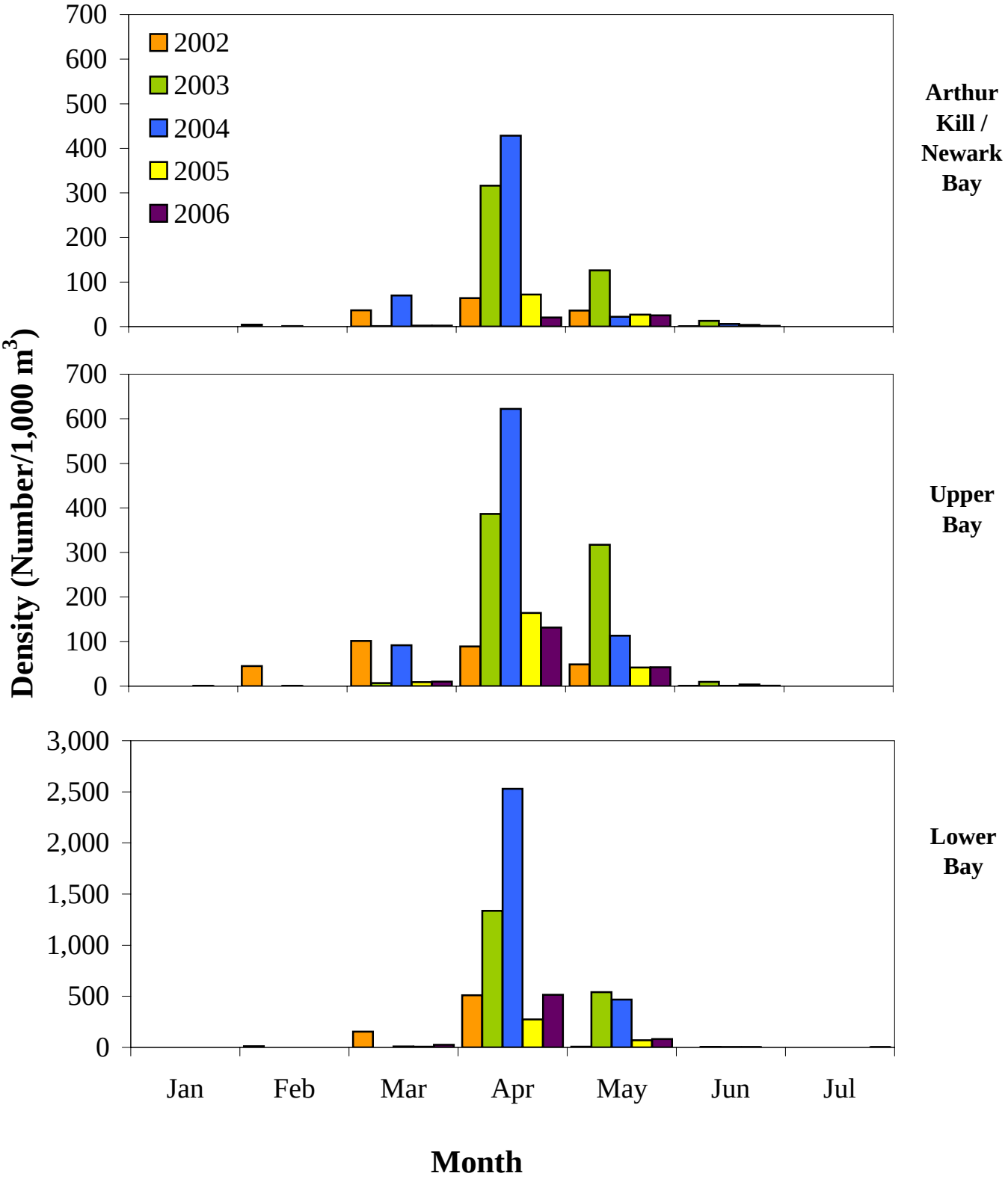


Figure 3-27 **Average monthly winter flounder larval density during the 2002, 2003, 2004, 2005, and 2006 surveys in the three study regions.**

Note(s): Scale change for Lower Bay.

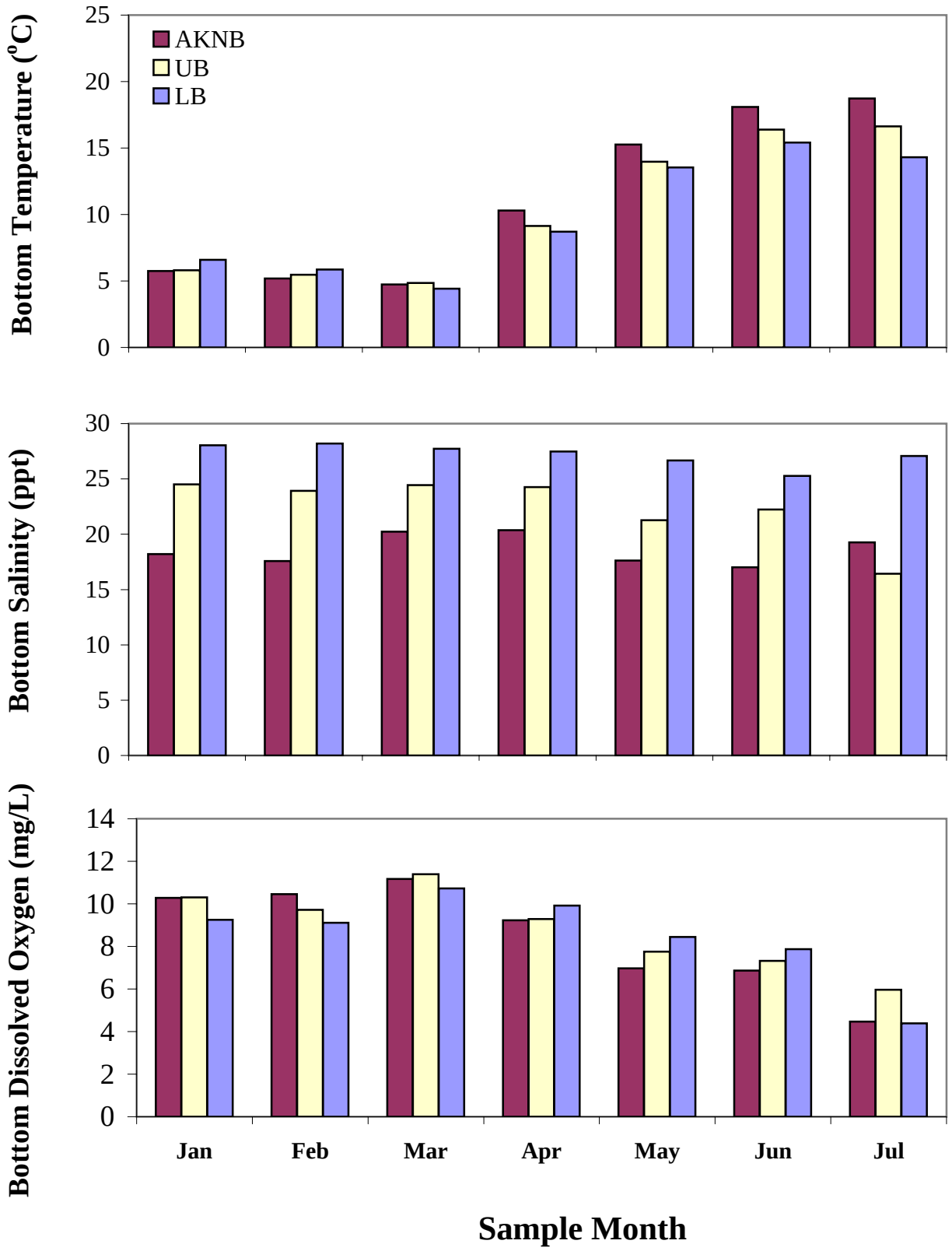


Figure 3-28 **Average monthly water quality measurements by area during the 2006 Aquatic Biological Survey.**

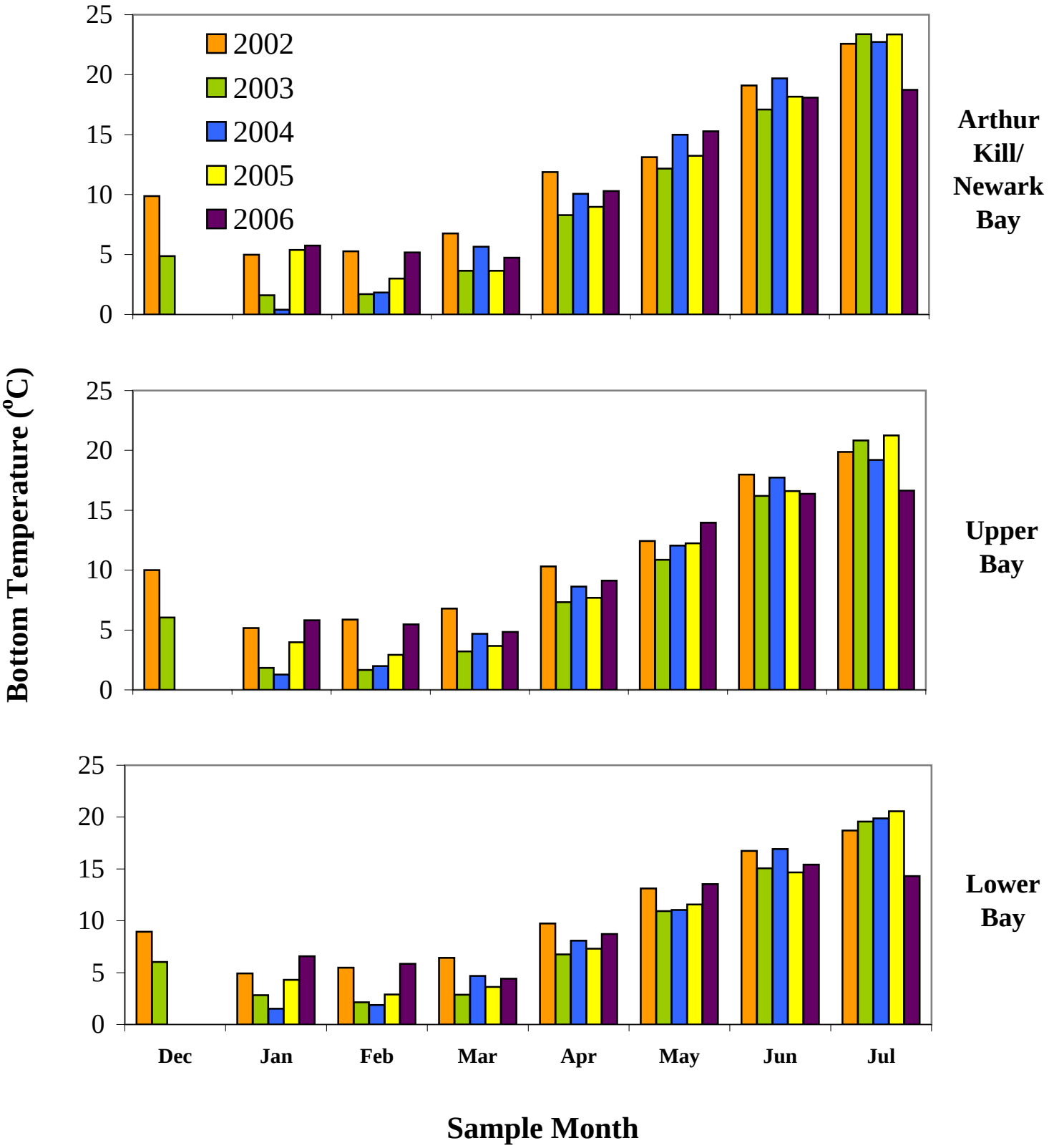


Figure 3-29 a **Average monthly bottom temperature measurements by area during the 2002-2006 Aquatic Biological Sampling Programs.**

Note: December sampling did not occur during the 2004-2006 Programs.

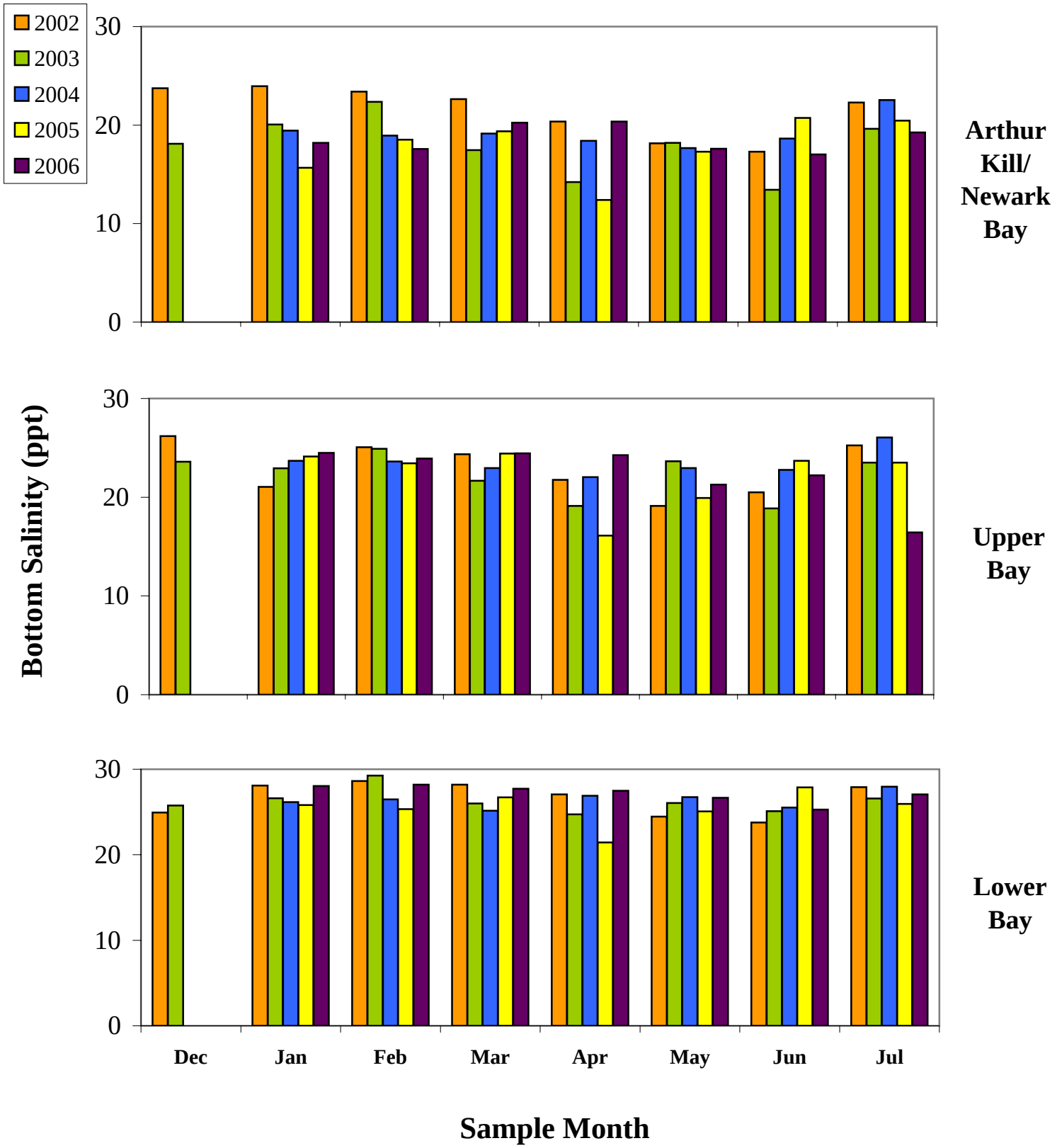


Figure 3-29 b **Average monthly bottom salinity measurements by area during the 2002-2006 Aquatic Biological Sampling Programs.**

Note: December sampling did not occur during the 2004-2006 Programs.

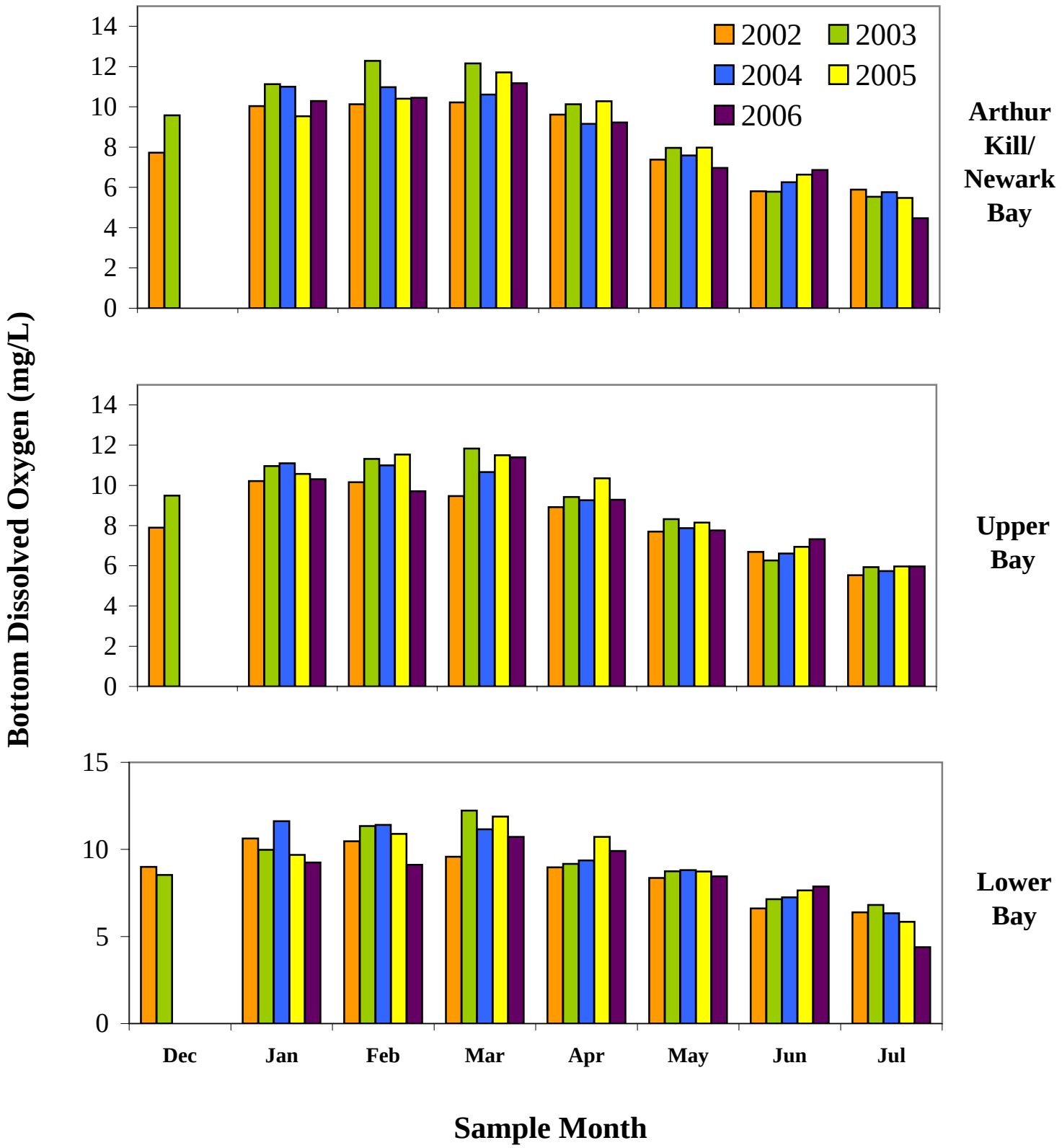


Figure 3-29 c **Average monthly bottom dissolved oxygen measurements by area during the 2002-2006 Aquatic Biological Sampling Programs.**

Note: December sampling did not occur during the 2004-2006 Programs.

Appendix A

Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

Date	Station_Code	Common Name	CPUE
17-Jan-06	LB-1	Atlantic Silverside	5
17-Jan-06	LB-1	Clearnose Skate	1
17-Jan-06	LB-2	Alewife	20
17-Jan-06	LB-2	American Shad	1
17-Jan-06	LB-2	Blueback Herring	1
17-Jan-06	LB-2	Silver Hake	5
17-Jan-06	LB-2	Spotted Hake	1
17-Jan-06	LB-4	Blueback Herring	3
17-Jan-06	LB-6	Alewife	29
17-Jan-06	LB-6	Atlantic Menhaden	2
17-Jan-06	LB-6	Blueback Herring	2
17-Jan-06	LB-6	Clearnose Skate	3
17-Jan-06	LB-6	Spotted Hake	3
17-Jan-06	LB-6	Striped Bass	7
17-Jan-06	LB-6	Winter Flounder	1
17-Jan-06	PJ-5	Silver Perch	2
17-Jan-06	SB-5	Alewife	1
17-Jan-06	SB-5	Blue Crab	5
17-Jan-06	SB-5	Clearnose Skate	2
17-Jan-06	SB-5	Four Beard Rockling	1
17-Jan-06	SB-5	Northern Pipefish	1
17-Jan-06	SB-5	Red Hake	107
17-Jan-06	SB-5	Silver Perch	1
17-Jan-06	SB-5	Striped Bass	2
17-Jan-06	SB-5	Windowpane	5
17-Jan-06	SB-5	Winter Flounder	7
17-Jan-06	SB-6	Alewife	2
17-Jan-06	SB-6	Atlantic Silverside	1
17-Jan-06	SB-6	Atlantic Tomcod	1
17-Jan-06	SB-6	Red Hake	8
17-Jan-06	SB-6	Silver Hake	2
17-Jan-06	SB-6	Silver Perch	1
17-Jan-06	SB-6	Spotted Hake	7
17-Jan-06	SB-6	Striped Bass	1
17-Jan-06	SB-6	Tautog	1
17-Jan-06	SB-6	Windowpane	1
19-Jan-06	AK-2	Red Hake	1
19-Jan-06	AK-2	Striped Bass	16
19-Jan-06	AK-2	White Perch	10
19-Jan-06	AK-2	Winter Flounder	3
19-Jan-06	AK-3	Striped Bass	7
19-Jan-06	AK-3	White Perch	18
19-Jan-06	NB-3	Blue Crab	1
19-Jan-06	NB-3	Blueback Herring	5
19-Jan-06	NB-5	Gizzard Shad	2

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

19-Jan-06	NB-5	Red Hake	2
19-Jan-06	NB-5	Striped Bass	21
19-Jan-06	NB-5	White Perch	616
19-Jan-06	NB-5	Winter Flounder	3
19-Jan-06	NB-6	White Perch	1
19-Jan-06	PJ-1	Blue Crab	2
19-Jan-06	PJ-1	Striped Bass	15
19-Jan-06	PJ-1	Winter Flounder	3
19-Jan-06	PJ-2	Blue Crab	1
19-Jan-06	PJ-2	Striped Bass	21
19-Jan-06	PJ-2	White Perch	1
19-Jan-06	PJ-2	Winter Flounder	3
19-Jan-06	PJ-3	White Perch	1
19-Jan-06	PJ-4	Atlantic Croaker	143
19-Jan-06	PJ-4	Gizzard Shad	7
19-Jan-06	PJ-4	Red Hake	20
19-Jan-06	PJ-4	Striped Bass	74
19-Jan-06	PJ-4	White Perch	7
19-Jan-06	PJ-4	Winter Flounder	3
20-Jan-06	SB-1	Striped Bass	50
20-Jan-06	SB-1	White Perch	5
20-Jan-06	SB-3	Atlantic Croaker	1
20-Jan-06	SB-3	Cunner	1
20-Jan-06	SB-3	Red Hake	1
20-Jan-06	SB-3	Striped Bass	14
20-Jan-06	SB-3	Winter Flounder	2
20-Jan-06	SB-4	Atlantic Croaker	24
20-Jan-06	SB-4	Bay Anchovy	1
20-Jan-06	SB-4	Red Hake	1
20-Jan-06	SB-4	Striped Bass	9
24-Jan-06	LB-1	Alewife	1
24-Jan-06	LB-1	Blueback Herring	1
24-Jan-06	LB-2	Alewife	28
24-Jan-06	LB-2	American Shad	1
24-Jan-06	LB-2	Blueback Herring	2
24-Jan-06	LB-4	Alewife	37
24-Jan-06	LB-4	Atlantic Menhaden	1
24-Jan-06	LB-4	Blueback Herring	6
24-Jan-06	LB-4	Clearnose Skate	2
24-Jan-06	LB-4	Red Hake	2
24-Jan-06	LB-4	Scup	1
24-Jan-06	LB-4	Silver Hake	3
24-Jan-06	LB-4	Silver Perch	4
24-Jan-06	LB-4	Striped Bass	2
24-Jan-06	LB-6	Alewife	42
24-Jan-06	LB-6	Atlantic Menhaden	1

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

24-Jan-06	LB-6	Silver Hake	1
24-Jan-06	LB-6	Striped Bass	2
24-Jan-06	SB-6	Alewife	1
24-Jan-06	SB-6	Bay Anchovy	1
24-Jan-06	SB-6	Red Hake	1
25-Jan-06	AK-3	Alewife	4
25-Jan-06	AK-3	White Perch	10
25-Jan-06	NB-4	Blueback Herring	1
25-Jan-06	NB-5	Atlantic Croaker	1
25-Jan-06	NB-5	Striped Bass	42
25-Jan-06	NB-5	Tautog	1
25-Jan-06	NB-5	White Perch	114
25-Jan-06	NB-5	Winter Flounder	2
25-Jan-06	NB-6	Gizzard Shad	5
25-Jan-06	NB-6	Red Hake	2
25-Jan-06	NB-6	Silver Perch	19
25-Jan-06	NB-6	Spotted Hake	1
25-Jan-06	NB-6	Striped Bass	116
25-Jan-06	NB-6	White Perch	158
25-Jan-06	NB-6	Winter Flounder	6
25-Jan-06	AK-7	Alewife	1
25-Jan-06	AK-7	Bay Anchovy	1
25-Jan-06	AK-7	Blueback Herring	2
25-Jan-06	AK-7	Winter Flounder	1
26-Jan-06	PJ-1	Blueback Herring	4
26-Jan-06	PJ-2	Blue Crab	1
26-Jan-06	PJ-2	Winter Flounder	1
26-Jan-06	PJ-4	Alewife	3
26-Jan-06	PJ-4	Atlantic Croaker	1
26-Jan-06	PJ-4	Gizzard Shad	17
26-Jan-06	PJ-4	Red Hake	2
26-Jan-06	PJ-4	Striped Bass	73
26-Jan-06	PJ-4	White Perch	5
26-Jan-06	PJ-4	Winter Flounder	5
27-Jan-06	SB-4	Alewife	8
27-Jan-06	SB-4	Bay Anchovy	3
27-Jan-06	SB-4	Blueback Herring	1
27-Jan-06	SB-4	Silver Hake	1
27-Jan-06	SB-5	Alewife	1
27-Jan-06	SB-5	Red Hake	5
27-Jan-06	SB-5	Silver Hake	2
27-Jan-06	SB-5	Spotted Hake	2
27-Jan-06	SB-5	Windowpane	1
27-Jan-06	SB-5	Winter Flounder	6
07-Feb-06	AK-2	Alewife	2
07-Feb-06	AK-2	Red Hake	4

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

07-Feb-06	AK-2	Striped Bass	8
07-Feb-06	AK-2	White Perch	16
07-Feb-06	AK-3	Atlantic Croaker	3
07-Feb-06	AK-3	Gizzard Shad	1
07-Feb-06	AK-3	Red Hake	2
07-Feb-06	AK-3	Striped Bass	11
07-Feb-06	AK-3	White Perch	13
07-Feb-06	NB-3	Atlantic Silverside	24
07-Feb-06	NB-3	Blue Crab	1
07-Feb-06	NB-3	Blueback Herring	10
07-Feb-06	NB-4	Blueback Herring	17
07-Feb-06	NB-5	Atlantic Croaker	6
07-Feb-06	NB-5	Blue Crab	1
07-Feb-06	NB-5	Red Hake	3
07-Feb-06	NB-5	Spotted Hake	1
07-Feb-06	NB-5	Striped Bass	34
07-Feb-06	NB-5	White Perch	234
07-Feb-06	NB-5	Winter Flounder	2
07-Feb-06	NB-6	Alewife	1
07-Feb-06	NB-6	Atlantic Croaker	1
07-Feb-06	NB-6	Bay Anchovy	1
07-Feb-06	NB-6	Gizzard Shad	1
07-Feb-06	NB-6	Striped Bass	2
07-Feb-06	NB-6	White Perch	3
07-Feb-06	PJ-3	Blueback Herring	4
07-Feb-06	AK-7	Atlantic Croaker	1
08-Feb-06	LB-2	Alewife	68
08-Feb-06	LB-2	Blue Crab	2
08-Feb-06	LB-2	Little Skate	1
08-Feb-06	LB-2	Red Hake	7
08-Feb-06	LB-2	Silver Hake	38
08-Feb-06	LB-2	Smooth Dogfish	1
08-Feb-06	LB-2	Spotted Hake	36
08-Feb-06	LB-2	Winter Flounder	2
08-Feb-06	LB-2	Winter Skate	2
08-Feb-06	LB-3	Alewife	22
08-Feb-06	LB-3	Blueback Herring	4
08-Feb-06	LB-4	Alewife	166
08-Feb-06	LB-4	American Shad	1
08-Feb-06	LB-4	Blueback Herring	105
08-Feb-06	LB-4	Spotted Hake	1
08-Feb-06	LB-6	Alewife	1188
08-Feb-06	LB-6	American Shad	20
08-Feb-06	LB-6	Atlantic Croaker	1
08-Feb-06	LB-6	Atlantic Menhaden	102
08-Feb-06	LB-6	Bay Anchovy	3

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

08-Feb-06	LB-6	Blueback Herring	125
08-Feb-06	LB-6	Red Hake	2
08-Feb-06	LB-6	Silver Hake	1
08-Feb-06	LB-6	Spotted Hake	3
08-Feb-06	LB-6	Striped Bass	1
08-Feb-06	LB-6	Winter Flounder	1
08-Feb-06	SB-5	Alewife	5
08-Feb-06	SB-5	Blueback Herring	3
08-Feb-06	SB-5	Red Hake	1
08-Feb-06	SB-5	Spotted Hake	6
08-Feb-06	SB-5	Striped Bass	1
08-Feb-06	SB-5	Winter Flounder	1
08-Feb-06	SB-6	Alewife	5
08-Feb-06	SB-6	Blueback Herring	4
08-Feb-06	SB-6	Red Hake	1
08-Feb-06	SB-6	Silver Hake	1
08-Feb-06	SB-6	Spotted Hake	1
08-Feb-06	SB-6	Striped Bass	2
09-Feb-06	PJ-1	Grubby	1
09-Feb-06	PJ-2	Blueback Herring	24
09-Feb-06	PJ-2	Winter Flounder	1
09-Feb-06	PJ-5	Alewife	2
09-Feb-06	PJ-5	Bay Anchovy	3
09-Feb-06	SB-1	Blueback Herring	110
09-Feb-06	SB-2	Blueback Herring	73
09-Feb-06	SB-2	Striped Bass	40
09-Feb-06	SB-2	Winter Flounder	3
09-Feb-06	SB-3	American Shad	1
09-Feb-06	SB-3	Blueback Herring	5
09-Feb-06	SB-3	Spotted Hake	1
09-Feb-06	SB-3	Striped Bass	1
09-Feb-06	SB-3	Winter Flounder	1
09-Feb-06	SB-4	Bay Anchovy	1
09-Feb-06	SB-4	Red Hake	2
09-Feb-06	SB-4	Striped Bass	4
21-Feb-06	LB-4	Alewife	29
21-Feb-06	LB-4	American Shad	1
21-Feb-06	LB-4	Blueback Herring	2
21-Feb-06	LB-4	Red Hake	3
21-Feb-06	LB-4	Silver Hake	1
21-Feb-06	LB-4	Smooth Dogfish	1
21-Feb-06	LB-4	Spotted Hake	4
21-Feb-06	LB-4	Winter Skate	1
21-Feb-06	LB-6	Atlantic Silverside	1
21-Feb-06	PJ-1	Tautog	1
21-Feb-06	PJ-4	Spotted Hake	3

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

22-Feb-06	AK-2	Alewife	4
22-Feb-06	AK-2	American Shad	2
22-Feb-06	AK-2	Cunner	2
22-Feb-06	AK-2	Red Hake	2
22-Feb-06	AK-2	Striped Bass	14
22-Feb-06	AK-2	White Perch	46
22-Feb-06	AK-2	Winter Flounder	2
22-Feb-06	AK-3	Alewife	1
22-Feb-06	AK-3	Silver Hake	1
22-Feb-06	AK-3	Striped Bass	11
22-Feb-06	AK-3	White Perch	6
22-Feb-06	AK-3	Winter Flounder	1
22-Feb-06	NB-4	Atlantic Silverside	1
22-Feb-06	NB-5	Alewife	4
22-Feb-06	NB-5	Bay Anchovy	1
22-Feb-06	NB-5	White Perch	4
22-Feb-06	NB-6	Alewife	2
22-Feb-06	NB-6	Striped Bass	253
22-Feb-06	NB-6	White Perch	407
22-Feb-06	NB-6	Winter Flounder	13
23-Feb-06	SB-2	Winter Skate	5
23-Feb-06	SB-3	American Shad	6
23-Feb-06	SB-3	Atlantic Silverside	1
23-Feb-06	SB-3	Blueback Herring	453
23-Feb-06	SB-3	Silver Hake	3
23-Feb-06	SB-3	Spotted Hake	2
23-Feb-06	SB-3	Striped Bass	3
23-Feb-06	SB-3	Windowpane	2
23-Feb-06	SB-3	Winter Flounder	7
23-Feb-06	SB-4	Alewife	26
23-Feb-06	SB-4	American Shad	2
23-Feb-06	SB-4	Blueback Herring	2
23-Feb-06	SB-4	Red Hake	1
23-Feb-06	SB-4	Silver Hake	13
23-Feb-06	SB-4	Smooth Dogfish	1
23-Feb-06	SB-4	Spotted Hake	62
23-Feb-06	SB-4	Striped Bass	8
23-Feb-06	SB-4	Winter Flounder	4
23-Feb-06	SB-5	Alewife	63
23-Feb-06	SB-5	American Shad	6
23-Feb-06	SB-5	Black Sea Bass	1
23-Feb-06	SB-5	Blue Crab	1
23-Feb-06	SB-5	Clearnose Skate	4
23-Feb-06	SB-5	Northern Pipefish	1
23-Feb-06	SB-5	Red Hake	211
23-Feb-06	SB-5	Silver Hake	3

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

23-Feb-06	SB-5	Smooth Dogfish	3
23-Feb-06	SB-5	Spotted Hake	81
23-Feb-06	SB-5	Windowpane	3
23-Feb-06	SB-5	Winter Flounder	17
23-Feb-06	SB-6	Alewife	38
23-Feb-06	SB-6	American Shad	8
23-Feb-06	SB-6	Blueback Herring	4
23-Feb-06	SB-6	Clearnose Skate	1
23-Feb-06	SB-6	Red Hake	183
23-Feb-06	SB-6	Silver Hake	10
23-Feb-06	SB-6	Spotted Hake	122
23-Feb-06	SB-6	Tautog	1
23-Feb-06	SB-6	Windowpane	12
23-Feb-06	SB-6	Winter Flounder	2
01-Mar-06	LB-1	American Sandlance	20
01-Mar-06	LB-1	Atlantic Silverside	2
01-Mar-06	LB-2	Alewife	437
01-Mar-06	LB-2	American Shad	10
01-Mar-06	LB-2	Atlantic Menhaden	10
01-Mar-06	LB-2	Blueback Herring	218
01-Mar-06	LB-2	Red Hake	11
01-Mar-06	LB-2	Silver Hake	3
01-Mar-06	LB-2	Smooth Dogfish	3
01-Mar-06	LB-2	Spotted Hake	39
01-Mar-06	LB-2	Windowpane	4
01-Mar-06	LB-2	Winter Flounder	11
01-Mar-06	PJ-5	Alewife	12
01-Mar-06	PJ-5	Bay Anchovy	2
01-Mar-06	PJ-5	Blue Crab	2
01-Mar-06	PJ-5	Blueback Herring	22
01-Mar-06	PJ-5	Silver Hake	2
01-Mar-06	PJ-5	Striped Bass	2
06-Mar-06	LB-2	Blueback Herring	1
06-Mar-06	LB-2	Red Hake	3
06-Mar-06	LB-4	Little Skate	1
06-Mar-06	LB-4	Red Hake	1
06-Mar-06	LB-5	Atlantic Silverside	1
06-Mar-06	LB-5	Little Skate	1
07-Mar-06	AK-2	Blueback Herring	1
07-Mar-06	AK-2	Striped Bass	6
07-Mar-06	AK-2	White Perch	10
07-Mar-06	AK-3	Alewife	1
07-Mar-06	AK-3	Atlantic Croaker	1
07-Mar-06	AK-3	Cunner	1
07-Mar-06	AK-3	Red Hake	7
07-Mar-06	AK-3	Spotted Hake	6

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

07-Mar-06	AK-3	Striped Bass	22
07-Mar-06	AK-3	White Perch	50
07-Mar-06	NB-5	Alewife	4
07-Mar-06	NB-5	American Shad	1
07-Mar-06	NB-5	Atlantic Croaker	1
07-Mar-06	NB-5	Blue Crab	2
07-Mar-06	NB-5	Silver Hake	1
07-Mar-06	NB-5	Spotted Hake	4
07-Mar-06	NB-5	Striped Bass	4
07-Mar-06	NB-5	White Perch	58
07-Mar-06	AK-7	American Eel	1
07-Mar-06	AK-7	Winter Flounder	1
09-Mar-06	PJ-1	Winter Flounder	1
09-Mar-06	PJ-4	Alewife	1
09-Mar-06	PJ-4	Atlantic Silverside	1
09-Mar-06	PJ-4	Bay Anchovy	1
09-Mar-06	PJ-4	Red Hake	3
09-Mar-06	PJ-4	Spotted Hake	8
09-Mar-06	PJ-4	Striped Bass	17
09-Mar-06	PJ-4	White Perch	1
09-Mar-06	PJ-4	Winter Flounder	7
09-Mar-06	PJ-5	Alewife	40
09-Mar-06	PJ-5	American Shad	9
09-Mar-06	PJ-5	Atlantic Menhaden	1
09-Mar-06	PJ-5	Blueback Herring	8
09-Mar-06	PJ-5	Red Hake	3
09-Mar-06	PJ-5	Silver Hake	3
09-Mar-06	PJ-5	Spotted Hake	48
09-Mar-06	PJ-5	Winter Flounder	10
09-Mar-06	SB-2	Blue Crab	3
09-Mar-06	SB-2	Winter Skate	3
09-Mar-06	SB-3	Cunner	1
09-Mar-06	SB-4	Alewife	25
09-Mar-06	SB-4	American Shad	2
09-Mar-06	SB-4	Blueback Herring	3
09-Mar-06	SB-4	Red Hake	1
09-Mar-06	SB-4	Spotted Hake	27
09-Mar-06	SB-4	Striped Bass	4
09-Mar-06	SB-4	Windowpane	1
09-Mar-06	SB-4	Winter Flounder	2
09-Mar-06	SB-4	Winter Skate	1
09-Mar-06	SB-5	Alewife	13
09-Mar-06	SB-5	American Shad	9
09-Mar-06	SB-5	Atlantic Silverside	1
09-Mar-06	SB-5	Blueback Herring	8
09-Mar-06	SB-5	Red Hake	8

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

09-Mar-06	SB-5	Spotted Hake	7
09-Mar-06	SB-5	Winter Flounder	2
10-Mar-06	NB-4	Bay Anchovy	1
10-Mar-06	NB-6	Alewife	2
10-Mar-06	NB-6	Blue Crab	1
10-Mar-06	NB-6	Gizzard Shad	2
10-Mar-06	NB-6	Red Hake	2
10-Mar-06	NB-6	Spotted Hake	1
10-Mar-06	NB-6	Striped Bass	1
10-Mar-06	NB-6	White Perch	15
10-Mar-06	NB-6	Winter Flounder	5
10-Mar-06	PJ-2	Blue Crab	1
10-Mar-06	SB-6	Alewife	31
10-Mar-06	SB-6	American Shad	9
10-Mar-06	SB-6	Atlantic Menhaden	1
10-Mar-06	SB-6	Blueback Herring	5
10-Mar-06	SB-6	Red Hake	4
10-Mar-06	SB-6	Spotted Hake	18
10-Mar-06	SB-6	Tautog	1
20-Mar-06	LB-2	Silver Hake	1
20-Mar-06	LB-2	Spotted Hake	1
20-Mar-06	LB-3	Pollock	1
20-Mar-06	LB-4	Northern Pipefish	1
20-Mar-06	LB-4	Winter Flounder	1
20-Mar-06	LB-5	Windowpane	1
20-Mar-06	LB-6	Alewife	114
20-Mar-06	LB-6	American Shad	27
20-Mar-06	LB-6	Atlantic Menhaden	4
20-Mar-06	LB-6	Blueback Herring	107
20-Mar-06	LB-6	Cunner	1
20-Mar-06	LB-6	Northern Pipefish	4
20-Mar-06	LB-6	Red Hake	10
20-Mar-06	LB-6	Spotted Hake	20
20-Mar-06	LB-6	Winter Flounder	6
20-Mar-06	SB-6	American Shad	275
20-Mar-06	SB-6	Spotted Hake	3
20-Mar-06	SB-6	Windowpane	1
21-Mar-06	AK-2	Alewife	54
21-Mar-06	AK-2	Atlantic Menhaden	3
21-Mar-06	AK-2	Blueback Herring	8
21-Mar-06	AK-2	Grubby	1
21-Mar-06	AK-2	Red Hake	8
21-Mar-06	AK-2	Silver Hake	1
21-Mar-06	AK-2	Spotted Hake	36
21-Mar-06	AK-2	Striped Bass	21
21-Mar-06	AK-2	White Perch	21

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

21-Mar-06	AK-2	Winter Flounder	4
21-Mar-06	AK-3	Blueback Herring	1
21-Mar-06	AK-3	Cunner	1
21-Mar-06	AK-3	Striped Bass	1
21-Mar-06	AK-3	White Perch	13
21-Mar-06	NB-3	Atlantic Silverside	13
21-Mar-06	NB-3	Winter Flounder	1
21-Mar-06	NB-5	Alewife	4
21-Mar-06	NB-5	Silver Hake	2
21-Mar-06	NB-5	Spotted Hake	8
21-Mar-06	NB-5	Striped Bass	10
21-Mar-06	NB-5	White Perch	43
21-Mar-06	NB-6	Red Hake	2
21-Mar-06	NB-6	Spotted Hake	2
21-Mar-06	NB-6	Striped Bass	48
21-Mar-06	NB-6	White Perch	56
21-Mar-06	AK-7	Atlantic Silverside	8
21-Mar-06	AK-7	Winter Flounder	3
22-Mar-06	PJ-2	Blue Crab	5
22-Mar-06	PJ-3	Blue Crab	1
22-Mar-06	PJ-4	Windowpane	1
22-Mar-06	PJ-5	Alewife	3
22-Mar-06	PJ-5	Black Sea Bass	1
22-Mar-06	PJ-5	Blue Crab	1
22-Mar-06	PJ-5	Grubby	1
22-Mar-06	PJ-5	Northern Pipefish	1
22-Mar-06	PJ-5	Red Hake	5
22-Mar-06	PJ-5	Silver Hake	1
22-Mar-06	PJ-5	Spotted Hake	111
22-Mar-06	PJ-5	Striped Bass	1
22-Mar-06	PJ-5	Winter Flounder	10
22-Mar-06	SB-1	Atlantic Silverside	3
22-Mar-06	SB-2	American Shad	2
22-Mar-06	SB-2	Winter Flounder	2
22-Mar-06	SB-4	Alewife	14
22-Mar-06	SB-4	American Shad	1
22-Mar-06	SB-4	Blueback Herring	1
22-Mar-06	SB-4	Spotted Hake	4
23-Mar-06	PJ-1	Atlantic Menhaden	1
23-Mar-06	PJ-1	Spotted Hake	1
23-Mar-06	PJ-1	Winter Flounder	1
23-Mar-06	SB-3	Atlantic Herring	1
23-Mar-06	SB-3	Blue Crab	2
23-Mar-06	SB-3	Windowpane	2
23-Mar-06	SB-3	Winter Flounder	1
23-Mar-06	SB-5	Alewife	13

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

23-Mar-06	SB-5	American Shad	3
23-Mar-06	SB-5	Atlantic Herring	1
23-Mar-06	SB-5	Atlantic Menhaden	1
23-Mar-06	SB-5	Blue Crab	1
23-Mar-06	SB-5	Cunner	1
23-Mar-06	SB-5	Northern Pipefish	1
23-Mar-06	SB-5	Red Hake	40
23-Mar-06	SB-5	Silver Hake	5
23-Mar-06	SB-5	Spotted Hake	47
23-Mar-06	SB-5	Windowpane	2
23-Mar-06	SB-5	Winter Flounder	2
23-Mar-06	SB-5	Winter Skate	1
17-Apr-06	LB-1	Blue Crab	1
17-Apr-06	LB-1	Summer Flounder	1
17-Apr-06	LB-1	Winter Skate	1
17-Apr-06	LB-3	Blue Crab	1
17-Apr-06	LB-3	Blueback Herring	2
17-Apr-06	LB-4	Alewife	2
17-Apr-06	LB-4	Blueback Herring	4
17-Apr-06	LB-5	Blueback Herring	1
17-Apr-06	LB-5	Winter Skate	1
17-Apr-06	LB-6	Alewife	16
17-Apr-06	LB-6	American Shad	1
17-Apr-06	LB-6	Blueback Herring	2
17-Apr-06	LB-6	Spotted Hake	2
17-Apr-06	LB-6	Striped Bass	1
17-Apr-06	LB-6	Winter Flounder	2
18-Apr-06	AK-2	Blue Crab	11
18-Apr-06	AK-2	Red Hake	38
18-Apr-06	AK-2	Spotted Hake	113
18-Apr-06	AK-2	Striped Bass	1
18-Apr-06	AK-2	Summer Flounder	1
18-Apr-06	AK-2	White Perch	1
18-Apr-06	AK-3	Blueback Herring	14
18-Apr-06	AK-3	Spotted Hake	4
18-Apr-06	AK-3	Striped Bass	1
18-Apr-06	AK-3	Winter Flounder	1
18-Apr-06	NB-3	American Shad	1
18-Apr-06	NB-3	Atlantic Herring	5
18-Apr-06	NB-4	Atlantic Herring	2
18-Apr-06	NB-4	Blue Crab	1
18-Apr-06	NB-6	Spotted Hake	1
18-Apr-06	AK-7	Striped Bass	13
18-Apr-06	AK-7	Winter Flounder	1
19-Apr-06	PJ-2	Bay Anchovy	6
19-Apr-06	PJ-2	Blue Crab	7

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

19-Apr-06	PJ-2	Winter Flounder	1
19-Apr-06	PJ-3	Blueback Herring	3
19-Apr-06	PJ-3	Winter Flounder	1
19-Apr-06	SB-1	American Shad	5
19-Apr-06	SB-1	Spotted Hake	15
19-Apr-06	SB-1	Striped Bass	53
19-Apr-06	SB-1	Windowpane	3
19-Apr-06	SB-1	Winter Flounder	8
19-Apr-06	SB-2	Striped Bass	8
19-Apr-06	SB-2	Windowpane	2
19-Apr-06	SB-2	Winter Flounder	2
19-Apr-06	SB-3	Cunner	1
19-Apr-06	SB-3	Grubby	1
19-Apr-06	SB-3	Little Skate	4
19-Apr-06	SB-3	Northern Pipefish	1
19-Apr-06	SB-3	Striped Bass	7
19-Apr-06	SB-3	Tautog	2
19-Apr-06	SB-3	Winter Flounder	1
19-Apr-06	SB-4	American Shad	2
19-Apr-06	SB-4	Blue Crab	2
19-Apr-06	SB-4	Northern Searobin	1
19-Apr-06	SB-4	Red Hake	3
19-Apr-06	SB-4	Spotted Hake	16
19-Apr-06	SB-4	Striped Bass	2
19-Apr-06	SB-4	Windowpane	1
19-Apr-06	SB-4	Winter Flounder	11
19-Apr-06	SB-6	Alewife	1
19-Apr-06	SB-6	Black Sea Bass	1
19-Apr-06	SB-6	Butterfish	1
19-Apr-06	SB-6	Grubby	1
19-Apr-06	SB-6	Red Hake	1
19-Apr-06	SB-6	Silver Hake	12
19-Apr-06	SB-6	Spotted Hake	70
19-Apr-06	SB-6	Summer Flounder	1
19-Apr-06	SB-6	Windowpane	6
19-Apr-06	SB-6	Winter Flounder	2
20-Apr-06	PJ-1	Atlantic Herring	14
20-Apr-06	PJ-1	Blue Crab	1
20-Apr-06	PJ-1	Tautog	2
20-Apr-06	PJ-4	Alewife	11
20-Apr-06	PJ-4	Atlantic Menhaden	1
20-Apr-06	PJ-4	Blue Crab	18
20-Apr-06	PJ-4	Blueback Herring	1
20-Apr-06	PJ-4	Red Hake	3
20-Apr-06	PJ-4	Spotted Hake	103
20-Apr-06	PJ-4	Winter Flounder	12

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

20-Apr-06	PJ-5	Alewife	1
20-Apr-06	PJ-5	Blue Crab	4
20-Apr-06	PJ-5	Blueback Herring	1
20-Apr-06	PJ-5	Red Hake	3
20-Apr-06	PJ-5	Spotted Hake	85
20-Apr-06	PJ-5	Striped Bass	1
20-Apr-06	PJ-5	Windowpane	1
20-Apr-06	PJ-5	Winter Flounder	11
20-Apr-06	SB-5	Red Hake	96
20-Apr-06	SB-5	Silver Hake	6
20-Apr-06	SB-5	Spotted Hake	253
20-Apr-06	SB-5	Windowpane	2
20-Apr-06	SB-5	Winter Flounder	24
20-Apr-06	SB-5	Winter Skate	2
16-May-06	AK-2	Atlantic Herring	1
16-May-06	AK-2	Blue Crab	1
16-May-06	AK-2	Red Hake	1
16-May-06	NB-3	Atlantic Herring	1
16-May-06	NB-3	Bay Anchovy	16
16-May-06	NB-3	Blue Crab	3
16-May-06	NB-3	Butterfish	1
16-May-06	NB-3	Winter Flounder	1
16-May-06	NB-4	Alewife	13
16-May-06	NB-4	American Shad	6
16-May-06	NB-4	Atlantic Herring	299
16-May-06	NB-4	Bay Anchovy	777
16-May-06	NB-4	Blue Crab	3
16-May-06	NB-4	Blueback Herring	5
16-May-06	NB-5	American Eel	1
16-May-06	NB-5	Blue Crab	42
16-May-06	NB-5	Red Hake	2
16-May-06	NB-5	Spotted Hake	90
16-May-06	NB-5	Windowpane	1
16-May-06	NB-6	Blue Crab	6
16-May-06	NB-6	Hogchocker	1
16-May-06	NB-6	Red Hake	1
16-May-06	NB-6	Spotted Hake	55
16-May-06	PJ-2	Alewife	65
16-May-06	PJ-2	American Shad	3
16-May-06	PJ-2	Atlantic Herring	53
16-May-06	PJ-2	Atlantic Tomcod	2
16-May-06	PJ-2	Bay Anchovy	152
16-May-06	PJ-2	Blue Crab	3
16-May-06	PJ-2	Blueback Herring	148
16-May-06	PJ-3	Alewife	1
16-May-06	PJ-3	Atlantic Herring	168

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

16-May-06	PJ-3	Bay Anchovy	11
16-May-06	PJ-3	Blue Crab	1
16-May-06	PJ-3	Blueback Herring	131
16-May-06	PJ-3	Butterfish	1
16-May-06	PJ-3	Spotted Hake	1
16-May-06	PJ-3	Striped Bass	3
17-May-06	LB-2	Scup	3
17-May-06	LB-3	Atlantic Herring	6
17-May-06	LB-3	Bay Anchovy	6199
17-May-06	LB-3	Blue Crab	1
17-May-06	LB-3	Little Skate	1
17-May-06	LB-4	Atlantic Tomcod	1
17-May-06	LB-4	Blueback Herring	1
17-May-06	LB-4	Butterfish	1
17-May-06	LB-4	Clearnose Skate	1
17-May-06	LB-4	Little Skate	1
17-May-06	LB-4	Red Hake	7
17-May-06	LB-4	Spotted Hake	146
17-May-06	LB-4	Striped Searobin	2
17-May-06	LB-4	Summer Flounder	7
17-May-06	LB-4	Windowpane	8
17-May-06	LB-4	Winter Flounder	5
17-May-06	LB-5	Bay Anchovy	70
17-May-06	LB-5	Blueback Herring	1
17-May-06	LB-6	Bay Anchovy	28
17-May-06	LB-6	Butterfish	2
17-May-06	SB-5	Spotted Hake	1
17-May-06	SB-6	Butterfish	1
17-May-06	SB-6	Scup	1
17-May-06	SB-6	Spotted Hake	1
18-May-06	PJ-1	Atlantic Herring	10
18-May-06	PJ-1	Bay Anchovy	43
18-May-06	PJ-1	Blueback Herring	1
18-May-06	PJ-1	Butterfish	2
18-May-06	PJ-1	Summer Flounder	1
18-May-06	PJ-1	Tautog	1
18-May-06	PJ-4	Blue Crab	13
18-May-06	PJ-4	Four Beard Rockling	1
18-May-06	PJ-4	Red Hake	1
18-May-06	PJ-4	Spotted Hake	37
18-May-06	PJ-4	Winter Flounder	3
18-May-06	PJ-5	Blue Crab	4
18-May-06	PJ-5	Northern Pipefish	1
18-May-06	PJ-5	Spotted Hake	6
18-May-06	PJ-5	Winter Flounder	3
18-May-06	SB-1	Atlantic Herring	30

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

18-May-06	SB-1	Bay Anchovy	4857
18-May-06	SB-1	Blue Crab	3
18-May-06	SB-1	Butterfish	7
18-May-06	SB-1	Spotted Hake	3
18-May-06	SB-1	Striped Bass	77
18-May-06	SB-1	Winter Flounder	7
18-May-06	SB-2	Atlantic Herring	5
18-May-06	SB-2	Atlantic Tomcod	3
18-May-06	SB-2	Bay Anchovy	490
18-May-06	SB-2	Blue Crab	8
18-May-06	SB-3	Bay Anchovy	13
18-May-06	SB-3	Blue Crab	1
18-May-06	SB-3	Scup	8
18-May-06	SB-3	Striped Bass	1
18-May-06	SB-3	Tautog	1
18-May-06	SB-4	Bay Anchovy	1
18-May-06	SB-4	Blue Crab	5
18-May-06	SB-4	Butterfish	2
18-May-06	SB-4	Cunner	1
18-May-06	SB-4	Red Hake	1
18-May-06	SB-4	Scup	4
18-May-06	SB-4	Silver Hake	1
18-May-06	SB-4	Spotted Hake	25
18-May-06	SB-4	Striped Searobin	1
18-May-06	SB-4	Summer Flounder	3
18-May-06	SB-4	Weakfish	1
18-May-06	SB-4	Windowpane	1
18-May-06	SB-4	Winter Flounder	10
12-Jun-06	LB-1	Clearnose Skate	1
12-Jun-06	LB-1	Smooth Dogfish	2
12-Jun-06	LB-1	Winter Flounder	1
12-Jun-06	LB-2	Scup	1
12-Jun-06	LB-2	Winter Flounder	3
12-Jun-06	LB-3	Bay Anchovy	1
12-Jun-06	LB-3	Butterfish	9
12-Jun-06	LB-4	Bay Anchovy	9
12-Jun-06	LB-4	Butterfish	7
12-Jun-06	LB-5	Butterfish	15
12-Jun-06	LB-6	Bay Anchovy	1
12-Jun-06	LB-6	Butterfish	1
12-Jun-06	SB-3	Atlantic Herring	1
12-Jun-06	SB-3	Bay Anchovy	168
12-Jun-06	SB-3	Scup	4
12-Jun-06	SB-3	Tautog	5
13-Jun-06	AK-2	Bay Anchovy	1
13-Jun-06	AK-2	Blue Crab	8

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

13-Jun-06	AK-2	Spotted Hake	5
13-Jun-06	AK-3	Blue Crab	2
13-Jun-06	AK-3	Spotted Hake	5
13-Jun-06	NB-3	Bay Anchovy	62
13-Jun-06	NB-3	Blue Crab	8
13-Jun-06	NB-4	Bay Anchovy	456
13-Jun-06	NB-4	Blue Crab	8
13-Jun-06	NB-5	Blue Crab	11
13-Jun-06	NB-5	Hogchocker	2
13-Jun-06	NB-5	Red Hake	1
13-Jun-06	NB-5	Spotted Hake	15
13-Jun-06	NB-6	Bay Anchovy	1
13-Jun-06	NB-6	Blue Crab	2
13-Jun-06	NB-6	Hogchocker	2
13-Jun-06	NB-6	Spotted Hake	2
13-Jun-06	PJ-1	Bay Anchovy	51
13-Jun-06	PJ-1	Blue Crab	2
13-Jun-06	PJ-1	Bluefish	2
13-Jun-06	PJ-1	Butterfish	1
13-Jun-06	PJ-1	Tautog	3
13-Jun-06	PJ-1	Winter Flounder	1
13-Jun-06	SB-5	Clearnose Skate	2
13-Jun-06	SB-5	Spotted Hake	1
13-Jun-06	SB-5	Striped Burrfish	1
13-Jun-06	SB-5	Winter Flounder	2
14-Jun-06	PJ-2	Bay Anchovy	2068
14-Jun-06	PJ-2	Blue Crab	1
14-Jun-06	PJ-2	Butterfish	3
14-Jun-06	PJ-3	Blue Crab	11
14-Jun-06	PJ-3	Summer Flounder	1
14-Jun-06	PJ-4	Spotted Hake	1
14-Jun-06	PJ-5	Butterfish	1
14-Jun-06	SB-1	Atlantic Tomcod	13
14-Jun-06	SB-1	Bay Anchovy	1083
14-Jun-06	SB-1	Blue Crab	13
14-Jun-06	SB-1	Blueback Herring	5
14-Jun-06	SB-1	Butterfish	8
14-Jun-06	SB-1	Scup	3
14-Jun-06	SB-1	Windowpane	3
14-Jun-06	SB-2	Atlantic Tomcod	2
14-Jun-06	SB-2	Bay Anchovy	96
14-Jun-06	SB-2	Blue Crab	2
14-Jun-06	SB-2	Blueback Herring	2
14-Jun-06	SB-2	Cunner	2
14-Jun-06	SB-4	Atlantic Tomcod	1
14-Jun-06	SB-4	Bay Anchovy	77

Appendix A. Finfish CPUE (Bottom Trawl) by date and station sampled during the 2006 Aquatic Biological Survey.

14-Jun-06	SB-4	Blueback Herring	2
14-Jun-06	SB-4	Butterfish	1
14-Jun-06	SB-4	Little Skate	1
14-Jun-06	SB-4	Northern Pipefish	2
14-Jun-06	SB-4	Northern Searobin	1
14-Jun-06	SB-4	Spotted Hake	6
14-Jun-06	SB-4	Striped Anchovy	1
14-Jun-06	SB-4	Winter Flounder	3

Appendix B

Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

Date	Station	Common Name	Stage	# Caught	Density
24-Jan-06	LB-2	Windowpane	PYS	1	4.2
25-Jan-06	AK-3	Atlantic croaker	JUV	1	5.8
25-Jan-06	AK-7	Atlantic croaker	JUV	2	22.9
25-Jan-06	AK-7	Atlantic croaker	PYS	2	22.9
25-Jan-06	NB-6	Atlantic croaker	JUV	9	67.2
25-Jan-06	NB-6	Atlantic croaker	PYS	9	67.2
26-Jan-06	PJ-5	Atlantic croaker	PYS	1	7.9
26-Jan-06	PJ-5	Atlantic croaker	JUV	3	23.7
27-Jan-06	SB-5	Rock gunnel	PYS	1	11.8
07-Feb-06	AK-2	Atlantic croaker	JUV	1	11.4
07-Feb-06	AK-2	Atlantic croaker	PYS	1	11.4
07-Feb-06	AK-3	Atlantic croaker	JUV	6	50.9
07-Feb-06	AK-3	Spotted hake	JUV	1	8.5
07-Feb-06	NB-5	Atlantic croaker	PYS	3	18.8
07-Feb-06	NB-5	Atlantic croaker	JUV	8	50.1
08-Feb-06	LB-1	Rock gunnel	PYS	1	7.7
08-Feb-06	LB-2	Grubby	PYS	1	14.6
08-Feb-06	LB-2	Rock gunnel	PYS	1	14.6
08-Feb-06	LB-3	Atlantic menhaden	PYS	1	5.5
08-Feb-06	LB-4	Grubby	PYS	1	7.6
08-Feb-06	LB-5	Atlantic menhaden	PYS	1	9.1
08-Feb-06	LB-5	Grubby	PYS	2	18.2
08-Feb-06	SB-5	Atlantic herring	PYS	1	4.1
08-Feb-06	SB-5	Atlantic menhaden	PYS	1	4.1
08-Feb-06	SB-5	Rock gunnel	PYS	1	4.1
08-Feb-06	SB-6	Atlantic menhaden	PYS	1	4.2
08-Feb-06	SB-6	Grubby	PYS	2	8.4
08-Feb-06	SB-6	Summer flounder	PYS	1	4.2
09-Feb-06	PJ-1	Grubby	PYS	2	17.1
09-Feb-06	PJ-5	Atlantic menhaden	PYS	3	19.5
09-Feb-06	SB-4	Grubby	PYS	2	9.9
21-Feb-06	PJ-1	Grubby	PYS	1	6.5
21-Feb-06	PJ-2	Grubby	YS	1	6.5
21-Feb-06	PJ-3	Atlantic menhaden	PYS	1	6.0
21-Feb-06	PJ-4	Grubby	PYS	1	5.9
22-Feb-06	AK-7	Grubby	PYS	5	31.5
22-Feb-06	NB-3	Grubby	PYS	1	6.5
22-Feb-06	NB-5	Atlantic croaker	JUV	1	6.8
22-Feb-06	NB-6	Atlantic menhaden	PYS	1	6.0
23-Feb-06	SB-1	Grubby	PYS	3	45.4
23-Feb-06	SB-2	Grubby	PYS	4	50.6
23-Feb-06	SB-4	Grubby	PYS	14	78.4
23-Feb-06	SB-4	Summer flounder	PYS	1	5.6
01-Mar-06	LB-1	Grubby	PYS	2	13.6
01-Mar-06	LB-2	Grubby	PYS	3	28.3

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

01-Mar-06	LB-4	Grubby	PYS	2	15.7
01-Mar-06	PJ-5	Winter flounder	Egg	4	57.3
06-Mar-06	LB-1	Atlantic silverside	PYS	2	8.6
06-Mar-06	LB-1	Grubby	PYS	2	8.6
06-Mar-06	LB-1	Rock gunnel	PYS	1	4.3
06-Mar-06	LB-1	Winter flounder	PYS	5	21.5
06-Mar-06	LB-2	Winter flounder	PYS	1	7.4
06-Mar-06	LB-3	Atlantic menhaden	PYS	1	7.5
06-Mar-06	LB-3	Grubby	PYS	14	105.0
06-Mar-06	LB-4	Grubby	PYS	3	12.3
06-Mar-06	LB-4	Winter flounder	PYS	2	8.2
06-Mar-06	LB-5	Grubby	PYS	4	30.0
06-Mar-06	LB-5	Winter flounder	PYS	2	15.0
06-Mar-06	LB-6	Grubby	PYS	2	11.7
06-Mar-06	LB-6	Spot	PYS	2	11.7
07-Mar-06	AK-2	Grubby	PYS	20	109.1
07-Mar-06	AK-2	Grubby	YS	1	5.5
07-Mar-06	AK-2	Winter flounder	PYS	1	5.5
07-Mar-06	AK-3	Grubby	PYS	3	17.5
07-Mar-06	AK-7	Atlantic tomcod	PYS	2	15.6
07-Mar-06	AK-7	Grubby	PYS	27	210.0
07-Mar-06	AK-7	Winter flounder	YS	1	7.8
07-Mar-06	NB-5	Acipenser sp.	PYS	1	5.2
07-Mar-06	NB-5	Grubby	PYS	6	31.3
09-Mar-06	PJ-1	Grubby	YS	1	7.5
09-Mar-06	PJ-1	Grubby	PYS	2	15.0
09-Mar-06	PJ-1	Winter flounder	YS	2	15.0
09-Mar-06	PJ-1	Winter flounder	PYS	2	15.0
09-Mar-06	PJ-3	Grubby	YS	1	6.7
09-Mar-06	PJ-3	Winter flounder	Egg	20	133.9
09-Mar-06	PJ-4	Gadid unidentified	Egg	5	25.7
09-Mar-06	PJ-4	Grubby	PYS	1	5.1
09-Mar-06	PJ-4	Winter flounder	YS	7	36.0
09-Mar-06	PJ-5	Acipenser sp.	JUV	1	6.3
09-Mar-06	PJ-5	Fourbeard rockling	Egg	2	12.6
09-Mar-06	PJ-5	Gadid unidentified	Egg	7	44.3
09-Mar-06	PJ-5	Gobiid unidentified	YS	2	12.6
09-Mar-06	PJ-5	Gobiid unidentified	PYS	10	63.2
09-Mar-06	PJ-5	Winter flounder	PYS	1	6.3
09-Mar-06	SB-1	Grubby	PYS	4	44.6
09-Mar-06	SB-1	Grubby	YS	2	22.3
09-Mar-06	SB-1	Winter flounder	YS	1	11.1
09-Mar-06	SB-1	Winter flounder	PYS	1	11.1
09-Mar-06	SB-2	Grubby	PYS	7	62.8
09-Mar-06	SB-3	Grubby	PYS	1	6.8
09-Mar-06	SB-4	Atlantic menhaden	PYS	1	5.3

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

09-Mar-06	SB-4	Grubby	PYS	3	15.8
09-Mar-06	SB-4	Winter flounder	PYS	1	5.3
09-Mar-06	SB-4	Winter flounder	YS	2	10.5
09-Mar-06	SB-5	Grubby	PYS	4	36.7
10-Mar-06	NB-3	Atlantic croaker	PYS	1	5.7
10-Mar-06	NB-3	Grubby	PYS	5	28.6
10-Mar-06	NB-4	Grubby	PYS	8	45.1
10-Mar-06	NB-6	Atlantic menhaden	PYS	1	4.0
10-Mar-06	NB-6	Grubby	PYS	9	35.7
10-Mar-06	NB-6	Grubby	YS	2	7.9
10-Mar-06	PJ-2	Grubby	PYS	3	14.7
10-Mar-06	PJ-2	Winter flounder	PYS	1	4.9
10-Mar-06	SB-6	Grubby	PYS	9	55.7
10-Mar-06	SB-6	Winter flounder	PYS	2	12.4
20-Mar-06	LB-1	Fourbeard rockling	Egg	1	5.2
20-Mar-06	LB-1	Grubby	PYS	4	20.7
20-Mar-06	LB-1	Winter flounder	PYS	3	15.5
20-Mar-06	LB-2	Fourbeard rockling	Egg	3	12.7
20-Mar-06	LB-2	Gadid unidentified	Egg	1	4.2
20-Mar-06	LB-2	Grubby	PYS	2	8.5
20-Mar-06	LB-2	Winter flounder	Egg	3	12.7
20-Mar-06	LB-3	Fourbeard rockling	Egg	3	19.4
20-Mar-06	LB-3	Winter flounder	YS	1	6.5
20-Mar-06	LB-3	Winter flounder	PYS	2	12.9
20-Mar-06	LB-4	Grubby	PYS	5	31.0
20-Mar-06	LB-5	Grubby	PYS	6	36.0
20-Mar-06	LB-5	Winter flounder	PYS	12	72.0
20-Mar-06	LB-6	Fourbeard rockling	Egg	1	5.4
20-Mar-06	LB-6	Grubby	PYS	1	5.4
20-Mar-06	LB-6	Winter flounder	PYS	19	103.1
20-Mar-06	LB-6	Winter flounder	UID	1	5.4
20-Mar-06	LB-6	Winter flounder	YS	20	108.5
20-Mar-06	SB-6	Atlantic herring	PYS	1	3.0
20-Mar-06	SB-6	Grubby	PYS	1	3.0
20-Mar-06	SB-6	Winter flounder	YS	2	6.1
20-Mar-06	SB-6	Winter flounder	PYS	6	18.2
21-Mar-06	AK-2	Fourbeard rockling	Egg	1	7.6
21-Mar-06	AK-2	Grubby	PYS	9	68.6
21-Mar-06	AK-3	Atlantic tomcod	PYS	1	5.6
21-Mar-06	AK-3	Grubby	PYS	3	16.8
21-Mar-06	AK-7	Acipenser sp.	PYS	1	6.9
21-Mar-06	AK-7	Grubby	PYS	16	110.1
21-Mar-06	AK-7	Winter flounder	PYS	1	6.9
21-Mar-06	NB-3	Grubby	PYS	12	65.8
21-Mar-06	NB-3	Winter flounder	PYS	2	11.0
21-Mar-06	NB-4	Grubby	PYS	1	5.2

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

21-Mar-06	NB-4	Winter flounder	PYS	1	5.2
21-Mar-06	NB-5	Atlantic menhaden	PYS	1	5.0
21-Mar-06	NB-5	Grubby	PYS	8	39.8
21-Mar-06	NB-5	Winter flounder	PYS	1	5.0
21-Mar-06	NB-6	Fourbeard rockling	Egg	5	26.4
21-Mar-06	NB-6	Gadid unidentified	Egg	3	15.9
21-Mar-06	NB-6	Grubby	PYS	2	10.6
22-Mar-06	PJ-2	Fourbeard rockling	Egg	1	7.0
22-Mar-06	PJ-2	Grubby	PYS	2	14.1
22-Mar-06	PJ-3	Grubby	PYS	5	32.4
22-Mar-06	PJ-3	Winter flounder	PYS	3	19.5
22-Mar-06	PJ-4	Fourbeard rockling	Egg	5	27.4
22-Mar-06	PJ-4	Grubby	PYS	7	38.4
22-Mar-06	PJ-4	Winter flounder	Egg	2	11.0
22-Mar-06	PJ-5	Fourbeard rockling	Egg	7	47.8
22-Mar-06	PJ-5	Grubby	PYS	8	54.7
22-Mar-06	PJ-5	Winter flounder	Egg	2	13.7
22-Mar-06	SB-1	Fourbeard rockling	Egg	1	0.2
22-Mar-06	SB-1	Gadid unidentified	Egg	1	0.2
22-Mar-06	SB-1	Grubby	PYS	3	0.6
22-Mar-06	SB-1	Winter flounder	YS	2	0.4
22-Mar-06	SB-1	Winter flounder	PYS	9	1.9
22-Mar-06	SB-2	Fourbeard rockling	Egg	20	178.6
22-Mar-06	SB-2	Grubby	PYS	2	17.9
22-Mar-06	SB-2	Winter flounder	PYS	1	8.9
22-Mar-06	SB-4	Atlantic menhaden	PYS	1	4.5
22-Mar-06	SB-4	Fourbeard rockling	Egg	2	9.1
22-Mar-06	SB-4	Gadid unidentified	Egg	1	4.5
22-Mar-06	SB-4	Grubby	PYS	1	4.5
22-Mar-06	SB-4	Winter flounder	Egg	1	4.5
23-Mar-06	PJ-1	Fourbeard rockling	Egg	2	14.1
23-Mar-06	PJ-1	Grubby	PYS	12	84.5
23-Mar-06	PJ-1	Winter flounder	PYS	4	28.2
23-Mar-06	SB-3	Fourbeard rockling	Egg	12	71.8
23-Mar-06	SB-3	Grubby	PYS	12	71.8
23-Mar-06	SB-3	Winter flounder	PYS	3	17.9
23-Mar-06	SB-3	Winter flounder	Egg	1	6.0
23-Mar-06	SB-5	Atlantic menhaden	PYS	1	7.7
23-Mar-06	SB-5	Fourbeard rockling	Egg	2	15.5
23-Mar-06	SB-5	Gadid unidentified	Egg	1	7.7
23-Mar-06	SB-5	Grubby	PYS	2	15.5
23-Mar-06	SB-5	Rock gunnel	PYS	1	7.7
03-Apr-06	LB-1	Grubby	PYS	9	49.1
03-Apr-06	LB-1	Winter flounder	PYS	48	262.0
03-Apr-06	LB-2	Grubby	PYS	56	253.6
03-Apr-06	LB-2	Grubby	YS	3	13.6

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

03-Apr-06	LB-2	Rock gunnel	PYS	1	4.5
03-Apr-06	LB-2	Winter flounder	PYS	5	22.6
03-Apr-06	LB-3	Fourbeard rockling	Egg	5	31.9
03-Apr-06	LB-3	Grubby	PYS	32	204.1
03-Apr-06	LB-3	Winter flounder	PYS	5	31.9
03-Apr-06	LB-4	Fourbeard rockling	Egg	1	5.1
03-Apr-06	LB-4	Grubby	PYS	47	239.9
03-Apr-06	LB-4	Rock gunnel	PYS	2	10.2
03-Apr-06	LB-4	Winter flounder	PYS	58	296.1
03-Apr-06	LB-5	Fourbeard rockling	Egg	1	7.1
03-Apr-06	LB-5	Gadid unidentified	Egg	3	21.3
03-Apr-06	LB-5	Grubby	PYS	13	92.1
03-Apr-06	LB-5	Winter flounder	UID	2	14.2
03-Apr-06	LB-5	Winter flounder	YS	8	56.7
03-Apr-06	LB-5	Winter flounder	PYS	38	269.3
03-Apr-06	LB-6	American sandlance	PYS	1	5.4
03-Apr-06	LB-6	Atlantic menhaden	PYS	1	5.4
03-Apr-06	LB-6	Atlantic menhaden	Egg	4	21.7
03-Apr-06	LB-6	Fourbeard rockling	Egg	1	5.4
03-Apr-06	LB-6	Grubby	PYS	5	27.1
03-Apr-06	LB-6	Grubby	YS	1	5.4
03-Apr-06	LB-6	Rock gunnel	PYS	1	5.4
03-Apr-06	LB-6	Winter flounder	PYS	3	16.3
03-Apr-06	SB-1	Fourbeard rockling	Egg	12	122.3
03-Apr-06	SB-1	Grubby	PYS	5	50.9
03-Apr-06	SB-1	Winter flounder	PYS	7	71.3
03-Apr-06	SB-2	Fourbeard rockling	Egg	26	217.9
03-Apr-06	SB-2	Grubby	PYS	13	108.9
03-Apr-06	SB-2	Winter flounder	PYS	2	16.8
03-Apr-06	SB-3	Fourbeard rockling	Egg	5	26.9
03-Apr-06	SB-3	Grubby	PYS	6	32.3
03-Apr-06	SB-3	Winter flounder	YS	8	43.1
03-Apr-06	SB-3	Winter flounder	PYS	35	188.6
03-Apr-06	SB-4	Fourbeard rockling	Egg	3	16.3
03-Apr-06	SB-6	Fourbeard rockling	Egg	1	3.8
03-Apr-06	SB-6	Grubby	PYS	4	15.0
03-Apr-06	SB-6	Winter flounder	PYS	7	26.3
04-Apr-06	AK-2	Fourbeard rockling	Egg	3	29.0
04-Apr-06	AK-2	Grubby	PYS	6	58.1
04-Apr-06	AK-2	Winter flounder	Egg	1	9.7
04-Apr-06	AK-3	Grubby	PYS	7	43.2
04-Apr-06	AK-7	Fourbeard rockling	Egg	2	28.9
04-Apr-06	AK-7	Grubby	PYS	2	28.9
04-Apr-06	AK-7	Winter flounder	PYS	2	28.9
04-Apr-06	NB-3	Grubby	PYS	3	16.7
04-Apr-06	NB-3	Winter flounder	PYS	1	5.6

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

04-Apr-06	NB-4	Grubby	PYS	3	18.2
04-Apr-06	NB-5	Atlantic herring	PYS	1	5.3
04-Apr-06	NB-5	Grubby	PYS	1	5.3
04-Apr-06	NB-6	Atlantic herring	PYS	1	5.2
04-Apr-06	NB-6	Grubby	PYS	7	36.7
05-Apr-06	PJ-1	Fourbeard rockling	Egg	10	72.3
05-Apr-06	PJ-1	Grubby	PYS	18	130.1
05-Apr-06	PJ-1	Winter flounder	PYS	2	14.5
05-Apr-06	PJ-2	Fourbeard rockling	Egg	5	71.6
05-Apr-06	PJ-2	Grubby	PYS	5	71.6
05-Apr-06	PJ-2	Winter flounder	PYS	2	28.6
05-Apr-06	PJ-2	Winter flounder	Egg	13	186.2
05-Apr-06	PJ-3	Fourbeard rockling	Egg	1	7.6
05-Apr-06	PJ-3	Grubby	PYS	5	38.2
05-Apr-06	PJ-3	Winter flounder	PYS	17	130.0
05-Apr-06	PJ-3	Winter flounder	YS	5	38.2
05-Apr-06	PJ-3	Winter flounder	Egg	1	7.6
05-Apr-06	PJ-4	Fourbeard rockling	Egg	7	35.0
05-Apr-06	PJ-4	Grubby	PYS	2	10.0
05-Apr-06	PJ-4	Winter flounder	PYS	1	5.0
05-Apr-06	PJ-4	Winter flounder	UID	1	5.0
05-Apr-06	PJ-5	Fourbeard rockling	Egg	4	22.2
05-Apr-06	PJ-5	Grubby	PYS	13	72.2
05-Apr-06	PJ-5	Spot	PYS	1	5.6
05-Apr-06	PJ-5	Winter flounder	PYS	4	22.2
05-Apr-06	SB-5	Atlantic menhaden	Egg	4	25.9
05-Apr-06	SB-5	Fourbeard rockling	Egg	6	38.8
05-Apr-06	SB-5	Grubby	PYS	5	32.3
05-Apr-06	SB-5	Winter flounder	UID	1	6.5
05-Apr-06	SB-5	Winter flounder	PYS	1	6.5
17-Apr-06	LB-1	Grubby	PYS	2	13.2
17-Apr-06	LB-1	Winter flounder	PYS	109	718.2
17-Apr-06	LB-2	Goosefish	YS	1	6.1
17-Apr-06	LB-2	Grubby	PYS	2	12.2
17-Apr-06	LB-2	Winter flounder	PYS	67	407.9
17-Apr-06	LB-3	Feather blenny	PYS	1	6.3
17-Apr-06	LB-3	Fourbeard rockling	Egg	6	37.7
17-Apr-06	LB-3	Grubby	PYS	5	31.5
17-Apr-06	LB-3	Windowpane	Egg	37	232.7
17-Apr-06	LB-3	Winter flounder	PYS	328	2063.2
17-Apr-06	LB-3	Winter flounder	YS	17	106.9
17-Apr-06	LB-3	Winter flounder	UID	36	226.4
17-Apr-06	LB-4	Grubby	PYS	21	119.6
17-Apr-06	LB-4	Grubby	YS	1	5.7
17-Apr-06	LB-4	Rock gunnel	PYS	1	5.7
17-Apr-06	LB-4	Winter flounder	PYS	218	1241.2

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

17-Apr-06	LB-5	Grubby	PYS	1	5.8
17-Apr-06	LB-5	Winter flounder	PYS	66	382.0
17-Apr-06	LB-6	Fourbeard rockling	Egg	1	6.2
17-Apr-06	LB-6	Windowpane	Egg	13	80.7
17-Apr-06	LB-6	Winter flounder	PYS	8	49.6
18-Apr-06	AK-3	Grubby	PYS	3	13.2
18-Apr-06	AK-3	Winter flounder	PYS	15	65.8
18-Apr-06	AK-7	Rock gunnel	PYS	1	8.7
18-Apr-06	AK-7	Winter flounder	PYS	3	26.2
18-Apr-06	NB-3	Grubby	PYS	1	5.6
18-Apr-06	NB-3	Winter flounder	PYS	10	55.9
18-Apr-06	NB-4	Grubby	PYS	1	5.3
18-Apr-06	NB-4	Winter flounder	PYS	8	42.3
18-Apr-06	NB-5	Grubby	PYS	6	33.3
18-Apr-06	NB-5	Grubby	YS	1	5.6
18-Apr-06	NB-5	Rock gunnel	PYS	1	5.6
18-Apr-06	NB-5	Winter flounder	PYS	5	27.8
18-Apr-06	NB-6	Grubby	PYS	2	8.3
18-Apr-06	NB-6	Grubby	YS	1	4.1
18-Apr-06	NB-6	Winter flounder	PYS	12	49.6
19-Apr-06	PJ-2	Grubby	PYS	2	10.4
19-Apr-06	PJ-2	Winter flounder	PYS	21	109.6
19-Apr-06	PJ-2	Winter flounder	YS	1	5.2
19-Apr-06	PJ-3	Winter flounder	PYS	9	64.2
19-Apr-06	SB-1	Grubby	PYS	5	56.3
19-Apr-06	SB-1	Winter flounder	PYS	14	157.6
19-Apr-06	SB-2	Grubby	PYS	1	7.9
19-Apr-06	SB-2	Windowpane	Egg	3	23.7
19-Apr-06	SB-2	Winter flounder	PYS	23	181.9
19-Apr-06	SB-3	Fourbeard rockling	Egg	5	0.8
19-Apr-06	SB-3	Grubby	PYS	6	0.9
19-Apr-06	SB-3	Winter flounder	PYS	26	4.0
19-Apr-06	SB-4	Fourbeard rockling	Egg	2	10.4
19-Apr-06	SB-4	Grubby	PYS	6	31.3
19-Apr-06	SB-4	Grubby	YS	1	5.2
19-Apr-06	SB-4	Windowpane	Egg	2	10.4
19-Apr-06	SB-4	Winter flounder	PYS	47	245.5
19-Apr-06	SB-6	Grubby	PYS	10	78.9
19-Apr-06	SB-6	Winter flounder	PYS	109	859.5
19-Apr-06	SB-6	Winter flounder	YS	2	15.8
19-Apr-06	SB-6	Winter flounder	UID	1	7.9
20-Apr-06	PJ-1	Fourbeard rockling	Egg	1	6.5
20-Apr-06	PJ-1	Grubby	PYS	4	26.0
20-Apr-06	PJ-1	Winter flounder	PYS	40	260.3
20-Apr-06	PJ-1	Winter flounder	YS	2	13.0
20-Apr-06	PJ-4	Fourbeard rockling	Egg	3	18.0

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

20-Apr-06	PJ-4	Grubby	PYS	2	12.0
20-Apr-06	PJ-4	Windowpane	Egg	4	24.0
20-Apr-06	PJ-4	Winter flounder	YS	1	6.0
20-Apr-06	PJ-4	Winter flounder	PYS	4	24.0
20-Apr-06	PJ-5	Grubby	PYS	4	18.3
20-Apr-06	PJ-5	Winter flounder	PYS	42	192.0
20-Apr-06	SB-5	Grubby	PYS	3	10.0
20-Apr-06	SB-5	Windowpane	Egg	1	3.3
20-Apr-06	SB-5	Winter flounder	PYS	43	143.9
20-Apr-06	SB-5	Winter flounder	YS	1	3.3
01-May-06	PJ-1	Winter flounder	PYS	4	22.8
01-May-06	PJ-2	Winter flounder	PYS	30	279.5
01-May-06	PJ-3	Grubby	JUV	1	7.2
01-May-06	PJ-3	Winter flounder	PYS	3	21.5
01-May-06	PJ-4	Atlantic menhaden	Egg	1	5.0
01-May-06	PJ-4	Fourbeard rockling	Egg	1	5.0
01-May-06	PJ-4	Windowpane	Egg	1	5.0
01-May-06	PJ-4	Winter flounder	PYS	37	183.4
01-May-06	PJ-5	Atlantic menhaden	Egg	1	5.3
01-May-06	PJ-5	Fourbeard rockling	Egg	1	5.3
01-May-06	PJ-5	Windowpane	Egg	4	21.0
01-May-06	PJ-5	Windowpane	YS	1	5.3
01-May-06	PJ-5	Winter flounder	PYS	50	263.1
01-May-06	SB-1	Gadid unidentified	Egg	1	11.3
01-May-06	SB-1	Windowpane	Egg	1	11.3
01-May-06	SB-1	Winter flounder	PYS	2	22.6
01-May-06	SB-1	Winter flounder	Egg	1	11.3
01-May-06	SB-2	Fourbeard rockling	Egg	2	16.7
01-May-06	SB-2	Winter flounder	PYS	7	58.6
01-May-06	SB-3	Fourbeard rockling	Egg	1	5.1
01-May-06	SB-3	Windowpane	Egg	2	10.2
01-May-06	SB-3	Winter flounder	PYS	15	76.8
01-May-06	SB-4	Fourbeard rockling	PYS	1	4.3
01-May-06	SB-4	Fourbeard rockling	Egg	1	4.3
01-May-06	SB-4	Gadid unidentified	Egg	5	21.3
01-May-06	SB-4	Windowpane	Egg	7	29.8
01-May-06	SB-4	Winter flounder	PYS	30	127.7
02-May-06	AK-2	Winter flounder	PYS	4	27.7
02-May-06	AK-3	Atlantic silverside	PYS	1	5.9
02-May-06	AK-3	Winter flounder	PYS	3	17.7
02-May-06	NB-3	Winter flounder	PYS	7	36.5
02-May-06	NB-4	Winter flounder	PYS	4	22.0
02-May-06	NB-5	Winter flounder	PYS	25	117.1
02-May-06	NB-6	Grubby	PYS	1	4.7
02-May-06	NB-6	Winter flounder	PYS	19	89.2
03-May-06	LB-1	Atlantic menhaden	Egg	5	190.8

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

03-May-06	LB-1	Windowpane	Egg	22	839.5
03-May-06	LB-1	Winter flounder	PYS	27	128.8
03-May-06	LB-2	Atlantic menhaden	Egg	6	20.2
03-May-06	LB-2	Windowpane	Egg	23	77.4
03-May-06	LB-2	Winter flounder	PYS	15	50.5
03-May-06	LB-3	Atlantic menhaden	Egg	16	1516.8
03-May-06	LB-3	Fourbeard rockling	Egg	4	379.2
03-May-06	LB-3	Northern searobin	Egg	1	94.8
03-May-06	LB-3	Tautog	Egg	27	2559.7
03-May-06	LB-3	Windowpane	Egg	44	4171.3
03-May-06	LB-3	Winter flounder	PYS	66	391.1
03-May-06	LB-4	Atlantic menhaden	Egg	14	2136.9
03-May-06	LB-4	Windowpane	Egg	9	1373.7
03-May-06	LB-4	Winter flounder	PYS	79	376.8
03-May-06	LB-5	Atlantic menhaden	Egg	76	30260.1
03-May-06	LB-5	Grubby	PYS	2	12.4
03-May-06	LB-5	Prionotus sp.	Egg	1	398.2
03-May-06	LB-5	Winter flounder	PYS	35	217.7
03-May-06	LB-6	Atlantic menhaden	Egg	22	53948.4
03-May-06	LB-6	Winter flounder	PYS	9	43.1
03-May-06	SB-5	Atlantic menhaden	Egg	11	149.7
03-May-06	SB-5	Windowpane	PYS	3	10.2
03-May-06	SB-5	Windowpane	Egg	4	54.4
03-May-06	SB-6	Atlantic menhaden	Egg	8	28.0
03-May-06	SB-6	Fourbeard rockling	PYS	1	3.5
03-May-06	SB-6	Windowpane	Egg	18	63.1
03-May-06	SB-6	Windowpane	PYS	1	3.5
03-May-06	SB-6	Winter flounder	PYS	8	28.0
16-May-06	AK-2	Bay anchovy	Egg	29	547.1
16-May-06	AK-2	Labridae	Egg	2	37.7
16-May-06	AK-2	Windowpane	PYS	1	18.9
16-May-06	AK-2	Winter flounder	PYS	6	113.2
16-May-06	AK-3	Atlantic menhaden	Egg	1	6.1
16-May-06	AK-3	Bay anchovy	Egg	29	177.2
16-May-06	AK-3	Labridae	Egg	1	6.1
16-May-06	AK-3	Winter flounder	PYS	2	12.2
16-May-06	NB-3	Atlantic menhaden	Egg	3	17.7
16-May-06	NB-3	Atlantic menhaden	UID	2	11.8
16-May-06	NB-3	Bay anchovy	Egg	47	277.5
16-May-06	NB-3	Labridae	Egg	1	5.9
16-May-06	NB-4	Atlantic menhaden	Egg	9	207.2
16-May-06	NB-4	Bay anchovy	Egg	53	1220.1
16-May-06	NB-4	Labridae	Egg	2	46.0
16-May-06	NB-6	Atlantic menhaden	Egg	19	437.4
16-May-06	NB-6	Bay anchovy	Egg	5	115.1
16-May-06	NB-6	Winter flounder	PYS	1	5.8

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

16-May-06	PJ-3	Atlantic menhaden	Egg	19	427.3
16-May-06	PJ-3	Winter flounder	PYS	1	11.2
17-May-06	LB-1	Atlantic menhaden	Egg	34	882.0
17-May-06	LB-1	Bay anchovy	Egg	4	103.8
17-May-06	LB-1	Labridae	Egg	14	363.2
17-May-06	LB-1	Prionotus sp.	Egg	1	25.9
17-May-06	LB-1	Windowpane	PYS	2	13.0
17-May-06	LB-1	Winter flounder	PYS	1	6.5
17-May-06	LB-2	Atlantic menhaden	Egg	3	43.5
17-May-06	LB-2	Bay anchovy	Egg	5	72.5
17-May-06	LB-2	Labridae	Egg	34	493.3
17-May-06	LB-2	Prionotus sp.	Egg	3	43.5
17-May-06	LB-2	Weakfish	Egg	27	391.7
17-May-06	LB-2	Windowpane	PYS	5	36.3
17-May-06	LB-3	Atlantic menhaden	Egg	70	1901.1
17-May-06	LB-3	Bay anchovy	Egg	31	841.9
17-May-06	LB-3	Labridae	Egg	9	244.4
17-May-06	LB-3	Prionotus sp.	Egg	4	108.6
17-May-06	LB-3	Windowpane	PYS	3	20.4
17-May-06	LB-3	Winter flounder	PYS	14	95.1
17-May-06	LB-4	Atlantic menhaden	Egg	28	1094.6
17-May-06	LB-4	Bay anchovy	Egg	5	195.5
17-May-06	LB-4	Labridae	Egg	19	742.8
17-May-06	LB-4	Prionotus sp.	Egg	6	234.6
17-May-06	LB-4	Unidentified	UID	2	9.8
17-May-06	LB-4	Windowpane	PYS	4	19.5
17-May-06	LB-4	Winter flounder	PYS	28	136.8
17-May-06	LB-5	Atlantic menhaden	Egg	92	15800.2
17-May-06	LB-5	Bay anchovy	Egg	6	1030.4
17-May-06	LB-5	Labridae	Egg	16	2747.9
17-May-06	LB-5	Prionotus sp.	Egg	8	1373.9
17-May-06	LB-5	Windowpane	PYS	1	5.4
17-May-06	LB-6	Atlantic menhaden	Egg	217	60037.0
17-May-06	LB-6	Bay anchovy	Egg	3	830.0
17-May-06	SB-5	Atlantic menhaden	Egg	146	25803.5
17-May-06	SB-5	Bay anchovy	Egg	2	353.5
17-May-06	SB-5	Labridae	Egg	16	2827.8
17-May-06	SB-5	Prionotus sp.	Egg	4	706.9
17-May-06	SB-5	Weakfish	Egg	12	2120.8
17-May-06	SB-5	Windowpane	PYS	2	11.0
17-May-06	SB-5	Winter flounder	PYS	4	22.1
17-May-06	SB-6	Atlantic menhaden	Egg	4	118.3
17-May-06	SB-6	Bay anchovy	Egg	7	207.1
17-May-06	SB-6	Labridae	Egg	9	266.3
17-May-06	SB-6	Prionotus sp.	Egg	1	29.6
17-May-06	SB-6	Windowpane	PYS	19	70.3

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

18-May-06	PJ-1	Atlantic menhaden	Egg	8	311.2
18-May-06	PJ-1	Atlantic menhaden	PYS	3	14.6
18-May-06	PJ-1	Bay anchovy	Egg	7	272.3
18-May-06	PJ-1	Labridae	Egg	10	388.9
18-May-06	PJ-1	Tautog	YS	1	4.9
18-May-06	PJ-1	Windowpane	PYS	3	14.6
18-May-06	PJ-4	Atlantic menhaden	Egg	48	1817.1
18-May-06	PJ-4	Bay anchovy	Egg	4	151.4
18-May-06	PJ-4	Labridae	Egg	24	908.5
18-May-06	PJ-4	Prionotus sp.	Egg	1	37.9
18-May-06	PJ-4	Windowpane	PYS	4	18.9
18-May-06	PJ-4	Winter flounder	PYS	3	14.2
18-May-06	PJ-5	Atlantic menhaden	Egg	33	1463.4
18-May-06	PJ-5	Bay anchovy	Egg	10	443.5
18-May-06	PJ-5	Labridae	Egg	12	532.2
18-May-06	PJ-5	Prionotus sp.	Egg	4	177.4
18-May-06	PJ-5	Weakfish	Egg	6	266.1
18-May-06	PJ-5	Windowpane	PYS	9	49.9
18-May-06	PJ-5	Winter flounder	PYS	5	27.7
18-May-06	SB-1	Atlantic menhaden	Egg	238	2379.4
18-May-06	SB-1	Bay anchovy	Egg	15	150.0
18-May-06	SB-1	Labridae	Egg	38	379.9
18-May-06	SB-1	Weakfish	Egg	14	140.0
18-May-06	SB-1	Windowpane	PYS	1	10.0
18-May-06	SB-1	Winter flounder	PYS	2	20.0
18-May-06	SB-2	Atlantic menhaden	YS	5	38.7
18-May-06	SB-2	Atlantic menhaden	Egg	49	3030.8
18-May-06	SB-2	Atlantic menhaden	UID	10	77.3
18-May-06	SB-2	Bay anchovy	Egg	7	433.0
18-May-06	SB-2	Labridae	Egg	10	618.5
18-May-06	SB-2	Tautog	YS	1	7.7
18-May-06	SB-2	Windowpane	PYS	1	7.7
18-May-06	SB-2	Winter flounder	PYS	1	7.7
18-May-06	SB-3	Atlantic menhaden	Egg	186	10078.5
18-May-06	SB-3	Bay anchovy	Egg	1	54.2
18-May-06	SB-3	Labridae	Egg	3	162.6
18-May-06	SB-3	Weakfish	Egg	2	108.4
18-May-06	SB-3	Windowpane	PYS	1	6.8
18-May-06	SB-4	Atlantic menhaden	Egg	80	3367.6
18-May-06	SB-4	Labridae	Egg	13	547.2
18-May-06	SB-4	Prionotus sp.	Egg	3	126.3
18-May-06	SB-4	Weakfish	Egg	5	210.5
18-May-06	SB-4	Windowpane	PYS	2	10.5
18-May-06	SB-4	Winter flounder	PYS	1	5.3
30-May-06	LB-1	Atlantic menhaden	Egg	70	6834.5
30-May-06	LB-1	Atlantic menhaden	UID	1	6.1

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

30-May-06	LB-1	Bay anchovy	Egg	4	390.5
30-May-06	LB-1	Fourspot flounder	YS	1	6.1
30-May-06	LB-1	Prionotus sp.	Egg	1	97.6
30-May-06	LB-1	Winter flounder	PYS	1	6.1
30-May-06	LB-2	Atlantic menhaden	Egg	12	381.1
30-May-06	LB-2	Bay anchovy	Egg	3	95.3
30-May-06	LB-2	Labridae	Egg	11	349.3
30-May-06	LB-2	Prionotus sp.	Egg	7	222.3
30-May-06	LB-2	Weakfish	Egg	7	222.3
30-May-06	LB-2	Windowpane	PYS	8	31.8
30-May-06	LB-2	Winter flounder	PYS	1	4.0
30-May-06	LB-3	Atlantic menhaden	Egg	60	5627.8
30-May-06	LB-3	Bay anchovy	Egg	36	3376.7
30-May-06	LB-3	Labridae	Egg	6	562.8
30-May-06	LB-3	Weakfish	Egg	5	469.0
30-May-06	LB-4	Atlantic menhaden	Egg	6	637.8
30-May-06	LB-4	Bay anchovy	Egg	5	531.5
30-May-06	LB-4	Labridae	Egg	52	5527.2
30-May-06	LB-4	Prionotus sp.	Egg	2	212.6
30-May-06	LB-4	Weakfish	Egg	4	425.2
30-May-06	LB-4	Windowpane	PYS	5	33.2
30-May-06	LB-5	Atlantic menhaden	Egg	115	12447.4
30-May-06	LB-5	Bay anchovy	Egg	27	2922.4
30-May-06	LB-5	Labridae	Egg	17	1840.0
30-May-06	LB-5	Northern pipefish	PYS	1	6.8
30-May-06	LB-6	Atlantic menhaden	Egg	22	8268.4
30-May-06	LB-6	Bay anchovy	Egg	9	3382.5
30-May-06	LB-6	Labridae	Egg	33	12402.6
30-May-06	LB-6	Northern pipefish	PYS	1	5.9
30-May-06	LB-6	Prionotus sp.	Egg	4	1503.3
30-May-06	SB-3	Atlantic menhaden	Egg	4	162.4
30-May-06	SB-3	Labridae	Egg	10	405.9
30-May-06	SB-3	Northern pipefish	PYS	7	35.5
30-May-06	SB-3	Windowpane	PYS	8	40.6
30-May-06	SB-4	Atlantic menhaden	Egg	98	472.9
30-May-06	SB-4	Bay anchovy	Egg	2	9.7
30-May-06	SB-4	Labridae	Egg	9	43.4
30-May-06	SB-4	Weakfish	Egg	5	24.1
30-May-06	SB-6	Atlantic menhaden	Egg	51	2379.5
30-May-06	SB-6	Labridae	Egg	8	373.3
30-May-06	SB-6	Prionotus sp.	Egg	1	46.7
30-May-06	SB-6	Weakfish	Egg	3	140.0
30-May-06	SB-6	Windowpane	PYS	1	5.8
31-May-06	AK-2	Atlantic menhaden	Egg	2	26.8
31-May-06	AK-2	Bay anchovy	Egg	56	749.4
31-May-06	AK-2	Labridae	Egg	4	53.5

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

31-May-06	AK-2	Winter flounder	PYS	1	6.7
31-May-06	AK-3	Atlantic menhaden	Egg	7	337.5
31-May-06	AK-3	Atlantic silverside	UID	1	6.0
31-May-06	AK-3	Atlantic silverside	PYS	1	6.0
31-May-06	AK-3	Atlantic silverside	YS	4	24.1
31-May-06	AK-3	Bay anchovy	Egg	40	1928.4
31-May-06	AK-3	Labridae	Egg	7	337.5
31-May-06	AK-3	Winter flounder	PYS	1	6.0
31-May-06	NB-3	Atlantic menhaden	Egg	1	45.7
31-May-06	NB-3	Bay anchovy	Egg	29	1324.4
31-May-06	NB-3	Northern pipefish	PYS	5	28.5
31-May-06	NB-4	Bay anchovy	Egg	67	2890.7
31-May-06	NB-4	Labridae	Egg	2	86.3
31-May-06	NB-4	Northern pipefish	PYS	3	16.2
31-May-06	NB-5	Bay anchovy	Egg	37	696.6
31-May-06	NB-5	Labridae	Egg	7	131.8
31-May-06	NB-6	Atlantic menhaden	Egg	4	75.5
31-May-06	NB-6	Bay anchovy	Egg	34	641.4
31-May-06	NB-6	Labridae	Egg	5	94.3
31-May-06	NB-6	Northern pipefish	PYS	2	9.4
31-May-06	NB-6	Windowpane	PYS	1	4.7
31-May-06	NB-6	Winter flounder	PYS	1	4.7
31-May-06	PJ-1	Atlantic menhaden	Egg	47	2491.9
31-May-06	PJ-1	Bay anchovy	Egg	9	477.2
31-May-06	PJ-1	Labridae	Egg	7	371.1
31-May-06	PJ-1	Prionotus sp.	Egg	1	53.0
31-May-06	PJ-2	Bay anchovy	Egg	13	711.3
31-May-06	PJ-2	Gadid unidentified	Egg	1	54.7
31-May-06	PJ-2	Labridae	Egg	6	328.3
31-May-06	PJ-2	Northern pipefish	PYS	2	13.7
31-May-06	PJ-3	Bay anchovy	Egg	47	332.0
31-May-06	PJ-3	Labridae	Egg	1	7.1
31-May-06	PJ-3	Windowpane	PYS	1	7.1
01-Jun-06	PJ-4	Atlantic menhaden	Egg	32	974.8
01-Jun-06	PJ-4	Bay anchovy	Egg	13	396.0
01-Jun-06	PJ-4	Labridae	Egg	22	670.2
01-Jun-06	PJ-4	Northern pipefish	PYS	4	15.2
01-Jun-06	PJ-5	Atlantic menhaden	Egg	72	6654.6
01-Jun-06	PJ-5	Bay anchovy	Egg	1	92.4
01-Jun-06	PJ-5	Labridae	Egg	9	831.8
01-Jun-06	PJ-5	Northern pipefish	PYS	2	11.6
01-Jun-06	PJ-5	Prionotus sp.	Egg	1	92.4
01-Jun-06	PJ-5	Windowpane	PYS	1	5.8
01-Jun-06	PJ-5	Winter flounder	PYS	3	17.3
01-Jun-06	SB-1	Atlantic menhaden	Egg	39	1733.6
01-Jun-06	SB-1	Bay anchovy	Egg	7	311.2

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

01-Jun-06	SB-1	Labridae	Egg	14	622.3
01-Jun-06	SB-1	Northern pipefish	PYS	1	11.1
01-Jun-06	SB-2	Atlantic menhaden	Egg	36	1463.6
01-Jun-06	SB-2	Bay anchovy	Egg	2	81.3
01-Jun-06	SB-2	Labridae	Egg	16	650.5
01-Jun-06	SB-5	Atlantic menhaden	Egg	58	3795.0
01-Jun-06	SB-5	Bay anchovy	Egg	18	1177.8
01-Jun-06	SB-5	Labridae	Egg	1	65.4
01-Jun-06	SB-5	Northern pipefish	PYS	2	8.2
12-Jun-06	LB-1	Atlantic menhaden	Egg	1	22.7
12-Jun-06	LB-1	Bay anchovy	Egg	9	204.4
12-Jun-06	LB-1	Gadid unidentified	Egg	2	45.4
12-Jun-06	LB-1	Labridae	Egg	9	204.4
12-Jun-06	LB-1	Northern pipefish	PYS	13	73.8
12-Jun-06	LB-1	Prionotus sp.	Egg	3	68.1
12-Jun-06	LB-2	Atlantic menhaden	Egg	3	91.7
12-Jun-06	LB-2	Bay anchovy	Egg	7	214.1
12-Jun-06	LB-2	Fourbeard rockling	PYS	1	3.8
12-Jun-06	LB-2	Gadid unidentified	Egg	1	30.6
12-Jun-06	LB-2	Labridae	Egg	11	336.4
12-Jun-06	LB-2	Northern pipefish	PYS	3	11.5
12-Jun-06	LB-2	Prionotus sp.	Egg	2	61.2
12-Jun-06	LB-2	Windowpane	PYS	1	3.8
12-Jun-06	LB-3	Atlantic menhaden	Egg	10	63.4
12-Jun-06	LB-3	Bay anchovy	Egg	26	164.9
12-Jun-06	LB-3	Labridae	Egg	9	57.1
12-Jun-06	LB-3	Prionotus sp.	Egg	1	6.3
12-Jun-06	LB-4	Atlantic menhaden	Egg	6	264.9
12-Jun-06	LB-4	Bay anchovy	Egg	7	309.0
12-Jun-06	LB-4	Gadid unidentified	Egg	2	88.3
12-Jun-06	LB-4	Gobiid unidentified	PYS	1	5.5
12-Jun-06	LB-4	Labridae	Egg	7	309.0
12-Jun-06	LB-4	Northern pipefish	PYS	1	5.5
12-Jun-06	LB-4	Prionotus sp.	Egg	5	220.7
12-Jun-06	LB-4	Winter flounder	PYS	1	5.5
12-Jun-06	LB-5	Atlantic menhaden	Egg	2	182.3
12-Jun-06	LB-5	Bay anchovy	Egg	17	1549.7
12-Jun-06	LB-5	Butterfish	JUV	1	5.7
12-Jun-06	LB-5	Gadid unidentified	Egg	6	546.9
12-Jun-06	LB-5	Labridae	Egg	11	1002.7
12-Jun-06	LB-5	Prionotus sp.	Egg	18	1640.8
12-Jun-06	LB-6	Bay anchovy	Egg	14	2679.0
12-Jun-06	LB-6	Labridae	Egg	3	574.1
12-Jun-06	LB-6	Prionotus sp.	Egg	3	574.1
12-Jun-06	LB-6	Windowpane	PYS	1	6.0
12-Jun-06	SB-3	Conger eel	LEPTO	1	10.2

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

12-Jun-06	SB-3	Grubby	JUV	2	20.4
12-Jun-06	SB-3	Labridae	Egg	5	51.1
12-Jun-06	SB-3	Northern pipefish	PYS	1	10.2
12-Jun-06	SB-3	Prionotus sp.	Egg	6	61.3
12-Jun-06	SB-3	Weakfish	Egg	5	51.1
12-Jun-06	SB-6	Atlantic menhaden	Egg	9	732.5
12-Jun-06	SB-6	Bay anchovy	Egg	8	651.1
12-Jun-06	SB-6	Fourbeard rockling	PYS	1	5.1
12-Jun-06	SB-6	Labridae	Egg	13	1058.0
12-Jun-06	SB-6	Northern pipefish	PYS	1	5.1
12-Jun-06	SB-6	Prionotus sp.	Egg	4	325.5
13-Jun-06	AK-2	Bay anchovy	Egg	29	531.5
13-Jun-06	AK-2	Labridae	Egg	23	421.6
13-Jun-06	AK-2	Prionotus sp.	Egg	3	55.0
13-Jun-06	AK-3	Atlantic menhaden	Egg	1	44.1
13-Jun-06	AK-3	Atlantic menhaden	PYS	1	5.5
13-Jun-06	AK-3	Bay anchovy	Egg	48	2118.0
13-Jun-06	AK-3	Bay anchovy	PYS	9	49.6
13-Jun-06	AK-3	Gobiid unidentified	PYS	18	99.3
13-Jun-06	AK-3	Labridae	Egg	9	397.1
13-Jun-06	AK-3	Northern pipefish	PYS	1	5.5
13-Jun-06	AK-3	Winter flounder	PYS	2	11.0
13-Jun-06	NB-3	Atlantic menhaden	Egg	1	49.6
13-Jun-06	NB-3	Atlantic menhaden	PYS	3	18.6
13-Jun-06	NB-3	Bay anchovy	Egg	29	1438.1
13-Jun-06	NB-3	Bay anchovy	PYS	22	136.4
13-Jun-06	NB-3	Gobiid unidentified	PYS	48	297.5
13-Jun-06	NB-3	Labridae	Egg	8	396.7
13-Jun-06	NB-3	Northern pipefish	PYS	2	12.4
13-Jun-06	NB-4	Atlantic menhaden	PYS	1	6.2
13-Jun-06	NB-4	Bay anchovy	Egg	237	2922.8
13-Jun-06	NB-4	Bay anchovy	PYS	41	252.8
13-Jun-06	NB-4	Gobiid unidentified	PYS	3	18.5
13-Jun-06	NB-5	Atlantic menhaden	PYS	1	7.0
13-Jun-06	NB-5	Atlantic menhaden	Egg	7	194.9
13-Jun-06	NB-5	Bay anchovy	Egg	19	529.0
13-Jun-06	NB-5	Gobiid unidentified	PYS	4	27.8
13-Jun-06	NB-5	Labridae	Egg	42	1169.4
13-Jun-06	NB-5	Northern pipefish	PYS	3	20.9
13-Jun-06	NB-5	Windowpane	PYS	1	7.0
13-Jun-06	NB-6	Bay anchovy	Egg	12	78.9
13-Jun-06	NB-6	Labridae	Egg	12	78.9
13-Jun-06	PJ-1	Atlantic menhaden	Egg	10	250.4
13-Jun-06	PJ-1	Bay anchovy	Egg	14	350.5
13-Jun-06	PJ-1	Labridae	Egg	33	826.2
13-Jun-06	PJ-1	Northern pipefish	PYS	2	12.5

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

13-Jun-06	SB-5	Atlantic menhaden	Egg	1	12.4
13-Jun-06	SB-5	Atlantic menhaden	PYS	3	9.3
13-Jun-06	SB-5	Bay anchovy	PYS	1	3.1
13-Jun-06	SB-5	Bay anchovy	Egg	16	197.7
13-Jun-06	SB-5	Labridae	Egg	7	86.5
13-Jun-06	SB-5	Northern pipefish	PYS	3	9.3
14-Jun-06	PJ-2	Atlantic menhaden	PYS	2	11.3
14-Jun-06	PJ-2	Bay anchovy	PYS	1	5.7
14-Jun-06	PJ-2	Bay anchovy	Egg	6	271.6
14-Jun-06	PJ-2	Labridae	Egg	22	995.7
14-Jun-06	PJ-2	Northern pipefish	PYS	3	17.0
14-Jun-06	PJ-3	Atlantic menhaden	Egg	1	30.6
14-Jun-06	PJ-3	Bay anchovy	Egg	41	1256.4
14-Jun-06	PJ-3	Bay anchovy	PYS	1	7.7
14-Jun-06	PJ-3	Gobiid unidentified	PYS	1	7.7
14-Jun-06	PJ-3	Labridae	Egg	13	398.4
14-Jun-06	PJ-3	Northern pipefish	PYS	1	7.7
14-Jun-06	PJ-4	Atlantic menhaden	PYS	1	5.4
14-Jun-06	PJ-4	Atlantic menhaden	Egg	19	410.0
14-Jun-06	PJ-4	Bay anchovy	Egg	7	151.1
14-Jun-06	PJ-4	Labridae	Egg	31	669.0
14-Jun-06	PJ-4	Prionotus sp.	Egg	1	21.6
14-Jun-06	PJ-4	Windowpane	PYS	1	5.4
14-Jun-06	PJ-5	Atlantic menhaden	Egg	9	358.1
14-Jun-06	PJ-5	Bay anchovy	PYS	2	9.9
14-Jun-06	PJ-5	Bay anchovy	Egg	21	835.5
14-Jun-06	PJ-5	Labridae	Egg	22	875.3
14-Jun-06	PJ-5	Northern pipefish	PYS	1	5.0
14-Jun-06	PJ-5	Windowpane	PYS	1	5.0
14-Jun-06	SB-1	Atlantic menhaden	PYS	13	149.4
14-Jun-06	SB-1	Atlantic menhaden	Egg	19	873.2
14-Jun-06	SB-1	Atlantic menhaden	YS	2	23.0
14-Jun-06	SB-1	Bay anchovy	PYS	1	11.5
14-Jun-06	SB-1	Bay anchovy	Egg	4	183.8
14-Jun-06	SB-1	Labridae	Egg	28	1286.9
14-Jun-06	SB-1	Northern pipefish	PYS	1	11.5
14-Jun-06	SB-2	American shad	Egg	4	151.7
14-Jun-06	SB-2	American shad	PYS	1	9.5
14-Jun-06	SB-2	Bay anchovy	PYS	1	9.5
14-Jun-06	SB-2	Bay anchovy	Egg	7	265.5
14-Jun-06	SB-2	Labridae	Egg	51	1934.4
14-Jun-06	SB-2	Windowpane	PYS	1	9.5
14-Jun-06	SB-4	Atlantic menhaden	Egg	1	14.1
14-Jun-06	SB-4	Bay anchovy	Egg	6	84.6
14-Jun-06	SB-4	Labridae	Egg	40	564.0
14-Jun-06	SB-4	Northern pipefish	PYS	3	21.1

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

14-Jun-06	SB-4	Prionotus sp.	Egg	3	42.3
14-Jun-06	SB-4	Weakfish	Egg	3	42.3
14-Jun-06	SB-4	Windowpane	Egg	8	112.8
05-Jul-06	AK-2	Bay anchovy	Egg	3	30.7
05-Jul-06	AK-2	Cunner	PYS	1	5.1
05-Jul-06	AK-2	Gobiid unidentified	PYS	5	25.6
05-Jul-06	AK-2	Labridae	Egg	5	51.2
05-Jul-06	AK-2	Northern pipefish	PYS	2	10.2
05-Jul-06	AK-2	Prionotus sp.	Egg	2	20.5
05-Jul-06	AK-2	Unidentified	UID	1	5.1
05-Jul-06	AK-3	Atlantic mackerel	Egg	1	8.8
05-Jul-06	AK-3	Atlantic menhaden	PYS	3	26.3
05-Jul-06	AK-3	Bay anchovy	Egg	12	105.3
05-Jul-06	AK-3	Bay anchovy	PYS	5	43.9
05-Jul-06	AK-3	Cunner	JUV	1	8.8
05-Jul-06	AK-3	Gadid unidentified	Egg	5	43.9
05-Jul-06	AK-3	Gobiid unidentified	PYS	2	17.6
05-Jul-06	AK-3	Inshore lizardfish	PYS	1	8.8
05-Jul-06	AK-3	Labridae	Egg	34	298.5
05-Jul-06	AK-3	Northern searobin	JUV	1	8.8
05-Jul-06	AK-3	Prionotus sp.	Egg	15	131.7
05-Jul-06	AK-3	Unidentified	UID	1	8.8
05-Jul-06	NB-3	Bay anchovy	PYS	7	233.9
05-Jul-06	NB-3	Bay anchovy	Egg	188	12564.5
05-Jul-06	NB-3	Gobiid unidentified	PYS	365	12196.9
05-Jul-06	NB-4	Bay anchovy	Egg	68	6706.6
05-Jul-06	NB-4	Bay anchovy	PYS	17	104.8
05-Jul-06	NB-4	Gobiid unidentified	PYS	65	400.7
05-Jul-06	NB-4	Northern pipefish	PYS	5	30.8
05-Jul-06	NB-5	Atlantic menhaden	PYS	1	8.3
05-Jul-06	NB-5	Bay anchovy	PYS	14	115.8
05-Jul-06	NB-5	Bay anchovy	Egg	7	115.8
05-Jul-06	NB-5	Gobiid unidentified	PYS	4	33.1
05-Jul-06	NB-5	Labridae	Egg	11	182.0
05-Jul-06	NB-5	Prionotus sp.	Egg	8	132.4
05-Jul-06	NB-5	Weakfish	Egg	2	33.1
05-Jul-06	NB-6	Bay anchovy	Egg	17	148.4
05-Jul-06	NB-6	Bay anchovy	PYS	9	78.6
05-Jul-06	NB-6	Gobiid unidentified	PYS	7	61.1
05-Jul-06	NB-6	Prionotus sp.	Egg	2	17.5
05-Jul-06	NB-6	Walleye	PYS	2	17.5
05-Jul-06	NB-6	Windowpane	PYS	3	26.2
05-Jul-06	PJ-1	Bay anchovy	PYS	56	354.4
05-Jul-06	PJ-1	Bay anchovy	Egg	19	1923.9
05-Jul-06	PJ-1	Gobiid unidentified	PYS	44	278.5
05-Jul-06	PJ-1	Lined seahorse	PYS	1	6.3

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

05-Jul-06	PJ-1	Northern pipefish	PYS	2	12.7
05-Jul-06	PJ-2	Bay anchovy	PYS	29	202.4
05-Jul-06	PJ-2	Bay anchovy	Egg	34	7591.8
05-Jul-06	PJ-2	Gobiid unidentified	PYS	61	425.6
05-Jul-06	PJ-2	Northern pipefish	PYS	8	55.8
05-Jul-06	PJ-3	Bay anchovy	Egg	52	3104.8
05-Jul-06	PJ-3	Bay anchovy	PYS	37	276.1
05-Jul-06	PJ-3	Gobiid unidentified	PYS	41	306.0
05-Jul-06	PJ-3	Northern pipefish	PYS	2	14.9
06-Jul-06	LB-1	Bay anchovy	PYS	10	129.9
06-Jul-06	LB-1	Bay anchovy	Egg	14	363.8
06-Jul-06	LB-1	Cunner	PYS	1	13.0
06-Jul-06	LB-1	Gadid unidentified	Egg	9	233.9
06-Jul-06	LB-1	Gobiid unidentified	PYS	263	3417.5
06-Jul-06	LB-1	Labridae	Egg	16	415.8
06-Jul-06	LB-1	Prionotus sp.	Egg	8	207.9
06-Jul-06	LB-1	Windowpane	PYS	1	13.0
06-Jul-06	LB-2	Bay anchovy	Egg	3	27.6
06-Jul-06	LB-2	Bay anchovy	PYS	1	9.2
06-Jul-06	LB-2	Gobiid unidentified	PYS	2	18.4
06-Jul-06	LB-2	Labridae	Egg	15	138.0
06-Jul-06	LB-2	Prionotus sp.	Egg	3	27.6
06-Jul-06	LB-2	Winter flounder	PYS	1	9.2
06-Jul-06	LB-3	Bay anchovy	PYS	22	74.5
06-Jul-06	LB-3	Bay anchovy	Egg	31	3360.0
06-Jul-06	LB-3	Gobiid unidentified	PYS	4	13.5
06-Jul-06	LB-3	Lined seahorse	PYS	1	3.4
06-Jul-06	LB-3	Northern pipefish	PYS	4	13.5
06-Jul-06	LB-4	Bay anchovy	Egg	3	216.9
06-Jul-06	LB-4	Gobiid unidentified	PYS	8	72.3
06-Jul-06	LB-4	Labridae	Egg	1	72.3
06-Jul-06	LB-5	Bay anchovy	Egg	8	32140.4
06-Jul-06	LB-5	Bay anchovy	PYS	10	39.2
06-Jul-06	LB-5	Gobiid unidentified	PYS	90	353.1
06-Jul-06	LB-5	Northern pipefish	PYS	1	3.9
06-Jul-06	LB-6	Bay anchovy	Egg	7	3380.0
06-Jul-06	LB-6	Bay anchovy	PYS	2	15.1
06-Jul-06	LB-6	Gobiid unidentified	PYS	311	2346.4
06-Jul-06	LB-6	Northern pipefish	PYS	1	7.5
06-Jul-06	LB-6	Prionotus sp.	Egg	13	6277.1
06-Jul-06	SB-3	Bay anchovy	PYS	1	11.9
06-Jul-06	SB-3	Bay anchovy	Egg	1	11.9
06-Jul-06	SB-3	Gobiid unidentified	PYS	3	35.7
06-Jul-06	SB-3	Labridae	Egg	19	226.4
06-Jul-06	SB-3	Prionotus sp.	Egg	2	23.8
06-Jul-06	SB-4	Atlantic menhaden	PYS	1	4.6

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

06-Jul-06	SB-4	Bay anchovy	PYS	1	4.6
06-Jul-06	SB-4	Bay anchovy	Egg	1	18.5
06-Jul-06	SB-4	Gadid unidentified	Egg	5	92.4
06-Jul-06	SB-4	Gobiid unidentified	PYS	6	27.7
06-Jul-06	SB-4	Labridae	Egg	32	591.2
06-Jul-06	SB-4	Northern pipefish	PYS	1	4.6
06-Jul-06	SB-4	Prionotus sp.	Egg	17	314.1
06-Jul-06	SB-6	Atlantic menhaden	PYS	2	14.0
06-Jul-06	SB-6	Bay anchovy	Egg	3	42.0
06-Jul-06	SB-6	Bay anchovy	PYS	26	182.0
06-Jul-06	SB-6	Gobiid unidentified	PYS	23	161.0
06-Jul-06	SB-6	Labridae	Egg	29	406.0
06-Jul-06	SB-6	Prionotus sp.	Egg	6	84.0
06-Jul-06	SB-6	Windowpane	PYS	1	7.0
07-Jul-06	PJ-4	Bay anchovy	PYS	60	242.7
07-Jul-06	PJ-4	Bay anchovy	Egg	23	1488.7
07-Jul-06	PJ-4	Gobiid unidentified	PYS	23	93.0
07-Jul-06	PJ-4	Labridae	Egg	6	388.4
07-Jul-06	PJ-4	Northern pipefish	JUV	3	12.1
07-Jul-06	PJ-4	Prionotus sp.	Egg	2	129.5
07-Jul-06	PJ-5	Atlantic menhaden	PYS	2	10.8
07-Jul-06	PJ-5	Atlantic silverside	PYS	1	5.4
07-Jul-06	PJ-5	Bay anchovy	PYS	11	59.1
07-Jul-06	PJ-5	Bay anchovy	Egg	10	215.1
07-Jul-06	PJ-5	Gadid unidentified	Egg	4	86.0
07-Jul-06	PJ-5	Gobiid unidentified	PYS	16	86.0
07-Jul-06	PJ-5	Goosefish	Egg	1	21.5
07-Jul-06	PJ-5	Labridae	Egg	18	387.2
07-Jul-06	PJ-5	Northern pipefish	JUV	1	5.4
07-Jul-06	PJ-5	Prionotus sp.	Egg	7	150.6
07-Jul-06	PJ-5	Weakfish	PYS	3	16.1
07-Jul-06	PJ-5	Windowpane	PYS	1	5.4
07-Jul-06	SB-1	Atlantic menhaden	PYS	1	15.0
07-Jul-06	SB-1	Bay anchovy	Egg	34	510.0
07-Jul-06	SB-1	Bay anchovy	PYS	8	120.0
07-Jul-06	SB-1	Gobiid unidentified	PYS	261	3915.3
07-Jul-06	SB-1	Labridae	Egg	7	105.0
07-Jul-06	SB-1	Northern pipefish	PYS	1	15.0
07-Jul-06	SB-1	Prionotus sp.	Egg	9	135.0
07-Jul-06	SB-2	Atlantic menhaden	PYS	2	15.0
07-Jul-06	SB-2	Bay anchovy	PYS	4	30.1
07-Jul-06	SB-2	Bay anchovy	Egg	37	278.1
07-Jul-06	SB-2	Gadid unidentified	Egg	4	30.1
07-Jul-06	SB-2	Gobiid unidentified	PYS	130	976.9
07-Jul-06	SB-2	Labridae	Egg	65	488.5
07-Jul-06	SB-2	Prionotus sp.	Egg	25	187.9

Appendix B. Ichthyoplankton (Epibenthic Sled) life stage densities by date and station collected during the 2006 Aquatic Biological Survey.

07-Jul-06	SB-2	Windowpane	PYS	1	7.5
07-Jul-06	SB-5	Atlantic menhaden	PYS	2	12.1
07-Jul-06	SB-5	Atlantic silverside	PYS	1	6.1
07-Jul-06	SB-5	Bay anchovy	Egg	6	72.9
07-Jul-06	SB-5	Bay anchovy	PYS	2	12.1
07-Jul-06	SB-5	Butterfish	PYS	1	6.1
07-Jul-06	SB-5	Gadid unidentified	Egg	7	85.0
07-Jul-06	SB-5	Gobiid unidentified	PYS	6	36.4
07-Jul-06	SB-5	Goosefish	Egg	2	24.3
07-Jul-06	SB-5	Labridae	Egg	60	728.8
07-Jul-06	SB-5	Northern searobin	JUV	2	12.1
07-Jul-06	SB-5	Prionotus sp.	Egg	5	60.7
07-Jul-06	SB-5	Tautog	PYS	4	24.3

Appendix C

Water Quality data by date and station collected during the 2006 Aquatic Biological Survey.

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

Date	Station	Temp	DO	Cond.	Salinity	Depth	Gear
24-Jan-06	LB-3	6.3	9.1	40580	25.6	17	Epibenthic Sled
24-Jan-06	LB-5	6.2	9.4	40710	25.6	17	Epibenthic Sled
24-Jan-06	LB-6	6.9	8.8	45700	28.8	42	Epibenthic Sled
24-Jan-06	LB-4	6.9	8.9	47420	29.6	37	Epibenthic Sled
24-Jan-06	LB-2	7.1	9.3	49640	32	52	Epibenthic Sled
24-Jan-06	LB-1	6.1	10	42150	26.7	17	Epibenthic Sled
24-Jan-06	SB-6	7	9	46220	29.6	49	Epibenthic Sled
25-Jan-06	AK-1						Epibenthic Sled
25-Jan-06	AK-2	6.1	10.2	35640	22.2	43	Epibenthic Sled
25-Jan-06	AK-3	5.9	10	29580	21.6	37	Epibenthic Sled
25-Jan-06	AK-7	5.7	10.1	28500	17.4	14	Epibenthic Sled
25-Jan-06	NB-4	5	11.7	13900	8	6	Epibenthic Sled
25-Jan-06	NB-3	5.1	11	17600	10.1	8	Epibenthic Sled
25-Jan-06	NB-5	6.2	9.5	38050	23.7	39	Epibenthic Sled
25-Jan-06	NB-6	6.2	9.5	38920	24.4	49	Epibenthic Sled
26-Jan-06	PJ-5	6.6	9.5	44390	28.2	46	Epibenthic Sled
26-Jan-06	PJ-3	4.2	11.2	27500	16.8	9	Epibenthic Sled
26-Jan-06	PJ-4	6.6	8.8	44060	28	41	Epibenthic Sled
26-Jan-06	PJ-1	4.2	11.6	25990	15.5	9	Epibenthic Sled
26-Jan-06	PJ-2	4.8	11.1	30010	18.3	15	Epibenthic Sled
27-Jan-06	SB-2	6.3	10.2	40790	25.7	29	Epibenthic Sled
27-Jan-06	SB-1	6	10.6	42570	27.2	22	Epibenthic Sled
27-Jan-06	SB-4	6.5	10	45600	28.6	39	Epibenthic Sled
27-Jan-06	SB-3	5	11.4	36750	22.8	14	Epibenthic Sled
27-Jan-06	SB-5	6.7	10	45260	28.8	54	Epibenthic Sled
07-Feb-06	AK-2	5.7	11.4	29720	18.5	43	Epibenthic Sled
07-Feb-06	AK-7	5.6	11.3	25000	15	10	Epibenthic Sled
07-Feb-06	AK-3	5.6	11.1	28150	17.2	39	Epibenthic Sled
07-Feb-06	NB-5	6	10.9	24950	15	39	Epibenthic Sled
07-Feb-06	NB-3	5.8	11.6	16560	9.7	8	Epibenthic Sled
07-Feb-06	NB-4	5.6	11.6	16000	9.2	7	Epibenthic Sled
07-Feb-06	NB-6	5.9	10.7	33980	20.9	47	Epibenthic Sled
07-Feb-06	PJ-3	4.6	12.4	19290	11.3	7	Epibenthic Sled
08-Feb-06	LB-3	6	8.2	40950	25.8	13	Epibenthic Sled
08-Feb-06	LB-5	6	9.2	43210	27.4	19	Epibenthic Sled
08-Feb-06	LB-6	6.5	8.6	45770	29.3	39	Epibenthic Sled
08-Feb-06	LB-4	6.7	8.4	46410	30.9	35	Epibenthic Sled
08-Feb-06	LB-2	6.8	8.4	45690	30.7	50	Epibenthic Sled
08-Feb-06	LB-1	6.7	8.5	45970	29.4	14	Epibenthic Sled
08-Feb-06	SB-6	6.1	9.3	35230	22.1	49	Epibenthic Sled
08-Feb-06	SB-5	5.2	10.1	28350	18.1	55	Epibenthic Sled
09-Feb-06	PJ-5	6.6	9.2	47250	30.3	39	Epibenthic Sled
09-Feb-06	PJ-4	6.6	8.3	46630	30	37	Epibenthic Sled
09-Feb-06	PJ-1	4.3	10.6	23890	14.1	10	Epibenthic Sled

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

09-Feb-06	PJ-2	6	9.1	37990	24	9	Epibenthic Sled
09-Feb-06	SB-2	6.7	8.1	44650	28.4	26	Epibenthic Sled
09-Feb-06	SB-1	6.2	8.8	39800	25	20	Epibenthic Sled
09-Feb-06	SB-4	6.4	8.7	41700	26.3	39	Epibenthic Sled
09-Feb-06	SB-3	5.6	9.6	33950	21	14	Epibenthic Sled
21-Feb-06	LB-3	4.9	9.9	42720	26.5	12	Epibenthic Sled
21-Feb-06	LB-5	4.7	10.2	42250	27.1	19	Epibenthic Sled
21-Feb-06	LB-6	4.4	10.6	42850	26.7	44	Epibenthic Sled
21-Feb-06	PJ-3	4.3	11.4	36250	22.6	39	Epibenthic Sled
21-Feb-06	PJ-4	5.7	9.6	43930	27.7	45	Epibenthic Sled
21-Feb-06	PJ-1	4.6	10.5	36500	22.9	11	Epibenthic Sled
21-Feb-06	PJ-2	4.5	10.7	33940	20.9	8	Epibenthic Sled
22-Feb-06	AK-3	4.5	8.6	34750	21.4	44	Epibenthic Sled
22-Feb-06	AK-7	4.5	9.4	33400	20.8	13	Epibenthic Sled
22-Feb-06	NB-3	4.5	9.8	30590	18.8	8	Epibenthic Sled
22-Feb-06	NB-4	4.5	9.8	30590	18.8	8	Epibenthic Sled
22-Feb-06	NB-5	4.8	9.5	36180	23.3	42	Epibenthic Sled
22-Feb-06	NB-6	4.4	10.2	32150	19.8	51	Epibenthic Sled
23-Feb-06	SB-5	5.6	9.3	46330	29.8	51	Epibenthic Sled
23-Feb-06	SB-6	5.4	9.6	43650	27.5	51	Epibenthic Sled
23-Feb-06	SB-3	4.8	10.2	35780	22.1	20	Epibenthic Sled
23-Feb-06	SB-4	5.5	9.3	45020	28.6	41	Epibenthic Sled
23-Feb-06	SB-1	5	9.5	38500	24.1	24	Epibenthic Sled
23-Feb-06	SB-2	5.1	9.7	40990	25.7	29	Epibenthic Sled
01-Mar-06	PJ-5	3.9	10	43720	27.5	39	Epibenthic Sled
01-Mar-06	LB-4	3.8	10.3	46430	29.3	35	Epibenthic Sled
01-Mar-06	LB-2	4.6	9.8	47960	30.8	49	Epibenthic Sled
01-Mar-06	LB-1	4.1	10.1	44660	28.2	11	Epibenthic Sled
06-Mar-06	LB-3	3.4	11.5	42340	26.4	14	Epibenthic Sled
06-Mar-06	LB-5	3.2	11.7	42100	26.3	18	Epibenthic Sled
06-Mar-06	LB-6	3.3	11.5	45230	28.5	42	Epibenthic Sled
06-Mar-06	LB-4	3.8	10.9	45210	28.6	36	Epibenthic Sled
06-Mar-06	LB-1	4.3	10.5	46510	29.5	17	Epibenthic Sled
06-Mar-06	LB-2	4.4	10.4	49400	31.5	49	Epibenthic Sled
07-Mar-06	AK-7	3.6	10.9	34610	21.1	19	Epibenthic Sled
07-Mar-06	AK-2	3.6	10.6	33750	20.7	41	Epibenthic Sled
07-Mar-06	AK-3	3.6	10.7	33850	20.8	41	Epibenthic Sled
07-Mar-06	NB-5	3.6	11.2	33590	20.6	49	Epibenthic Sled
09-Mar-06	SB-3	4.1	13.3	37610	22.8	16	Epibenthic Sled
09-Mar-06	SB-4	4.3	11.6	42010	26.5	34	Epibenthic Sled
09-Mar-06	SB-1	4.2	11.1	41050	25.8	19	Epibenthic Sled
09-Mar-06	SB-2	4.2	11.6	41490	25	24	Epibenthic Sled
09-Mar-06	SB-5	4.5	10.7	46110	29.3	49	Epibenthic Sled
09-Mar-06	PJ-5	4.4	10.9	45860	29	45	Epibenthic Sled
09-Mar-06	PJ-4	4.5	11	45130	28.6	45	Epibenthic Sled

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

09-Mar-06	PJ-1	4.3	12	33530	20.6	12	Epibenthic Sled
09-Mar-06	PJ-3	4.4	12.4	31150	19.5	8	Epibenthic Sled
10-Mar-06	PJ-2	4.4	14.1	32710	21	13	Epibenthic Sled
10-Mar-06	NB-6	4.4	13.3	36230	22.4	48	Epibenthic Sled
10-Mar-06	NB-4	5.3	13.5	30810	18.8	5	Epibenthic Sled
10-Mar-06	NB-3	5.4	13.5	29560	18	5	Epibenthic Sled
10-Mar-06	SB-6	4.9	12.9	43220	27.8	48	Epibenthic Sled
20-Mar-06	LB-3	5.2	11.1	38250	24	15	Epibenthic Sled
20-Mar-06	LB-5	4.9	11	38140	23.7	18	Epibenthic Sled
20-Mar-06	LB-6	5.2	10.8	42450	26.9	40	Epibenthic Sled
20-Mar-06	LB-4	5.1	10.9	40130	25.1	35	Epibenthic Sled
20-Mar-06	LB-2	5.7	9.8	47050	29.7	51	Epibenthic Sled
20-Mar-06	LB-1	5.2	10.5	43220	27.5	11	Epibenthic Sled
20-Mar-06	SB-6	5.6	10	44350	27.9	47	Epibenthic Sled
21-Mar-06	NB-3	5.2	10.5	30600	18.7	8	Epibenthic Sled
21-Mar-06	NB-4	5.1	10.5	29900	18.3	7	Epibenthic Sled
21-Mar-06	NB-5	5	10.4	34300	21.2	51	Epibenthic Sled
21-Mar-06	AK-2	5.1	10.4	33600	20.7	48	Epibenthic Sled
21-Mar-06	AK-3	5.4	10.3	32800	20.2	47	Epibenthic Sled
21-Mar-06	AK-7	5.7	10.8	32800	20.3	14	Epibenthic Sled
21-Mar-06	NB-6	5.3	9.8	34500	21.5	49	Epibenthic Sled
22-Mar-06	SB-1	5.4	14.6	37650	23.5	19	Epibenthic Sled
22-Mar-06	SB-2	5.4	11.5	38870	24.2	24	Epibenthic Sled
22-Mar-06	SB-4	5.3	12	35410	22	37	Epibenthic Sled
22-Mar-06	PJ-5	5.5	11	43370	27.4	45	Epibenthic Sled
22-Mar-06	PJ-4	5.4	9.3	43740	27.7	49	Epibenthic Sled
22-Mar-06	PJ-3	5.3	10.7	34050	21	9	Epibenthic Sled
22-Mar-06	PJ-2	5.2	10.5	30670	18.7	7	Epibenthic Sled
23-Mar-06	SB-3	5.3	10.3	36400	22.7	12	Epibenthic Sled
23-Mar-06	PJ-1	5	10.7	30550	19.1	7	Epibenthic Sled
23-Mar-06	SB-5	5.9	9.8	39260	24.6	49	Epibenthic Sled
03-Apr-06	LB-3	8.2	10.4	41520	26.5	15	Epibenthic Sled
03-Apr-06	LB-5	8.8	11.3	40860	25.9	17	Epibenthic Sled
03-Apr-06	LB-6	8.4	11.2	42730	27.4	45	Epibenthic Sled
03-Apr-06	LB-4	7.8	10.8	43500	27.7	37	Epibenthic Sled
03-Apr-06	LB-2	7.4	9.9	46580	29.9	54	Epibenthic Sled
03-Apr-06	LB-1	8	10.3	45180	28.9	18	Epibenthic Sled
03-Apr-06	SB-6	7.9	10.1	43510	27.7	51	Epibenthic Sled
03-Apr-06	SB-3	8.1	10.2	39800	25.2	16	Epibenthic Sled
03-Apr-06	SB-4	8	10	42310	26.9	40	Epibenthic Sled
03-Apr-06	SB-1	8	9.9	40610	25.7	24	Epibenthic Sled
03-Apr-06	SB-2	8.1	9.9	38970	24.7	29	Epibenthic Sled
04-Apr-06	NB-6	9.1	10.2	33610	21	45	Epibenthic Sled
04-Apr-06	NB-5	9.1	10.3	33750	21	44	Epibenthic Sled
04-Apr-06	NB-3	9.3	9.6	29670	18.3	7	Epibenthic Sled

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

04-Apr-06	NB-4	9.3	9.5	29720	18.3	7	Epibenthic Sled
04-Apr-06	AK-3	8.9	9.8	33680	21	44	Epibenthic Sled
04-Apr-06	AK-7	9.8	10.8	32910	20.5	14	Epibenthic Sled
04-Apr-06	AK-2	8.6	9.8	36160	22.7	47	Epibenthic Sled
05-Apr-06	PJ-2	8.3	10.3	30230	18.6	9	Epibenthic Sled
05-Apr-06	PJ-3	8.2	10	33850	20.7	7	Epibenthic Sled
05-Apr-06	PJ-5	7.9	9.5	41670	26.4	45	Epibenthic Sled
05-Apr-06	PJ-4	7.9	9.5	40920	25.9	45	Epibenthic Sled
05-Apr-06	SB-5	7.8	9.6	41910	26.4	54	Epibenthic Sled
05-Apr-06	PJ-1	8.1	10	32490	20.2	11	Epibenthic Sled
17-Apr-06	LB-3	9.9	9.6	40620	25.9	16	Epibenthic Sled
17-Apr-06	LB-5	9.6	9.6	39820	25.3	21	Epibenthic Sled
17-Apr-06	LB-6	9.9	9.8	39630	25.2	43	Epibenthic Sled
17-Apr-06	LB-4	9.2	8.7	43120	27.7	37	Epibenthic Sled
17-Apr-06	LB-2	8.4	8.5	47280	30.4	49	Epibenthic Sled
17-Apr-06	LB-1	9	8.9	45070	29	16	Epibenthic Sled
18-Apr-06	NB-5	11.1	8.5	32490	20.2	52	Epibenthic Sled
18-Apr-06	NB-6	11.1	8.2	32490	20.2	48	Epibenthic Sled
18-Apr-06	NB-3	11.4	8.2	31860	19.8	8	Epibenthic Sled
18-Apr-06	NB-4	11.4	8.2	31860	19.8	7	Epibenthic Sled
18-Apr-06	AK-2	11.2	8.5	33250	20.7	47	Epibenthic Sled
18-Apr-06	AK-7	12.4	9	33140	20.8	14	Epibenthic Sled
18-Apr-06	AK-3	11.5	8.6	33070	20.7	39	Epibenthic Sled
19-Apr-06	SB-6	9.7	8.8	40830	25.9	46	Epibenthic Sled
19-Apr-06	SB-3	10.2	8.7	37540	23.8	16	Epibenthic Sled
19-Apr-06	SB-4	9.7	8.5	41070	26.1	39	Epibenthic Sled
19-Apr-06	SB-1	10.3	8.5	38020	24.1	22	Epibenthic Sled
19-Apr-06	SB-2	9.8	8.4	39600	25.1	29	Epibenthic Sled
19-Apr-06	PJ-3	11.3	9.4	33640	21.3	10	Epibenthic Sled
19-Apr-06	PJ-2	10.4	8.9	34070	21.3	10	Epibenthic Sled
20-Apr-06	PJ-1	11	8.8	32800	20.9	10	Epibenthic Sled
20-Apr-06	PJ-5	9.8	8.2	41480	26.4	46	Epibenthic Sled
20-Apr-06	SB-5	10.6	8.7	36550	23.1	52	Epibenthic Sled
20-Apr-06	PJ-4	9.8	8.3	42390	27.2	48	Epibenthic Sled
01-May-06	SB-3	12.3	7.7	32150	20	13	Epibenthic Sled
01-May-06	SB-4	12	7.6	36780	23.4	37	Epibenthic Sled
01-May-06	SB-1	12	7	34290	21.5	21	Epibenthic Sled
01-May-06	SB-2	12.2	7.5	34480	21.7	27	Epibenthic Sled
01-May-06	PJ-4	11.8	7.6	39370	25	47	Epibenthic Sled
01-May-06	PJ-5	12.1	8.1	37300	23	48	Epibenthic Sled
01-May-06	PJ-3	12.7	8.4	27900	17.2	11	Epibenthic Sled
01-May-06	PJ-1	12.3	8	30220	18.8	13	Epibenthic Sled
01-May-06	PJ-2	12.6	7.9	25790	15.8	11	Epibenthic Sled
02-May-06	NB-6	12.7	8.1	30510	18.8	47	Epibenthic Sled
02-May-06	NB-5	12.7	8.1	30510	18.8	53	Epibenthic Sled

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

02-May-06	NB-3	13.3	8.1	26140	16	11	Epibenthic Sled
02-May-06	NB-4	13.3	8.1	26140	16	11	Epibenthic Sled
02-May-06	AK-2	12.8	8.1	31290	19.4	48	Epibenthic Sled
02-May-06	AK-3	13.5	7.6	27840	17	48	Epibenthic Sled
03-May-06	LB-3	12.6	7.5	35950	27.7	17	Epibenthic Sled
03-May-06	LB-5	12.4	7.7	37020	23.3	19	Epibenthic Sled
03-May-06	LB-6	12	8.2	42070	27	44	Epibenthic Sled
03-May-06	LB-4	12	7.4	42750	27.6	35	Epibenthic Sled
03-May-06	LB-1	12.2	8.8	45090	29.1	17	Epibenthic Sled
03-May-06	LB-2	11.9	8.5	45000	29.1	52	Epibenthic Sled
03-May-06	SB-6	12.8	9.1	34890	20.8	51	Epibenthic Sled
03-May-06	SB-5	12.5	8.3	37580	23	54	Epibenthic Sled
16-May-06	PJ-2	14.5	7.2	30080	18.4	9	Epibenthic Sled
16-May-06	PJ-3	14.5	7.1	30300	18.9	9	Epibenthic Sled
16-May-06	NB-6	15	6.3	29170	18.1	54	Epibenthic Sled
16-May-06	NB-5	15	6.3	29170	18.1	50	Epibenthic Sled
16-May-06	NB-4	15.4	6.2	25310	15.5	9	Epibenthic Sled
16-May-06	NB-3	15.4	6.2	25310	15.5	9	Epibenthic Sled
16-May-06	AK-2	14.9	6.2	30020	18.7	43	Epibenthic Sled
16-May-06	AK-3	15.4	6.2	28560	17.7	44	Epibenthic Sled
17-May-06	LB-3	14.5	7.8	36550	23.2	17	Epibenthic Sled
17-May-06	LB-5	14.5	7.4	36880	23.4	20	Epibenthic Sled
17-May-06	LB-6	14.3	7.2	38450	25.5	43	Epibenthic Sled
17-May-06	LB-4	13	7.1	42390	28.6	39	Epibenthic Sled
17-May-06	LB-1	14	7.3	41980	27	15	Epibenthic Sled
17-May-06	LB-2	12.6	8.1	45220	29.2	51	Epibenthic Sled
17-May-06	SB-6	13.8	7.3	40660	26	47	Epibenthic Sled
17-May-06	SB-5	13.8	7.1	39640	25.3	47	Epibenthic Sled
18-May-06	SB-3	14.7	7.2	32760	20.5	15	Epibenthic Sled
18-May-06	SB-4	14.2	7.5	37600	23.9	39	Epibenthic Sled
18-May-06	SB-1	14.4	7.4	35750	22.6	21	Epibenthic Sled
18-May-06	SB-2	14.4	7.2	36120	22.7	26	Epibenthic Sled
18-May-06	PJ-1	15.1	7.7	29900	18.6	16	Epibenthic Sled
18-May-06	PJ-4	14.3	7.3	37620	23.8	49	Epibenthic Sled
18-May-06	PJ-5	14.3	8	38250	24.6	47	Epibenthic Sled
30-May-06	LB-3	14.7	9.6	38660	24.7	16	Epibenthic Sled
30-May-06	LB-5	14.9	9.6	37600	23.9	18	Epibenthic Sled
30-May-06	LB-6	15.2	10.8	40600	26.4	41	Epibenthic Sled
30-May-06	LB-4	14	9.7	42220	27.2	38	Epibenthic Sled
30-May-06	LB-2	13.3	9.8	44720	28.9	48	Epibenthic Sled
30-May-06	LB-1	15.5	9.6	43920	28.2	17	Epibenthic Sled
30-May-06	SB-6	14.5	9	40250	25.8	45	Epibenthic Sled
30-May-06	SB-3	15.8	8.3	32580	20.4	16	Epibenthic Sled
30-May-06	SB-4	15.1	8.2	37990	24	39	Epibenthic Sled
31-May-06	NB-5	17.2	6.8	29510	18.3	50	Epibenthic Sled

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

31-May-06	NB-6	17.2	6.8	29510	18.3	47	Epibenthic Sled
31-May-06	NB-3	17.8	6.6	28190	17.4	8	Epibenthic Sled
31-May-06	NB-4	17.8	6.6	28190	17.4	8	Epibenthic Sled
31-May-06	AK-2	17.1	6.7	29740	18.4	47	Epibenthic Sled
31-May-06	AK-3	18.3	6.5	28630	17.6	47	Epibenthic Sled
31-May-06	PJ-3	17.6	7.9	25780	15.9	11	Epibenthic Sled
31-May-06	PJ-1	16.8	7.7	30450	19	15	Epibenthic Sled
31-May-06	PJ-2	18	7.8	24680	15.2	9	Epibenthic Sled
01-Jun-06	PJ-4	15.1	7.9	39690	25.3	40	Epibenthic Sled
01-Jun-06	PJ-5	15.4	7.6	36620	23.2	44	Epibenthic Sled
01-Jun-06	SB-5	16.2		27650	21	45	Epibenthic Sled
01-Jun-06	SB-1	15.9	7	34220	21.1	21	Epibenthic Sled
01-Jun-06	SB-2	15.5	7.2	36790	23.3	30	Epibenthic Sled
12-Jun-06	LB-3	16.7	9.1	33800	21.3	17	Epibenthic Sled
12-Jun-06	LB-5	16.3	7.6	36880	23.3	18	Epibenthic Sled
12-Jun-06	LB-6	15.7	7.9	40450	25.9	42	Epibenthic Sled
12-Jun-06	LB-4	14.9	7.6	41160	26.4	33	Epibenthic Sled
12-Jun-06	LB-1	15.5	7.7	40120	25.8	11	Epibenthic Sled
12-Jun-06	LB-2	13.4	7.3	44590	29	45	Epibenthic Sled
12-Jun-06	SB-6	15.8	7.3	38190	24.3	42	Epibenthic Sled
12-Jun-06	SB-3	17.1	6.3	31920	20	13	Epibenthic Sled
13-Jun-06	AK-2	17.9	6.8	27810	16.4	45	Epibenthic Sled
13-Jun-06	AK-3	18.3	6.8	26640	16.4	46	Epibenthic Sled
13-Jun-06	NB-4	18.2	6.6	27200	16.8	10	Epibenthic Sled
13-Jun-06	NB-3	18.3	6.8	26220	16.1	10	Epibenthic Sled
13-Jun-06	NB-6	17.9	7.1	29000	18.2	49	Epibenthic Sled
13-Jun-06	NB-5	17.9	7.1	29000	18.2	49	Epibenthic Sled
13-Jun-06	PJ-1	17.6	7.2	31250	19.5	11	Epibenthic Sled
13-Jun-06	SB-5	15.8	7.8	38580	24.7	51	Epibenthic Sled
14-Jun-06	SB-1	16.5	7.3	34940	22.9	21	Epibenthic Sled
14-Jun-06	SB-2	16.7	6.7	34770	22	26	Epibenthic Sled
14-Jun-06	SB-4	16.1	7.6	37400	23.8	40	Epibenthic Sled
14-Jun-06	PJ-4	16	7.9	39220	25	45	Epibenthic Sled
14-Jun-06	PJ-5	15.5	8	39740	25.4	46	Epibenthic Sled
14-Jun-06	PJ-3	18.4	7.2	27990	17.3	6	Epibenthic Sled
14-Jun-06	PJ-2	18.5	6.8	27010	16.8	7	Epibenthic Sled
05-Jul-06	AK-3	17.4	4.5	35160	22.3	35	Epibenthic Sled
05-Jul-06	AK-2	16.6	4.5	35180	23.1	42	Epibenthic Sled
05-Jul-06	NB-6	15.4	4.2	38990	25	46	Epibenthic Sled
05-Jul-06	NB-5	15.4	4.2	39120	25	46	Epibenthic Sled
05-Jul-06	NB-4	23.8	4.7	17190	10.1	6	Epibenthic Sled
05-Jul-06	NB-3	23.8	4.7	17190	10.1	5	Epibenthic Sled
05-Jul-06	PJ-3	21.2	6.1	19290	11.5	8	Epibenthic Sled
05-Jul-06	PJ-1	21.3	5.1	19670	11.8	10	Epibenthic Sled
05-Jul-06	PJ-2	21.3	6.1	20520	11.8	6	Epibenthic Sled

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

06-Jul-06	LB-3	15.4	4.1	39970	25.5	14	Epibenthic Sled
06-Jul-06	LB-5	15.2	4	40290	25.8	16	Epibenthic Sled
06-Jul-06	LB-6	12.8	3.4	44580	28.8	39	Epibenthic Sled
06-Jul-06	LB-4	13.3	4.1	44070	28.3	32	Epibenthic Sled
06-Jul-06	LB-2	14.7	5.2	43840	26.5	47	Epibenthic Sled
06-Jul-06	LB-1	14.4	5.5	42650	27.5	12	Epibenthic Sled
06-Jul-06	SB-6	13.3	4.7	43610	28.2	43	Epibenthic Sled
06-Jul-06	SB-3	17.3	4.6	33050	20.6	16	Epibenthic Sled
06-Jul-06	SB-4	13.4	4.6	43310	28	39	Epibenthic Sled
07-Jul-06	PJ-4	14.3	6.2	19340	12	42	Epibenthic Sled
07-Jul-06	PJ-5	15.5	7.1	23200	14.2	43	Epibenthic Sled
07-Jul-06	SB-5	13.7	7.8	24000	14.7	48	Epibenthic Sled
07-Jul-06	SB-2	15.1	6.8	23400	14.4	25	Epibenthic Sled
07-Jul-06	SB-1	16.6	6.5	22650	13.6	20	Epibenthic Sled
17-Jan-06	LB-3	4.4	9.6	35950	22.2	21	Trawl
17-Jan-06	LB-5	4.8	9.3	37530	23.3	20	Trawl
17-Jan-06	LB-6	5.2	9.1	41710	26	45	Trawl
17-Jan-06	LB-4	6.7	8.4	47430	30.3	37	Trawl
17-Jan-06	LB-2	6.7	8.5	46850	30.2	51	Trawl
17-Jan-06	LB-1	6.4	8.2	38010	30.9	14	Trawl
17-Jan-06	SB-6	6	8.7	42750	27.1	51	Trawl
17-Jan-06	PJ-5	5.6	8.9	41640	26.2	46	Trawl
17-Jan-06	SB-5	5.8	8.9	42150	26.8	52	Trawl
19-Jan-06	AK-2	5.2	10.9	30720	18.8	43	Trawl
19-Jan-06	AK-3	4.8	10.8	27640	16.7	41	Trawl
19-Jan-06	NB-7	4.4	11.9	20660	11.6	5	Trawl
19-Jan-06	NB-6	5	9.8	28340	17.3	49	Trawl
19-Jan-06	NB-4	4.2	11.6	12750	7.2	6	Trawl
19-Jan-06	NB-3	4.2	11.6	12750	7.2	7	Trawl
19-Jan-06	NB-5	4.9	9.8	28440	17.4	39	Trawl
19-Jan-06	PJ-3	3.7	11.9	16600	9.7	7	Trawl
19-Jan-06	PJ-4	4	11.5	24150	14.4	44	Trawl
19-Jan-06	PJ-1	2.8	12.9	9450	5	8	Trawl
19-Jan-06	PJ-2	2.9	13.1	8050	4.4	7	Trawl
20-Jan-06	SB-1	4.3	10.6	24520	14.5	21	Trawl
20-Jan-06	SB-4	6.1	9	40640	25.6	39	Trawl
20-Jan-06	SB-3	4.9	10.2	30820	18.6	17	Trawl
24-Jan-06	LB-3	6.3	9.1	40580	25.6	17	Trawl
24-Jan-06	LB-5	6.2	9.4	40710	25.6	17	Trawl
24-Jan-06	LB-6	6.9	8.8	45700	28.8	42	Trawl
24-Jan-06	LB-4	6.9	8.9	47420	29.6	37	Trawl
24-Jan-06	LB-2	7.1	9.3	49640	32	52	Trawl
24-Jan-06	LB-1	6.1	10	42150	26.7	17	Trawl
24-Jan-06	SB-6	7	9	46230	29.6	49	Trawl
25-Jan-06	AK-2	6.1	10.2	35640	22.2	43	Trawl

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

25-Jan-06	AK-3	5.9	10	29580	21.6	37	Trawl
25-Jan-06	AK-7	5.7	10.1	28500	17.4	14	Trawl
25-Jan-06	NB-4	5	11.7	13900	8	6	Trawl
25-Jan-06	NB-3	5.1	11	17600	10.1	8	Trawl
25-Jan-06	NB-5	6.2	9.5	38050	23.7	39	Trawl
25-Jan-06	NB-6	6.2	9.5	38920	24.4	49	Trawl
26-Jan-06	PJ-5	6.6	9.5	44390	28.2	46	Trawl
26-Jan-06	PJ-3	4.2	11.2	27500	16.8	9	Trawl
26-Jan-06	PJ-4	6.6	8.8	44060	28	41	Trawl
26-Jan-06	PJ-1	4.2	11.6	25990	15.5	9	Trawl
26-Jan-06	PJ-2	4.8	11.1	30010	18.3	15	Trawl
27-Jan-06	SB-2	6.3	10.2	40790	25.7	29	Trawl
27-Jan-06	SB-1	6	10.6	42570	27.2	22	Trawl
27-Jan-06	SB-4	6.5	10	45600	28.6	39	Trawl
27-Jan-06	SB-3	5	11.4	36750	22.8	14	Trawl
27-Jan-06	SB-5	6.7	10	45260	28.8	54	Trawl
07-Feb-06	AK-2	5.7	11.4	29720	18.5	43	Trawl
07-Feb-06	AK-7	5.6	11.3	25000	15	10	Trawl
07-Feb-06	AK-3	5.6	11.1	28150	17.2	39	Trawl
07-Feb-06	NB-5	6	10.9	24950	15	39	Trawl
07-Feb-06	NB-3	5.8	11.6	16560	9.7	5	Trawl
07-Feb-06	NB-4	5.6	11.6	16000	9.2	7	Trawl
07-Feb-06	NB-6	5.9	10.7	33980	20.9	47	Trawl
07-Feb-06	PJ-3	4.6	12.4	19290	11.3	7	Trawl
08-Feb-06	LB-3	6	8.2	40950	25.8	13	Trawl
08-Feb-06	LB-5	6	9.2	43210	27.4	19	Trawl
08-Feb-06	LB-6	6.5	8.6	45710	29.3	39	Trawl
08-Feb-06	LB-4	6.7	8.4	46410	30.9	35	Trawl
08-Feb-06	LB-2	6.8	8.4	45690	30.7	50	Trawl
08-Feb-06	LB-1	6.7	8.5	45970	29.4	14	Trawl
08-Feb-06	SB-6	6.1	9.3	35230	22.1	49	Trawl
08-Feb-06	SB-5	5.2	10.1	28350	18.1	55	Trawl
09-Feb-06	PJ-5	6.6	9.2	47250	30.3	39	Trawl
09-Feb-06	PJ-4	6.6	8.3	46630	30	37	Trawl
09-Feb-06	PJ-1	4.3	10.6	23890	14.1	10	Trawl
09-Feb-06	PJ-2	6	9.1	37990	24	9	Trawl
09-Feb-06	SB-2	6.7	8.1	44650	28.4	26	Trawl
09-Feb-06	SB-1	6.2	8.8	39800	25	20	Trawl
09-Feb-06	SB-4	6.4	8.7	41700	26.3	39	Trawl
09-Feb-06	SB-3	5.6	9.6	33950	21	14	Trawl
21-Feb-06	LB-3	4.9	9.9	42720	26.5	12	Trawl
21-Feb-06	LB-5	4.7	10.2	43250	27.1	19	Trawl
21-Feb-06	LB-6	4.4	10.6	42850	26.7	44	Trawl
21-Feb-06	LB-4	4.3	11.4	36250	22.6	39	Trawl
21-Feb-06	PJ-3	4.5	11.1	34280	20.8	8	Trawl

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

21-Feb-06	PJ-4	5.7	9.6	43930	27.7	45	Trawl
21-Feb-06	PJ-1	4.6	10.5	36500	22.9	11	Trawl
21-Feb-06	PJ-2	4.5	10.7	33940	20.9	8	Trawl
22-Feb-06	AK-2	4.6	9.5	36570	22.8	44	Trawl
22-Feb-06	AK-3	4.5	8.6	34730	21.4	44	Trawl
22-Feb-06	AK-7	4.5	9.4	33400	20.8	13	Trawl
22-Feb-06	NB-3	4.5	9.8	30590	18.8	8	Trawl
22-Feb-06	NB-4	4.5	9.8	30590	18.8	8	Trawl
22-Feb-06	NB-5	4.8	9.5	36180	23.3	42	Trawl
22-Feb-06	NB-6	4.4	10.2	32150	19.8	51	Trawl
23-Feb-06	SB-5	5.5	9.4	45450	28.9	51	Trawl
23-Feb-06	SB-6	5.5	9.8	40400	26.5	50	Trawl
23-Feb-06	SB-3	4.9	10	36850	23.3	19	Trawl
23-Feb-06	SB-4	5.4	9.3	45190	28.7	41	Trawl
23-Feb-06	SB-1	5	9.5	38500	24.1	24	Trawl
23-Feb-06	SB-2	5.1	9.7	40990	25.7	29	Trawl
01-Mar-06	PJ-5	3.9	10	43720	27.5	39	Trawl
01-Mar-06	LB-2	4.6	9.8	47960	30.8	49	Trawl
01-Mar-06	LB-1	4.1	10.1	44660	28.2	11	Trawl
06-Mar-06	LB-3	3.7	11.5	42100	26.4	13	Trawl
06-Mar-06	LB-5	3.2	11.9	42020	26.3	17	Trawl
06-Mar-06	LB-6	3.3	11.5	45230	28.5	42	Trawl
06-Mar-06	LB-4	3.8	10.9	45210	28.6	35	Trawl
06-Mar-06	LB-1	4.1	10.9	45820	29.1	16	Trawl
06-Mar-06	LB-2	4.4	10.6	49250	31.4	46	Trawl
07-Mar-06	AK-2	3.8	11	35290	21.8	45	Trawl
07-Mar-06	AK-7	3.6	10.9	34610	21.1	19	Trawl
07-Mar-06	AK-3	3.6	10.7	33850	20.8	41	Trawl
07-Mar-06	NB-5	3.6	11.2	33590	20.6	49	Trawl
09-Mar-06	SB-3	4.1	13.3	37610	22.8	16	Trawl
09-Mar-06	SB-4	4.3	11.6	42010	26.5	34	Trawl
09-Mar-06	SB-1	4.2	11.1	41050	25.8	19	Trawl
09-Mar-06	SB-2	4.2	11.6	41490	25	24	Trawl
09-Mar-06	SB-5	4.5	10.7	46110	29.3	53	Trawl
09-Mar-06	PJ-5	4.4	10.9	45860	29	45	Trawl
09-Mar-06	PJ-4	4.5	11	45130	28.6	45	Trawl
09-Mar-06	PJ-1	4.3	12	33530	20.6	12	Trawl
09-Mar-06	PJ-3	4.4	12.4	31150	19.5	8	Trawl
10-Mar-06	PJ-2	4.4	14.1	32710	21	13	Trawl
10-Mar-06	NB-6	4.4	13.3	36230	22.4	48	Trawl
10-Mar-06	NB-4	5.3	13.5	30810	18.8	5	Trawl
10-Mar-06	NB-3	5.4	13.5	29560	18	5	Trawl
10-Mar-06	SB-6	4.9	12.9	43220	27.8	48	Trawl
20-Mar-06	LB-3	5.2	11.1	38250	24	18	Trawl
20-Mar-06	LB-5	4.9	11	38140	23.7	18	Trawl

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

20-Mar-06	LB-6	5.2	10.8	42450	26.9	40	Trawl
20-Mar-06	LB-4	5.1	10.9	40130	25.1	35	Trawl
20-Mar-06	LB-2	5.7	9.8	47050	29.7	51	Trawl
20-Mar-06	LB-1	5.2	10.5	43220	27.5	15	Trawl
20-Mar-06	SB-6	5.6	10	44350	27.9	42	Trawl
21-Mar-06	NB-5	5.5	10	35000	21.6	47	Trawl
21-Mar-06	NB-3	5.2	10.5	30600	18.7	8	Trawl
21-Mar-06	NB-4	5.1	10.5	29900	18.3	7	Trawl
21-Mar-06	AK-2	5.1	10.4	33600	20.7	46	Trawl
21-Mar-06	AK-3	5.4	10.3	32800	20.2	47	Trawl
21-Mar-06	AK-7	5.7	10.8	32800	20.3	14	Trawl
21-Mar-06	NB-6	5.3	9.8	34500	21.5	49	Trawl
22-Mar-06	SB-1	5.4	14.6	37650	23.5	19	Trawl
22-Mar-06	SB-2	5.4	11.5	38870	24.2	24	Trawl
22-Mar-06	SB-4	5.3	12	35410	22	37	Trawl
22-Mar-06	PJ-5	5.5	11	43370	27.4	45	Trawl
22-Mar-06	PJ-4	5.4	9.3	43740	27.7	49	Trawl
22-Mar-06	PJ-3	5.3	10.7	34050	21	9	Trawl
22-Mar-06	PJ-2	5.2	10.5	30670	18.7	7	Trawl
23-Mar-06	PJ-1	5	10.7	30550	19.1	7	Trawl
23-Mar-06	SB-3	5.3	10.3	36400	22.7	12	Trawl
23-Mar-06	SB-5	5.9	9.8	39260	24.6	49	Trawl
17-Apr-06	LB-3	9.9	9.6	40620	25.9	16	Trawl
17-Apr-06	LB-5	9.4	9.6	39820	25.3	21	Trawl
17-Apr-06	LB-6	9.9	9.8	39630	25.2	43	Trawl
17-Apr-06	LB-4	9.2	8.7	43120	27.7	37	Trawl
17-Apr-06	LB-2	8.4	8.5	47280	30.4	49	Trawl
17-Apr-06	LB-1	9	8.9	45070	29	16	Trawl
18-Apr-06	NB-4	11.4	8.2	31860	19.8	7	Trawl
18-Apr-06	AK-2	11.2	8.5	33250	20.7	47	Trawl
18-Apr-06	AK-7	12.4	9	33140	20.8	14	Trawl
18-Apr-06	AK-3	11.5	8.6	33070	20.7	39	Trawl
18-Apr-06	NB-5	11.1	8.5	32490	20.2	52	Trawl
18-Apr-06	NB-6	11.1	8.5	32490	20.2	42	Trawl
18-Apr-06	NB-3	11.4	8.2	31860	19.8	8	Trawl
19-Apr-06	SB-6	9.7	8.8	40830	25.9	46	Trawl
19-Apr-06	SB-3	10.2	8.7	37540	23.8	16	Trawl
19-Apr-06	SB-4	9.7	8.5	41070	26.1	39	Trawl
19-Apr-06	SB-1	10	8.5	38020	24.1	22	Trawl
19-Apr-06	SB-2	9.8	8.4	39600	25.1	29	Trawl
19-Apr-06	PJ-3	11.3	9.4	33640	21.3	10	Trawl
19-Apr-06	PJ-2	10.4	8.9	34070	21.3	10	Trawl
20-Apr-06	PJ-1	11	8.8	32800	20.9	10	Trawl
20-Apr-06	PJ-5	9.8	8.2	41480	26.4	46	Trawl
20-Apr-06	SB-5	10.6	8.7	36550	23.1	52	Trawl

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

20-Apr-06	PJ-4	9.8	8.3	42390	27.2	48	Trawl
16-May-06	PJ-2	14.5	7.2	30800	18.4	9	Trawl
16-May-06	PJ-3	14.5	7.1	30300	18.9	9	Trawl
16-May-06	NB-6	15	6.3	29170	18.1	54	Trawl
16-May-06	NB-5	15	6.3	29170	18.1	51	Trawl
16-May-06	NB-4	15.4	6.2	25310	15.5	9	Trawl
16-May-06	NB-3	15.4	6.2	25310	15.5	9	Trawl
16-May-06	AK-2	14.9	6.2	20020	18.7	43	Trawl
16-May-06	AK-3	15.4	6.2	28560	17.7	44	Trawl
17-May-06	LB-3	14.5	7.8	36550	23.2	17	Trawl
17-May-06	LB-5	14.5	7.4	36880	23.4	20	Trawl
17-May-06	LB-6	14.3	7.2	38450	25.5	43	Trawl
17-May-06	LB-4	13	7.1	42390	28.6	39	Trawl
17-May-06	LB-1	14	7.3	41990	27	15	Trawl
17-May-06	LB-2	12.6	8.1	45220	29.2	51	Trawl
17-May-06	SB-6	13.8	7.3	40660	26	47	Trawl
17-May-06	SB-5	13.8	7.1	39640	25.3	47	Trawl
18-May-06	SB-3	14.7	7.2	32760	20.5	15	Trawl
18-May-06	SB-4	14.2	7.5	37600	23.9	39	Trawl
18-May-06	SB-1	14.4	7.4	35750	22.6	21	Trawl
18-May-06	SB-2	14.4	7.2	36120	22.7	26	Trawl
18-May-06	PJ-1	15.1	7.7	29900	18.6	16	Trawl
18-May-06	PJ-4	14.3	7.3	37620	23.8	49	Trawl
18-May-06	PJ-5	14.3	8	38250	24.6	47	Trawl
12-Jun-06	LB-3	16.7	9.1	33800	21.3	17	Trawl
12-Jun-06	LB-5	16.3	7.6	36880	23.3	18	Trawl
12-Jun-06	LB-6	15.7	7.9	40450	25.9	42	Trawl
12-Jun-06	LB-4	14.9	7.6	41160	26.4	34	Trawl
12-Jun-06	LB-1	15.5	7.7	40120	25.8	11	Trawl
12-Jun-06	LB-2	13.4	7.3	44590	29	45	Trawl
12-Jun-06	SB-6	15.8	7.3	38190	24.3	42	Trawl
12-Jun-06	SB-3	17.1	6.3	31920	20	13	Trawl
13-Jun-06	AK-2	17.9	6.8	27810	16.6	45	Trawl
13-Jun-06	AK-3	18.3	6.8	26640	16.4	45	Trawl
13-Jun-06	NB-4	18.2	6.6	27200	16.8	10	Trawl
13-Jun-06	NB-3	18.3	6.8	26220	16.1	10	Trawl
13-Jun-06	NB-6	17.9	7.1	29000	18.2	49	Trawl
13-Jun-06	NB-5	17.9	7.1	29000	18.2	49	Trawl
13-Jun-06	PJ-1	17.6	7.2	31250	19.5	11	Trawl
13-Jun-06	SB-5	15.8	7.8	38580	24.7	51	Trawl
14-Jun-06	SB-1	16.5	7.3	35940	22.9	21	Trawl
14-Jun-06	SB-2	16.7	6.7	34770	22	26	Trawl
14-Jun-06	SB-4	16.1	7.6	37400	23.8	41	Trawl
14-Jun-06	PJ-4	16	7.9	39220	25	45	Trawl
14-Jun-06	PJ-5	15.5	8	39740	25.4	46	Trawl

Appendix C. Water quality data by date and station collected during the 2006 Aquatic Biological Survey. The following parameters were collected: Bottom water temperature (^{o}C), bottom water dissolved oxygen (DO, mg/L), bottom water conductivity (SPC@25^{o}C), bottom water salinity (ppt), and water depth (ft).

14-Jun-06	PJ-3	18.4	7.2	27990	17.3	6	Trawl
14-Jun-06	PJ-2	18.5	6.8	27010	16.8	7	Trawl