DREDGED MATERIAL MANAGEMENT PLAN
FISHERIES RESOURCES SURVEY FOR
NEW BEDFORD
FINAL REPORT

Prepared for
MASSACHUSETTS OFFICE OF
COASTAL ZONE MANAGEMENT
100 Cambridge Street
Boston, Massachusetts 02202

Prepared by

NORMANDEAU ASSOCIATES INC.
25 Nashua Road
Bedford, NH 03110-5500

17769.004

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1.0 INTRODUCTION

Fisheries and lobster sampling were conducted in New Bedford Harbor from June 1998 through May 1999 in support of the development of Dredged Material Management Plan. The purpose of these surveys was to provide data that can be used to evaluate the effects of dredging and aquatic disposal on fisheries resources.

2.0 METHODS AND MATERIALS

Fisheries sampling (seine and trawl) was conducted twice per month from June through October 1998, and May 1999 and once per month in November 1998 through April 1999 (Table 2-1) at three seine and five trawl stations. The gear and methods used in this project were developed in consultation with Massachusetts Division of Marine Fisheries to be consistent with previous studies including Fiske et al. (1968) and the Salem Sound 2000 project.

2.1 FISHERIES SAMPLING

A 50-foot seine with 3/16 inch delta mesh was used to sample the fish resources of the nearshore habitat (0-1 m) and a 30-foot trawl was used to sample deeper water (2-10 m) in New Bedford Harbor (Table 2-2). The trawl had 2-inch stretch mesh in the body and 1 ½-inch stretch mesh with a ¼-inch liner in the cod end to retain smaller fish. Sample locations (Figure 2-1) for each of these gears were fixed and located with differential GPS (Global Positioning System). To sample the nearshore habitat, the seine was positioned parallel to shore in approximately 1 m of water, and then hauled directly to shore covering a rectangular area. The deeper water habitat was sampled using the trawl towed for approximately 400 m. One seine or trawl sample was collected at each station. The location of the beginning and end of each trawl sample was recorded with differential GPS to verify sampling location throughout the program. No sampling occurred at Station NT3 in February due to bad weather.

Catch per unit effort (CPUE) was calculated as catch per haul for the seine. Tow length varied slightly in the trawl samples, and the CPUE was standardized to a 400 m tow length using the following method:

$$CPUE_{S,T} = (CATCH_{S,T}/TOW_T)\ 400$$

where,

$CPUE_{S,T}$ = Catch per unit effort for species S in sample T
$CATCH_{S,T}$ = Catch of species S in sample T
TOW_T = Tow length in m of sample T

Table 2-1. Sampling Dates for Fisheries Sampling in New Bedford Harbor, June 1998 Through May 1999.

Month	Date
June 1998	11, 23
July	8, 21
August	4, 18
September	1, 17
October	9, 20
November	12
December	10
January 1999	21
February	22
March	25
April	21
May	11, 25

Table 2-2. Specifications for Sampling Gear Used in the New Bedford Harbor Fisheries Investigations.

Seine		
	Length	50 ft.
	Height	4 ft.
	Mesh	3/16 in. square Delta 35
	Bag	4x4x6 ft.
Trawl		
	Foot rope length	30 ft.
	Head rope length	27 ft.
	Mesh size body cod end	 2 in. stretch mesh 1 ½ in. stretch mesh
	Cod end liner	¼ in. knotless
	Legs	5 ft.
	Doors	32x16 in. oak with steel runners

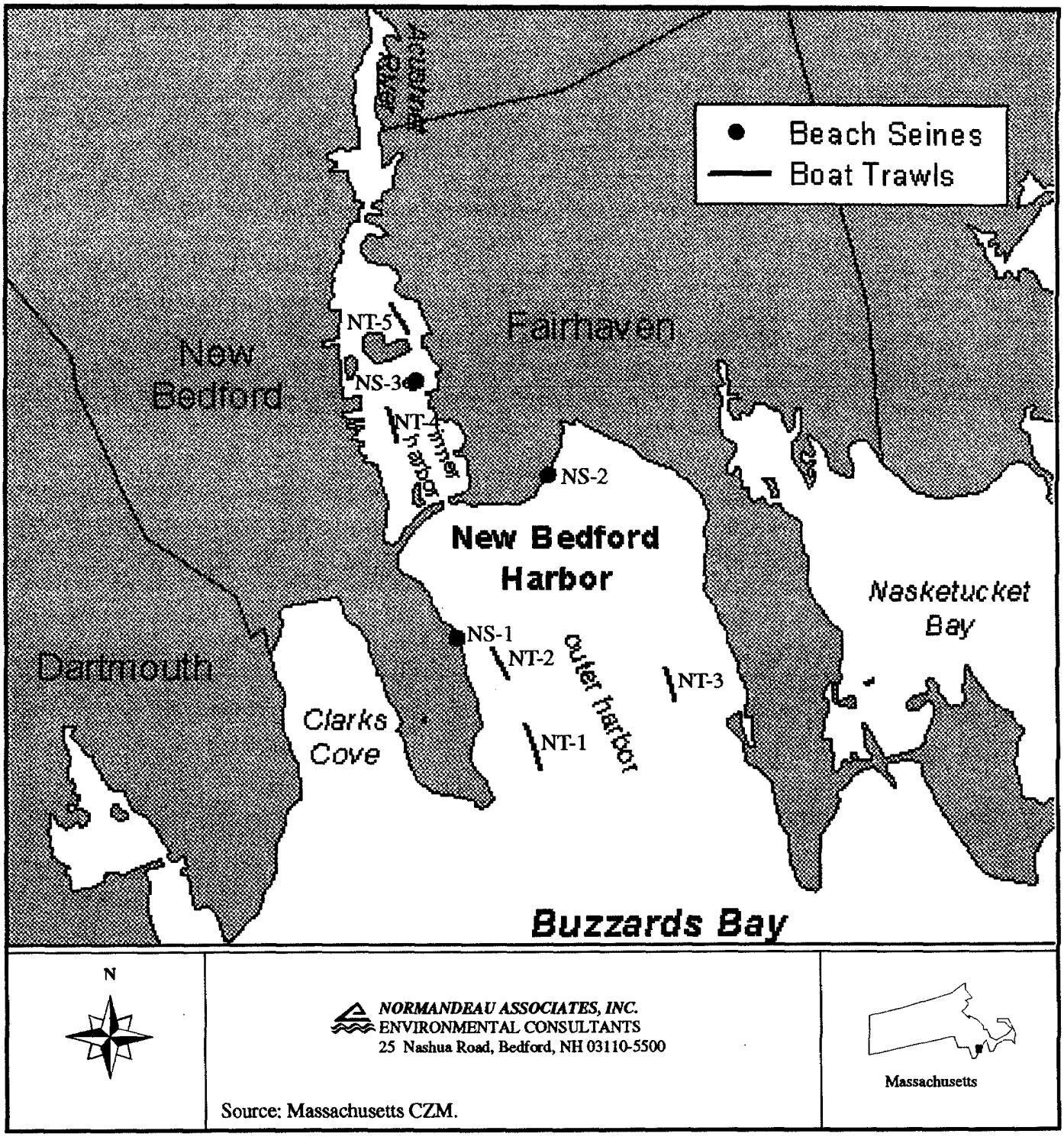

Figure 2-1. Location of fish sampling stations in New Bedford Harbor, June 1998 through May 1999.

For each seine and trawl sample, all fish were identified to species, counted and measured for total length to the nearest mm. Length frequency diagrams for scup, black sea bass and cunner captured at individual stations are presented as Appendix Figures 1-12. Total biomass of each species in each sample was measured to the nearest gram. Biomass data are presented in Appendix Tables 5 through 8 and 15 through 20. If catches were exceptionally large, the total count was estimated through volumetric subsampling, and a minimum of 20 fish were measured for total length to the nearest mm. Ages of fish were estimated based on their lengths. Fish less than one year old were termed young-of-the-year (YOY) and fish one year old were termed yearlings. Water temperature (°C) dissolved oxygen (mg/l), and salinity (ppt) were recorded at seine and trawl stations.

Catch data from each station (catch/haul for seine; catch/400 m tow for trawl) were $\log_{10}(x+1)$ transformed prior to the calculation of monthly and annual means. After means were calculated in the log scale, data were back transformed to the arithmetic scale for presentation as geometric means. Because catch data are presented in the arithmetic scale, the "total" rows on the CPUE tables may not equal the sum of the individual species. The $\log_{10}(x+1)$ data transformation and subsequent calculation of geometric means is appropriate for data sets with many zero catches, and a few samples with large catches (Green 1979). Geometric means tend to normalize data and de-emphasize large catches. As a result, they are usually smaller than arithmetic means calculated from the same data set.

3.0 RESULTS

Seine sampling occurred at three stations in New Bedford Harbor and described the nearshore fish community (0-1 m depth). Trawl sampling took place at five stations and described the deeper- water fish community in New Bedford Harbor (2-10 m depth). Descriptions of the habitat at each sampling station are provided in Table 3-1.

3.1 SEINE CATCHES

The seine catches in New Bedford Harbor were dominated by large catches of a few species and a few sampling events when no fish were captured. Atlantic silverside was the most common fish captured, accounting for 44% of the total catch (Table 3-2; page 6). Also numerically dominant were striped killifish (16%), mummichog (9%), cunner (7%), and winter flounder (6%).

Atlantic silverside occurred every month except January and February (Table 3-2) and YOY 50-60 mm in length first appeared in seine catches in June and July. Striped killifish occurred in seine samples in July through December (Table 3-2), especially at Station NS2. YOY were first recruited to the seine in late July at lengths less than 40 mm. Recruitment continued throughout the summer as small striped killifish (<40 mm) were captured in every sampling event. Mummichog are a common shore-zone fish in Atlantic Coast estuaries, and flooded salt marsh and mud flats are important habitats for foraging (Halpin 1997; Javonillo 1997). Mummichog occurred in June through September (Table 3-2) and were most common at Station NS2, which was proximal to a salt

marsh. Mummichog less than 50 mm were recruited to the seine throughout the summer. Cunner were present in the shore zone from June through September, November and May (Table 3-2). They were most common at Station NS2 and a large catch (n=89) was made in November (Appendix Table 3). Winter flounder occurred in June through September, November and May (Table 3-2), and were most common at Station NS3 in the Inner Harbor.

When data from all stations are combined, variations in the abundance of the most common fish, Atlantic silverside, was the primary factor in the seasonality of shore zone fish community (Table 3-2). Geometric monthly mean CPUE increased from June to July and peaked in August due to large catches of Atlantic silverside (all stations) and Atlantic menhaden (Station NS1; Appendix Table 2). Monthly mean CPUE was relatively consistent in September through November, and began to decrease in December. No fish were captured in January and February. In March through May monthly mean CPUE began to increase as Atlantic silverside and winter flounder began to appear in the catch.

3.1.1 Station NS1

Station NS1 was located in the South End of New Bedford near the ferry dock landing (Figure 2-1). Annual geometric mean CPUE ranked second among the three stations and was dominated by Atlantic silverside (Table 3-3). Atlantic menhaden, striped killifish, bluefish, and northern puffer also made substantive contributions to the total mean CPUE. Monthly geometric mean CPUE was highest in August and November due to large catches of YOY Atlantic silverside between 50 and 90 mm in August and November and YOY Atlantic menhaden between 40 and 80 mm in August. No fish were captured in January through March. Striped killifish

Table 3-1. Descriptions of Sampling Stations in New Bedford Harbor.

Station	Location	Depth (m)	Substrate	Comments
NS1	Ferry Dock	—	sand	moderate slope, *Crepidula* shells
NS2	East of Fort Phoenix	—	sand, rocks	saltmarsh nearby
NS3	NE side of Crow Island	—	sand	steep slope
NT1	South of lighthouse	7-8	silt-sand	shells present
NT2	North of lighthouse	5-6	silt-sand	*Codium* and red filamentous algae
NT3	East side of harbor	7-8	silt, sand, shells	some *Codium* present
NT4	Inner Harbor	8-9	soft anaerobic silt	*Ulva* and *Agarum* present
NT5	North of Popes Island	2-3	shells and gravel over sand and silt	*Ulva* present

Table 3-2. Geometric mean catch per unit effort (catch/haul) for seine samples at all stations combined (n=54) in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic silverside	5.89	19.10	33.69	6.36	16.82	5.69	0.26	0.00	0.00	0.26	1.84	2.27	3.46	0.43	43.63
Cunner	0.12	0.20	0.20	0.57	0.00	6.11	0.00	0.00	0.00	0.00	0.00	0.20	0.29	0.17	7.48
Mummichog	1.31	1.74	2.64	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.15	8.74
Striped killifish	0.00	1.46	2.74	7.01	2.85	1.00	0.26	0.00	0.00	0.00	0.00	0.00	0.73	0.23	15.97
Winter flounder	0.26	0.70	0.51	0.51	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.47	0.24	0.07	6.25
Other Species	0.89	2.62	25.22	3.31	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.65	0.85	0.33	17.94
Total	11.14	38.09	207.39	22.46	26.68	34.32	0.59	0.00	0.00	0.26	1.84	5.29	7.11	0.66	100.00

Table 3-3. Geometric mean catch per unit effort (catch/haul) for seine samples (n=18) at Station NS1 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	131.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	11.16
Atlantic silverside	0.73	15.03	122.83	1.00	12.04	49.00	0.00	0.00	0.00	0.00	22.00	2.74	4.19	0.64	45.17
Bluefish	0.00	3.00	4.10	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.20	9.26
Northern puffer	0.00	1.45	5.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.18	6.32
Striped killifish	0.00	0.00	0.73	0.00	3.69	7.00	1.00	0.00	0.00	0.00	0.00	0.00	0.50	0.23	11.12
Other Species	1.24	1.45	10.14	3.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	2.46	0.86	0.25	16.98
Total	2.87	27.88	716.97	5.48	15.25	57.00	1.00	0.00	0.00	0.00	22.00	11.96	8.03	0.77	100.00

occurred in August and October through November, and were primarily YOY and yearling fish less than 80 mm. Bluefish occurred only in July through September and these were YOY fish less than 160 mm. YOY northern puffer occurred in July and August at lengths less than 50 mm.

3.1.2 Station NS2

Station NS2 was located to the east of Fort Phoenix on a sandy shallow beach (Figure 2-1). Annual geometric mean CPUE was highest at this station and Atlantic silverside was the dominant species (Table 3-4). Striped killifish, mummichog, cunner, and black sea bass were the remaining dominant fishes at this station. Monthly geometric mean was highest in August and September due to large catches of mummichog in August and striped killifish in September. No fish were captured in January, February, and April. Atlantic silverside occurred in every month except January, February and April, but were most common in June and September. In June these fish were between 80 and 132 mm and were probably yearlings. In September, YOY fish less than 60 mm predominated. YOY and yearling striped killifish were common in July and August with very high catches occurring in September. Mummichog only occurred in June through September and YOY and yearling age groups comprised the catch. Cunner were captured in August and September with high catches of YOY less than 50 mm occurring in November. YOY black sea bass less than 30 mm were captured in August and September.

3.1.3 Station NS3

Station NS3 was located on the northeast side of Crow Island in the Inner Harbor (Figure 2-1). Annual geometric mean CPUE was lowest at this station among the three stations. As with the other stations, Atlantic silverside was the most common fish (Table 3-5). Striped killifish, winter flounder, cunner, and northern kingfish were also dominants. Monthly geometric mean CPUE was highest in August and October due to large catches of Atlantic silverside. No fish were captured in December through April. Atlantic silverside occurred only in June through October. In June yearling fish greater than 100 mm were present, but by July, YOY less than 50 mm were recruited to the seine. In August through October both age groups were present with YOY more predominant. Striped killifish were captured in August through October. YOY fish less than 50 mm were present each month, and yearling fish greater than 70 mm occurred in September and October. YOY winter flounder less than 71 mm were captured in July through September and November. Cunner occurred sporadically in June, July and November. In June and July all cunner were YOY less than 30 mm.

Table 3-4. Geometric mean catch per unit effort (catch/haul) for seine samples (n=18) at Station NS2 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic silverside	31.85	13.42	4.29	31.74	9.95	5.00	1.00	0.00	0.00	1.00	0.00	8.38	3.92	0.46	33.37
Black sea bass	0.00	0.00	10.49	3.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.26	6.83
Cunner	0.00	0.00	0.73	1.24	0.00	89.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.45	10.21
Mummichog	6.07	19.49	47.06	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.49	17.86
Striped killifish	0.00	13.93	12.45	108.39	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.49	0.57	19.14
Other Species	1.00	1.83	24.48	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.83	0.32	12.60
Total	45.64	49.97	185.95	182.50	17.97	94.00	1.00	0.00	0.00	1.00	0.00	12.56	10.89	0.83	100.00

Table 3-5. Geometric mean catch per unit effort (catch/haul) for seine samples (n=18) at Station NS3 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic silverside	4.74	34.10	62.71	5.08	38.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.47	0.63	54.10
Cunner	0.41	0.73	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.08	5.75
Northern kingfish	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	3.24
Striped killifish	0.00	0.00	1.24	3.69	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.19	14.02
Winter flounder	0.00	0.73	0.73	0.41	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.16	11.72
Other Species	2.87	0.41	0.00	0.41	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.41	0.29	0.13	11.17
Total	8.90	39.58	66.42	9.86	67.78	7.00	0.00	0.00	0.00	0.00	0.00	0.41	3.97	0.66	100.00

3.2 TRAWL CATCHES

Catches in the trawl were dominated by scup (23%), cunner (21%), winter flounder (13%), black sea bass (9%), and northern pipefish (6%) (Table 3-6; page 13). Descriptions of the habitat at each station are found in Table 3-1.

The fish community of New Bedford Harbor sampled by the trawl differed among the stations. Stations NT1, NT2, NT3, and NT4 were all dominated by either scup or cunner, with black sea bass also contributing to the catch. Catches were lower at Station NT5, located farthest upriver, and the community was dominated by winter flounder, seaboard goby, and Atlantic silverside. At each station, single large catches of some of the less abundant species affected the total annual catch. Atlantic herring was the fourth most common fish at Stations NT1 and NT4, but this ranking was due to single large catches only in March. Similarly, there were large catches of Atlantic silverside in December and March at Station NT2 and in March at Station NT3.

When data from all stations are combined, the recruitment patterns of scup, cunner, and black sea bass were the important factors determining the patterns of monthly abundances of the deeper- water fish community of New Bedford Harbor. Monthly geometric mean CPUE was highest in August and September (Table 3-6) due to the recruitment of YOY scup less than 79 mm, and black sea bass less than 49 mm (Figures 3-1, 3-2).

When sampling started in June of 1998, yearling scup (110-129 mm) were present at Stations NT1 and NT2 (Appendix Figures 1 and 2). Yearling scup did not appear at Station NT3 until July (Appendix Figure 3). In August, there was a major recruitment event of YOY scup (<49 mm) at all stations except NT5. YOY scup dominated the catch until November, when catches of all ages decreased to near zero (Figure 3-1).

YOY black sea bass less than 30 mm were first recruited to the trawl in August and September (Figure 3-2). By October, the smallest black sea bass were between 40 and 49 mm indicating either recruitment of slightly larger fish, or growth of fish recruited in August and September. Although cunner were an important part of the fish community of New Bedford Harbor, there was no large, single pulse of recruitment. In contrast to scup and black sea bass, recruitment of YOY cunner took place over a longer time period, from July through November (Figure 3-3). The extended recruitment period for cunner is a reflection of its longer spawning season, compared to scup and black sea bass.

3.2.1 Station NT1

Station NT1 was located off the South End, south of the lighthouse (Figure 2-1). Annual geometric mean CPUE (22.28/trawl) ranked second among the five stations, and the catch was dominated by scup, black sea bass, cunner, Atlantic herring, and butterfish (Table 3-7; page 13). Monthly geometric mean CPUE was highest in July through September due to large catches of scup,

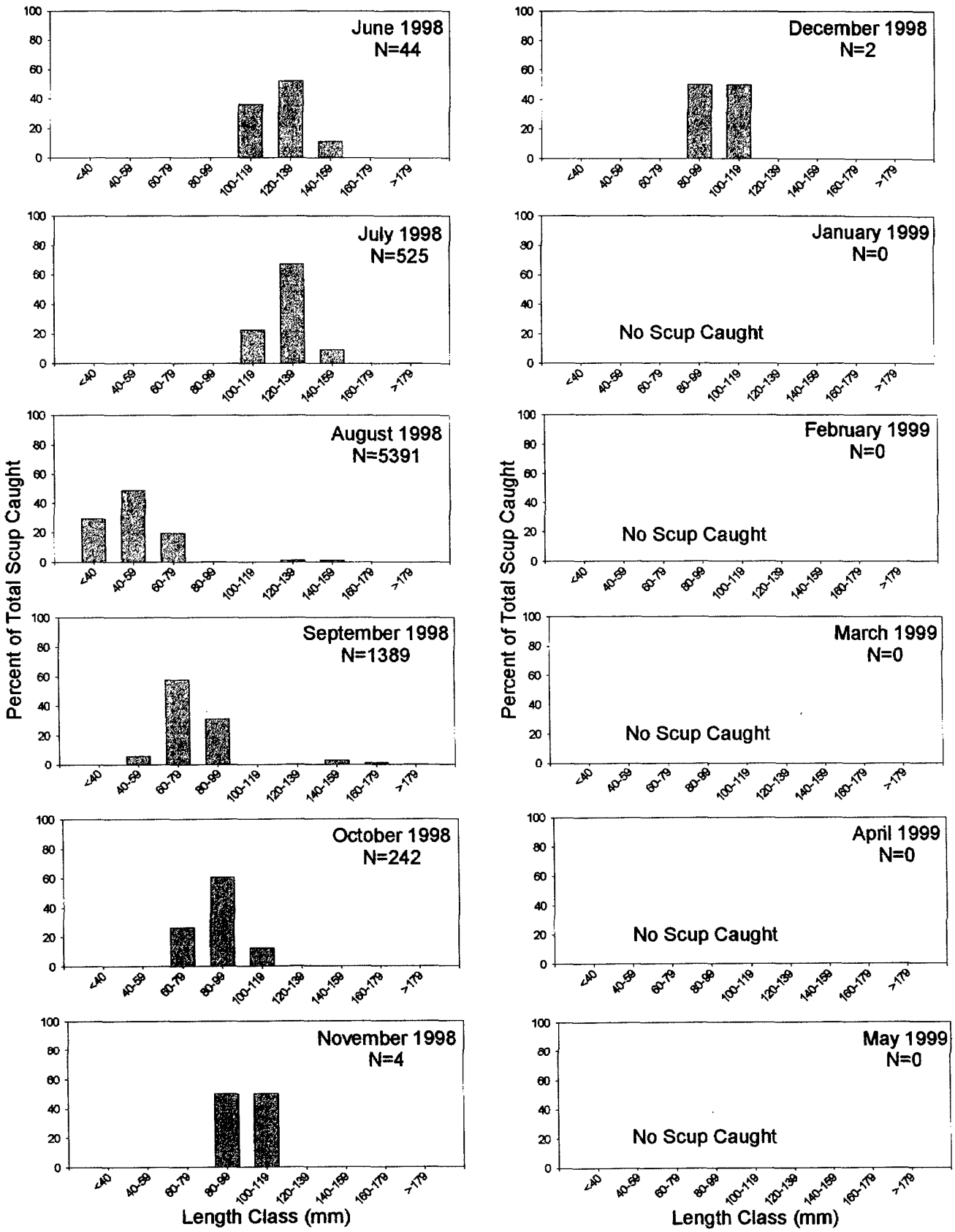

Figure 3-1. Length-frequency diagram for scup captured in the trawl at all stations combined in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).

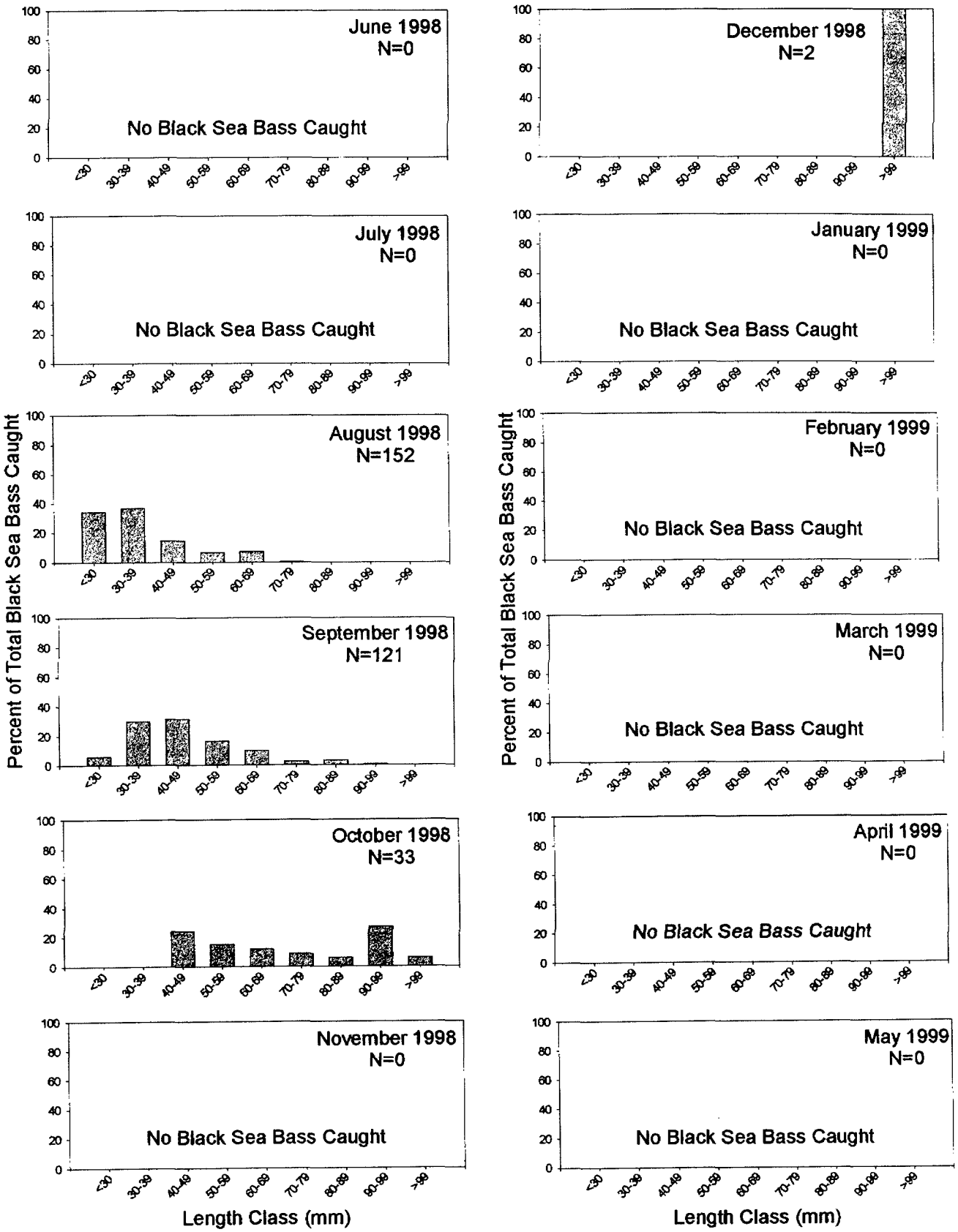

Figure 3-2. Length-frequency diagram for black sea bass captured in the trawl at all stations combined in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).

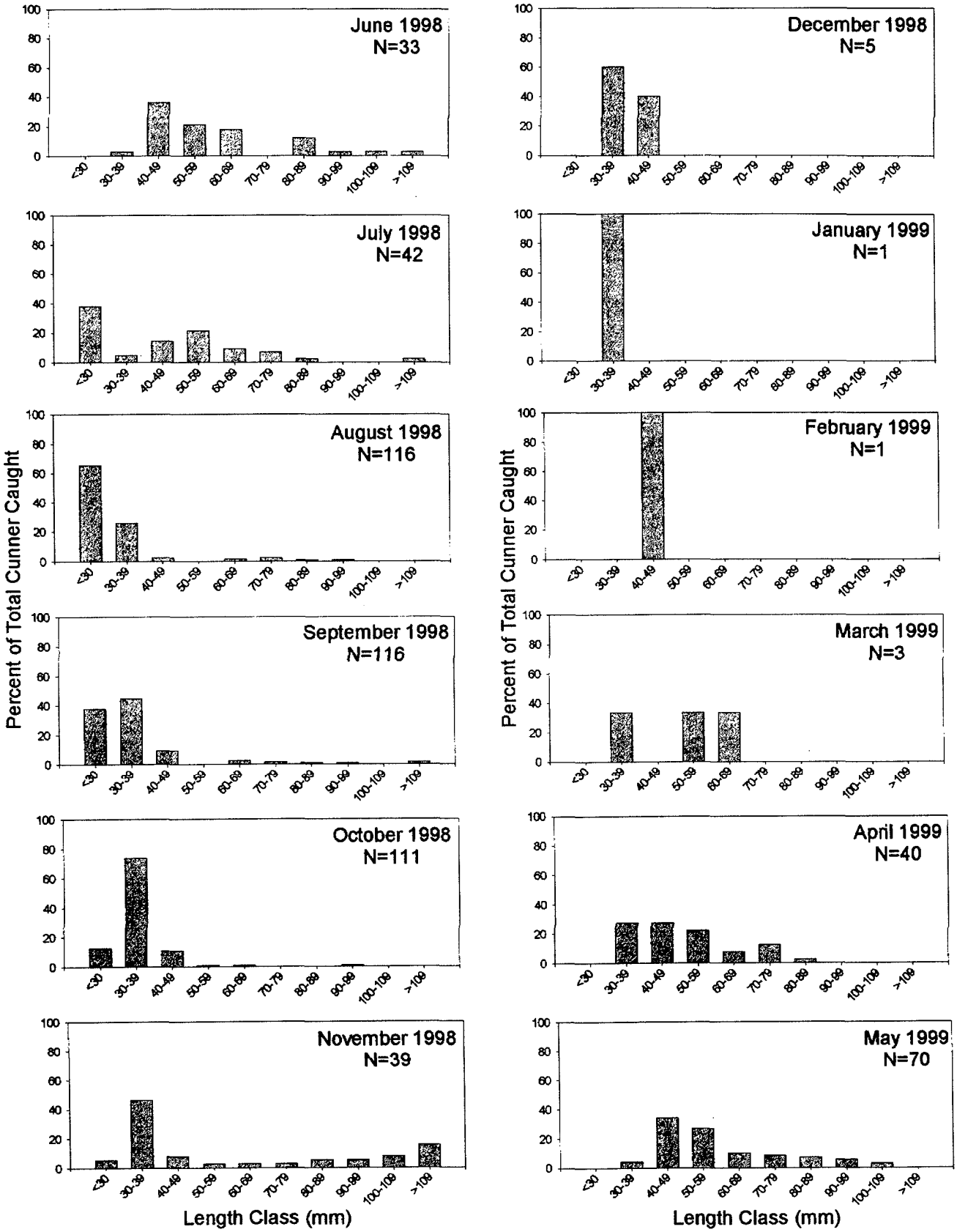

Figure 3-3. Length-frequency diagram for cunner captured in the trawl at all stations combined in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).

Table 3-6. Geometric mean catch per unit effort (catch/400-m tow) for trawl samples at all stations combined (n=89) in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Black sea bass	0.00	0.00	6.73	5.44	1.95	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.54	0.25	9.10
Cunner	1.90	1.51	5.68	1.94	2.80	3.07	0.58	0.15	0.19	0.43	3.72	3.45	1.69	0.18	20.77
Northern pipefish	0.11	0.00	1.57	0.39	0.61	0.58	0.42	0.00	0.00	0.32	0.63	0.00	0.33	0.09	6.00
Scup	0.82	9.83	61.71	52.71	4.76	0.38	0.24	0.00	0.00	0.00	0.00	0.00	2.05	0.58	23.43
Winter flounder	1.02	0.58	0.60	0.47	0.88	0.52	0.66	0.51	0.41	1.60	1.27	1.91	0.82	0.07	12.54
Other Species	1.05	2.41	6.43	4.98	1.98	0.64	2.97	1.66	0.68	59.43	1.04	1.96	2.83	0.33	28.17
Total	7.58	22.45	189.81	82.62	32.52	6.47	8.08	2.67	1.45	70.44	9.01	11.00	15.95	0.46	100.00

Table 3-7. Geometric mean catch per unit effort (catch/400-m tow) for trawl samples (n=18) at station NT1 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	169.76	0.00	0.00	0.63	0.53	8.57
Black sea bass	0.00	0.00	16.20	30.27	2.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.43	11.27
Butterfish	0.00	3.50	1.59	29.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.35	8.62
Cunner	0.73	0.98	2.26	1.21	0.00	0.00	0.00	0.00	0.00	0.98	4.88	4.09	0.84	0.21	10.72
Scup	4.61	166.63	1331.6	244.55	86.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.40	1.21	35.31
Other Species	4.80	5.92	6.22	9.24	3.43	0.00	1.90	0.00	1.00	21.46	1.95	5.78	3.25	0.31	25.51
Total	16.82	178.73	1376.9	318.39	93.25	0.00	1.90	1.00	1.00	192.20	6.83	9.83	22.28	0.99	100.00

and in March due to a large catch of Atlantic herring. No fish were captured in November, and catches were low from November through February.

In June and July yearling scup (100-159 mm) were present in the trawl catches (Appendix Figure 1). In August YOY scup less than 40 mm were first recruited to the trawl. Black sea bass were first recruited to the trawl in August at lengths less than 30 mm (Appendix Figure 5). The highest CPUE occurred in August and September, and these were almost exclusively YOY fish. By November these fish were no longer captured and had presumably moved offshore to deeper water. Cunner were present from June through September, and March through May with the highest abundances in April and May (Table 3-7). YOY cunner less than 30 mm were first recruited in August (Appendix Figure 9). A large single catch of YOY Atlantic herring (<75 mm) was made in March, and no herring were captured at any other time. Butterfish occurred from July through September with the highest catches occurring in September. In July YOY less than 60 mm were captured, and by September these fish were generally less than 80 mm.

3.2.2 Station NT2

Station NT2 was located off the South End, but north of the lighthouse (Figure 2-1). Large amounts of *Codium* spp. were often present in the catch along with other red and green filamentous algae. Annual geometric mean CPUE (21.64/trawl) ranked third among the stations, and cunner was the most common fish captured (Table 3-8). Scup, Atlantic silverside, black sea bass, and northern pipefish also made significant contributions to the total catch. Monthly geometric mean CPUE was highest in August and September due to large catches of scup.

Cunner occurred in every month except January and March, and were most common in August through November and May. YOY cunner less than 30 mm were present in the catch in July through November, indicating a prolonged spawning season, and continued recruitment (Appendix Figure 10). Scup occurred in June through October. Yearling scup were present in the catch until August when YOY scup less than 40 mm were recruited to the trawl (Appendix Figure 2). Atlantic silverside only occurred in December and March at lengths between 75 and 110 mm. Black sea bass were captured in August through October. YOY less than 49 mm were common in August and September (Appendix Figure 6). Northern pipefish occurred sporadically in August, November, and April.

3.2.3 Station NT3

Station NT3 was located in the east side of New Bedford Harbor (Figure 2-1). Annual geometric mean CPUE (17.69/trawl) ranked fourth among the five stations, and the catch was dominated by cunner, scup, black sea bass, Atlantic silverside, and winter flounder (Table 3-9). Monthly geometric mean CPUE was highest in August and September due to large catches of scup and black sea bass.

Table 3-8. Geometric mean catch per unit effort (catch/400-m tow) for trawl samples (n=18) at station NT2 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	22.44	0.00	0.00	20.00	0.00	0.00	0.68	0.42	10.30
Black sea bass	0.00	0.00	5.29	3.17	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.21	7.05
Cunner	2.00	0.95	25.70	25.66	45.17	21.00	0.98	0.00	1.00	0.00	1.00	22.44	4.51	0.53	34.03
Northern pipefish	0.00	0.00	3.05	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.26	0.14	4.63
Scup	2.61	52.24	81.19	112.61	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.55	0.74	25.27
Other Species	1.00	0.96	2.83	2.11	1.80	0.00	0.00	0.98	1.00	16.00	2.00	1.95	1.56	0.23	18.72
Total	6.35	55.27	249.22	207.55	52.66	22.00	23.41	0.98	2.00	36.00	4.00	24.47	21.64	0.56	100.00

Table 3-9. Geometric mean catch per unit effort (catch/400-m tow) for trawl samples (n=17) at station NT3 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb[a]	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	.	27.00	0.00	0.00	0.54	0.37	8.69
Black sea bass	0.00	0.00	21.72	19.30	1.65	0.00	0.00	0.00	.	0.00	0.00	0.00	0.91	0.45	13.09
Cunner	10.58	14.08	5.36	0.00	7.68	2.00	4.00	1.00	.	2.00	6.00	1.00	3.41	0.29	30.05
Scup	0.00	15.72	463.24	107.59	1.43	0.00	0.00	0.00	.	0.00	0.00	0.00	2.75	0.95	26.77
Winter flounder	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	.	1.00	4.00	1.00	0.35	0.17	6.15
Other Species	0.00	0.39	4.50	1.95	1.43	0.00	3.00	2.00	.	0.00	2.00	1.00	1.12	0.20	15.25
Total	10.58	29.96	536.56	129.42	13.30	2.00	7.00	6.00	.	30.00	12.00	3.00	17.69	0.59	100.00

[a] No samples collected due to bad weather.

Cunner were captured every month sampling occurred except September (Table 3-9). Catches were highest in June and July, and YOY fish less than 30 mm were first recruited in July (Appendix Figure 11). Scup occurred in July through October, and large catches were made in August and September. Prior to August yearling scup were present, and in August through October YOY scup less than 59 mm were recruited (Appendix Figure 3). Black sea bass were captured in August through October. YOY black sea bass less than 59 mm were present in August and September (Appendix Figure 7). Atlantic silverside were only captured in January and March and these fish were primarily between 80 and 123 mm. These fish were probably a mixture of YOY and yearlings. Yearling and older winter flounder were captured in September and March through May.

3.2.4 Station NT4

Station NT4 was located in the Inner Harbor, to the east of the New Bedford docks. Annual geometric mean CPUE (25.47/trawl) was highest at this station, and the catch was dominated by cunner, scup, northern pipefish, Atlantic herring, and winter flounder (Table 3-10). Monthly geometric mean CPUE was highest in March due to a very large catch of Atlantic herring (n=1,468), and in September due to large catches of scup.

Cunner were captured every month except December through March, and CPUE was highest in November and April (Table 3-10). YOY cunner less than 39 mm were recruited to the trawl in July through September, and in April (Appendix Figure 12). Scup were captured in August through December with the highest CPUE occurring in September (Table 3-10). YOY scup less than 40 mm were first captured in August, and catches of older scup were very low (Appendix Figure 4).

Northern pipefish occurred every month except July, January, February, and May, and the highest CPUE occurred in August through November (Table 3-10). The majority of the northern pipefish captured were greater than 100 mm. A large catch of Atlantic herring occurred in March (n=1,468) with a smaller catch in January (Table 3-10). These fish were all YOY less than 50 mm. Winter flounder were captured every month except November and December, with the highest CPUE occurring in June and July. YOY winter flounder less than 45 mm were recruited to the trawl in June.

Although not among the five most abundant fishes at Station NT4, black sea bass were recruited to the trawl in August at less than 30 mm (Appendix Figure 8). This was the only month small black sea bass were recruited, and by November, most had presumably move to deeper water.

3.2.5 Station NT5

Station NT5 was located in the Inner Harbor north of Popes Island (Figure 2-1). Annual geometric mean (5.08/trawl) was the lowest at this station among the five stations (Table 3-11). Winter flounder was the dominant fish followed by seaboard goby, Atlantic silverside, bay anchovy,

Table 3-10. Geometric mean catch per unit effort (catch/400-m tow) for trawl samples (n=18) at station NT4 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	1468.0	0.00	0.00	1.18	0.85	12.58
Cunner	2.38	0.70	9.84	2.74	0.99	16.00	0.00	0.00	0.00	0.00	27.32	2.46	2.10	0.40	18.20
Northern pipefish	0.69	0.00	5.39	4.20	3.44	4.00	1.90	0.00	0.00	1.00	1.95	0.00	1.30	0.23	13.38
Scup	0.00	0.00	18.08	103.92	12.26	4.00	1.90	0.00	0.00	0.00	0.00	0.00	1.92	0.57	17.26
Winter flounder	4.13	4.04	0.41	0.73	0.41	0.00	0.00	1.00	1.00	1.00	0.98	2.81	1.04	0.17	11.52
Other Species	1.75	16.41	23.16	10.40	8.07	1.00	1.90	3.00	0.00	15.00	0.98	5.58	4.37	0.34	27.07
Total	9.23	21.63	57.66	121.70	26.81	25.00	5.71	11.00	1.00	1485.0	31.22	11.69	25.47	0.61	100.00

Table 3-11. Geometric mean catch per unit effort (catch/400-m tow) for trawl samples (n=18) at station NT5 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic silverside	0.00	0.00	6.18	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.18	8.05
Bay anchovy	0.00	0.00	3.90	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.15	6.46
Seaboard goby	0.00	0.00	0.00	0.00	0.00	5.00	2.86	0.00	0.00	0.00	0.00	0.00	0.30	0.20	9.52
Windowpane flounder	0.00	0.00	0.00	0.41	1.40	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.17	0.09	5.73
Winter flounder	1.65	0.00	3.31	0.99	15.73	7.00	11.43	1.00	1.00	2.79	5.13	8.49	3.23	0.28	52.49
Other Species	0.73	0.00	6.43	0.41	1.40	0.00	0.00	0.00	1.00	1.86	0.00	0.41	0.63	0.19	17.76
Total	2.00	0.00	22.26	2.84	20.05	12.00	15.24	1.00	2.00	4.65	5.13	9.25	5.08	0.33	100.00

and windowpane. Monthly geometric mean CPUE was highest in August and October due to large catches of Atlantic silverside in August and winter flounder in October.

Winter flounder were captured every month except July, and were most abundant in October through December. There was little evidence of significant recruitment of YOY winter flounder, with the exception of November when fish less than 100 mm were captured. Seaboard goby, all less than 52 mm, were captured only in November and December. Atlantic silverside were captured only in August and October. These fish were YOY less than 86 mm with fish as small as 27 mm occurring in August. Bay anchovy were captured in August and September, and these fish were primarily YOY less than 30 mm. Windowpane occurred in September, October and December. These fish were a mixture of YOY and yearlings.

3.3 WATER QUALITY

Water temperature (°C), salinity (ppt), and dissolved oxygen (mg/l) data were collected during most sampling efforts from June 1998 through May 1999 (Table 3-12). At both seine and trawl stations, water temperature followed a predictable seasonal pattern . Water temperatures were highest in August and lowest in January. Salinity did not vary much among months or stations, but was generally lowest at Station NT5, located furthest upriver. Salinity was near oceanic and ranged from 25.0 ppt to 31.4 ppt, a reflection of the limited freshwater input from the Acushnet River to New Bedford Harbor. Dissolved oxygen ranged from 7.9 mg/l to 13.5 mg/l for the months sampled. These levels were near saturation and were not limiting to fish distribution.

4.0 DISCUSSION

4.1 SEINE

Seine sampling described the shallow-water fish community of New Bedford Harbor. This community was dominated by Atlantic silverside, striped killifish, and mummichog.
There were few major differences in the fish community among the three seine stations. Atlantic silverside was the most common fish at all stations, and striped killifish ranked either second (NS2, NS3) or third in abundance. A single large catch of Atlantic menhaden in August (Appendix Table 2) distinguished Station NS1 from the other stations, along with the relatively large contributions of bluefish and northern puffer. Cunner were among the dominants at Stations NS2 and NS3, while mummichog and black sea bass were dominants only at NS2. Winter flounder and northern kingfish were among the dominant fish species only at Station NS3.

The recruitment and movements of YOY fishes that use the shore zone as nursery habitat was a large influence on the seasonality of the nearshore fish community. YOY Atlantic silverside typically spawn from May through July and grow rapidly until winter when they become rare in the shore zone (Conover and Ross 1982). Atlantic silverside apparently migrate offshore in the winter (Conover and Murawski 1982) and mortality during this period can be high (Conover and Ross

Table 3-12. Water Quality Data for Fisheries Sampling in New Bedford Harbor June 1998 through May 1999[a].

Station	Parameter	Jun	Jul	Aug	Sep	Oct[b]	Nov	Dec[b]	Jan	Feb	Mar	Apr	May
NS1	Temperature (°C)	18.1	23.2	23.5	22.2	16.9	9.3	8.1	1.6	1.7	6.0	9.9	14.5
	Salinity (ppt)					25.0	31.2		29.8	29.8	30.0	30.4	30.2
	D. O. (mg/l)					8.3	10.2		11.9	11.9	10.6	9.5	
NS2	Temperature (°C)	19.0	19.5	24.4	22.1	16.9	9.4	6.7		0.6	6.4	10.3	13.7
	Salinity (ppt)					30.1	31.2			30.1	30.2	30.5	30.8
	D. O. (mg/l)					8.1	9.0			12.8	10.8	9.6	
NS3	Temperature (°C)	18.2	22	25.5	22.5	17	9.1	7.6	1.6	2.4	7.3	10.3	13.4
	Salinity (ppt)					27.1	30.0		29.8	29.2	26.7	29.4	30.7
	D. O. (mg/l)					7.9	9.1		11.9	12.2	10.8	10.4	
NT1	Temperature (°C)	19	20.7	22.6	21.6	16.2	9.6	8.5	2.4	2.9	4.9	9.4	13.0
	Salinity (ppt)						31.4		31.2	30.6	30.8	30.9	31.0
	D. O. (mg/l)						9.1		11.6	13.0	10.6	9.6	
NT2	Temperature (°C)	19	21.4	23.7	22.7	16	9.5	8.5	2.5	2.9	5.3	9.8	13.5
	Salinity (ppt)						31.3		31.0	30.6	30.2	30.7	30.8
	D. O. (mg/l)						9.2		12.7	12.8	10.9	10.0	
NT3	Temperature (°C)	19.9	19.3	21.8	21.8	16.1	9.6	8.7	2.5		4.9	9.2	10.9
	Salinity (ppt)						31.3				30.8	31.0	31.2
	D. O. (mg/l)						9.6				10.8	10.3	
NT4	Temperature (°C)	17.1	18.4	24	21.3	16	9.6	8.5	2.5	2.9	5.4	10.2	14.6
	Salinity (ppt)						30.8		30.4	29.8	30.0	30.4	29.7
	D. O. (mg/l)						8.8		12.2	13.5	10.5	10.3	
NT5	Temperature (°C)	19.2	19.4	25.8	23.5	16.3	9.5	8.0	2.6	2.9	6.9	10.7	15.9
	Salinity (ppt)						29.8		29.2	29.2		29.8	28.9
	D. O. (mg/l)						9.0		12.0	12.5		10.6	

[a] Salinity and dissolved oxygen not requested to be collected until October
[b] Water quality meter malfunctions in October and December

1982). CPUE of silverside decreased as the fish moved to deeper water and offshore as water temperatures decreased. Striped killifish and mumichog were common in August, and September, and YOY and yearling appeared to be dominant. Similar, to silversides, both striped killifish and mummichog appeared to move to deeper water in response to decreasing water temperatures. Cunner spawn in June and July (Dew 1976), and were first recruited to the seine in June and July at lengths less than 30 mm. Cunner are structure oriented fish and were most common at Station NS2. The habitat provided by the boulders along the sandy beach at Station NS2 may have provided habitat for this fish. South and west of Cape Cod, winter flounder spawning can begin as early as November (Grimes et al. 1989). In New Bedford Harbor, YOY winter flounder less than 40 mm were captured in May and June. YOY Atlantic menhaden are often found in schools in inshore waters during the summer (Rogers and Van Den Avyle 1989), and the capture of a large school at Station NS1 is a reflection of this behavior.

4.2 TRAWL

The trawl sampling described the deeper-water fish community of New Bedford Harbor. Scup, cunner, and black sea bass were dominant at all stations except NT5, where winter flounder were dominant.

As with the nearshore fish community, the seasonality of the deeper water fish community was strongly influenced by the recruitment and movements of YOY fish. Scup, cunner and black sea bass were the numerically dominant YOY fishes captured in the trawl. Scup spawn between early May and mid-July in nearshore open waters and bays, and move to deeper offhsore waters in the fall and winter (Finkelstein 1969; Morse 1978). YOY scup become demersal at lengths of about 15 to 30 mm, and are found in shallower waters within bays and estuaries (Morse 1978). The distribution of scup in New Bedford Harbor was consistent with the published literature. Yearling scup were present from June through September, and YOY scup were recruited to the trawl in August at lengths less than 40 mm. By November, CPUE of both lifestages was low as scup moved offshore to overwintering areas.

The temporal distribution of cunner was similar to that discussed for seine catches. Cunner were present almost every month, and catches were highest in August due to recruitment of YOY. Catches were lowest in December through March as the fish moved offshore for overwintering.

Black sea bass spawn in the summer and YOY recruit to estuaries in the late summer (Musick and Mercer 1977). By the fall black sea bass migrate offshore and to the south. The occurrence of black sea bass from August through October, and the low catches after November are consistent with these movements.

4.3 COMMUNITY COMPARISONS

New Bedford Harbor has received extensive anthropogenic influences throughout its history, and is presently subject to extensive residual PCB pollution. However, the composition of the fish community was typical of the Virginian (south of Cape Cod) zoogeographic province, and similar to other nearby estuaries on Buzzards Bay, and the south shore of Cape Cod that are considered more pristine (Ayvazian et al. 1992; Hoff and Ibara 1977; Stone et al. 1994).

Hoff and Ibara (1977) studied the nearshore fish community of the nearby Slocum River estuary (about 10 km SW of New Bedford Harbor) from 1966 through 1968. Atlantic silverside and mummichog were the most common fish captured; these fish ranked first and third in the nearshore fish community of New Bedford Harbor. The monthly pattern of abundance in the Slocum River estuary was also similar to the pattern observed in New Bedford Harbor. Abundances were highest in the late summer and fall, and then decreased rapidly in the winter as water temperatures decreased. Ayvazian et al. (1992) studied the nearshore fish community of Waquoit Bay. Mummichog and Atlantic silverside were the two most abundant fish captured. Similar to Hoff and Ibara (1977) and this study, catches were largest in the late summer and fall and very low during the winter. Fiske et al. (1968) studied the fishes of the Westport River where Atlantic silverside and mummichog were the most abundant fishes.

The habitat of the nearshore sampling stations (seine stations) was probably most diverse at Station NS2. The substrate at this station was sand, but boulders were interspersed among the sand and fringing saltmarsh vegetation surrounded the station. Atlantic silverside and striped killifish are often found in open beach habitat while cunner and black sea bass are attracted to the structure afforded by the boulders. Mummichogs were probably strays from the nearby saltmarsh. Station NS1 was more of an open sandy beach with very little hard structure. The fish community at this station was dominated by pelagic fishes such as menhaden and Atlantic silverside that are not structure dependent. Similarly, there was little structure at Station NS1, and the fish community was dominated by open-water fishes such as Atlantic silverside and striped killifish.

Few studies have been directed at the deeper-water fishes in the vicinity of New Bedford Harbor. Although both Fiske et al. (1968) and Ayvazian et al. (1992) conducted trawling, the depths sampled were shallower than the depths sampled in this study. Depths sampled in New Bedford Harbor ranged from 5 to 8 m at all stations except NT5 where the depth was 2 to 3 m (Table 3-1). The deeper-water fish community in New Bedford Harbor was dominated by YOY scup, cunner, black sea bass at all stations except NT5 where winter flounder were most common. Winter flounder were also common in Waquoit Bay were Ayvazian et al. (1992) sampled with a trawl at depths similar to that of Station NT5.

The deeper-water fish communiy of New Bedford Harbor appears to be similar to that of other estuaries in the mid-Atlantic. In a summary of the distribution and abundance of fishes in mid-Atlantic estuaries, scup, cunner, and winter flounder were listed as abundant to highly abundant

in the mixing and seawater zones of Buzzards Bay, and black sea bass were listed as common (Stone et al. 1994).

The recruitment patterns of scup, cunner, black sea bass, and winter flounder in New Bedford Harbor were consistent with the published spawning and recruitment seasons. Scup spawn in early May through mid-July (Finkelstein 1969) and YOY recruit to inshore waters in summer (Morse 1978). Cunner were recruited from July through November which is indicative of an extended spawning season. Wheatland (1956) found that the spawning period for cunner in Long Island Sound was from May through October, but Dew (1976) presented evidence that little spawning occurred after July. The continued recruitment of YOY throughout the summer is consistent with the longer spawning period of Wheatland (1956). Black sea bass spawn in the summer, offshore at depths of 18-45 m primarily from Virginia to Montauk , Long Island (Musick and Mercer 1977). They become demersal at 13-24 mm and enter estuarine nursery grounds, which is consistent with the data from this program. Winter flounder can spawn as early as November in the mid-Atlantic bight, and estuaries are often habitat for juveniles (Grimes et al. 1989). Although no recently settled winter flounder (<30 mm) were captured at Station NT5, juveniles (100-200 mm) were more common than at any other station indicating that the inner harbor may be habitat for juveniles.

The fish communities and habitat of the deeper-water stations in New Bedford Harbor were very similar with the exception of Station NT5. Depths at Stations NT1 through NT4 were ranged from 5 to 9 m, and the substrate consisted of silt and sand, with *Codium* spp. present at Stations NT2 and NT3. Scup, cunner and black sea bass were dominant at these stations. Station NT5 located in shallower water (2-3 m) and farthest upriver, had a gravel and shell substrate over silt. Winter flounder and seaboard goby were dominant at this station. Station NT5 may provide nursery habitat for winter flounder, and seaboard goby may be taking advantage of the shelter provided by the shells.

New Bedford Harbor is generally considered a degraded environment, yet it supports a fish fauna that is similar to that found in nearby, less disturbed estuaries. The number of YOY scup, black sea bass, cunner and winter flounder found in New Bedford Harbor indicates that it provides nursery habitat for these important commercial and recreational fish. Despite the current degraded condition of the harbor, it may be an important habitat for juvenile fish in Buzzards Bay.

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APPENDICES

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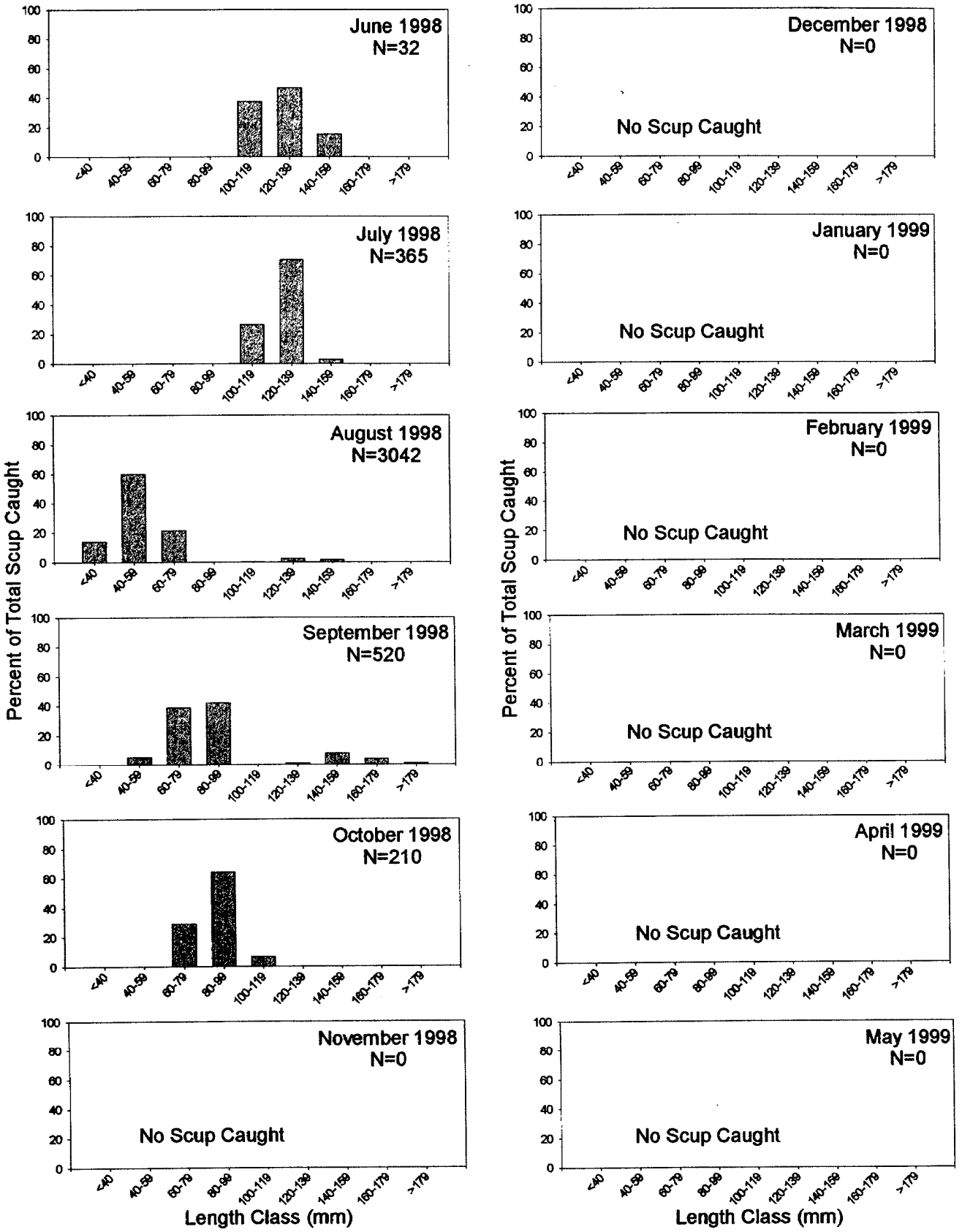
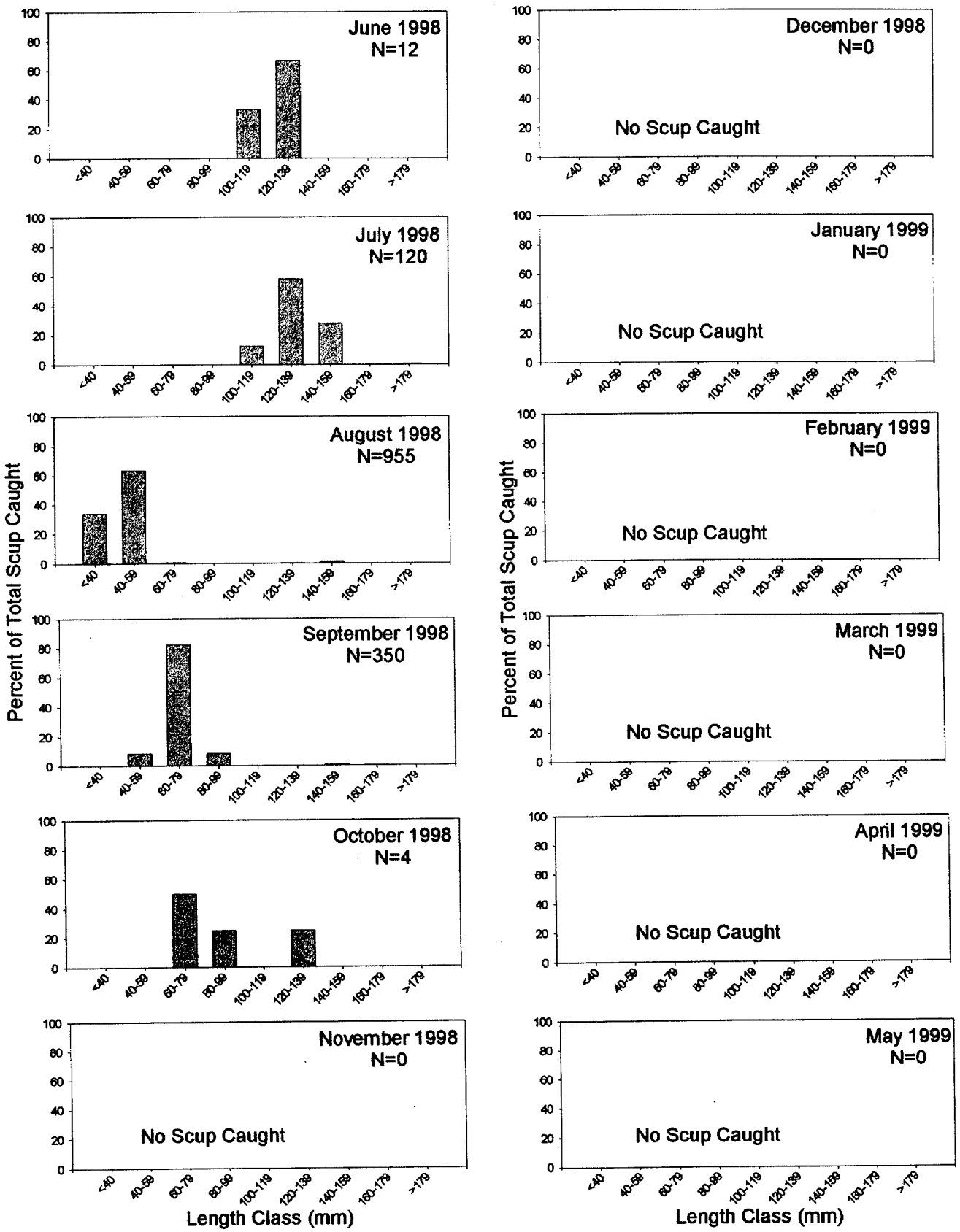
Appendix Figure 11. Length-frequency diagram for cunner captured in the trawl at Station NT3 in New Bedford Harbor, June 1998 through May 1999.

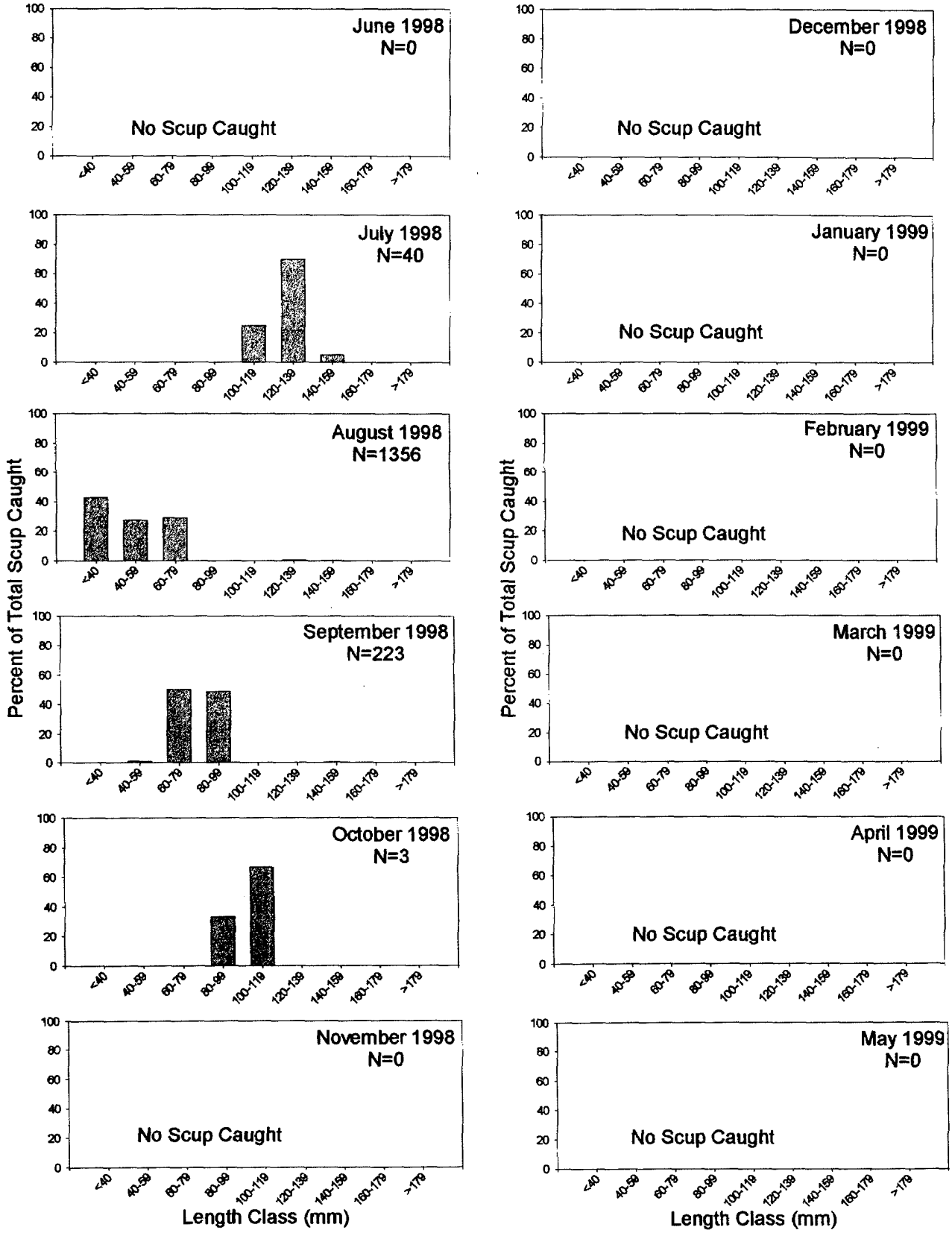
Appendix Figure 12. Length-frequency diagram for cunner captured in the trawl at Station NT4 in New Bedford Harbor, June 1998 through May 1999.



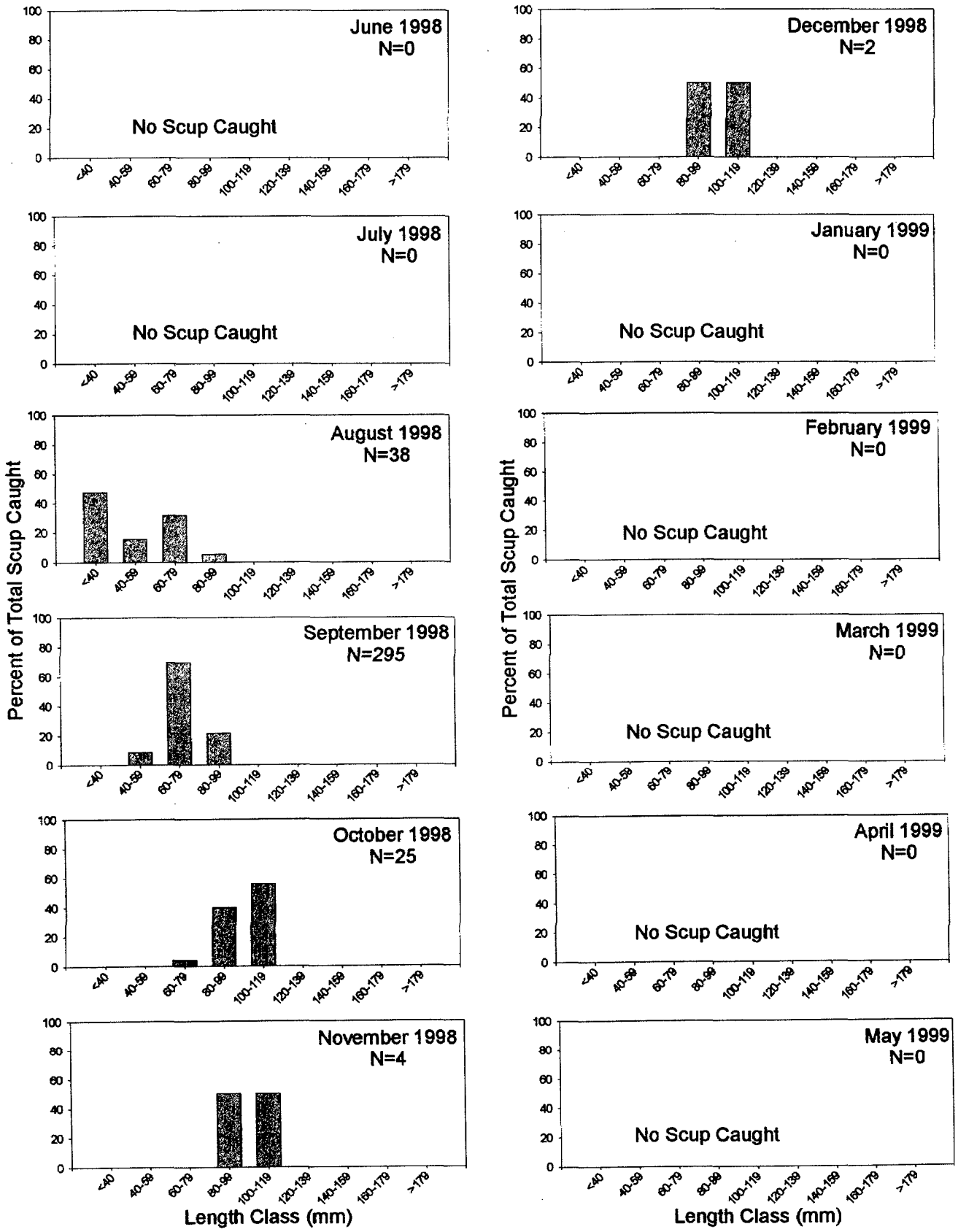
Appendix Figure 1. Length-frequency diagram for scup captured in the trawl at Station NT1 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



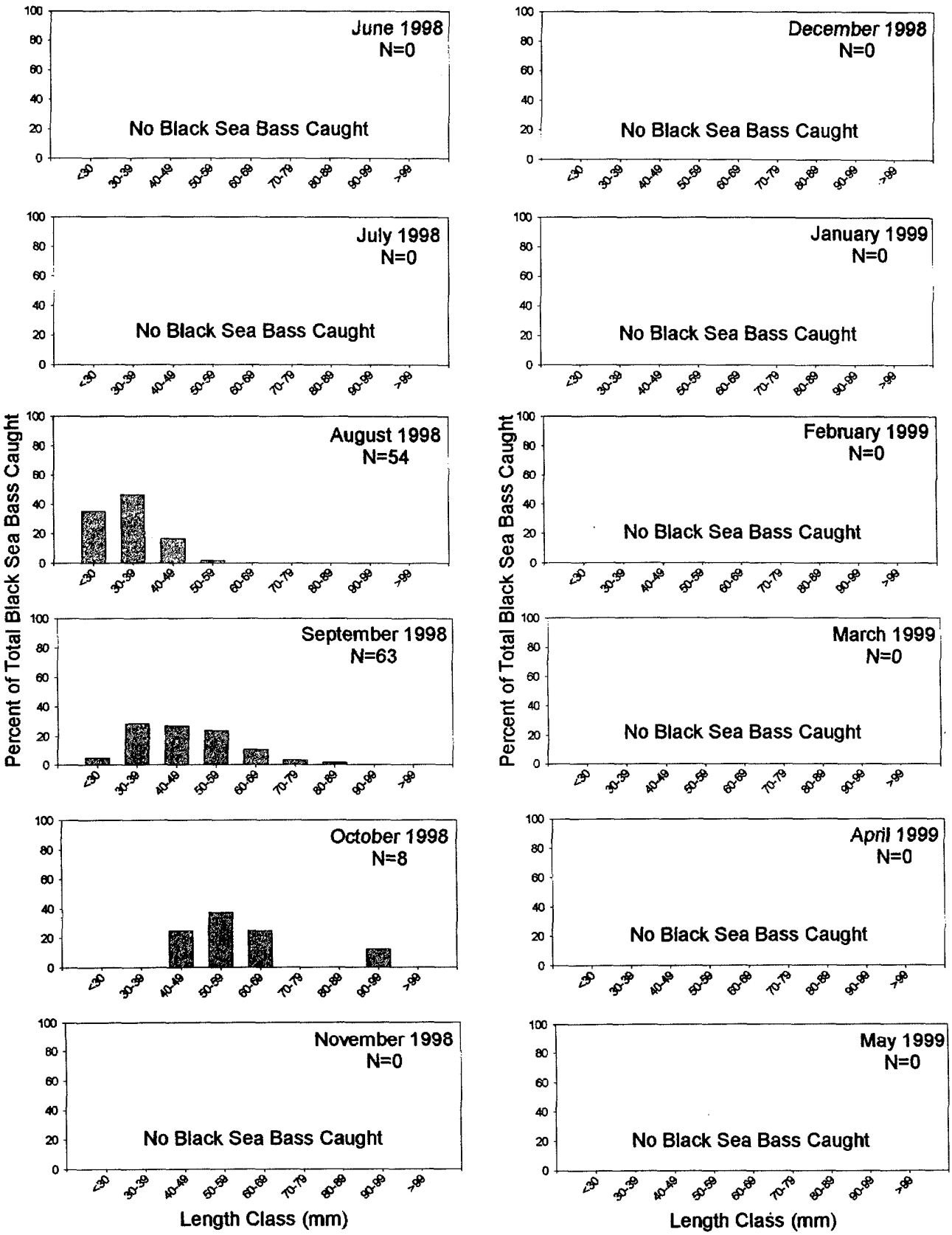
Appendix Figure 2. Length-frequency diagram for scup captured in the trawl at Station NT2 in New Bedford Harbor, June 1998 through May 1999 (N = number of fish).



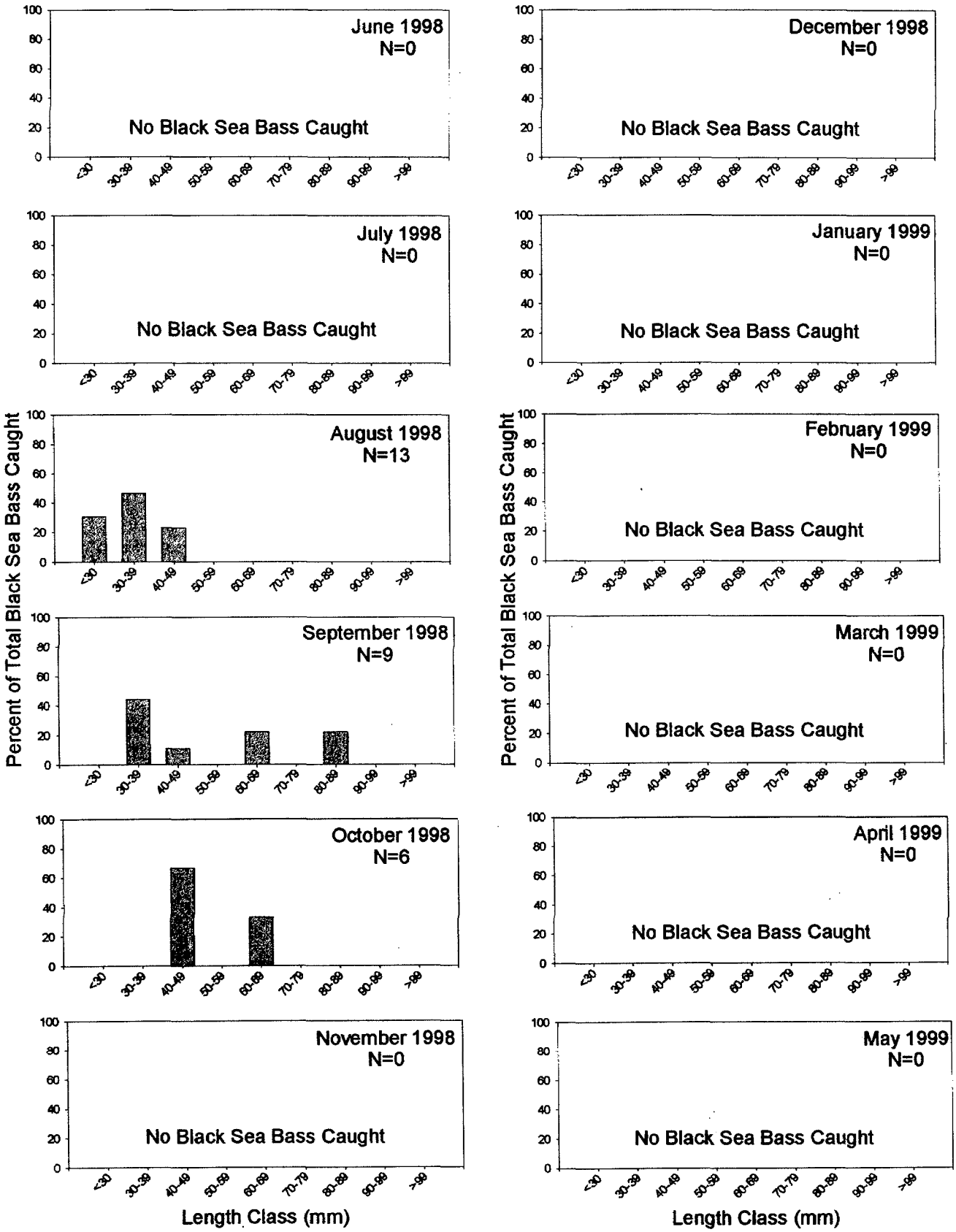
Appendix Figure 3. Length-frequency diagram for scup captured in the trawl at Station NT3 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



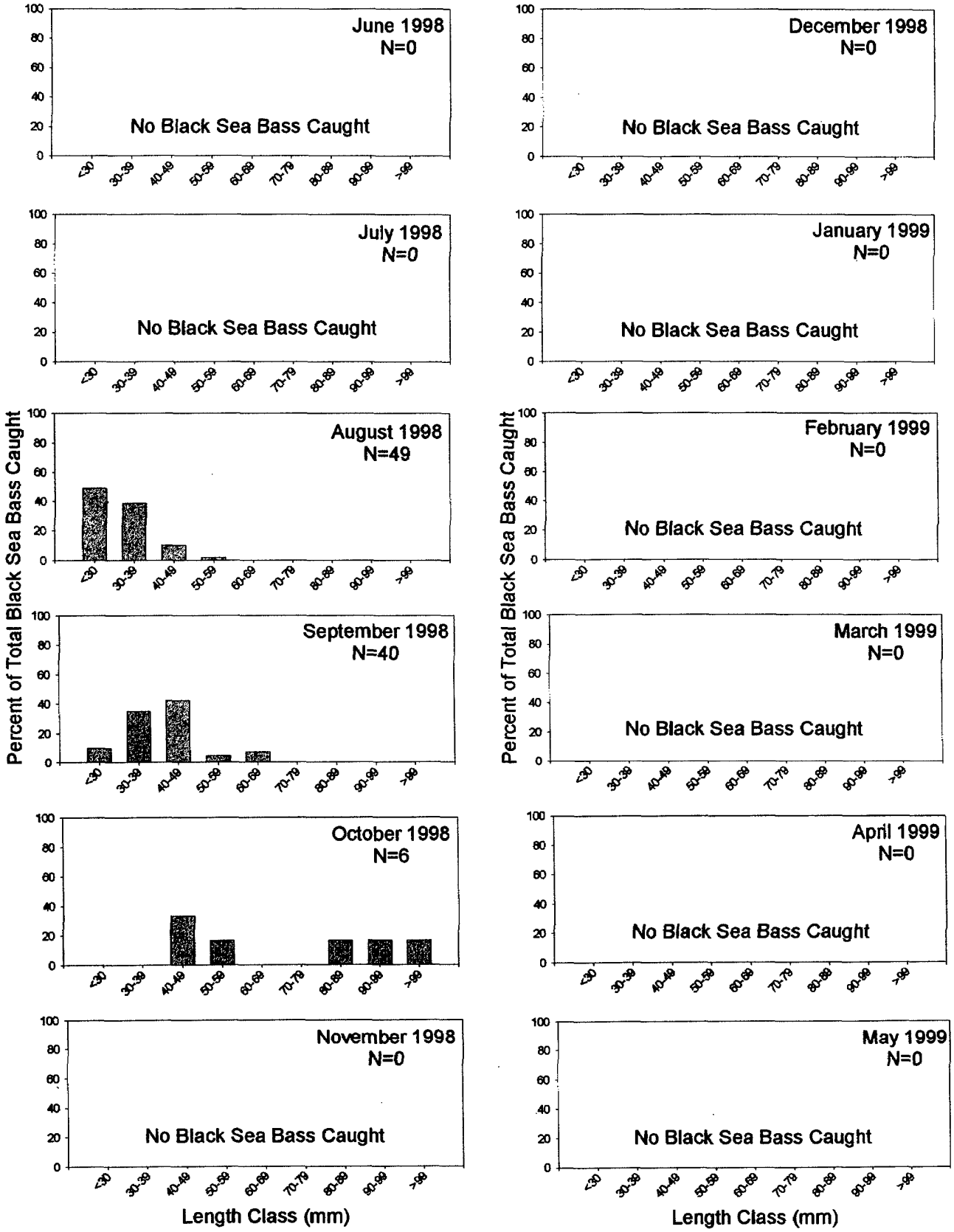
Appendix Figure 4. Length-frequency diagram for scup captured in the trawl at Station NT4 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



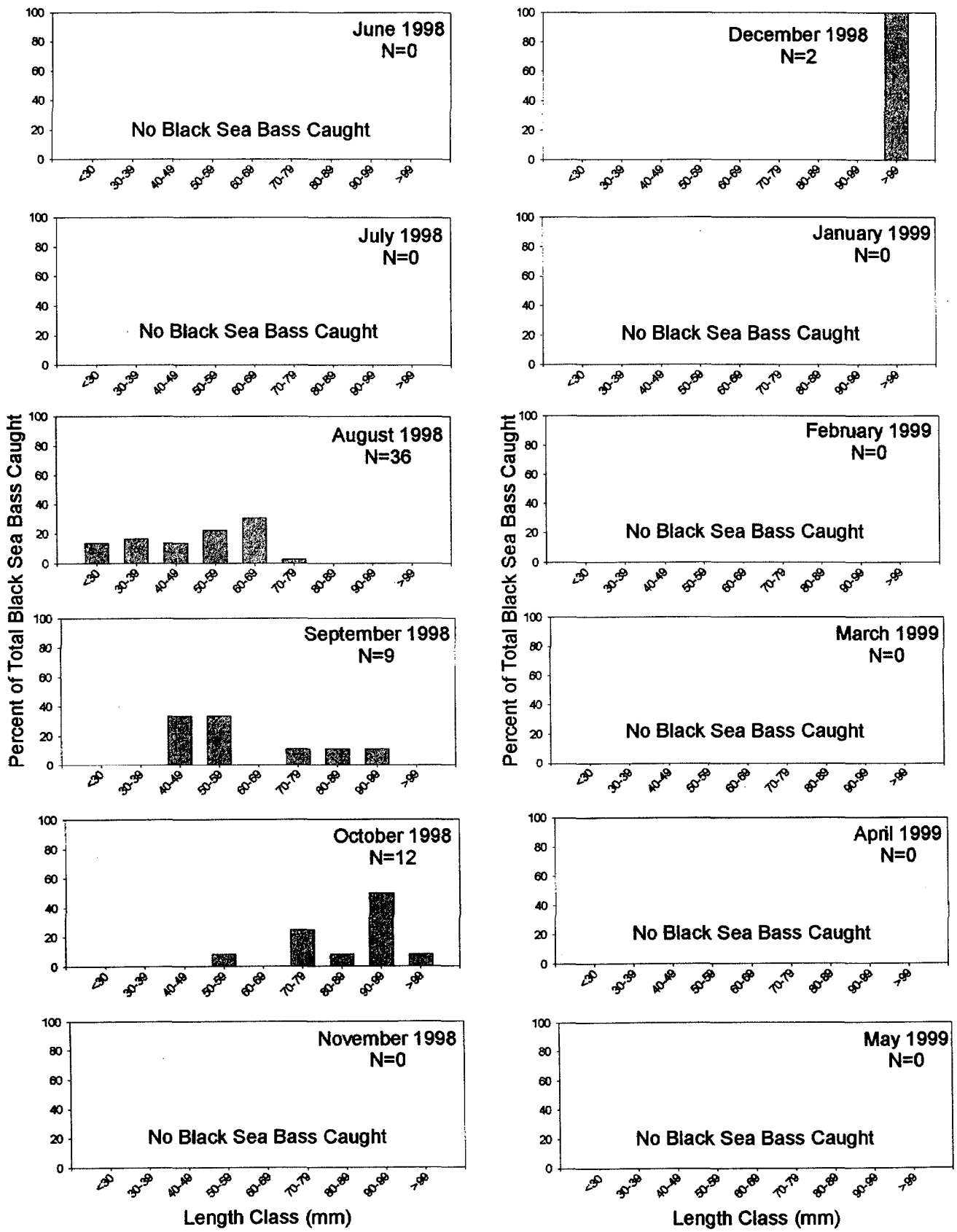
Appendix Figure 5. Length-frequency diagram for black sea bass captured in the trawl at Station NT1 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



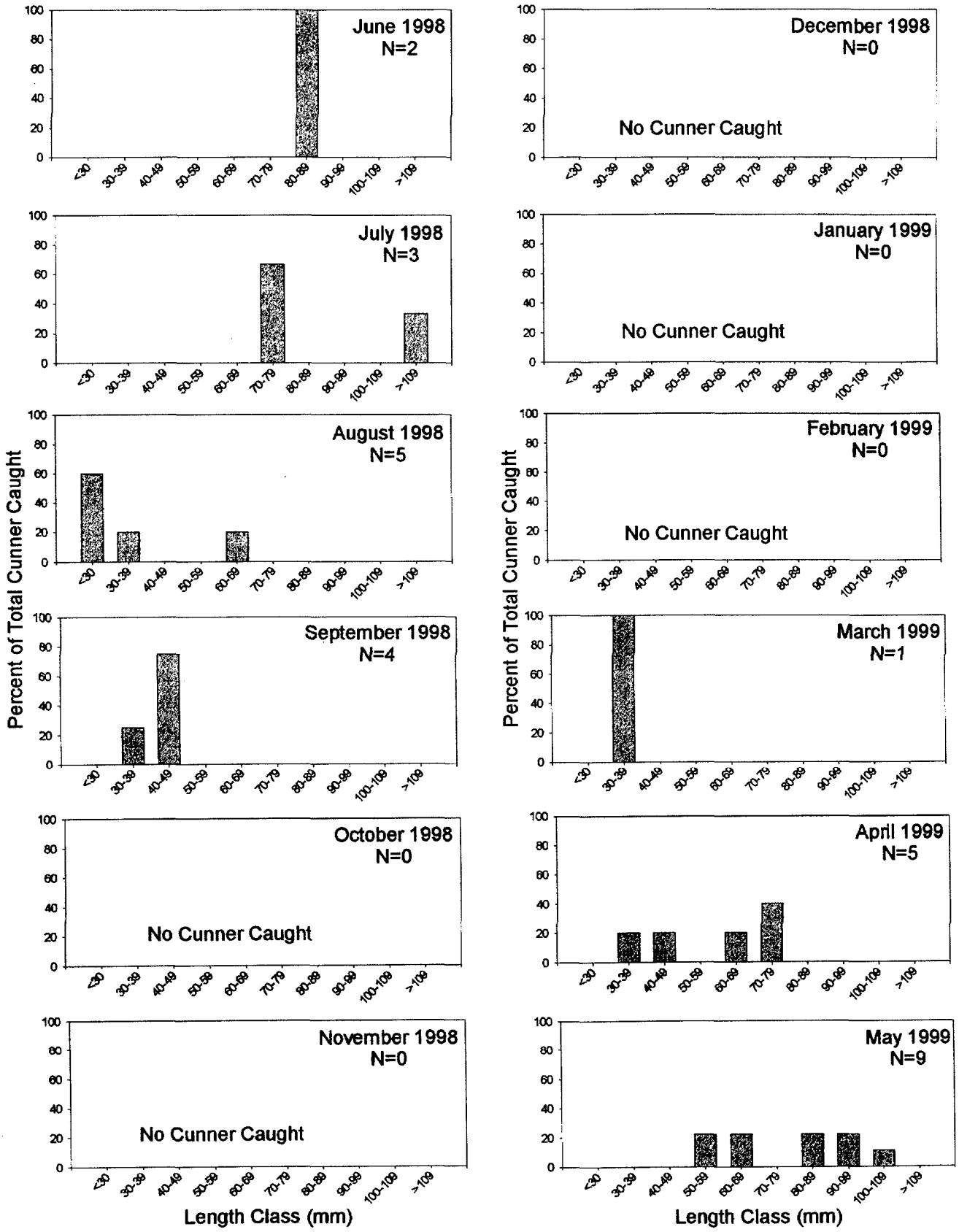
Appendix Figure 6. Length-frequency diagram for black sea bass captured in the trawl at Station NT2 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



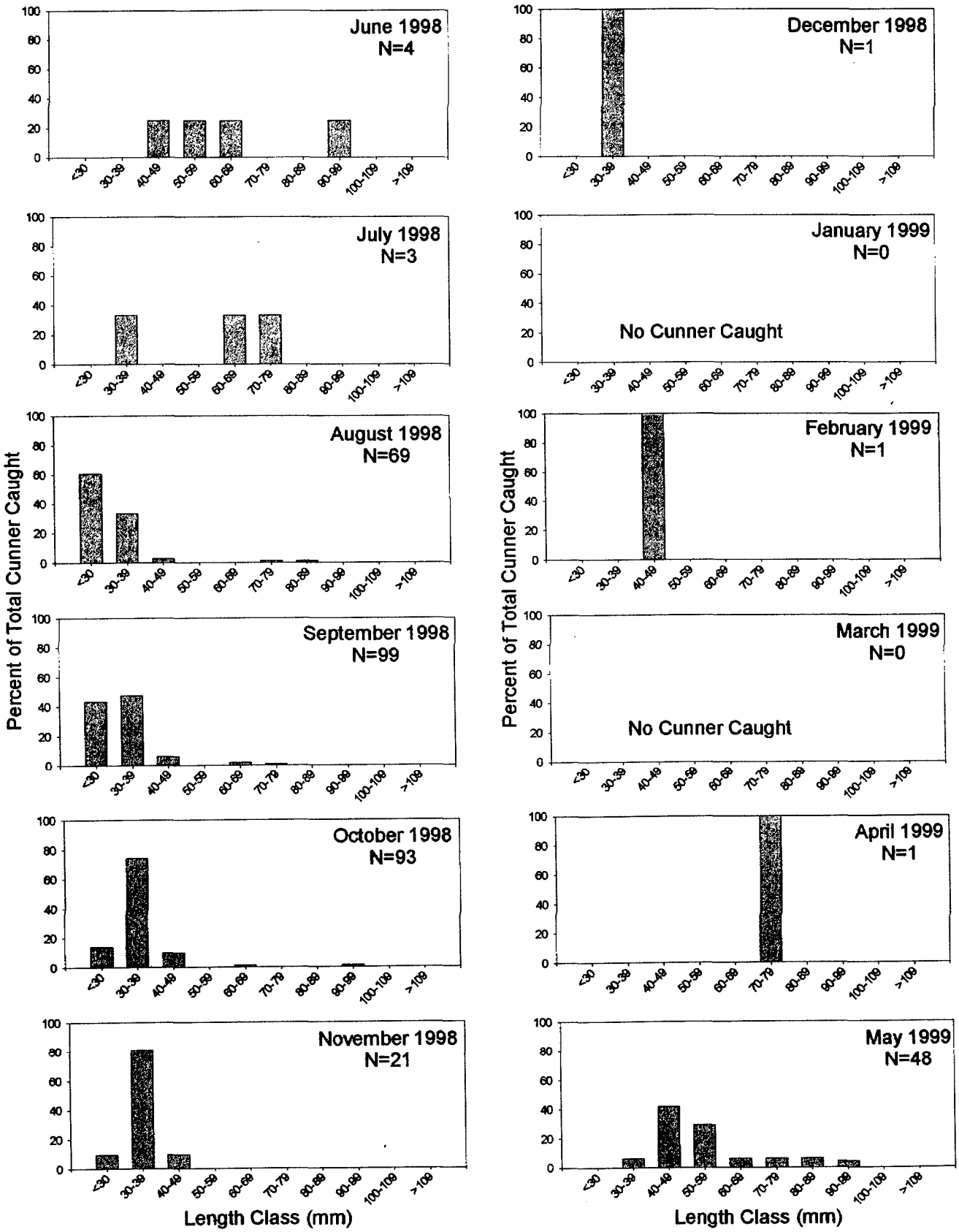
Appendix Figure 7. Length-frequency diagram for black sea bass captured in the trawl at Station NT3 in New Bedford Harbor, June 1998 through May 1999 (N = number of fish).



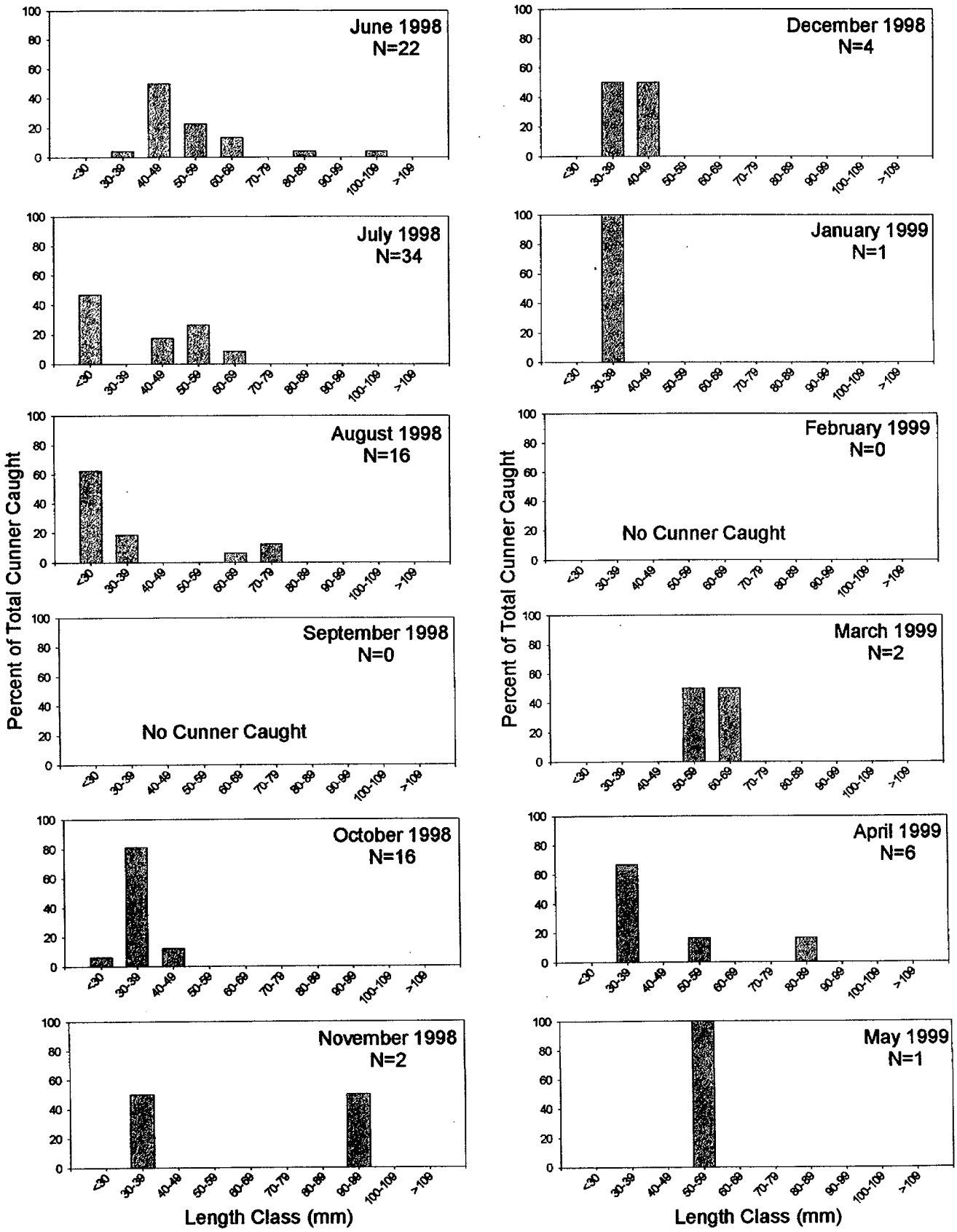
Appendix Figure 8. Length-frequency diagram for black sea bass captured in the trawl at Station NT4 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



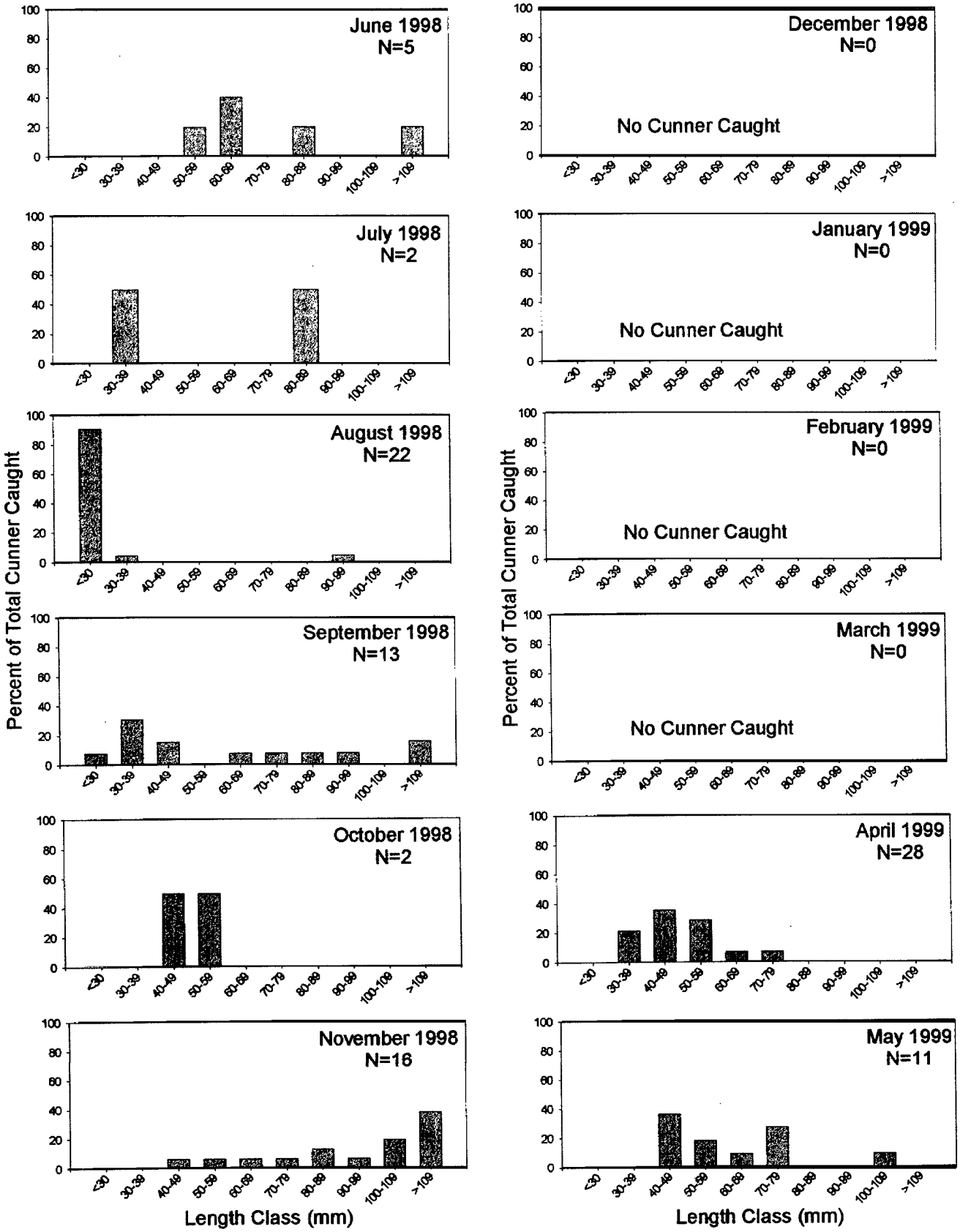
Appendix Figure 9. Length-frequency diagram for cunner captured in the trawl at Station NT1 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



Appendix Figure 10. Length-frequency diagram for cunner captured in the trawl at Station NT2 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



Appendix Figure 11. Length-frequency diagram for cunner captured in the trawl at Station NT3 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).



Appendix Figure 12. Length-frequency diagram for cunner captured in the trawl at Station NT4 in New Bedford Harbor, June 1998 through May 1999 (N=number of fish).

APPENDIX TABLES

APPENDIX TABLE A-1.

Common and scientific names of fishes captured in the seine in New Bedford Harbor.

Common Name	Scientific Name
Atlantic menhaden	*Brevoortia tyrannus*
Atlantic silverside	*Menidia menidia*
Atlantic tomcod	*Microgadus tomcod*
Black sea bass	*Centropristis striata*
Bluefish	*Pomatomus saltatrix*
Cunner	*Tautogolabrus adspersus*
Fourspine stickleback	*Apeltes quadracus*
Grubby	*Myoxocephalus aenaeus*
Hake sp.	*Urophycis* sp.
Mummichog	*Fundulus heteroclitus*
Northern kingfish	*Menticirrhus saxatilis*
Northern pipefish	*Syngnathus fuscus*
Northern puffer	*Sphoeroides maculatus*
Scup	*Stenotomus chrysops*
Seaboard goby	*Gobiosoma ginsburgi*
Sheepshead minnow	*Cyprinodon variegatus*
Smooth flounder	*Pleuronectes putnami*
Spotted hake	*Urophycis regia*
Striped killlifish	*Fundulus majalis*
Striped searobin	*Prionotus evolans*
Inland silverside	*Menidia beryllina*
Winter flounder	*Pseudopleuronectes americanus*

APPENDIX TABLE A-2. Common and scientific names of fishes captured in the trawl in New Bedford Harbor.

Common Name	Scientific Name
Alewife	*Alosa psuedoharengus*
American eel	*Anguilla rostrata*
Atlantic herring	*Clupea harengus*
Atlantic menhaden	*Brevoortia tyrannus*
Atlantic silverside	*Menidia menidia*
Banded rudderfish	*Seriola zonata*
Bay anchovy	*Anchoa mitchilli*
Black sea bass	*Centropristis striata*
Blueback herring	*Alosa aestivalis*
Butterfish	*Peprilus triacanthus*
Crevalle jack	*Caranx hippos*
Cunner	*Tautogolabrus adspersus*
Grubby	*Myoxocephalus aenaeus*
Gulfstream flounder	*Citharichthys arctifrons*
Mummichog	*Fundulus heteroclitus*
Northern kingfish	*Menticirrhus saxatilis*
Northern pipefish	*Syngnathus fuscus*
Northern searobin	*Prionotus carolinus*
Oyster toadfish	*Opsanus tau*
Pollock	*Pollachius virens*
Rainbow smelt	*Osmerus mordax*
Red hake	*Urophycis chuss*
Scup	*Stenotomus chrysops*
Seaboard goby	*Gobiosoma ginsburgi*
Short bigeye	*Pristigenys alta*
Skate sp.	*Raja* sp.
Smooth flounder	*Pleuronectes putnami*
Spotted hake	*Urophycis regia*
Striped bass	*Morone saxatilis*
Striped searobin	*Prionotus evolans*
Summer flounder	*Paralichthys dentatus*
Tautog	*Tautoga onitis*
Weakfish	*Cynoscion regalis*
White perch	*Morone americana*
Windowpane	*Scophthalmus aquosus*
Winter flounder	*Pseudopleuronectes americanus*

Appendix Table 1. Arithmetic mean catch per unit effort (catch/haul) of all species captured in the seine at all stations combined in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	2908.0	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	242.42	242.33	77.54
Atlantic silverside	18.00	72.67	178.17	20.00	274.67	18.00	0.33	0.00	0.00	0.33	7.33	16.67	50.51	25.11	16.16
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.10	0.10	0.03
Black sea bass	0.00	0.00	4.33	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.43	0.20
Bluefish	0.00	2.50	4.17	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.39	0.20
Cunner	0.17	0.33	0.33	1.00	0.00	30.33	0.00	0.00	0.00	0.00	0.00	0.33	2.71	2.51	0.87
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.01
Fundulus sp.	0.00	0.00	9.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.76	0.24
Grubby	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.03	0.03	0.01
Mummichog	2.50	17.83	16.83	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21	1.92	1.03
Northern kingfish	0.00	1.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.13	0.06
Northern pipefish	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.03	0.02	0.01
Northern puffer	0.00	1.00	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.27	0.11
Scup	0.00	0.17	4.17	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.34	0.12
Seaboard goby	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Sheepshead minnow	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Smooth flounder	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Spotted hake	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Striped killifish	0.00	37.00	31.00	45.67	4.17	2.33	0.33	0.00	0.00	0.00	0.00	0.00	10.04	4.95	3.21
Striped searobin	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Tidewater silverside	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.02
Winter flounder	0.50	0.83	0.83	0.67	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.83	0.44	0.16	0.14
Total	22.50	133.67	3161.8	74.33	278.83	52.67	0.67	0.00	0.00	0.33	7.33	19.50	312.64	260.09	100.00

Appendix Table 2. Arithmetic mean catch per unit effort (catch/haul) of all species captured in the seine at station NS1 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	8724.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	727.00	727.00	91.99
Atlantic silverside	1.00	128.00	458.50	1.50	18.50	49.00	0.00	0.00	0.00	0.00	22.00	6.50	57.08	38.02	7.22
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	0.29	0.29	0.04
Black sea bass	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.01
Bluefish	0.00	7.50	12.50	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	1.16	0.23
Cunner	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.25	0.13	0.03
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fundulus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.08	0.08	0.01
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.04
Northern pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern puffer	0.00	2.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.49	0.08
Scup	0.00	0.50	12.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	1.03	0.15
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sheepshead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.01
Striped killifish	0.00	0.00	1.00	0.00	5.50	7.00	1.00	0.00	0.00	0.00	0.00	0.00	1.21	0.69	0.15
Striped searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tidewater silverside	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.02
Winter flounder	0.00	0.50	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.02
Total	3.00	139.50	9218.0	7.50	24.00	57.00	1.00	0.00	0.00	0.00	22.00	12.00	790.33	766.24	100.00

Appendix Table 3. Arithmetic mean catch per unit effort (catch/haul) of all species captured in the seine at station NS2 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.21	0.30
Atlantic silverside	47.00	52.00	7.00	40.50	20.50	5.00	1.00	0.00	0.00	1.00	0.00	43.50	18.13	6.15	26.51
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black sea bass	0.00	0.00	13.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	1.26	2.68
Bluefish	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.12
Cunner	0.00	0.00	1.00	2.00	0.00	89.00	0.00	0.00	0.00	0.00	0.00	0.00	7.67	7.40	11.21
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fundulus sp.	0.00	0.00	27.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.29	2.29	3.35
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	6.50	53.50	50.50	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.54	5.76	13.95
Northern kingfish	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.06
Northern pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern puffer	0.00	0.50	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.33	0.55
Scup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sheepshead minnow	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.06
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped killifish	0.00	111.00	90.00	126.50	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.54	14.39	40.28
Striped searobin	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.06
Tidewater silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winter flounder	1.50	1.00	1.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.58	0.24	0.85
Total	55.00	218.50	195.50	186.00	23.50	94.00	1.00	0.00	0.00	1.00	0.00	46.00	68.38	24.46	100.00

Appendix Table 4. Arithmetic mean catch per unit effort (catch/haul) of all species captured in the seine at station NS3 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Atlantic silverside	6.00	38.00	69.00	18.00	785.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.33	64.72	96.37
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black sea bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bluefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	0.50	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.11	0.26
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.11
Fundulus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubby	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.11
Northern kingfish	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.21	0.26
Northern pipefish	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.08	0.06	0.11
Northern puffer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaboard goby	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Sheepshead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped killifish	0.00	0.00	2.00	10.50	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.90	1.74
Striped searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tidewater silverside	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Winter flounder	0.00	1.00	1.00	0.50	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.41	0.79
Total	9.50	43.00	72.00	29.50	789.00	7.00	0.00	0.00	0.00	0.00	0.00	0.50	79.21	64.86	100.00

Appendix Table 5. Arithmetic mean biomass per unit effort (g/haul) of all species captured in the seine at all stations combined in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	5400.0	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	450.35	449.97	71.39
Atlantic silverside	98.83	156.67	299.50	38.17	350.50	48.67	0.67	0.00	0.00	1.00	35.00	90.00	93.25	34.34	14.78
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.08	0.08	0.01
Black sea bass	0.00	0.00	1.33	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.18	0.04
Bluefish	0.00	15.83	166.67	35.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.14	13.85	2.88
Cunner	0.17	0.17	0.17	1.00	0.00	29.67	0.00	0.00	0.00	0.00	0.00	0.50	2.64	2.46	0.42
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00
Fundulus sp.	0.00	0.00	23.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99	1.99	0.31
Grubby	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.04	0.04	0.01
Mummichog	14.67	104.33	46.67	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.15	9.08	2.24
Northern kingfish	0.00	0.67	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.91	0.15
Northern pipefish	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.04	0.03	0.01
Northern puffer	0.00	0.17	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.21	0.04
Scup	0.00	6.67	150.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.31	12.41	2.27
Seaboard goby	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Sheepshead minnow	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Smooth flounder	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Spotted hake	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.02
Striped killifish	0.00	95.00	33.00	236.67	19.33	10.00	1.00	0.00	0.00	0.00	0.00	0.00	32.92	20.15	5.22
Striped searobin	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.01
Tidewater silverside	2.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.04
Winter flounder	0.33	2.50	3.00	1.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00	3.33	0.96	0.37	0.15
Total	117.33	383.83	6138.5	337.17	369.83	90.00	1.67	0.00	0.00	1.00	35.00	95.67	630.83	502.54	100.00

Appendix Table 6. Arithmetic mean biomass per unit effort (g/haul) of all species captured in the seine at station NS1 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	16200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1350.0	1350.0	86.20
Atlantic silverside	8.00	355.00	638.00	2.00	45.00	132.00	0.00	0.00	0.00	0.00	105.00	45.00	110.83	56.29	7.08
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.25	0.25	0.02
Black sea bass	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00
Bluefish	0.00	47.50	500.00	84.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.63	41.39	3.36
Cunner	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.50	0.29	0.16	0.02
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fundulus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.13	0.13	0.01
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	33.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75	2.75	0.18
Northern pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern puffer	0.00	0.50	6.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.54	0.04
Scup	0.00	20.00	450.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.92	37.22	2.74
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sheepshead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.42	0.03
Striped killifish	0.00	0.00	2.00	0.00	22.00	27.00	3.00	0.00	0.00	0.00	0.00	0.00	4.50	2.73	0.29
Striped searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tidewater silverside	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.67	0.04
Winter flounder	0.00	0.50	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.01
Total	16.00	428.50	17830	133.50	67.00	160.00	3.00	0.00	0.00	0.00	105.00	51.00	1566.1	1478.9	100.00

Appendix Table 7. Arithmetic mean biomass per unit effort (g/haul) of all species captured in the seine at station NS2 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	0.00	11.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.96	0.47
Atlantic silverside	239.00	55.50	8.50	64.50	31.50	14.00	2.00	0.00	0.00	3.00	0.00	225.00	53.58	24.89	26.44
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black sea bass	0.00	0.00	4.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.51	0.37
Bluefish	0.00	0.00	0.00	21.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	1.79	0.88
Cunner	0.00	0.00	0.50	2.00	0.00	84.00	0.00	0.00	0.00	0.00	0.00	0.00	7.21	6.98	3.56
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fundulus sp.	0.00	0.00	71.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.96	5.96	2.94
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	38.50	313.00	140.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.00	27.25	20.72
Northern kingfish	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02
Northern pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern puffer	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.04
Scup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sheepshead minnow	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped killifish	0.00	285.00	94.00	672.00	11.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	88.75	58.21	43.79
Striped searobin	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.08
Tidewater silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winter flounder	1.00	2.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	1.33	0.82	0.66
Total	278.50	656.00	324.00	790.00	42.50	101.00	2.00	0.00	0.00	3.00	0.00	235.00	202.67	78.40	100.00

Appendix Table 8. Arithmetic mean biomass per unit effort (g/haul) of all species captured in the seine at station NS3 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Atlantic menhaden	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.07
Atlantic silverside	49.50	59.50	252.00	48.00	975.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	115.33	80.85	93.23
Atlantic tomcod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black sea bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bluefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	0.50	0.50	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.33	0.34
Fourspine stickleback	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.07
Fundulus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubby	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03
Hake sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.46	0.37
Northern kingfish	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.10
Northern pipefish	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.13	0.09	0.10
Northern puffer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaboard goby	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03
Sheepshead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped killifish	0.00	0.00	3.00	38.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.50	3.60	4.45
Striped searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tidewater silverside	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03
Winter flounder	0.00	5.00	7.00	1.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.71	1.15
Total	57.50	67.00	262.00	88.00	1000.0	9.00	0.00	0.00	0.00	0.00	0.00	1.00	123.71	82.60	100.00

Appendix Table 9. Arithmetic mean catch per unit effort (catch/400-m tow) of all species captured in the trawl at all stations combined in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
American eel	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.25	330.92	0.00	0.00	27.76	27.56	27.24
Atlantic menhaden	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
Atlantic silverside	0.00	0.00	1.34	0.00	0.29	0.00	4.49	0.60	0.00	14.92	0.00	0.00	1.80	1.25	1.77
Banded rudderfish	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Bay anchovy	0.00	1.59	2.33	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.22	0.34
Black sea bass	0.00	0.00	14.48	11.75	3.29	0.00	0.38	0.00	0.00	0.00	0.00	0.00	2.49	1.47	2.45
Butterfish	0.00	1.92	2.91	7.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.65	1.01
Crevalle jack	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Cunner	3.24	3.93	11.08	11.35	10.95	7.80	1.00	0.20	0.25	0.60	7.84	7.60	5.49	1.28	5.38
Grubby	0.00	0.00	0.10	0.00	0.00	0.00	0.40	0.40	0.25	0.00	0.40	0.55	0.18	0.06	0.17
Gulf Stream flounder	0.20	0.10	0.00	1.06	0.40	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.16	0.09	0.16
Mummichog	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Northern kingfish	0.00	0.00	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02
Northern pipefish	0.19	0.00	2.57	0.89	1.29	1.00	0.58	0.00	0.00	0.40	0.79	0.00	0.64	0.22	0.63
Northern searobin	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
Oyster toadfish	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.02	0.02	0.02
Rainbow smelt	0.00	0.19	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.10	0.06	0.09
Red hake	0.29	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.05	0.03	0.05
Scup	4.25	50.58	492.25	135.55	24.05	0.80	0.38	0.00	0.00	0.00	0.00	0.00	58.99	41.02	57.88
Seaboard goby	0.00	0.00	0.10	0.59	0.00	1.00	0.57	0.20	0.00	0.00	0.20	0.00	0.22	0.09	0.22
Short bigeye	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Skate sp.	0.00	0.00	0.00	0.00	0.10	0.00	0.19	0.00	0.00	0.00	0.20	0.32	0.07	0.03	0.07
Smooth flounder	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
Spotted hake	0.50	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.15	0.08	0.15
Striped bass	0.00	0.10	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02
Striped searobin	0.00	0.00	0.09	0.29	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.05
Summer flounder	0.00	0.39	1.32	0.59	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.23	0.11	0.22
Tautog	0.00	0.10	0.00	0.10	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.06	0.03	0.06
Weakfish	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.03	0.03	0.03
Windowpane flounder	0.37	0.28	0.29	0.30	0.58	0.00	0.19	0.00	0.25	0.00	0.20	0.32	0.23	0.05	0.23
Winter flounder	1.76	1.14	0.96	0.59	3.28	1.40	2.29	0.60	0.50	1.74	2.02	3.41	1.64	0.28	1.61
Total	11.00	61.07	530.95	171.28	45.21	12.20	10.65	4.00	1.50	349.57	11.84	13.71	101.91	48.87	100.00

Appendix Table 10. Arithmetic mean catch per unit effort (catch/400-m tow) of all species captured in the trawl at station NT1 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	169.76	0.00	0.00	14.23	14.14	7.48
Atlantic menhaden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.61	0.00	0.00	1.30	1.30	0.68
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02
Black sea bass	0.00	0.00	25.52	30.39	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.99	3.13	2.62
Butterfish	0.00	3.90	2.86	30.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.09	2.50	1.62
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	1.00	1.46	2.29	1.95	0.00	0.00	0.00	0.00	0.00	0.98	4.88	4.29	1.40	0.49	0.74
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulf Stream flounder	0.98	0.49	0.00	5.31	1.98	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.81	0.45	0.42
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.48	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.04
Northern pipefish	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.98	0.98	0.00	0.20	0.11	0.11
Northern searobin	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.04
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.00	0.00	0.16	0.16	0.09
Red hake	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.06
Scup	15.24	178.05	1385.4	251.30	104.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	161.20	113.94	84.76
Seaboard goby	0.00	0.00	0.48	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.12	0.08
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.95	0.16	0.11	0.08
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	1.50	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.37	0.20	0.19
Striped bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped searobin	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02
Summer flounder	0.00	1.46	3.21	1.45	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.63	0.29	0.33
Tautog	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.48	0.00	0.00	0.49	0.00	0.00	0.00	0.00	1.00	0.00	0.98	0.95	0.32	0.12	0.17
Winter flounder	0.50	1.46	0.95	0.49	0.00	0.00	0.00	0.00	0.00	2.93	0.00	2.38	0.73	0.29	0.38
Total	21.14	189.76	1422.6	323.59	111.88	0.00	1.90	1.00	1.00	192.20	6.83	10.48	190.20	116.14	100.00

Appendix Table 11. Arithmetic mean catch per unit effort (catch/400-m tow) of all species captured in the trawl at station NT2 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	1.25	1.25	1.59
Atlantic menhaden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	22.44	0.00	0.00	20.00	0.00	0.00	3.54	2.39	4.51
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black sea bass	0.00	0.00	6.01	4.39	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.61	1.42
Butterfish	0.00	0.00	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.16
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	2.00	1.40	33.23	48.29	45.83	21.00	0.98	0.00	1.00	0.00	1.00	23.41	14.84	5.43	18.94
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.49	0.21	0.11	0.26
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Northern pipefish	0.00	0.00	3.25	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.44	0.28	0.56
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.08	0.08	0.11
Rainbow smelt	0.00	0.00	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.20
Red hake	0.00	0.00	0.49	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.10
Scup	6.00	56.22	434.32	170.73	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.77	37.30	71.16
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short bigeye	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.50	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.16	0.09	0.21
Striped bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped searobin	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.05
Summer flounder	0.00	0.48	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.12	0.06	0.15
Tautog	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.12	0.09	0.16
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winter flounder	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	1.00	0.00	0.00	0.25	0.13	0.32
Total	9.50	59.05	479.63	225.85	52.79	22.00	23.41	0.98	2.00	36.00	4.00	25.37	78.38	40.52	100.00

Appendix Table 12. Arithmetic mean catch per unit effort (catch/400-m tow) of all species captured in the trawl at station NT3 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	.	0.00	0.00	0.00	0.18	0.18	0.22
Atlantic menhaden	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.04	0.04	0.05
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	.	27.00	0.00	0.00	2.73	2.44	3.26
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.04	0.04	0.05
Black sea bass	0.00	0.00	23.37	19.51	3.00	0.00	0.00	0.00	.	0.00	0.00	0.00	4.17	2.60	4.99
Butterfish	0.00	0.00	11.22	0.49	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	1.06	1.02	1.27
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	10.79	15.81	7.34	0.00	7.93	2.00	4.00	1.00	.	2.00	6.00	1.00	5.26	1.48	6.30
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	.	0.00	1.00	0.00	0.27	0.19	0.33
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.04	0.04	0.05
Northern kingfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Northern pipefish	0.00	0.00	0.00	0.00	0.98	0.00	1.00	0.00	.	0.00	0.00	0.00	0.18	0.12	0.21
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Red hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Scup	0.00	18.60	623.38	106.78	1.48	0.00	0.00	0.00	.	0.00	0.00	0.00	68.39	56.35	81.85
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	.	0.00	1.00	1.00	0.23	0.12	0.27
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Striped bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Striped searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Summer flounder	0.00	0.00	2.44	0.98	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.31	0.23	0.37
Tautog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.04	0.04	0.05
Winter flounder	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	.	1.00	4.00	1.00	0.59	0.36	0.71
Total	10.79	34.88	668.73	130.73	13.88	2.00	7.00	6.00	.	30.00	12.00	3.00	83.55	59.56	100.00

Appendix Table 13. Arithmetic mean catch per unit effort (catch/400-m tow) of all species captured in the trawl at station NT4 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.05
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	1468.0	0.00	0.00	122.92	122.28	79.03
Atlantic menhaden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic silverside	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	12.00	0.00	0.00	1.04	1.00	0.67
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	7.44	5.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.72	0.67
Black sea bass	0.00	0.00	17.49	4.48	5.98	0.00	1.90	0.00	0.00	0.00	0.00	0.00	2.49	1.49	1.60
Butterfish	0.00	5.71	0.49	5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.63	0.63
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	2.43	0.95	10.57	6.50	0.99	16.00	0.00	0.00	0.00	0.00	27.32	5.50	5.86	2.44	3.76
Grubby	0.00	0.00	0.49	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.37	0.22	0.24
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern pipefish	0.93	0.00	6.27	4.43	4.99	4.00	1.90	0.00	0.00	1.00	1.95	0.00	2.12	0.65	1.36
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.16	0.11	0.10
Red hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.04	0.04	0.03
Scup	0.00	0.00	18.13	146.43	12.33	4.00	1.90	0.00	0.00	0.00	0.00	0.00	15.23	12.05	9.79
Seaboard goby	0.00	0.00	0.00	1.50	0.00	0.00	0.00	1.00	0.00	0.00	0.98	0.00	0.29	0.16	0.19
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.20	0.16	0.13
Striped bass	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03
Striped searobin	0.00	0.00	0.00	0.98	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.09	0.08
Summer flounder	0.00	0.00	0.49	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.06	0.05
Tautog	0.00	0.00	0.00	0.48	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.12	0.06	0.08
Weakfish	0.00	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.08
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.17	0.17	0.11
Windowpane flounder	1.40	1.41	1.44	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.52	0.20	0.33
Winter flounder	4.29	4.25	0.49	1.00	0.49	0.00	0.00	1.00	1.00	1.00	0.98	2.95	1.45	0.44	0.93
Total	9.55	21.66	61.46	173.26	27.22	25.00	5.71	11.00	1.00	1485.0	31.22	14.36	155.54	121.60	100.00

Appendix Table 14. Arithmetic mean catch per unit effort (catch/400-m tow) of all species captured in the trawl at station NT5 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.86	0.00	0.00	0.24	0.17	2.87
Atlantic menhaden	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.49
Atlantic silverside	0.00	0.00	6.21	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.52	7.70
Banded rudderfish	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.47
Bay anchovy	0.00	0.00	6.07	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.50	7.07
Black sea bass	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.48
Butterfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crevalle jack	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.47
Cunner	0.00	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.20	0.16	2.46
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern pipefish	0.00	0.00	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28	3.36
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scup	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.49
Seaboard goby	0.00	0.00	0.00	0.00	0.00	5.00	2.86	0.00	0.00	0.00	0.00	0.00	0.65	0.46	7.89
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	1.00
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped bass	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.49
Striped searobin	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.48
Summer flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tautog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.00	0.00	0.00	0.50	1.44	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.24	0.14	2.90
Winter flounder	3.00	0.00	3.35	0.99	15.93	7.00	11.43	1.00	1.00	2.79	5.13	9.50	5.09	1.43	61.37
Total	4.00	0.00	22.34	2.95	20.28	12.00	15.24	1.00	2.00	4.65	5.13	10.00	8.30	2.20	100.00

Appendix Table 15. Arithmetic mean biomass per unit effort (g/400-m tow) of all species captured in the trawl at all stations combined in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00
American eel	0.00	0.00	0.00	0.00	0.00	192.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	16.00	1.54
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.25	92.05	0.00	0.00	7.79	7.66	0.75
Atlantic menhaden	0.00	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.01
Atlantic silverside	0.00	0.00	3.48	0.00	2.44	0.00	39.02	2.60	0.00	304.10	0.00	0.00	29.30	25.18	2.82
Banded rudderfish	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00
Bay anchovy	0.00	3.54	4.66	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.47	0.07
Black sea bass	0.00	0.00	15.64	22.57	22.57	0.00	7.62	0.00	0.00	0.00	0.00	0.00	5.70	2.66	0.55
Butterfish	0.00	11.95	4.66	86.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.59	7.15	0.83
Crevalle jack	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00
Cunner	14.12	9.01	9.92	14.66	8.56	54.80	1.40	0.40	0.25	0.99	20.97	28.49	13.63	4.52	1.31
Grubby	0.00	0.00	1.46	0.00	0.00	0.00	4.00	10.00	0.75	0.00	4.40	5.32	2.16	0.91	0.21
Gulf Stream flounder	1.48	0.49	0.00	0.58	0.30	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.28	0.13	0.03
Mummichog	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00
Northern kingfish	0.00	0.00	2.29	0.39	19.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	1.62	0.18
Northern pipefish	0.56	0.00	2.59	0.59	46.20	2.40	0.97	0.00	0.00	0.79	0.59	0.00	4.56	3.79	0.44
Northern searobin	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.79	0.08
Oyster toadfish	0.00	71.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.95	5.95	0.57
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	1.62	0.29	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.00	0.00	0.34	0.21	0.03
Red hake	1.45	0.00	2.44	0.00	11.71	0.00	0.00	0.00	0.00	0.00	0.00	0.21	1.32	0.97	0.13
Scup	127.43	1565.8	989.23	1165.7	237.86	10.00	5.71	0.00	0.00	0.00	0.00	0.00	341.81	161.90	32.88
Seaboard goby	0.00	0.00	0.10	0.10	0.00	0.80	0.57	0.20	0.00	0.00	0.20	0.00	0.16	0.08	0.02
Short bigeye	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00
Skate sp.	0.00	0.00	0.00	0.00	45.00	0.00	142.86	0.00	0.00	0.00	120.00	161.38	39.10	18.37	3.76
Smooth flounder	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.03
Spotted hake	19.70	7.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.15	4.14	2.36	0.40
Striped bass	0.00	62.86	0.00	0.00	58.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.12	6.83	0.97
Striped searobin	0.00	0.00	0.09	0.49	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.11	0.02
Summer flounder	0.00	82.93	1186.2	385.45	80.00	0.00	0.00	0.00	0.00	0.00	0.00	308.68	170.27	99.86	16.38
Tautog	0.00	8.29	0.00	9.81	18.73	0.00	0.00	0.00	0.00	0.00	0.00	264.23	25.09	21.81	2.41
Weakfish	0.00	0.00	0.00	4.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.04
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.33	0.33	0.03
Windowpane flounder	51.98	3.30	4.87	30.17	34.17	0.00	11.43	0.00	1.25	0.00	0.39	140.21	23.15	11.73	2.23
Winter flounder	113.63	90.92	98.13	59.62	569.57	330.00	657.14	123.19	250.00	389.83	529.06	689.42	325.04	68.34	31.26
Total	334.14	1920.2	2337.4	1781.7	1156.9	590.00	871.30	137.59	252.50	793.92	675.61	1625.1	1039.7	208.19	100.00

Appendix Table 16. Arithmetic mean biomass per unit effort (g/400-m tow) of all species captured in the trawl at station NT1 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.01
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	110.24	0.00	0.00	9.27	9.18	0.49
Atlantic menhaden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.49	0.00	0.00	5.04	5.04	0.27
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00
Black sea bass	0.00	0.00	17.56	52.98	10.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.79	4.51	0.36
Butterfish	0.00	9.76	4.76	411.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.52	34.22	1.89
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	7.50	15.61	4.03	3.90	0.00	0.00	0.00	0.00	0.00	1.95	17.56	34.76	7.11	3.07	0.38
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulf Stream flounder	7.38	2.44	0.00	2.88	1.49	0.00	2.86	0.00	0.00	0.00	0.00	0.00	1.42	0.64	0.08
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	11.43	0.00	97.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.08	8.10	0.48
Northern pipefish	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	1.95	0.98	0.00	0.29	0.17	0.02
Northern searobin	0.00	0.00	47.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.97	3.97	0.21
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.85	0.00	0.00	0.49	0.49	0.03
Red hake	7.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.61	0.03
Scup	457.14	5180.0	3551.2	3198.0	969.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1113.0	521.91	59.36
Seaboard goby	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	714.29	0.00	0.00	0.00	0.00	476.19	99.21	68.47	5.29
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	76.00	29.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.86	10.72	6.63	0.57
Striped bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped searobin	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00
Summer flounder	0.00	414.63	2896.8	869.92	400.00	0.00	0.00	0.00	0.00	0.00	0.00	1047.6	469.08	245.22	25.02
Tautog	0.00	41.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.46	3.46	0.18
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	176.19	0.00	0.00	73.17	0.00	0.00	0.00	0.00	5.00	0.00	1.95	380.95	53.11	33.45	2.83
Winter flounder	85.00	45.37	78.57	15.61	0.00	0.00	0.00	0.00	0.00	48.78	0.00	285.71	46.59	23.62	2.48
Total	816.48	5740.0	6613.0	4629.7	1480.0	0.00	717.14	1.00	5.00	229.27	20.49	2248.1	1875.0	698.50	100.00

Appendix Table 17. Arithmetic mean biomass per unit effort (g/400-m tow) of all species captured in the trawl at station NT2 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.83	0.83	0.17
Atlantic menhaden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	195.12	0.00	0.00	50.00	0.00	0.00	20.43	16.41	4.16
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black sea bass	0.00	0.00	3.28	12.20	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	1.20	0.42
Butterfish	0.00	0.00	0.00	6.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.57	0.12
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	10.00	1.86	15.34	24.39	36.39	10.00	0.98	0.00	1.00	0.00	4.00	62.44	13.87	5.48	2.82
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	17.00	1.95	1.83	1.41	0.37
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.03
Northern pipefish	0.00	0.00	1.40	0.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	0.37	0.20	0.07
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.02
Red hake	0.00	0.00	12.20	0.00	58.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89	4.89	1.20
Scup	180.00	2081.4	732.26	958.05	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	330.97	184.73	67.41
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short bigeye	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.03
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	3.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.66	2.18	1.32	0.44
Striped bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped searobin	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.02
Summer flounder	0.00	0.00	448.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	341.46	65.85	44.89	13.41
Tautog	0.00	0.00	0.00	0.00	53.66	0.00	0.00	0.00	0.00	0.00	0.00	439.02	41.06	36.45	8.36
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winter flounder	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.00	3.00	0.00	0.00	4.58	4.14	0.93
Total	243.00	2092.7	1214.7	1004.4	179.59	12.00	196.10	1.95	4.00	63.00	22.00	858.54	491.00	191.53	100.00

Appendix Table 18. Arithmetic mean biomass per unit effort (g/400-m tow) of all species captured in the trawl at station NT3 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	.	0.00	0.00	0.00	0.18	0.18	0.02
Atlantic menhaden	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.04	0.04	0.01
Atlantic silverside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	.	1350.0	0.00	0.00	123.91	122.61	16.18
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.04	0.04	0.01
Black sea bass	0.00	0.00	12.97	25.85	22.50	0.00	0.00	0.00	.	0.00	0.00	0.00	5.57	3.02	0.73
Butterfish	0.00	0.00	18.05	0.49	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	1.69	1.64	0.22
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	32.17	21.40	13.22	0.00	5.43	14.00	6.00	2.00	.	3.00	15.00	2.00	10.38	2.99	1.36
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	.	0.00	5.00	0.00	2.27	1.83	0.30
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.13	0.13	0.02
Northern kingfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Northern pipefish	0.00	0.00	0.00	0.00	220.00	0.00	2.00	0.00	.	0.00	0.00	0.00	20.18	19.98	2.64
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Red hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Scup	0.00	567.44	616.65	804.88	7.85	0.00	0.00	0.00	.	0.00	0.00	0.00	181.53	94.76	23.71
Seaboard goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	225.00	0.00	0.00	0.00	.	0.00	600.00	500.00	120.45	67.49	15.73
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Striped bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Striped searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Summer flounder	0.00	0.00	1902.4	707.32	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	237.25	178.39	30.99
Tautog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.00	0.00	0.00	73.17	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	6.65	6.65	0.87
Winter flounder	0.00	0.00	0.00	121.95	0.00	0.00	0.00	0.00	.	2.00	135.00	350.00	55.36	33.29	7.23
Total	32.17	590.23	2564.3	1733.7	480.78	14.00	28.00	17.00	.	1355.0	755.00	852.00	765.65	249.48	100.00

Appendix Table 19. Arithmetic mean biomass per unit effort (g/400-m tow) of all species captured in the trawl at station NT4 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	960.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	80.00	10.98
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	340.00	0.00	0.00	28.58	28.31	3.92
Atlantic menhaden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic silverside	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	60.00	0.00	0.00	5.04	5.00	0.69
Banded rudderfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bay anchovy	0.00	16.74	21.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18	2.16	0.44
Black sea bass	0.00	0.00	44.37	21.81	65.61	0.00	38.10	0.00	0.00	0.00	0.00	0.00	14.16	6.63	1.94
Butterfish	0.00	50.00	0.49	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.29	4.20	0.73
Crevalle jack	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cunner	20.92	6.19	13.13	45.00	0.99	250.00	0.00	0.00	0.00	0.00	68.29	29.00	36.13	20.42	4.96
Grubby	0.00	0.00	7.32	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	22.00	6.61	4.36	0.91
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern pipefish	2.79	0.00	4.86	2.95	10.49	10.00	2.86	0.00	0.00	2.00	0.98	0.00	3.08	1.06	0.42
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	357.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.76	29.76	4.09
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	8.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	1.09	0.76	0.15
Red hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.08	0.08	0.01
Scup	0.00	0.00	45.98	866.67	191.95	50.00	28.57	0.00	0.00	0.00	0.00	0.00	98.60	71.60	13.54
Seaboard goby	0.00	0.00	0.00	0.50	0.00	0.00	0.00	1.00	0.00	0.00	0.98	0.00	0.21	0.11	0.03
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted hake	19.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.17	6.89	5.37	0.95
Striped bass	0.00	314.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.19	26.19	3.60
Striped searobin	0.00	0.00	0.00	1.45	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.14	0.03
Summer flounder	0.00	0.00	682.93	350.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.08	61.54	11.82
Tautog	0.00	0.00	0.00	49.05	40.00	0.00	0.00	0.00	0.00	0.00	0.00	750.00	69.92	62.03	9.60
Weakfish	0.00	0.00	0.00	23.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.97	1.97	0.27
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	1.67	1.67	0.23
Windowpane flounder	83.72	16.51	24.33	0.00	24.39	0.00	0.00	0.00	0.00	0.00	0.00	250.00	33.25	20.91	4.56
Winter flounder	108.13	409.24	33.17	62.50	146.34	0.00	0.00	62.00	550.00	500.00	48.78	341.67	188.49	58.69	25.88
Total	235.06	1178.2	878.45	1436.5	480.77	1270.0	69.52	116.00	550.00	927.00	119.02	1479.2	728.31	154.23	100.00

Appendix Table 20. Arithmetic mean biomass per unit effort (g/400-m tow) of all species captured in the trawl at station NT5 in New Bedford Harbor, June 1998 through May 1999.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Annual Mean CPUE	S.E.	Percent
Alewife	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American eel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atlantic herring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.08	0.01
Atlantic menhaden	0.00	0.00	6.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.57	0.04
Atlantic silverside	0.00	0.00	16.89	0.00	12.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.42	1.66	0.18
Banded rudderfish	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.01
Bay anchovy	0.00	0.00	1.42	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.12	0.01
Black sea bass	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.03
Butterfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crevalle jack	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.01
Cunner	0.00	0.00	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.41	0.33	0.03
Grubby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulf Stream flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mummichog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern kingfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern pipefish	0.00	0.00	6.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.04
Northern searobin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oyster toadfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow smelt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scup	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.01
Seaboard goby	0.00	0.00	0.00	0.00	0.00	4.00	2.86	0.00	0.00	0.00	0.00	0.00	0.57	0.39	0.04
Short bigeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skate sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smooth flounder	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.58	1.58	0.12
Spotted hake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped bass	0.00	0.00	0.00	0.00	292.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.39	24.39	1.81
Striped searobin	0.00	0.00	0.00	0.00	5.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.48	0.04
Summer flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tautog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weakfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Windowpane flounder	0.00	0.00	0.00	4.50	146.46	0.00	57.14	0.00	0.00	0.00	0.00	0.00	17.34	12.65	1.29
Winter flounder	325.00	0.00	378.90	98.05	2701.5	1650.0	3285.7	552.00	450.00	1395.3	2461.5	2300.0	1299.8	332.62	96.35
Total	344.00	0.00	416.49	104.01	3163.3	1654.0	3345.7	552.00	451.00	1395.3	2461.5	2301.0	1349.0	350.42	100.00