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Stomach contents of twenty-four species of fish caught in Cape Cod Bay and/or Massachusetts Bay during the period 1972-1978--DATA REPORT

by

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INTRODUCTION

Information on the feeding ecology of fishes in Cape Cod Bay and Massachusetts Bay is useful for describing the marine environment in the area as part of the Massachusetts Bay Biome program. The Massachusetts Bay "Biome" refers here to the coastal zone between Cape Cod and Cape Ann, and extends from the tidal zone to roughly the 100 m depth contour. Lux and Kelly (1978) described the fisheries resources in the Biome based on National Marine Fisheries Service otter trawl survey information gathered from 1949 to 1974 and on the commercial harvest in the region. They also noted numerous publications which provide a historical background on the marine resources of the region. This data report was prepared to serve as an addendum to the paper compiled by Lux and Kelly (loc. cit.). The information presented herein is a summary of the analysis of all fish stomachs collected as part of the Biome study.

METHODS

Collections consisted of 262 stomachs representing 24 species of fish caught at specified Biome stations (Figure 1) during annual spring and autumn bottom trawl surveys conducted by the NMFS (Grosslein 1969). Details of the bottom trawl survey techniques may be obtained from the Resource Surveys Investigation, NMFS, NEFC, Woods Hole Laboratory, Woods Hole, Massachusetts 02543. Feeding data on all species are based on collections from 1972 through 1978. The number of each species collected from particular years, seasons, and stations is listed in Table 1. Common and scientific names of fish used throughout this report were taken from Bailey (1970).

Samples collected in 1972 were labeled for cruise, station, and species. A more refined collection method was used during the period 1973-1978 with each stomach being individually wrapped and labeled according to cruise,

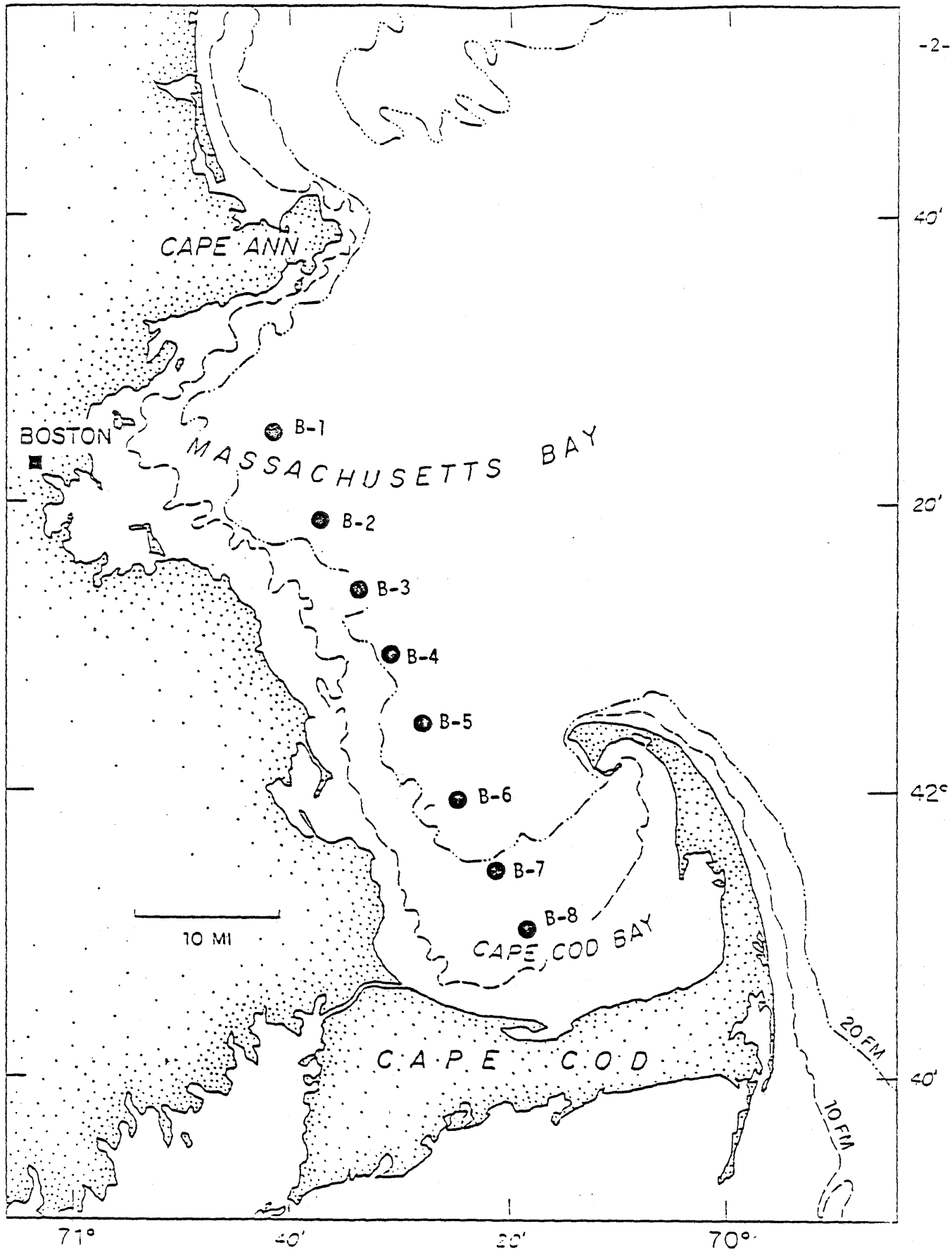

Figure 1. Station locations sampled from 1972-1978 in conjunction with the Northeast Fisheries Center as part of the Massachusetts Bay Biome program.

Table 1. Year, season, location, and number of each species represented in collections gathered for stomach content information as part of the Massachusetts Bay Biome program.

	Season and Year							Station								
Predator	Fall 1972	Spring 1974	Spring 1975	Fall 1976	Spring 1977	Fall 1977	Spring 1978	1	2	3	4	5	6	7	8	Total
Atlantic hagfish		1									1					1
Spiny dogfish	9							2	7							9
Thorny skate	1	1							1		1					2
Smooth skate		3									3					3
Alewife	9							9								9
American shad	1							1								1
Atlantic herring					1		35	9	6		11	10				36
Goosefish	1				2	3	1		2		2		3			7
Fourbeard rockling	2	1							2		1					3
Atlantic cod	37							37								37
Silver hake	7				6				7			6				13
Pollock	9							8	1							9
Red hake	3								3							3
White hake	22							3	19							22
Ocean pout	1						10	1							10	11
Blackbelly rosefish		1									1					1
Redfish	10							10								10
Sea raven	4	1						4			1					5
Longhorn sculpin	4							4								4
Mailed sculpin		2									2					2
Fourspot flounder	3							2	1							3
Witch flounder	13			6				2	17							19
American plaice	13		31	6				26	14	10						50
Yellowtail flounder	2							2								2
Grand Total																262

station, species, and fish length, sex, and maturity. Fish lengths were recorded in centimeters as either fork length for fish with forked tails or total length for those with unforked tails. The measurement used for each species is given at the bottom of Tables 2-25. All samples were preserved in 3.7 percent formaldehyde.

At the laboratory the preserved samples were opened and the contents identified. Prey species were counted, blotted dry and weighed (i.e., wet weight); then all data were recorded on a standard logsheet.

Stomach content data for each species are presented in Tables 2-25. Major food categories (e.g., CRUSTACEA) appear in upper case type and the cumulative weight and percentage weight (of the total stomach contents) for these categories are underlined. Subordinate and specific items appear in script or lower case, their weights and percentage weights being offset. Percentage occurrence data were calculated from all specimens examined (including empty stomachs) and is given for each species whose stomachs were individually examined (in contrast to a group of stomachs being opened and the contents examined together as was done for the 1972 samples). Stomach content categories designated as "other" (e.g., other copepods) include organisms for which degree of digestion prohibited more precise information. Parasites were included in the listing of stomach contents when they were identified in the stomachs. When organisms could not be identified to any level they were classified as animal remains. The total weight of all stomach contents and the percentage weight, along with the number of specimens, number of empty stomachs, mean stomach content weight, mean specimen length, and length range of the specimens are given at the bottom of Tables 2-25. "N.A." indicates data not available when it occurs within a particular table.

Table 2. Stomach contents of Atlantic hagfish, *Myxine glutinosa* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
(NONE)	0.000	0.0	0.0
Total	0.000g		100.0%

Number of specimens	1
Number of empty stomachs	1
Mean stomach content weight(g)	0.000
Mean total length of specimens(cm)	45
Length range of specimens(cm)	--

Table 3. Stomach contents of spiny dogfish, *Squalus acanthias* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.249		0.2
Decapod shrimp	0.249	11.1	0.2
PISCES	98.049		85.4
Hippoglossoides platessoides	98.049	11.1	85.4
ANIMAL REMAINS	16.489	N.A.	14.4
Total	114.787g		100.0%

Number of specimens	9
Number of empty stomachs	4
Mean stomach content weight(g)	12.754
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 4. Stomach contents of thorny skate, *Raja radiata* (Donovan).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
TREMATODA	0.196	50.0	95.0
POLYCHAETA	0.010		1.0
Nephtyidae	0.010	50.0	1.0
CRUSTACEA	0.025		2.6
Lysianassidae	0.025	50.0	2.6
ANIMAL REMAINS	0.013	50.0	1.4
Total	0.964g		100.0%

Number of specimens	2
Number of empty stomachs	0
Mean stomach content weight(g)	0.482
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 5. Stomach contents of smooth skate, *Raja senta* (Garman).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.021		60.0
Gammaridea	0.019	100.0	54.3
Erythrops erythropthalma	0.002	33.0	5.7
ANIMAL REMAINS	0.014	33.0	40.0
Total	0.035g		100.0%

Number of specimens	3
Number of empty stomachs	0
Mean stomach content weight(g)	0.012
Mean total length of specimens(cm)	19
Length range of specimens(cm)	10-31

Table 6. Stomach contents of alewife, *Alosa pseudoharengus* (Wilson).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	1.078		100.0
Centropages spp.	0.034	11.1	3.2
Neomysis americana	1.044	66.7	96.8
Total	1.078g		100.0%

Number of specimens	9
Number of empty stomachs	2
Mean stomach content weight(g)	0.120
Mean fork length of specimens(cm)	24
Length range of specimens(cm)	20-28

Table 7. Stomach contents of American shad, *Alosa sapidissima* (Wilson).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.640	100.0	100.0
Total	0.640g		100.0%

Number of specimens	1
Number of empty stomachs	0
Mean stomach content weight(g)	0.640
Mean fork length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 8. Stomach contents of Atlantic herring, *Clupea harengus harengus* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	3.136		94.5
Westwoodilla spp.	0.555	22.2	16.7
Parathemisto spp.	0.005	13.9	0.2
Decapod shrimp	0.002	2.8	0.1
Cumacea	0.003	2.8	0.1
Meganyctiphanes norvegica	0.178	2.8	5.4
Other euphausiids	0.094	8.3	2.8
Calanus finmarchicus	0.002	2.8	0.1
Pseudocalanus minutus	1.056	19.4	31.8
Calanoida	0.009	11.1	0.3
Other copepods	0.361	19.4	10.9
Crustacean larvae	0.001	11.1	<0.1
Other Crustacea	0.870	38.9	26.1
PISCES	0.022		0.6
Scombridae eggs	0.021	5.6	0.6
Pisces eggs	0.001	2.8	<0.1
ANIMAL REMAINS	0.165	41.7	4.9
Total	3.323g		100.0%

Number of specimens	36
Number of empty stomachs	5
Mean stomach content weight(g)	0.092
Mean fork length of specimens(cm)	27
Length range of specimens(cm)	22-32

Table 9. Stomach contents of goosefish, *Lophius americanus* (Valenciennes).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
TREMATODA	<0.001	14.3	<0.1
NEMATODA	0.007	14.3	<0.1
CRUSTACEA	0.550		0.1
Dichelopandalus leptocerus	0.515	14.3	0.1
Mysidacea	0.002	14.3	<0.1
Other Crustacea	0.033	14.3	<0.1
PISCES	567.976		99.9
Pleuronectiformes	246.519	28.6	43.4
Other Pisces	321.457	57.2	56.5
ANIMAL REMAINS	<0.001	14.3	<0.1
Total	568.533g		100.0%

Number of specimens	7
Number of empty stomachs	1
Mean stomach content weight(g)	81.219
Mean total length of specimens(cm)	33
Length range of specimens(cm)	14-72

Table 10. Stomach contents of fourbeard rockling, *Enchelyopus cimbrias* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
NEMATODA	<0.001	66.6	<0.1
POLYCHAETA	0.012		66.7
Spionidae	0.009	33.3	50.0
Ampharetidae	0.003	33.3	16.7
CRUSTACEA	0.006		33.3
Gammaridea	<0.001	33.3	<0.1
Cumacea	0.002	33.3	11.1
Mysidacea	<0.001	33.3	<0.1
Calanoida	<0.001	33.3	<0.1
Other copepods	<0.001	33.3	<0.1
Other Crustacea	0.004	100.0	22.2
ANIMAL REMAINS	<0.001	100.0	<0.1
Total	0.018g		100.0%

Number of specimens	3
Number of empty stomachs	0
Mean stomach content weight(g)	0.006
Mean total length of specimens(cm)	20
Length range of specimens(cm)	15-25

Table 11. Stomach contents of Atlantic cod, *Gadus morhua* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
POLYCHAETA	4.392		4.5
Aphroditidae	3.517	N.A.	3.6
Other Polychaeta	0.875	N.A.	0.9
CRUSTACEA	51.897		53.6
Amphipoda	0.047	N.A.	<0.1
Axius serratus	4.317	N.A.	4.5
Crangon septemspinosus	0.122	N.A.	0.1
Spirontocaris spinus	0.230	N.A.	0.2
Eualus fabricii	0.229	N.A.	0.2
Eualus pusiolus	0.386	N.A.	0.4
Dichelopandalus leptocerus	4.195	N.A.	4.3
Other pandalids	6.170	N.A.	6.4
Other decapod shrimp	2.452	N.A.	2.5
Hyas coaractus	0.272	N.A.	0.3
Pagurus pubescens	2.242	N.A.	2.3
Euphausiacea	0.172	N.A.	0.2
Mysis mixta	0.204	N.A.	0.2
Other Crustacea	30.859	N.A.	32.0
MOLLUSCA	4.818		5.0
Theuthidida	4.818	N.A.	5.0
ECHINODERMATA	2.805		2.9
Ophiopholis acuelata	0.331		0.3
Holothuroidea	2.474	N.A.	2.6
PISCES	31.477		32.5
Gadidae	11.403	N.A.	11.8
Other Pisces	20.074	N.A.	20.7
SAND AND ROCK	1.429	N.A.	1.5
Total	96.818g		100.0%

Number of specimens	37
Number of empty stomachs	0
Mean stomach content weight(g)	2.617
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 12. Stomach contents of silver hake, *Merluccius bilinearis* (Mitchill).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	9.393		9.7
Dichelopandalus leptocerus	4.365	N.A.	4.5
Mysis mixta	5.028	N.A.	5.2
PISCES	87.778		90.3
Ammodytes americanus	62.572	N.A.	64.4
Other Pisces	25.206	N.A.	25.9
Total	97.171g		100.0%

Number of specimens	13
Number of empty stomachs	2
Mean stomach content weight(g)	7.475
Mean fork length of specimen (cm)	N.A.
Length range of specimens(cm)	N.A.

Table 13. Stomach contents of pollock, *Pollachius virens* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	22.276		100.0
Dichelopandalus leptocerus	8.574	N.A.	38.5
Pandalus montagui	3.170	N.A.	14.2
Mysis mixta	2.788	N.A.	12.5
Other Crustacea	7.744	N.A.	34.8
Total	22.276		100.0%

Number of specimens	9
Number of empty stomachs	3
Mean stomach content weight(g)	2.475
Mean fork length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 14. Stomach contents of red hake, *Urophycis chuss* (Walbaum).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
POLYCHAETA	0.620	N.A.	3.2
CRUSTACEA	18.541		96.6
Crangon septemspinosa	0.243	N.A.	1.3
Dichelopandalus leptocerus	18.298	N.A.	95.3
MOLLUSCA	0.040		0.2
Gastropoda operculum	0.040	N.A.	0.2
Total	19.201		100.0%

Number of specimens	3
Number of empty stomachs	1
Mean stomach content weight(g)	6.40
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 15. Stomach contents of white hake, *Urophycis tenuis* (Mitchill).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
NEMATODA	0.037	N.A.	<0.1
CRUSTACEA	176.777		65.2
Dichelopandalus leptocerus	21.277	N.A.	7.8
Pandalus borealis	155.500	N.A.	57.4
Crangon septemspinosa	0.152	N.A.	<0.1
PISCES	94.193		34.8
Cryptacanthodes maculatus	62.586	N.A.	23.1
Hippoglossoides platessoides	31.607	N.A.	11.7
Total	271.007(g)		100.0%

Number of specimens	22
Number of empty stomachs	1
Mean stomach content weight(g)	12.319
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 16. Stomach contents of ocean pout, *Macrozoarces americanus* (Block and Schneider).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
POLYCHAETA	0.282	N.A.	3.1
MOLLUSCA	0.053		0.6
Nucula sp.	0.053	N.A.	0.6
ECHINODERMATA	8.815		96.3
Ophiuroidea	1.270	N.A.	13.9
Other Echinodermata	7.545	N.A.	82.4
Total	9.150g		100.0%

Number of specimens	11
Number of empty stomachs	9
Mean stomach content weight(g)	0.832
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 17. Stomach contents of blackbellied rosefish, *Helicolenus dactylopterus* (De la Roche).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.004		100.0
Unidentified shrimp	0.004	100.0	100.0
Total	0.004g		100.0%

Number of specimens	1
Number of empty stomachs	0
Mean stomach content weight(g)	0.004
Mean fork length of specimens(cm)	7
Length range of specimens(cm)	-

Table 18. Stomach contents of redfish, *Sebastes marinus* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
TREMATODA	0.026	90.0	0.6
POLYCHAETA	0.004	10.0	0.1
CRUSTACEA	3.845		94.7
Decapod larvae	0.004	30.0	0.1
Mysis mixta	3.760	30.0	92.6
Other mysids	0.081	20.0	2.0
Calanus spp.			<0.1
ANIMAL REMAINS	0.187	10.0	4.6
Total	4.062g		100.0%

Number of specimens	10
Number of empty stomachs	0
Mean stomach content weight(g)	0.406
Mean fork length of specimens(cm)	14
Length range of specimens(cm)	11-21

Table 19. Stomach contents of sea raven, *Hemitripterus americanus* (Gmelin).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	1.318		30.9
Pandalidae	1.041	N.A.	24.4
Mysis mixta	0.046	N.A.	1.1
Other shrimp	0.231	N.A.	5.4
PISCES	2.947		69.1
Cryptacanthodes maculatus	0.981	N.A.	23.0
Other Pisces	1.966	N.A.	46.1
Total	4.265		100.0%

Number of specimens	5
Number of empty stomachs	0
Mean stomach content weight(g)	0.853
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 20. Stomach contents of longhorn sculpin, *Myoxocephalus octodecemspinosus* (Mitchill).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
POLYCHAETA	0.296		13.1
Aphroditidae	0.296	N.A.	13.1
CRUSTACEA	0.991		43.8
Unciola irrorata	0.016	N.A.	0.7
Dichelopandalus leptocerus	0.738	N.A.	32.6
Mysis mixta	0.237	N.A.	10.5
PISCES	0.978		43.1
Aspidophoroides monopterygius	0.978	N.A.	43.1
Total	2.265		100.0%

Number of specimens	4
Number of empty stomachs	1
Mean stomach content weight(g)	0.566
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 21. Stomach contents of mailed sculpin, *Triglops nybelini* (Jensen).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.020	100.0	100.0
Total	0.020g		100.0%

Number of specimens	2
Number of empty stomachs	0
Mean stomach content weight(g)	0.010
Mean total length of specimens(cm)	12
Length range of specimens(cm)	12

Table 22. Stomach contents of fourspot flounder, *Paralichthys oblongus* (Mitchill).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.140		100.0
Unidentified shrimp	0.140	66.7	100.0
Total	0.140(g)		100.0%

Number of specimens	3
Number of empty stomachs	1
Mean stomach content weight(g)	0.047
Mean total length of specimens(cm)	15
Length range of specimens(cm)	14-17

Table 23. Stomach contents of witch flounder, *Glyptocephalus cynoglossus* (Linnaeus).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
NEMATODA	0.001	10.5	0.3
POLYCHAETA	0.146		38.4
Sternaspidae	0.027	5.3	7.1
Nephtyidae	0.012	5.3	3.2
Other Polychaeta	0.107	21.1	28.1
CRUSTACEA	0.127		33.4
Gammaridea	0.020	21.1	5.2
Pseudoleptucuma minor	0.030	15.8	7.9
Other cumaceans	0.019	31.6	5.0
Other Crustacea	0.058	47.4	15.3
ANIMAL REMAINS	0.106	57.9	27.9
Total	0.380g		100.0%

Number of specimens	19
Number of empty stomachs	0
Mean stomach content weight(g)	0.020
Mean total length of specimens(cm)	13
Length range of specimens(cm)	6-18

Table 24. Stomach contents of American plaice, *Hippoglossoides platessoides* (Fabricius).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
NEMATODA	1.851	N.A.	38.0
TREMATODA	<0.001	N.A.	<0.1
POLYCHAETA	0.639		13.1
Flabelligeridae	0.040	N.A.	0.8
Other Polychaeta	0.599	N.A.	12.3
CRUSTACEA	0.021		0.4
Gammaridea	0.012	N.A.	0.2
Erythrops erythrophthalma	<0.001	N.A.	<0.1
Calanoida	0.009	N.A.	0.2
Other Crustacea	<0.001	N.A.	<0.1
ANIMAL REMAINS	2.365	N.A.	48.5
Total	4.876g		100.0%

Number of specimens	50
Number of empty stomachs	14
Mean stomach content weight(g)	0.098
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

Table 25. Stomach contents of yellowtail flounder, *Limanda ferruginea* (Storer).

CONTENTS	Weight(g)	Percentage occurrence	Percentage weight
CRUSTACEA	0.020		7.7
Isopoda	0.020	50.0	7.7
ANIMALS REMAINS	0.240	50.0	92.3
Total	0.260g		100.0%

Number of specimens	2
Number of empty stomachs	0
Mean stomach content weight(g)	0.130
Mean total length of specimens(cm)	N.A.
Length range of specimens(cm)	N.A.

DISCUSSION

The analysis of fish stomach contents showed that the predators sampled in the Biome area generally utilize four main prey groups: crustaceans, fish, polychaetes, and echinoderms (Table 26). Crustaceans, the prey most frequently identified in the stomachs, accounted for a substantial portion of the diet (>25% by weight) of 16 of the 24 species examined. For example, amphipods were the main dietary item (54.3%) of smooth skate; pandalid shrimp were eaten in large quantities by red hake (*Dichelopandalus leptocerus*, 95.3%), white hake (*Pandalus* spp., 57.4%), longhorn sculpin (*Dichelopandalus leptocerus*, 32.6%), and sea raven (unidentified pandalids, 24.4%); mysids comprised the majority of food taken by alewife (*Neomysis americana*, 96.8%), and redfish (*Mysis mixta*, 92.6%); and calanoid copepods made up a large part of the diet (32.2%) of Atlantic herring.

Fish were taken as food in large quantities by seven of the species examined. Fish remains (unidentifiable because of digestion) were found in the stomachs of goosefish (56.5%), sea raven (46.1%), longhorn sculpin (43.1%), Atlantic cod (32.5%), and silver hake (25.9%). Fishes identified as prey included *Ammodytes americanus*, American sand lance (64.4% of the silver hake diet), *Hippoglossoides platessoides*, American plaice (85.4% of the spiny dogfish diet and 11.7% of the food of white hake), *Cryptacanthodes maculatus*, wrymouth (approximately 23% of the stomach contents of both white hake and sea raven), and "Other Pleuronectiformes" (43.4% of the diet of goosefish).

Table 26. Stomach contents of 24 species of fish caught in the Cape Cod and Massachusetts Bay region during the period 1972-1978. Data are presented as a percentage weight (+ indicates present but <0.1%).

Prey	Atlantic hagfish	Spiny dogfish	Thorny skate	Smooth skate	Alewife	American shad	Atlantic herring	Goosefish	Fourbeard rockling	Atlantic cod	Silver hake	Pollock
POLYCHAETA	-	-	1.0	-	-	-	-	-	66.7	4.5	-	-
Aphroditidae	-	-	-	-	-	-	-	-	-	3.6	-	-
Nephtyidae	-	-	1.0	-	-	-	-	-	-	-	-	-
Other Polychaeta	-	-	-	-	-	-	-	-	66.7	0.9	-	-
CRUSTACEA	-	0.2	2.6	60.0	100.0	100.0	94.5	0.1	33.3	53.6	9.7	100.0
Amphipoda	-	-	2.6	54.3	-	-	16.9	-	<0.1	<0.1	-	-
Crangon septemspinosa	-	-	-	-	-	-	-	-	-	0.1	-	-
Dichelopandalus leptocerus	-	-	-	-	-	-	-	0.1	-	4.3	4.5	38.5
Pandalus spp.	-	-	-	-	-	-	-	-	-	-	-	14.2
Other pandalids	-	-	-	-	-	-	-	-	-	6.4	-	-
Other decapods	-	0.2	-	-	-	-	0.1	-	-	10.4	-	-
Mysis mixta	-	-	-	-	-	-	-	-	-	0.2	5.2	12.5
Erythrops erythropthalma	-	-	-	5.7	-	-	-	-	-	-	-	-
Neomysis americana	-	-	-	-	96.8	-	-	-	-	-	-	-
Other mysids	-	-	-	-	-	-	-	<0.1	<0.1	-	-	-
Meganyctiphanes norvegica	-	-	-	-	-	-	5.4	-	-	-	-	-
Other euphausiids	-	-	-	-	-	-	2.8	-	-	0.2	-	-
Calanoid copepods	-	-	-	-	3.2	-	32.2	-	<0.1	-	-	-
Other copepods	-	-	-	-	-	-	10.9	-	<0.1	-	-	-
Other Crustacea	-	-	-	-	-	100.0	26.2	<0.1	33.3	32.0	-	34.8
ECHINODERMATA	-	-	-	-	-	-	-	-	-	2.9	-	-
Ophiuroidea	-	-	-	-	-	-	-	-	-	0.3	-	-
Other Echinodermata	-	-	-	-	-	-	-	-	-	2.6	-	-
PISCES	-	85.4	-	-	-	-	0.6	99.9	-	32.5	90.3	-
Dryptacanthodes maculatus	-	-	-	-	-	-	-	-	-	-	-	-
Hippoglossoides platessoides	-	85.4	-	-	-	-	-	-	-	-	-	-
Other Pleuronectiformes	-	-	-	-	-	-	-	43.4	-	-	-	-
Ammodytes americanus	-	-	-	-	-	-	-	-	-	-	64.4	-
Other Pisces	-	-	-	-	-	-	0.6	56.5	-	32.5	25.9	-
MISCELLANEOUS	-	14.4	96.4	40.0	-	-	4.9	<0.1	<0.1	6.5	-	-
Number of specimens	1	9	2	3	9	1	36	7	3	37	13	9
Number of empty stomachs	1	4	0	0	2	0	5	1	0	0	2	3

Table 26. cont'd.

Prey	Red hake	White hake	Ocean pout	Blackbelly rosefish	Redfish	Sea raven	Longhorn sculpin	Mailed sculpin	Fourspot flounder	Witch flounder	American plaice	Y'tail flounder
POLYCHAETA	3.2	-	3.1	-	0.1	-	13.1	-	-	38.4	13.1	-
Aphroditidae	-	-	-	-	-	-	13.1	-	-	-	-	-
Nephtyidae	-	-	-	-	-	-	-	-	-	3.2	-	-
Other Polychaeta	3.2	-	3.1	-	0.1	-	-	-	-	35.2	13.1	-
CRUSTACEA	96.6	65.2	-	100.0	94.7	30.9	43.8	100.0	100.0	33.4	0.4	7.7
Amphipoda	-	-	-	-	-	-	0.7	-	-	5.2	0.2	-
Crangon septemspinosa	1.3	<0.1	-	-	-	-	-	-	-	-	-	-
Dichelopandalus leptocerus	95.3	7.8	-	-	-	-	32.6	-	-	-	-	-
Pandalus spp.	-	57.4	-	-	-	-	-	-	-	-	-	-
Other pandalids	-	-	-	-	-	24.4	-	-	-	-	-	-
Other decapods	-	-	-	-	0.1	-	-	-	-	-	-	-
Mysis mixta	-	-	-	-	92.6	1.1	10.5	-	-	-	-	-
Erythrops erythropthalma	-	-	-	-	-	-	-	-	-	-	<0.1	-
Neomysis americana	-	-	-	-	-	-	-	-	-	-	-	-
Other mysids	-	-	-	-	2.0	-	-	-	-	-	-	-
Meganyctiphanes norvegica	-	-	-	-	-	-	-	-	-	-	-	-
Other euphausiids	-	-	-	-	-	-	-	-	-	-	-	-
Calanoid copepods	-	-	-	-	<0.1	-	-	-	-	-	0.2	-
Other copepods	-	-	-	-	-	-	-	-	-	-	-	-
Other Crustacea	-	-	-	100.0	-	5.4	-	100.0	100.0	28.2	<0.1	7.7
ECHINODERMATA	-	-	96.3	-	-	-	-	-	-	-	-	-
Ophiuroidea	-	-	13.9	-	-	-	-	-	-	-	-	-
Other Echinodermata	-	-	82.4	-	-	-	-	-	-	-	-	-
PISCES	-	34.8	-	-	-	69.1	43.1	-	-	-	-	-
Cryptacanthodes maculatus	-	23.1	-	-	-	23.0	-	-	-	-	-	-
Hippoglossoides platessoides	-	11.7	-	-	-	-	-	-	-	-	-	-
Other Pleuronectiformes	-	-	-	-	-	-	-	-	-	-	-	-
Ammodytes americanus	-	-	-	-	-	-	-	-	-	-	-	-
Other Pisces	-	-	-	-	-	46.1	43.1	-	-	-	-	-
MISCELLANEOUS	0.2	<0.1	0.6	-	5.2	-	-	-	-	28.2	86.5	92.3
Number of specimens	3	22	11	1	10	5	4	2	3	19	50	2
Number of empty stomachs	1	1	9	0	0	0	1	0	1	0	14	0

Polychaetes were a major prey of fourbeard rockling (66.7%) and witch flounder (38.4%). Fairly large quantities of polychaetes were also eaten by American plaice (13.1%) and longhorn sculpin (13.1%). Echinoderms made up a substantial part of the diet of only one predator, namely ocean pout (96.3%).

The occurrence of American plaice in spiny dogfish stomachs is of special interest. In a recent paper (Bowman 1981) I described the distribution and abundance of juvenile American plaice (along with the juveniles of 14 other species). The largest numbers of juvenile American plaice occurred within the Biome area, indicating that the region is an important nursery ground for this species. In addition, it has been documented that spiny dogfish are one of the more abundant fish in the area from spring to fall both in terms of numbers and biomass (Lux and Kelly 1978; Howe et al. 1980). Spiny dogfish are described by Bigelow and Schroeder (1953) as "Voracious almost beyond belief....." Papers by Noskov and Vinogradov (1977) and Edwards and Bowman (1979) indicate that the total consumption of spiny dogfish is almost unequaled among Northwest Atlantic continental shelf fishes. The food data presented in this paper, although based on few specimens, when combined with the information from reports cited above, gives some indication of the potential predation by spiny dogfish on juvenile American plaice.

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