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Seasonal Food Habits of Demersal Fish in the Northwest Atlantic - 1972

by

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INTRODUCTION

The food habits project at the Northeast Fisheries Center, Woods Hole, Massachusetts, was designed to provide information on the feeding interactions of marine fish in the Northwest Atlantic. Seasonal dietary information is needed to understand how marine fish partition resources throughout the year.

Seasonal variations in the stomach contents of fishes have previously been reported. A study off Cape Cod, Massachusetts, by Wigley and Theroux (1965) showed the quantity of fish found in haddock stomachs is higher during April and May, while crustaceans are the predominant food in March and June. The seasonal variability in the food habits of red and silver hake caught in the Northwest Atlantic were observed by Vinogradov (1971). He found red hake consume more amphipods in late autumn than during winter when the variety of food groups increases. Observations on silver hake showed their feeding rate drops in winter, except in the Hudson Canyon area where intensive feeding occurs throughout the year.

This investigation provides data from a broader geographical range, Cape Hatteras to western Nova Scotia, and deals with a greater number of predator species than previous reports. The food habits of 18 species of marine fish collected during the spring and autumn of 1972 are examined in this report.

METHODS AND MATERIALS

Stomachs were excised from fish caught with an otter trawl during spring and fall groundfish surveys conducted by the ALBATROSS IV. The survey extends from Cape Hatteras, southerly, to western Nova Scotia, northerly, and comprises five major ecological zones: the Middle Atlantic, southern New England, Georges Bank, the Gulf of Maine, and western Nova Scotia (Figure 1). These divisions were delineated because of differences in hydrography, geography and biology (Grosslein 1969). Tows were made at depths ranging from 27 m to 366 m for a period of 30 minutes. The collection of 7,213 stomachs, representing 18 species of fish, was made during the spring and autumn of 1972. The distribution of the samples is shown in Appendix 1. Fish stomachs were excised at sea, labeled by station and species, pooled regardless of size and preserved in 10% Formalin[1].

At the laboratory the preserved stomachs were opened and the contents identified to the lowest possible taxa. Each prey species was then counted, damp dried (blotted dry), weighed and the data recorded. When numerous amounts of small animals occurred an estimate of the total number was derived by examining a subsample of the total and then multiplying the results by the appropriate expansion factor (determined by the ratio of the subsample weight

[1] Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

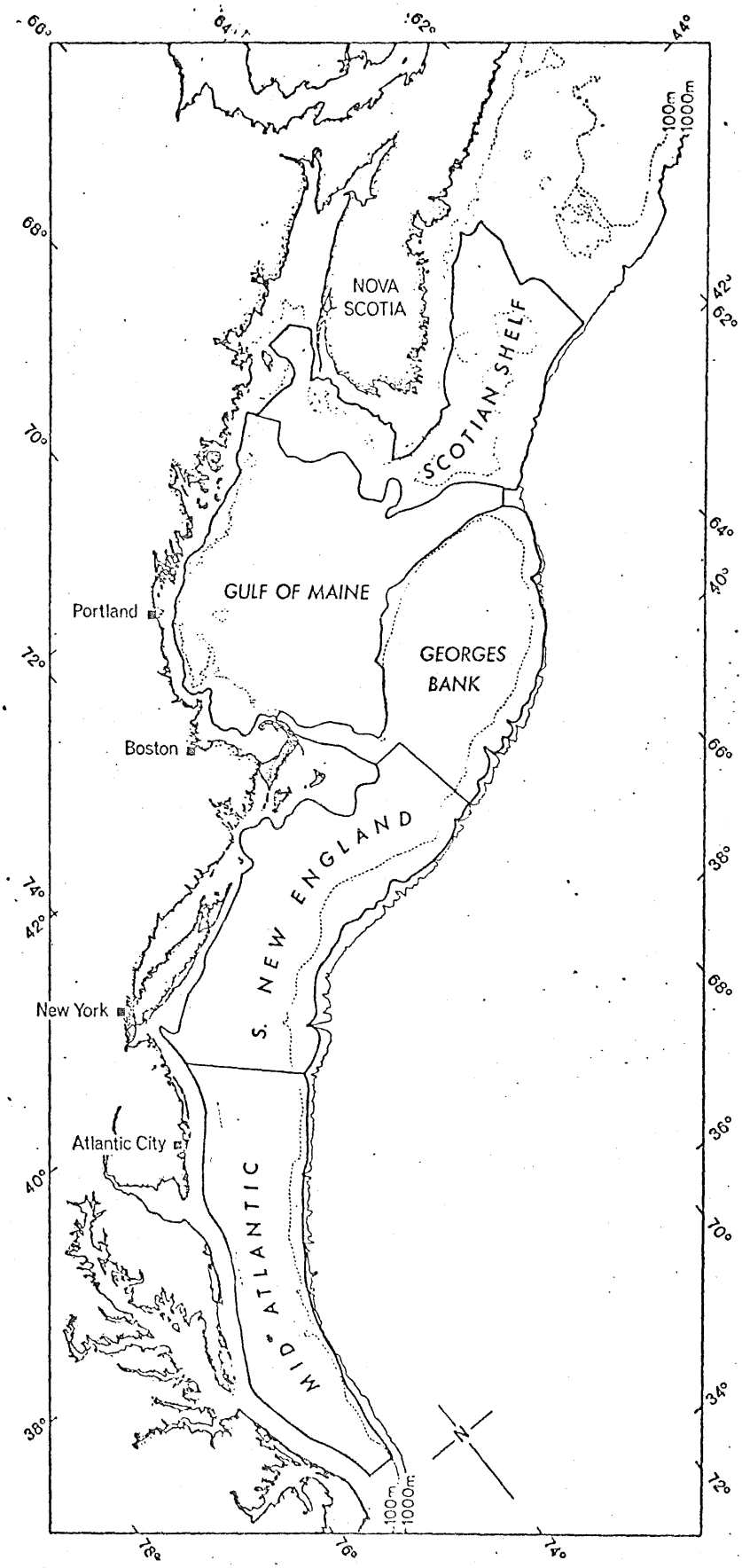

Figure 1. Areas sampled during the spring and fall of 1972 by the Groundfish Survey Unit, NEFC, Woods Hole, Massachusetts.

to the total weight). Reduction of the data was accomplished by the use of computer facilities at the laboratory.

Food habit data for each predator are presented in tabular form, arranged in phyletic sequence, with the accepted common name (Anon., 1970) of each predator in the upper right corner of the table. Items found in the stomachs which were not major diet constituents have been grouped into broad taxa or are listed in the category "OTHER PHYLA". Stomach content groups which comprise less than 0.1 percent of the total stomach contents weight are indicated on the tables by a "+" sign. Results of the analysis are presented as a percentage of the total stomach contents weight for each prey group. The cumulative percentage of the total stomach content weight for major food categories is underlined. The percent stomach content weights for more specific groups are offset. Located at the bottom of each table are the total number of samples examined, the percent of that total which were empty and the mean weight per stomach. Calculations for the mean weight per stomach were made by dividing the total weight of all stomach contents by the total number of samples. Mean length data for each species was computed by multiplying the number of fish caught at each length times that length, adding their products, and dividing by the total number of fish (found only in Table 19).

DISCUSSION

The food habit data for 18 fish species is summarized in Table 19. A statistical analysis of the summary data was performed utilizing the Mann-Whitney U-test (Elliott, 1971). The test was used to compare the major prey items consumed during the spring and autumn (utilizing prey common to several species). Some prey species are known to vary in distribution and abundance at different times of the year. These differences may be reflected in the food habits of marine fish.

Squid (Loligo and Illex), an important prey of spiny dogfish, goosefish, sea raven, fourspot flounder, and witch flounder, are known to have a broader distribution in the autumn when water temperatures are warmer. During the spring between Cape Hatteras and western Nova Scotia squid are mostly confined to waters of 8 - 12°C along the upper continental slope (Tibbetts, 1975). When water temperatures become warmer throughout the summer, an onshore movement occurs resulting in a wider distribution during the autumn. If the squid occupy more feeding niches in the autumn they may be subject to predation by more fish species. However, the Mann-Whitney U-test showed no significant difference in the quantity of squid consumed during the spring and autumn by fish in this study.

Another prey group known to be more widely distributed in the fall are the euphausiids Meganyctiphane norvegica and Thysanoessa inermis (Bigelow, 1926), which were also the most common euphausiid species found in

the stomachs. However, the quantity of euphausiids consumed was not found to vary significantly between seasons.

Fish and amphipods found in the stomachs were also tested statistically; they revealed no significant differences as prey items between the spring and fall.

Seasonal variations in the food habits of fish have been previously established (ie., Wigley 1965; Tyler 1971; Vinogradov 1971). The results of this study revealed no significant differences in the prey types between spring and autumn. The food groups appeared to be similar during both seasons.

The lack of significant seasonal prey variation may have resulted from the large geographical range and multiple predator types considered. This can be better explained as follows: several of the predators (ie., silver hake, red hake, spiny dogfish) studied have seasonal distributions similar to those of their prey (Grosslein, 1973), therefore, their prey types may remain constant, fish such as redfish utilize only one major food source (euphausiids) and merely have a more difficult time obtaining food at different times of the year, or spawning times may interfere with the food habits of some fish species during certain seasons. Intensive sampling of one predator species in a restricted location may better reveal seasonal changes in its diet, as was suggested by Wigley and Theroux, 1965.

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Table 1. Stomach contents of *Squalus acanthias* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scoti % wt	
	S	F	S	F	S	F	S	F	S	F
HYDROZOA	-	-	-	4.8	-	-	-	-	-	-
NEMERTEA	-	-	-	-	+	0.6	-	-	0.3	-
POLYCHAETA	0.3	-	0.1	0.1	+	0.5	0.1	-	-	-
SIPUNCULIDA	-	-	-	0.3	-	25.0	-	-	-	-
CRUSTACEA	1.3	-	1.6	4.7	0.7	3.3	2.8	0.4	6.8	-
Cancridae	0.2	-	1.2	3.7	0.5	0.4	-	-	-	-
Cancer	0.2	-	1.2	3.7	0.5	0.4	-	-	-	-
Paguridae	-	-	-	0.7	0.1	1.3	-	-	-	-
Pasiphaeidae	-	-	-	-	+	-	2.6	-	-	-
Galatheidae	1.1	-	0.1	-	-	-	-	-	4.7	-
Other Decapods	-	-	0.3	0.3	0.1	1.2	0.1	0.1	-	-
Other Crustacea	+	-	+	-	+	0.4	0.1	0.3	2.1	-
MOLLUSCA	61.5	-	10.2	42.8	-	6.8	-	-	-	-
Gastropoda	-	-	-	-	-	0.6	-	-	-	-
Cephalopoda	61.5	-	8.5	42.8	-	5.8	-	-	-	-
Loligo	61.5	-	8.5	42.8	-	5.8	-	-	-	-
Other Mollusca	+	-	1.7	-	-	0.4	-	-	-	-
PISCES	36.6	-	87.3	44.9	98.8	58.0	96.1	-	89.0	-
Chondrichthyes	-	-	-	2.4	-	-	-	-	-	-
Squalus acanthias	-	-	-	2.4	-	-	-	-	-	-
Raja eglanteria	-	-	-	-	-	0.5	-	-	-	-
Clupeidae	-	-	-	-	4.9	9.1	20.2	-	-	-
Etrumeus teres	-	-	-	-	-	9.1	-	-	-	-
Other Clupeidae	-	-	-	-	4.9	-	20.2	-	-	-
Gadidae	-	-	4.6	21.7	-	+	-	-	-	-
Belonidae	-	-	-	-	-	1.3	-	-	-	-
Cryptacanthodidae	-	-	-	0.1	-	-	-	-	-	-
Scombridae	20.4	-	50.2	13.3	21.8	2.0	-	-	-	-
Scomber	20.4	-	50.2	13.3	21.8	2.0	-	-	-	-
Bothidae	-	-	-	-	5.0	0.4	-	-	-	-
Scophthalmus aquosus	-	-	-	-	-	0.4	-	-	-	-
Other Bothidae	-	-	-	-	5.0	-	-	-	-	-
Pleuronectidae	-	-	3.5	+	11.0	-	-	-	-	-
Limanda ferruginea	-	-	-	-	11.0	-	-	-	-	-
Other Pleuronectidae	-	-	3.5	+	-	-	-	-	-	-
Pisces eggs	-	-	-	-	-	11.4	-	-	-	-
Other Pisces	16.2	-	29.0	7.4	56.1	33.3	75.9	-	89.0	-
OTHER PHYLA	-	-	0.1	0.1	-	0.4	-	+		-
ANIMAL REMAINS	0.3	-	0.7	2.3	0.5	4.8	0.9	99.6	3.9	-
SAND AND ROCK	-	-	+	-	+	0.6	0.1	-	-	-
No. of stomachs	31	-	81	55	44	107	10	16	11	-
Percent empty	41.9	-	14.8	18.2	15.9	25.2	0.0	18.8	63.6	-
$\bar{X}$ wt per stomach (g)	34.1	-	31.3	17.9	50.2	6.8	50.0	3.2	4.9	-

Table 2. Stomach contents of *Lophius americanus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
CRUSTACEA	22.0	0.8	0.1	6.3	1.4	+	32.5	-	-	-
Cancridae	22.0	-	-	-	-	-	-	-	-	-
Cancer irroratus	22.0	-	-	-	-	-	-	-	-	-
Crangonidae	-	-	-	-	0.1	-	-	-	-	-
Pandalidae	-	0.8	-	0.3	1.3	-	32.5	-	-	-
Pandalus	-	-	-	-	1.3	-	32.5	-	-	-
other Pandalidae	-	0.8	-	0.3	-	-	-	-	-	-
Other Decapoda	-	+	0.1	6.0	-	+	-	-	-	-
MOLLUSCA	-	41.1	15.1	19.4	-	3.8	-	-	-	-
Cephalopoda	-	41.1	15.1	19.4	-	3.8	-	-	-	-
Loligo	-	6.2	15.1	9.2	-	-	-	-	-	-
Illex	-	14.2	-	-	-	-	-	-	-	-
Other cephalopoda	-	20.7	+	10.2	-	3.8	-	-	-	-
PISCES	78.0	57.6	84.8	64.3	98.5	96.2	67.5	100.0	100.0	100.0
Rajidae	-	-	-	-	-	-	-	-	-	100.0
Raja binoculata	-	-	-	-	-	-	-	-	-	100.0
Squalidae	-	-	-	7.1	-	-	-	-	-	-
Squalus	-	-	-	7.1	-	-	-	-	-	-
Notacanthidae	-	-	-	-	-	63.7	-	-	-	-
Chauliodontidae	-	-	-	2.5	-	-	-	-	-	-
Gadidae	-	38.0	-	12.4	-	-	-	9.2	-	-
Merluccius bilinearis	-	-	-	-	-	-	-	9.2	-	-
Urophycis chuss	-	20.4	-	4.2	-	-	-	-	-	-
Other Gadidae	-	17.6	-	8.2	-	-	-	-	-	-
Ophidiidae	30.7	1.7	-	-	-	-	-	-	-	-
Zoarcidae	-	0.9	-	-	-	-	-	-	-	-
Scombridae	-	-	-	-	-	32.5	-	-	-	-
Scomber scombrus	-	-	-	-	-	32.5	-	-	-	-
Stromateidae	-	3.4	-	-	-	-	-	-	-	-
Scorpaenidae	-	1.2	-	5.1	-	-	-	89.9	-	-
Triglidae	-	-	11.0	14.1	-	-	-	-	-	-
Cottidae	-	-	-	-	35.6	-	-	-	-	-
Bothidae	-	0.8	-	-	-	-	-	-	-	-
Pleuronectidae	-	2.1	-	-	-	-	-	-	100.0	-
Other Pisces	47.3	9.5	73.8	23.1	62.9	+	67.5	0.9	-	-
ANIMAL REMAINS	-	0.5	-	10.0	0.1	+	-	-	-	-
No. of stomachs	7	79	18	44	10	9	6	3	1	1
Percent empty	57.1	50.6	33.3	40.9	40.0	55.6	50.0	33.3	0.0	0.0
$\bar{X}$ wt per stomach (g)	24.9	12.8	21.3	23.1	22.2	236.1	2.9	148.4	146.5	145.8

Table 3. Stomach contents of *Gadus morhua* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
ANTHOZOA	-	-	-	-	-	-	-	-	0.3	-
NEMERTEA	-	-	-	0.4	-	+	-	0.7	-	+
SIPUNCULIDA	-	-	-	-	-	+	-	-	-	-
POLYCHAETA	-	-	5.9	0.7	-	0.3	0.6	0.5	2.1	0.1
Aphrodita	-	-	5.8	-	-	-	0.3	-	1.3	-
Other Polychaeta	-	-	0.1	0.7	+	0.3	0.3	0.5	0.8	0.1
CRUSTACEA	81.2	-	12.8	13.2	93.8	6.8	29.9	48.3	31.3	15.8
Axiidae	-	-	-	-	-	-	-	-	3.7	-
Axius	-	-	-	-	-	-	-	-	3.7	-
Cancridae	55.3	-	8.5	9.7	0.1	1.7	10.0	9.8	-	-
Cancer	55.3	-	8.5	9.7	0.1	1.7	10.0	9.8	-	-
Crangonidae	-	-	0.1	+	12.6	0.5	-	+	0.2	0.2
Crangon	-	-	0.1	+	12.6	0.5	-	+	0.2	0.2
Geryonidae	-	-	-	-	-	-	12.5	31.7	-	-
Geryon	-	-	-	-	-	-	12.5	31.7	-	-
Majidae	-	-	-	0.1	-	0.2	-	1.2	13.8	3.6
Hyas	-	-	-	0.1	-	0.2	-	1.2	13.8	3.6
Paguridae	-	-	-	0.1	-	0.8	0.1	0.2	1.8	0.5
Pagurus	-	-	-	0.1	-	0.8	-	0.2	-	0.5
Other Paguridae	-	-	-	-	-	-	0.1	-	1.8	-
Pandalidae	-	-	0.1	1.6	0.4	1.6	1.0	1.7	4.5	4.6
Dichelopandalus	-	-	-	1.6	-	1.6	-	1.5	-	2.7
Pandalus	-	-	-	-	-	+	-	0.2	-	1.9
Other Pandalidae	-	-	0.1	-	0.4	-	1.0	-	4.5	-
Other Decapoda	-	-	3.9	1.6	0.6	0.7	2.9	0.7	2.7	2.5
Euphausiacea	-	-	-	-	-	0.4	0.2	1.0	0.7	2.5
Meganyctiphanes	-	-	-	-	-	0.1	-	1.0	-	2.5
Thysanoessa	-	-	-	-	-	0.2	-	-	-	-
Other Euphausiacea	-	-	-	-	-	0.1	0.2	+	0.7	-
Mysidacea	-	-	-	-	56.7	-	-	-	-	-
Neomysis	-	-	-	-	41.9	-	-	-	-	-
Other Mysidacea	-	-	-	-	14.8	-	+	-	-	-
Amphipoda	-	-	0.1	0.1	3.0	0.1	0.1	0.2	0.1	-
Other Crustacea	25.9	-	0.1	+	20.4	0.8	3.1	1.8	3.8	1.9
MOLLUSCA	-	-	1.9	1.5	-	0.8	0.1	1.8	0.3	0.1
Pelecypoda	-	-	-	0.2	-	0.2	-	-	-	-
Gastropoda	-	-	1.8	1.3	-	0.6	0.1	1.6	0.1	0.1
Other Mollusca	-	-	0.1	+	-	-	-	0.2	0.2	+

Table 3. Stomach contents of *Gadus morhua* (continued)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
ECHINODERMATA	-	-	0.6	0.8	0.4	1.1	1.0	1.1	5.8	0.1
Echinoidea	-	-	-		0.1	-	0.1	0.1	0.3	-
Ophiuroidea	-	-	-	0.8	-	0.6	0.5	1.0	1.6	0.1
Holothuroidea	-	-	0.6	-	0.3	0.5	0.4	-	1.9	-
Asteroidea	-	-	-	-	-	-	-	-	2.0	-
PISCES	9.8	-	70.3	76.7	2.4	86.5	64.9	42.1	50.3	76.8
Clupeidae	-	-	16.5	76.6	-	78.8	19.8	-	4.1	36.6
Clupea harengus	-	-	-	76.6	-	69.5		-	-	-
Other Clupeidae	-	-	16.5	-	-	9.3	19.8	-	4.1	36.6
Argentinidae	-	-	-	-	-	-	11.8	-	-	-
Argentina silus	-	-	-	-	-	-	11.8	-	-	-
Gadidae	-	-	-	-	-	0.1	6.3	-	23.3	0.6
Gadus morhua	-	-	-	-	-	-	-	-	0.3	-
Melanogrammus aeglefinus	-	-	-	-	-	-	-	-	0.9	-
Merluccius bilinearis	-	-	-	-	-	-	-	-	6.8	-
Other Gadidae	-	-	-	-	-	0.1	6.3	-	15.3	0.6
Anarhichadidae	-	-	-	-	-	-	17.3	-	-	-
Scombridae	-	-	25.6	-	-	-	-	-	-	17.2
Scomber scombrus	-	-	25.6	-	-	-	-	-	-	17.2
Cottidae	-	-	4.4	-	-	-	-	0.3	-	-
Pleuronectiformes	-	-	3.2	-	-	0.3	1.7	-	-	-
Paralichthys dentatus	-	-		-	-	0.1	-	-	-	-
Other Pleuronectiformes	-	-	3.2	-	-	0.2	1.7	-	-	-
Other Pisces	9.8	-	20.6	0.1	2.4	7.3	8.0	41.8	22.9	22.4
OTHER PHYLA	0.4	-	+	+	0.1	+	0.1	0.1	0.1	+
ANIMAL REMAINS	8.6	-	8.4	4.1	3.2	3.5	3.3	5.4	9.5	6.8
SAND AND ROCK	-	-	0.1	2.6	0.1	1.0	0.1	+	0.3	0.3
No. of stomachs	1	-	11	20	60	280	58	94	111	64
Percent empty	0.0	-	0.0	10.0	0.0	8.2	3.4	10.6	27.3	7.8
$\bar{X}$ wt per stomach (g)	22.4	-	83.5	65.1	1.1	31.8	36.8	13.6	18.6	12.6

Table 4. Stomach contents of *Melanogrammus aeglefinus* (haddock) by ecological area expressed as percent of the total weight for the spring and fall of 1972 (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	-	-	1.6	3.8	20.9	9.2	5.3	10.6
CRUSTACEA	-	-	24.3	-	94.4	32.4	45.2	6.3	17.0	13.6
Axiidae	-	-	-	-	-	-	-	-	6.0	-
Axius	-	-	-	-	-	-	-	-	6.0	-
Crangonidae	-	-	-	-	2.8	3.8	-	-	-	0.6
Crangon	-	-	-	-	2.8	3.8	-	-	-	0.6
Majidae	-	-	-	-	-	-	7.4	-	0.1	-
Hyas	-	-	-	-	-	-	7.4	-	0.1	-
Paguridae	-	-	-	-	-	6.9	0.1	0.5	2.8	0.2
Pandalidae	-	-	-	-	-	2.3	4.0	-	0.5	0.2
Other Decapods	-	-	-	-	0.2	2.8	1.9	3.7	2.5	2.9
Euphausiacea	-	-	-	-	-	0.2	-	1.0	-	0.7
Mysidacea	-	-	-	-	25.4	-	-	-	-	-
Amphipoda	-	-	17.7	-	61.9	13.2	19.0	0.5	3.7	7.6
Isopoda	-	-	-	-	-	1.2	-	0.3	-	0.9
Other Crustacea	-	-	6.6	-	4.1	2.0	12.8	0.3	1.4	0.5
MOLLUSCA	-	-	-	-	0.1	0.3	0.6	1.0	4.2	9.8
Pelecypoda	-	-	-	-	0.1	+	0.4	0.7	3.2	4.4
Gastropoda	-	-	-	-	-	-	0.1	-	0.9	-
Octopoda	-	-	-	-	-	-	-	-	-	4.1
Other Mollusca	-	-	-	-	-	0.3	0.1	0.3	0.1	1.3
ECHINODERMATA	-	-	-	-	0.9	16.4	16.9	71.2	36.9	41.4
Echinoidea	-	-	-	-	-	+	0.9	4.8	6.4	8.6
Strongylocentrotus	-	-	-	-	-	-	-	-	-	5.4
Echinarachinius	-	-	-	-	-	+	-	-	-	0.9
Other Echinoidea	-	-	-	-	-	-	0.9	4.8	6.4	2.3
Ophiuroidea	-	-	-	-	0.9	15.3	13.3	65.1	19.0	29.1
Ophiopholis	-	-	-	-	-	4.2	-	1.1	-	16.5
Ophiura	-	-	-	-	-	4.5	-	38.9	-	9.4
Other Ophiuroidea	-	-	-	-	0.9	6.6	13.3	25.1	19.0	3.2
Holothuroidea	-	-	-	-	-		1.9	-	11.4	-
Other Echinodermata	-	-	-	-	-	1.1	0.8	1.3	0.1	3.7
PISCES	-	-	-	-	0.3	-	-	-	7.6	9.1
Pollachius virens	-	-	-	-	-	-	-	-	7.6	-
Other Pisces	-	-	-	-	0.3	-	-	-	-	9.1
OTHER PHYLA	-	-	1.1	-	0.1	0.2	0.6	0.4	0.3	1.5
ANIMAL REMAINS	-	-	66.6	-	2.2	46.7	10.0	11.5	26.8	12.1
SAND AND ROCK	-	-	8.0	-	0.4	0.2	5.8	0.4	1.9	1.9
No. of stomachs	-	-	2	-	28	78	56	84	67	92
Percent empty	-	-	0.0	-	7.1	19.2	3.6	20.2	9.0	4.3
$\bar{X}$ wt per stomach (g)	-	-	0.5	-	0.6	0.8	2.0	4.0	4.0	3.6

Table 5. Stomach contents of *Merluccius bilinearis* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	-	1.2	-	-	-	-	-	-
CRUSTACEA	14.6	70.9	3.9	69.5	-	79.5	83.8	-	98.9	-
Crangonidae	4.9	5.7	0.1	12.2	-	18.9	-	-	-	-
Crangon	4.9	5.7	0.1	12.2	-	18.9	-	-	-	-
Pandalidae	-	60.4	0.7	15.2	-	6.2	-	-	-	-
Dichelopandalus	-	60.4	-	15.2	-	6.2	-	-	-	-
Other pandalidae	-	-	0.7	-	-	-	-	-	-	-
Pasiphaeidae	-	-	-	-	-	-	67.8	-	-	-
Pasiphaea	-	-	-	-	-	-	67.8	-	-	-
Euphausiacea	2.9	0.2	2.1	1.3	-	16.4	7.9	-	93.5	-
Meganyctiphanes	-	-	2.1	-	-	-	-	-	-	-
Thysanoessa	-	-	-	-	-	4.8	-	-	-	-
Other euphausiacea	2.9	0.2	-	1.3	-	11.6	7.9	-	93.5	-
Mysidacea	1.5	-	0.1	-	-	-	-	-	-	-
Amphipoda	0.8	2.0	0.2	28.1	-	0.4	+	-	-	-
Copepoda	-	-	-	-	-	-	0.2	-	-	-
Other crustacea	4.5	2.6	0.7	12.7	-	21.2	7.9	-	5.4	-
MOLLUSCA	17.2	7.1	-	-	-	17.0	-	-	-	-
Cephalopoda	17.2	7.1	-	-	-	17.0	-	-	-	-
Loligo	-	-	-	-	-	17.0	-	-	-	-
Octopoda	-	7.1	-	-	-	-	-	-	-	-
Other Cephalopoda	17.2	-	-	-	-	-	-	-	-	-
PISCES	61.0	14.0	95.1	8.3	-	5.5	14.1	100.0	-	-
Myctophidae	17.4	-	-	-	-	-	-	-	-	-
Gadidae	23.0	-	13.1	-	-	-	14.0	-	-	-
Merluccius bilinearis	23.0	-	0.3	-	-	-	14.0	-	-	-
Other Gadidae	-	-	12.8	-	-	-	-		-	-
Stichaeidae	-	-	-	-	-	3.2	-	-	-	-
Lumpenus	-	-	-	-	-	3.2	-	-	-	-
Ammodytidae	-	-	0.1	-	-	-	-	-	-	-
Scombridae	-	-	81.2	-	-	-	-	-	-	-
Scomber scombrus	-	-	81.2	-	-	-	-	-	-	-
Stromateidae	5.8	-	-	-	-	-	-	-	-	-
Peprilus triacanthus	5.8	-	-	-	-	-	-	-	-	-
Pleuronectiformes	-	0.4	-	3.7	-	-	-	-	-	-
Other Pisces	14.8	13.6	0.7	4.6	-	2.3	0.1	-	-	-
OTHER PHYLA	±	-	±	0.2	-	0.3	-	-	-	-
ANIMAL REMAINS	7.2	8.0	1.0	20.8	-	14.1	2.1	-	1.1	-
No. of stomachs	112	85	64	18	-	43	97	2	8	-
Percent empty	37.5	27.1	32.8	5.6	-	23.3	34.0	0.0	37.5	-
$\bar{X}$ wt per stomach (g)	0.7	0.6	6.5	0.5	-	0.9	1.3	211.8	0.4	-

Table 6. Stomach contents of *Merluccius albidus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
CRUSTACEA	-	100.0	3.1	3.1	7.1	15.2	-	-	-	-
Pandalidae	-	-	-	2.0	-	7.5	-	-	-	
Dichelopandalus	-	-	-	1.9	-	7.5	-	-	-	
Pandalus	-	-	-	0.1	-	-	-	-	-	
Pasiphaeidae	-	37.5	-	-	-	4.8	-	-	-	
Pasiphaea	-	37.5	-	-	-	4.8	-	-	-	
Other shrimp	-	-	-	1.1	7.1	1.1	-	-	-	
Euphausiacea	-	62.5	3.1	+	-	1.8	-	-	-	
Meganyctiphanes	-	62.5	1.9	+	-	1.8	-	-	-	
Other Euphausiacea	-	-	1.2	-	-	-	-	-	-	
MOLLUSCA	-	-	-	-	-	6.0	-	-	-	-
Cephalapoda	-	-	-	-	-	6.0	-	-	-	
PISCES	-	-	96.9	96.7	92.9	78.3	-	-	-	-
Gadidae	-	-	-	96.7		-	-	-	-	
Other Pisces	-	-	96.9	-	92.9	78.3	-	-	-	
ANIMAL REMAINS	-	-	+	0.2	-	0.5	-	-	-	-
No. of stomachs	-	4	12	28	10	44	-	-	-	-
Percent empty	-	25.0	33.3	46.4	60.0	65.9	-	-	-	-
$\bar{X}$ wt per stomach (g)	-	0.1	2.8	3.9	0.5	0.6	-	-	-	-

Table 7. Stomach contents of *Pollachius virens* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA		-	-	-	0.2	-	0.1	-	-	-
CRUSTACEA		-	-	-	57.8	28.0	70.3	13.5	39.6	43.3
Pandalidae	-	-	-	-	-	0.1	0.3	2.1	11.3	-
Pandalus borealis	-	-	-	-	-	-	-	0.5	-	-
Other Pandalidae	-	-	-	-	-	0.1	0.3	1.6	11.3	-
Pasiphaeidae	-	-	-	-	-	-	64.4	4.3	-	-
Pasiphaea	-	-	-		-	-	64.4	4.3	-	-
Other Decapoda	-	-	-	-	0.1	-	0.2	0.4	0.7	4.9
Euphausiacea	-	-	-	-	55.7	24.8	3.2	4.4	26.2	37.4
Meganyctiphanes	-	-	-	-	55.2	24.8	2.4	3.5	20.2	37.4
Other Euphausiacea	-	-	-	-	0.5	-	0.8	0.9	6.0	
Amphipoda	-	-	-	-	0.3	-	-	-	1.1	-
Other Crustacea	-	-	-	-	1.7	3.1	2.2	2.3	0.3	1.0
MOLLUSCA		-	-	-	0.7	-	0.4	-	0.1	-
Gastropoda	-	-	-	-	0.7	-	-	-	-	-
Cephalopoda	-	-	-	-	-	-	0.4	-	-	-
Other Mollusca	-	-	-	-	-	-	-	-	0.1	-
PISCES	100.0	-	-	-	28.7	53.1	28.6	83.9	0.1	43.5
Clupeidae	94.9	-	-	-	5.6	-	1.4	13.3	-	-
Clupea harengus	94.9	-	-	-	-	-	-	-	-	-
Other Clupeidae	-	-	-	-	5.6	-	1.4	13.3	-	-
Maurolicidae	-	-	-	-	-	32.9	-	-	-	1.7
Maurolicus	-	-	-	-	-	32.9	-	-	-	1.7
Gadidae	-	-	-	-	2.5	-	10.6	-	-	14.3
Melanogrammus	-	-	-	-	-	-	-	-	-	14.3
Merluccius bilinearis	-	-	-	-	2.5	-	10.6	-	-	-
Scorpaenidae	-	-	-	-	-	-	-	0.7	-	-
Sebastes marinus	-	-	-	-	-	-	-	0.7	-	-
Other Pisces	5.1	-	-	-	20.6	20.2	16.6	69.9	0.1	27.5
OTHER PHYLA	-	-	-	-	0.5	1.7	0.1	0.5	5.2	1.0
ANIMAL REMAINS	-	-	-	-	12.1	17.2	0.5	1.9	55.0	11.6
SAND AND ROCK	-	-	-	-	-	-	-	0.2	-	0.6
No. of stomachs	2	-	-	-	80	29	59	74	63	38
Percent empty	50.0	-	-	-	1.3	0.0	23.7	16.2	39.7	13.2
$\overline{X}$ wt per stomach (g)	6.7	-	-	-	5.0	3.3	16.9	12.4	0.3	4.1

Table 8. Stomach contents of *Urophycis chuss* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt.		Southern New England % wt.		Georges Bank % wt.		Gulf of Maine % wt.		Western Nova Scotia % wt.	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	2.0	6.6	-	1.1	1.3	5.3	0.5	15.4
Opheliidae	-	-	-	0.7	-	-	-	2.9	-	-
Nephtyiidae	-	-	-	1.8	-	-	-	0.1	-	-
Orbiniidae	-	-	-	2.1	-	-	-	-	-	-
Other Polychaeta	-	-	2.0	2.0	-	1.1	1.3	2.3	0.5	15.4
CRUSTACEA	34.6	68.4	63.7	35.0	-	42.9	17.8	81.6	91.3	8.7
Galatheidae	32.3	-	-	-	-	-	-	-	-	-
Munidopsis	32.3	-	-	-	-	-	-	-	-	-
Axiidae	-	-	-	4.8	-	-	-	-	-	-
Calocaris	-	-	-	4.8	-	-	-	-	-	-
Cancridae	-	0.4	-	5.6	-	6.4	-	27.3	-	-
Cancer	-	0.4	-	5.6	-	6.4	-	27.3	-	-
Crangonidae	0.2	4.2	5.7	1.9	-	17.4	0.4	1.0	0.9	-
Crangon	0.2	4.2	5.7	1.9	-	17.4	0.4	1.0	0.9	-
Pandalidae	-	40.4	-	7.6	-	4.7	3.7	27.2	77.1	-
Dichelopandalus	-	40.4	-	7.6	-	4.7	-	27.2	26.1	-
Pandalus	-		-	-	-	-	3.7	-	51.0	-
Other Decapods	0.4	14.6	5.4	5.1	-	5.2	12.4	13.9	9.3	-
Amphipoda	1.6	0.3	42.1	3.2	-	3.4	+	3.6	0.9	1.8
Isopoda	-	2.8	-	0.3	-	3.1	-	0.2	-	6.9
Other Crustacea	0.1	5.7	10.5	6.5	-	2.7	1.3	8.4	3.1	-
MOLLUSCA	0.2	0.2	0.1	4.7	-	8.6	-	9.3	-	-
Gastropoda	-	-	-	+	-	8.6	-	9.3	-	-
Cephalopoda	-	-	-	4.5	-	-	-	-	-	-
Other Mollusca	0.2	0.2	0.1	0.2	-	+	-	-	-	-
PISCES	51.8	23.8	15.0	36.2	-	12.8	78.0	2.1	-	-
Clupeidae	-	-	-	-	-	8.7	-	-	-	-
Gadidae	-	-	4.9	0.8	-	-	-	-	-	-
Merluccius	-	-	-	0.8	-	-	-	-	-	-
Urophycis chuss	-	-	4.9	-	-	-	-	-	-	-
Cryptacanthodidae	-	-	-	4.6	-	-	-	-	-	-
Scombridae	-	-	10.1	-	-	-	-	-	-	-
Scomber	-	-	10.1	-	-	-	-	-	-	-
Cottidae	-	-	-	-	-	0.6	-	-	-	-
Other Pisces	51.8	23.8	-	30.8	-	3.5	78.0	2.1	-	-
OTHER PHYLA	0.1	+	3.5	2.6	-	-	-	+	6.6	-
ANIMAL REMAINS	10.9	7.4	14.8	14.5	-	34.5	2.9	1.7	1.6	75.9
SAND AND ROCK	2.4	0.2	0.9	0.4	-	0.1	-	-	-	-
No. of stomachs	28	28	79	192	-	62	19	19	13	1
Percent empty	14.3	14.3	27.8	12.0	-	14.5	26.3	0.0	15.4	0.0
$\bar{X}$ wt per stomach (g)	1.4	1.9	1.1	3.1	-	2.5	3.3	4.6	2.7	0.8

Table 9. Stomach contents of Urophycis tenuis by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt S	Middle Atlantic % wt F	Southern New England % wt S	Southern New England % wt F	Georges Bank % wt S	Georges Bank % wt F	Gulf of Maine % wt S	Gulf of Maine % wt F	Western Nova Scotia % wt. S	Western Nova Scotia % wt. F
POLYCHAETA	-	-	-	0.5	-	0.5	0.8	0.2	0.8	+
Aphrodita	-	-	-	-	-	-	0.8	-	0.8	-
Other Polychaeta	-	-	-	0.5	-	0.5	+	0.2	-	-
CRUSTACEA	-	-	3.0	0.2	0.2	11.9	14.6	1.2	22.0	1.0
Axiidae	-	-	-	-	-	-	-	-	1.4	-
Calocaris	-	-	-	-	-	-	-	-	1.4	-
Cancridae	-	-	-	-	-	2.0	-	-	-	-
Cancer	-	-	-	-	-	2.0	-	-	-	-
Crangonidae	-	-	1.3	-	0.2	-	0.4	-	-	-
Crangon	-	-	1.3	-	0.2	-	0.4	-	-	-
Paguridae	-	-	-	-	-	3.6	-	-	-	-
Pagurus	-	-	-	-	-	3.6	-	-	-	-
Pandalidae	-	-	1.1	-	-	6.2	1.2	0.9	12.7	0.5
Dichelopandalus	-	-	1.1	-	-	-	0.1	-	12.6	-
Pandalus	-	-	-	-	-	-	1.1	0.4	0.1	0.4
Other Pandalidae	-	-	-	-	-	6.2	-	0.5	-	0.1
Euphausiacea	-	-	+	-	-	-	10.8	-	2.6	-
Meganyctiphanes	-	-	-	-	-	-	10.8	-	1.9	-
Other Euphausiacea	-	-	+	-	-	-	+	-	0.7	-
Amphipoda	-	-	0.2	-	-	-	0.2	-	0.1	-
Other Crustacea	-	-	0.4	0.2	+	0.1	2.0	0.3	5.2	0.5
MOLLUSCA	-	-	6.9	-	18.5	10.0	0.2	-	8.1	-
Cephalopoda	-	-	6.9	-	18.5	10.0	0.2	-	8.1	-
PISCES	-	-	89.3	99.0	79.1	70.5	80.0	97.3	51.9	98.6
Gadidae	-	-	14.6	-	9.4	45.9	5.8	-	13.7	-
Melanogrammus	-	-	-	-	-	42.4	-	-	-	-
Merluccius	-	-	14.6	-	9.4	-	-	-	-	-
Phycis chesteri	-	-	-	-	-	3.5	-	-	-	-
Urophycis tenuis	-	-	-	-	-	-	3.8	-	7.4	-
Other Gadidae	-	-	-	-	-	-	2.0	-	6.3	-
Scombridae	-	-	-	-	-	-	-	59.5	-	-
Scomber	-	-	-	-	-	-	-	59.5	-	-
Other Pisces	-	-	74.7	99.0	69.7	24.6	74.2	37.8	38.2	98.6
OTHER PHYLA	-	-	-	-	+	+	+	-	-	+
ANIMAL REMAINS	-	-	0.8	0.3	2.2	6.9	4.4	1.3	17.2	0.4
SAND AND ROCK	-	-	-	-	-	0.2	-	-	-	-
No. of stomachs	-	-	39	12	16	26	100	20	46	15
Percent empty	-	-	30.8	41.7	62.5	23.1	48.0	40.0	19.6	26.7
$\bar{X}$ wt per stomach (g)	-	-	12.6	4.5	15.0	5.9	6.7	71.1	4.1	102.4

Table 10. Stomach contents of *Macrozoarces americanus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	10.4	2.7	0.5	8.1	-	-	-	-
Aphroditidae	-	-	10.2	-	-	-	-	-	-	-
Other Polychaeta	-	-	0.2	2.7	0.5	8.1	-	-	-	-
CRUSTACEA	-	-	26.0	0.5	4.2	16.7	-	-	-	-
Cancridae	-	-	7.4	-	1.3	-	-	-	-	-
Cancer	-	-	7.4	-	1.3	-	-	-	-	-
Majidae	-	-	-	-	0.7	-	-	-	-	-
Hyas	-	-	-	-	0.7	-				
Paguridae	-	-	-	-	0.6	-	-	-	-	-
Pagurus	-	-	-	-	0.6	-	-	-	-	-
Pandalidae	-	-	-	-	-	3.8	-	-	-	-
Other Decapoda	-	-	1.9	0.5	0.9	-	-	-	-	-
Amphipoda	-	-	15.1	-	0.6	12.9	-	-	-	-
Corophiidae	-	-	10.6	-	0.2	-	-	-	-	-
Other Amphipoda	-	-	4.5	-	0.4	12.9	-	-	-	-
Other Crustacea	-	-	1.6	-	0.1	-	-	-	-	-
MOLLUSCA	-	-	0.5	-	6.1	-	-	-	-	-
Pelecypoda	-	-	0.4	-	5.9	-	-	-	-	-
Pecten	-	-	-	-	4.5	-	-	-	-	-
Other Pelecypoda	-	-	0.4	-	1.4	-	-	-	-	-
Other Mollusca	-	-	0.1	-	0.2	-	-	-	-	-
ECHINODERMATA	-	-	59.2	-	81.2	-	-	-	-	-
Echinoidea	-	-	59.2	-	71.6	-	-	-	-	-
Strongylocentrotus	-	-	0.9	-	0.6	-	-	-	-	-
Echinarachnius	-	-	46.0	-	61.7	-	-	-	-	-
Other Echinoidea	-	-	12.3	-	9.3	-	-	-	-	-
Ophiuroidea	-	-	+	-	9.6	-	-	-	-	-
Ophiopholis	-	-	-	-	1.1	-	-	-	-	-
Other Ophiuroidea	-	-	+	-	8.5	-	-	-	-	-
OTHER PHYLA	-	-	0.2	37.8	1.9	6.2	-	-	-	-
ANIMAL REMAINS	-	-	3.2	59.0	5.4	69.0	-	-	-	-
SAND AND ROCK	-	-	0.5	-	0.7	-	-	-	-	-
No. of stomachs	-	-	120	9	90	15	-	-	-	-
Percent empty	-	-	17.5	0.0	31.1	40.0	-	-	-	-
$\bar{X}$ wt per stomach (g)	-	-	5.6	0.1	13.0	0.1	-	-	-	-

Table 11. Stomach contents of *Peprilus triacanthus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	0.6	0.2	-	-	-	-	-	-
Nephtys	-	-	0.6	-	-	-	-	-	-	-
Other Polychaeta	-	-	-	0.2	-	-	-	-	-	-
CRUSTACEA	-	0.2	0.3	5.3	-	39.6	-	-	-	0.1
Amphipoda	-	0.2	-	-	-	0.7	-	-	-	-
Hyperia	-	0.1	-	-	-	-	-	-	-	-
Parathemisto	-	0.1	-	-	-	-	-	-	-	-
Other Hyperiidae	-	+	-	-	-	0.6	-	-	-	-
Aoridae	-	-	-	-	-	0.1	-	-	-	-
Other Amphipoda	-	-	-	-	-	-	-	-	-	-
Copepoda	-	-	0.3	-	-	-	-	-	-	-
Other Crustacea	-	-	-	5.3	-	38.9	-	-	-	0.1
CHAETOGNATHA	-	-	0.6	11.5	-	7.9	-	-	-	-
Sagitta	-	-	-	11.5	-	7.9	-	-	-	-
Other Chaetognatha	-	-	0.6	-	-	-	-	-	-	-
LARVACEA	-	-	39.6	-	-	0.2	-	-	-	-
Oikopleura	-	-	19.0	-	-	-	-	-	-	-
Other Larvacea	-	-	20.6	-	-	0.2	-	-	-	-
ASCIDIACEA	-	82.8	11.4	70.5	-	22.3	-	-	-	-
Salpa	-	-	9.3	70.4	-	22.3	-	-	-	-
Other Ascidiacea	-	82.8	2.1	0.1	-	-	-	-	-	-
THALIACEA	-	-	36.2	-	-	-	-	-	-	-
OTHER PHYLA	-	-	-	-	-	0.1	-	-	-	0.1
ANIMAL REMAINS	-	17.0	11.3	12.5	-	29.9	-	-	-	99.8
No. of stomachs	-	20	152	91	1	61	-	1	-	5
Percent empty	-	0.0	35.5	7.7	100.0	41.0	-	100.0	-	0.0
$\bar{X}$ wt per stomach (g)	-	0.6	0.3	0.4	0.0	0.2	-	0.0	-	0.6

Table 12. Stomach contents of *Sebastes marinus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic		Southern New England		Georges Bank		Gulf of Maine		Western Nova Scotia	
	% wt		% wt		% wt		% wt		% wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	-	-	-	-	-	-	0.6	-
CRUSTACEA	-	-	-	-	77.3	85.0	69.4	97.9	99.0	100.0
Decapoda	-	-	-	-	-	28.6	-	-	0.5	-
Euphausiacea	-	-	-	-	43.5	54.6	43.7	95.9	97.2	-
Meganytiphanes	-	-	-	-	41.9	10.2	43.7	95.9	97.2	-
Other Euphausiacea	-	-	-	-	1.6	44.4	-	-	-	-
Amphipoda	-	-	-	-	0.2	-	-	-	0.1	-
Isopoda	-	-	-	-	-	-	-	-	0.2	-
Copepoda	-	-	-	-	-	-	-	-	0.8	-
Other Crustacea	-	-	-	-	33.6	1.8	25.7	2.0	0.2	100.0
PISCES	-	-	-	-	22.7	-	1.0	-	-	-
ANIMAL REMAINS	-	-	-	-	-	15.0	29.6	2.1	0.4	-
No. of stomachs	-	-	1	-	38	16	39	33	81	3
Percent empty	-	-	100.0	-	26.3	43.8	51.3	30.3	39.5	66.7
$\bar{X}$ wt per stomach (g)	-	-	0.0	-	1.23	0.29	0.34	3.19	0.49	0.1

Table 13. Stomach contents of *Hemitripterus americanus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
CRUSTACEA	-	-	3.5	99.7	0.1	7.2	1.8	2.2	-	-
Cancridae	-	-	-	94.0	-	6.1	-	-	-	-
Cancer borealis	-	-	-	94.0	-	6.1	-	-	-	-
Crangonidae	-	-	-	1.3	+	+	-	0.3	-	-
Crangon	-	-	-	1.3	+	+	-	0.3	-	-
Paguridae	-	-	-	-	-	0.5	-	-	-	-
Pandalidae	-	-	3.5	3.5	-	0.5	-	0.8	-	-
Dichelopandalus	-	-	3.5	-	-	0.4	-	-	-	-
Other Pandalidae	-	-	-	3.5	-	0.1	-	0.8	-	-
Hippolytidae	-	-	-	-	-	-	1.8	-	-	-
Amphipoda	-	-	-	-	+	-	-	-	-	-
Crustacea larvae	-	-	-	-	-	0.1	-	-	-	-
Other Crustacea	-	-	-	0.9	0.1	-	-	1.1	-	-
MOLLUSCA	-	-	-	-	1.0	72.9	11.1	71.9	-	-
Cephalopoda	-	-	-	-	1.0	72.9	11.1	71.9	-	-
Loligo pealei	-	-	-	-	-	72.9	-	71.9	-	-
Other Cephalopoda	-	-	-	-	1.0	-	11.1	-	-	-
PISCES	-	-	93.8	-	98.8	19.9	87.0	24.7	100.0	-
Rajidae	-	-	-	-	1.7	-	-	-	-	-
Gadidae	-	-	8.8	-	24.5	9.2	-	-	-	-
Melanogrammus	-	-	-	-	24.5	-	-	-	-	-
Other Gadidae	-	-	8.8	-	-	9.2	-	-	-	-
Zoarcidae	-	-	60.8	-	-	-	-	-	-	-
Macrozoarces	-	-	60.8	-	-	-	-	-	-	-
Pholidae	-	-	-	-	0.7	-	-	-	-	-
Pholis	-	-	-	-	0.7	-	-	-	-	-
Cottidae	-	-	-	-	57.2	0.4	-	-	-	-
Myoxocephalus	-	-	-	-	57.2	0.4	-	-	-	-
Cyclopteridae	-	-	-	-	0.6	+	-	-	-	-
Liparis	-	-	-	-	0.6	+	-	-	-	-
Pleuronectiformes	-	-	-	-	0.3	-	-	-	-	-
Other Pisces	-	-	24.2	-	13.8	10.3	87.0	24.7	100.0	-
OTHER PHYLA	-	-	0.2	0.3	0.1	+	0.1	1.2	-	-
ROCK	-	-	2.5	-	-	-	-	-	-	-
No. of stomachs	-	-	6	5	40	22	4	3	1	1
Percent empty	-	-	50.0	40.0	42.5	50.0	0.0	33.3	0.0	100
$\bar{X}$ wt per stomach (g)	-	-	2.7	1.4	13.9	11.8	6.2	6.5	36.2	0.

Table 14. Stomach contents of *Myoxocephalus octodecemspinosus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	0.1	-	0.5	2.5	0.9	4.2	-	10.4	2.0	0.3
CRUSTACEA	93.8	-	85.7	83.6	95.0	80.7	2.0	62.8	77.3	70.9
Cancridae	82.0	-	26.6	22.1	0.1	-	-	49.5	-	-
Cancer	82.0	-	26.6	22.1	0.1	-	-	49.5	-	-
Crangonidae	+	-	2.0	1.7	1.7	55.2	-	2.0	2.5	-
Crangon	+	-	2.0	1.7	1.7	55.2	-	2.0	2.5	-
Majidae	-	-	-	4.4	-	-	-	-	37.3	40.
Hyas	-	-	-	4.4	-	-	-	-	37.3	40.
Paguridae	3.8	-	-	5.5	70.6	-	-	-	0.5	-
Pandalidae	-	-	-	-	-	-	-	4.4	-	8.
Portunidae	-	-	2.3	-	-	-	-	-	-	-
Other Decapoda	2.1	-	7.8	32.9	11.9	19.8	-	-	30.9	0.
Euphausiacea	-	-	-	-	-	-	-	-	-	21.
Amphipoda	+	-	20.2	1.5	7.5	1.3	2.0	3.9	0.2	0.
Isopoda	2.1	-	5.8	-	-	-	-	-	-	-
Other Crustacea	3.8	-	21.0	15.5	3.2	4.4	-	3.0	5.9	-
MOLLUSCA	-	-	-	5.1	-	0.4	-	-	-	-
PISCES	1.5	-	13.3	0.1	1.4	0.9	-	12.5	6.2	17.1
Zoarcidae	-	-	8.2	-	-	-	-	-	-	-
Macrozoarces	-	-	8.2	-	-	-	-	-	-	-
Syngnathidae	1.3	-	-	-	-	-	-	-	-	-
Stichaeidae	-	-	3.6	-	-	-	-	-	-	-
Ulvaria	-	-	3.6	-	-	-	-	-	-	-
Cyclopteridae	-	-	-	-	1.2	0.9	-	-	-	-
Liparis	-	-	-	-	1.2	0.9	-	-	-	-
Other Pisces	0.2	-	1.5	0.1	0.2	-	-	12.5	6.2	17.
OTHER PHYLA	-	-	0.1	+	0.1	-	0.2	3.3	+	-
ANIMAL REMAINS	4.5	-	0.3	8.7	2.4	13.8	97.8	11.0	10.5	11.4
SAND AND ROCK	-	-	0.1	+	0.1	-	-	-	4.0	0.3
No. of stomachs	18	-	116	111	12	20	27	23	32	20
Percent empty	5.6	-	7.8	38.7	0.0	20.0	77.8	52.2	28.1	35.0
$\bar{X}$ wt per stomach (g)	2.6	-	1.3	0.5	1.8	0.5	0.1	0.5	0.8	1.5

Table 15. Stomach contents of *Paralichthyus oblongus* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach Content Group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	-	0.1	-	+	-	2.8	-	-
CRUSTACEA	62.5	88.8	29.3	23.6	-	52.0	-	42.1	-	-
Galatheidae	7.3	-	-	-	-	-	-	-	-	-
Munida	7.3	-	-	-	-	-	-	-	-	-
Cancridae	53.9	-	17.9	5.1	-	-	-	-	-	-
Cancer	53.9	-	17.9	5.1	-	-	-	-	-	-
Crangonidae	-	-	-	2.7	-	14.7	-	9.6	-	-
Crangon	-	-	-	2.7	-	14.7	-	9.6	-	-
Pandalidae	-	88.5	-	8.4	-	29.5	-	29.5	-	-
Dichelopandalis	-	88.5	-	4.1	-	11.0	-	29.5	-	-
Other Pandalidae	-	-	-	4.3	-	18.5	-	-	-	-
Other Decapods	0.6	-	5.2	2.9	-	5.0	-	-	-	-
Amphipoda	0.1	0.3	3.8	1.0	-	+	-	1.7	-	-
Other Crustacea	0.6	-	2.4	3.5	-	2.8	-	1.3	-	-
MOLLUSCA	9.4	-	56.7	25.3	92.4	0.2	-	-	-	-
Cephalopoda	8.2	-	56.2	25.3	92.4	0.2	-	-	-	-
Loligo	-	-	19.7	-	-	-	-	-	-	-
Illex	-	-	-	5.5	-	-	-	-	-	-
Rossia	-	-	8.5	-	-	-	-	-	-	-
Other Cephalopoda	8.2	-	28.0	19.8	92.4	0.2	-	-	-	-
Other Mollusca	1.2	-	0.5	-	-	-	-	-	-	-
PISCES	18.0	-	3.4	34.0	6.4	26.0	-	47.3	-	-
Gadidae	15.5	-	2.4	30.3	-	22.6	-	-	-	-
Merluccius	15.5	-	2.4	26.3	-	22.6	-	-	-	-
Other Gadidae	-	-	-	4.0	-	-	-	-	-	-
Pleuronectidae	-	-	-	-	-	-	-	38.6	-	-
Glyptocephalus	-	-	-	-	-	-	-	38.6	-	-
Other Pisces	2.5	-	1.0	3.7	6.4	3.4	-	8.7	-	-
OTHER PHYLA	+	5.2	0.7	0.3	-	0.1	-	3.1	-	-
ANIMAL REMAINS	8.7	6.0	9.8	16.3	1.2	21.7	100.0	4.7	-	-
SAND AND ROCK	1.4	-	0.1	0.4	-	-	-	-	-	-
No. of stomachs	51	1	365	277	44	67	3	3	-	-
Percent empty	49.0	0.0	57.5	31.4	88.6	10.4	66.7	0.0	-	-
$\bar{X}$ wt per stomach (g)	0.3	5.8	0.2	0.7	0.2	1.2	0.3	1.8	-	-

Table 16. Stomach contents of Glyptocephalus cynoglossus by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fal

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
PRIAPULIDA	-	-	-	-	-	-	-	-	-	8.1
POLYCHAETA	93.9	-	91.4	22.9	75.9	80.8	71.7	79.9	41.9	72.2
Flabelligeridae	-	-	20.2	-	-	-	+	-	0.1	-
Sabellidae	-	-	16.4	-	-	-	2.1	-	-	-
Lumbrineridae	12.1	-	8.1	17.7	11.3	14.2	10.1	17.2	2.0	2.5
Nephtyidae	-	-	19.7	1.0	8.4	2.5	3.7	9.2	2.2	6.9
Orbiniidae	-	-	13.1	-	-	-	-	-	-	-
Other Polychaeta	81.8	-	13.9	4.2	56.2	64.1	55.8	53.5	37.6	62.8
CRUSTACEA	6.1	-	2.3	14.4	0.4	4.0	3.0	4.5	6.6	10.9
Cancridae	-	-	-	6.2	-	-	-	-	-	-
Cancer	-	-	-	6.2	-	-	-	-	-	-
Amphipoda	-	-	2.0	1.0	0.4	1.7	0.7	1.4	4.7	8.1
Other Crustacea	6.1	-	0.3	7.2	-	2.3	2.3	3.1	1.9	2.8
MOLLUSCA	-	-	0.2	59.0	0.1	0.2	0.1	0.8	0.5	0.7
Cephalopoda	-	-	-	48.0	-	-	-	-	-	-
Loligo	-	-	-	48.0	-	-	-	-	-	-
Other Mollusca	-	-	0.2	11.0	0.1	0.2	0.1	0.8	0.5	0.7
ECHINODERMATA	-	-	-	-	1.2	-	7.2	-	42.1	-
Holothuroidea	-	-	-	-	1.2	-	7.2	-	42.1	-
Thyone	-	-	-	-	-	-	2.7	-	34.3	-
Other Holothuroidea	-	-	-	-	1.2	-	4.5	-	7.8	-
ASCIDIACEA	-	-	-	-	-	-	1.1	-	0.1	-
PISCES	-	-	-	0.6	8.5	-	4.3	-	-	-
OTHER PHYLA	-	-	1.5	-	2.0	-	0.6	5.2	0.5	1.8
ANIMAL REMAINS	-	-	4.6	3.1	11.9	14.6	11.9	9.3	8.2	6.3
SAND AND ROCK	-	-	-	-	-	0.4	0.1	0.3	0.1	-
No. of stomachs	4	-	25	54	37	39	225	88	125	67
Percent empty	0.0	-	40.0	35.2	13.5	0.0	9.8	3.4	7.2	3.0
$\bar{X}$ wt per stomach (g)	0.04	-	0.61	0.73	0.38	0.57	0.48	0.67	0.71	0.46

Table 17. Stomach contents of *Hippoglossoides platessoides* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S = spring, F = fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
POLYCHAETA	-	-	-	-	0.2	0.5	8.4	2.7	2.3	2.9
CRUSTACEA	-	-	100.0	-	2.0	38.1	16.1	11.4	1.6	85.2
Paguridae	-	-	-	-	-	-	-	-	-	60.0
Pagurus	-	-	-	-	-	-	-	-	-	60.0
Pandalidae	-	-	-	-	1.4	38.0	2.5	11.4	0.3	-
Dichelopandalus	-	-	-	-	+	38.0	0.9	11.4	-	-
Other Pandalidae	-	-	-	-	1.4	-	1.6	-	0.3	-
Other Decapods	-	-	0.6	-	0.3	-	0.6	-	1.0	3.0
Euphausiacea	-	-	-	-	-	-	-	-	-	22.1
Meganyctiphanes	-	-	-	-	-	-	-	-	-	22.1
Amphipoda	-	-	99.3	-	0.1	-	0.1	-	0.2	-
Other Crustacea	-	-	0.1	-	0.2	0.1	12.9	+	0.1	0.1
MOLLUSCA	-	-	-	-	0.3	-	9.2	5.9	0.3	3.6
Pelecypoda	-	-	-	-	-	-	8.9	5.2	-	-
Nuculana	-	-	-	-	-	-	3.3	5.2	-	-
Yolidia	-	-	-	-	-	-	2.2	-	-	-
Other Pelecypoda	-	-	-	-	-	-	3.4	-	-	-
Gastropoda	-	-	-	-	-	-	-	-	-	3.5
Neptunea	-	-	-	-	-	-	-	-	-	3.5
Other Mollusca	-	-	-	-	0.3	-	0.3	0.7	0.3	0.1
ECHINODERMATA	-	-	-	-	95.9	49.1	49.9	74.8	85.1	3.4
Echinoidea	-	-	-	-	81.3	35.8	8.5	2.2	82.1	0.8
Strongylocentrotus	-	-	-	-	-	-	-	-	8.4	-
Echinarachnius	-	-	-	-	80.1	-	-	-	72.7	-
Other Echinoidea	-	-	-	-	1.2	35.8	8.5	2.2	1.0	0.8
Ophiuroidea	-	-	-	-	14.6	13.3	41.4	72.6	3.0	2.6
Ophiura	-	-	-	-	-	12.6	22.7	64.1	2.3	2.6
Other Ophiuroidea	-	-	-	-	14.6	0.7	18.7	8.5	0.7	+
PISCES	-	-	-	-	0.1	5.0	5.1	0.1	-	0.5
Cottidae	-	-	-	-	-	-	1.3	-	-	
Other Pisces	-	-	-	-	0.1	5.0	3.8	0.1	-	0.5
OTHER PHYLA	-	-	-	-	0.1	0.4	2.9	0.1	0.4	0.3
ANIMAL REMAINS	-	-	-	-	1.4	6.9	7.8	5.0	1.9	4.1
SAND AND ROCK	-	-	-	-	+	-	0.6	-	8.4	-
No. of stomachs	-	-	3	1	159	12	229	95	117	44
Percent empty	-	-	0.0	100.0	57.9	58.3	40.6	32.6	51.3	52.3
$\bar{X}$ wt per stomach (g)	-	-	1.0	0.0	2.5	1.1	0.7	0.6	1.6	2.5

Table 18. Stomach contents of *Limanda ferruginea* by ecological area expressed as percent of the total weight for the spring and fall of 1972. (S=spring, F=fall)

Stomach content group	Middle Atlantic % wt		Southern New England % wt		Georges Bank % wt		Gulf of Maine % wt		Western Nova Scotia % wt	
	S	F	S	F	S	F	S	F	S	F
COELENTERATA	1.5	-	-	-	-	-	7.9	-	21.0	-
NEMERTEA	3.6	-	1.1	-	-	-	-	-	0.5	-
POLYCHAETA	53.2	-	20.9	7.4	-	17.9	22.2	-	25.5	-
Spioniformia	20.3	-	0.3	-	-	15.8	0.1	-	-	-
Polydora	16.5	-	-	-	-	-	-	-	-	-
Other Spioniformia	3.8	-	0.3	-	-	15.8	0.1	-	-	-
Scoleciformia	1.9	-	1.9	-	-	-	1.2	-	1.4	-
Terebelliformia	0.3	-	0.3	-	-	-	0.1	-	12.5	-
Sabelliformia	0.7	-	3.0	-	-	-	14.6	-	11.2	-
Nereidiformia	10.2	-	7.8	-	-	-	1.9	-	0.1	-
Lumbrineridae	3.9	-	2.5	-	-	-	0.2	-	-	-
Nephtyidae	2.8	-	3.4	-	-	-	1.6	-	-	-
Other Nereidiformia	3.5	-	1.9	-	-	-	0.1	-	0.1	-
Other Polychaeta	19.8	-	7.6	7.4	-	2.1	4.3	-	0.3	-
CRUSTACEA	16.1	-	57.0	21.3	-	55.6	46.2	-	39.8	-
Amphipoda	12.3	-	50.5	17.8	-	53.3	45.8	-	38.7	-
Unicola	5.3	-	7.9	-	-	-	37.0	-	0.9	-
Byblis	-	-	15.0	-	-	-	-	-	-	-
Leptocheirus	0.2	-	10.6	0.2	-	45.4	-	-	-	-
Other Amphipoda	6.8	-	17.0	17.6	-	7.9	8.8	-	37.8	-
Decapoda	0.5	-	4.2	-	-	-	-	-	1.0	-
Other Crustacea	3.3	-	2.3	3.5	-	2.3	0.4	-	0.1	-
MOLLUSCA	0.7	-	0.6	3.9	-	0.6	-	-	-	-
ECHINODERMATA	1.8	-	0.7	-	-	-	0.6	-	0.7	-
ASCIDIACEA	3.0	-	4.4	-	-	-	-	-	-	-
PISCES	5.5	-	-	-	-	-	-	-	1.6	-
OTHER PHYLA	1.6	-	0.5	-	-	-	-	-	-	-
ANIMAL REMAINS	6.6	-	10.8	66.5	-	0.5	18.6	-	8.6	-
SAND AND ROCK	6.4	-	4.0	0.9	-	25.4	4.5	-	2.3	-
No. of stomachs	169	-	306	40	-	25	27	-	49	1
Percent empty	6.5	-	16.7	57.5	-	12.0	48.1	-	51.0	100.0
$\bar{X}$ wt per stomach(g)	0.8	-	0.5	0.1	-	0.8	0.4	-	0.3	-

Table 19. Food habits and average length of 18 species of marine fish collected during the spring and autumn of 1972. (S = spring, F = autumn)

Stomach content group	Predator Species: Spiny dogfish % wt S	Spiny dogfish % wt F	Goosefish % wt S	Goosefish % wt F	Atlantic cod % wt S	Atlantic cod % wt F	Haddock % wt S	Haddock % wt F	Silver hake % wt S	Silver hake % wt F
POLYCHAETA	0.1	0.3	-	-	2.1	0.4	9.4	9.4	-	+
CRUSTACEA	1.4	4.0	5.0	1.5	28.2	12.4	28.3	11.8	21.9	12.4
Anomura	0.3	0.9		-	2.1	0.6	6.0	0.9	-	-
Brachyura	0.7	2.3	4.1	-	16.4	7.1	2.1	-	-	-
Caridea	0.3	-	0.9	0.2	2.4	2.2	1.6	0.9	14.8	8.3
Euphausiacea	-	-	-	-	0.4	0.5	-	0.8	3.9	1.3
Mysidacea	-	-	-	-	0.7		1.1	-	0.3	-
Amphipoda	-	+	-	-	0.1	0.1	10.5	4.8	0.2	0.7
Other Crustacea	0.1	0.8	+	1.3	6.1	1.9	7.0	4.4	2.7	2.1
MOLLUSCA	14.3	26.7	6.1	14.6	0.5	0.9	3.0	4.9	2.3	1.9
Cephalopoda	14.3	26.5	6.1	14.6	-	-	-	1.8	2.3	1.9
Other Mollusca	-	0.2	-	-	0.5	0.9	3.0	3.1	-	-
ECHINODERMATA	-	-	-	-	2.7	1.1	29.7	53.0	-	-
Echinoidea	-	-	-	-	0.1	+	4.6	6.1	-	-
Ophiuroidea	-	-	+	-	0.8	0.7	16.6	44.5	-	-
Other Echinodermata	-	+	-	-	1.8	0.4	8.5	2.4	-	-
ASCIDIACEA	-	-	-	-	-	-	-	-	-	-
PISCES	83.5	49.0	88.8	81.6	59.1	80.2	5.2	4.2	73.6	83.5
Clupeidae	3.3	3.7	-	-	12.7	67.6	-	-	-	-
Gadidae	1.8	12.1	-	11.6	11.7	0.1	5.2	-	14.5	-
Scombridae	31.0	8.3	-	14.5	4.6	1.1	-	-	53.6	81.7
Scorpaenidae	-	-	-	9.8	-	-	-	-	-	-
Bothidae	1.7	0.2	-	0.2	-	-	-	-	-	-
Pleuronectidae	3.8	-	15.5		-	0.1	-	-	-	-
Other Pisces	41.9	24.7	73.3	45.5	30.1	11.3	-	4.2	5.5	1.8
OTHER PHYLA	0.1	13.6	+	+	0.2	0.2	0.4	0.8	+	+
ANIMAL REMAINS	0.6	6.1	0.1	2.3	7.0	3.8	21.1	14.8	2.2	2.2
SAND AND ROCK	+	0.3	-	-	0.2	1.0	2.9	1.1	-	-
No. of stomachs	177	178	42	136	241	458	153	254	281	148
Percent empty	22.0	22.5	40.5	47.1	2.1	8.7	6.5	14.2	35.2	23.0
$\bar{X}$ wt per stomach (g)	35.9	9.9	22.5	34.9	21.4	26.8	2.6	2.9	2.2	3.5
$\bar{X}$ predator length (cm)	68.9	67.4	64.9	34.1	56.4	44.8	45.6	35.8	28.7	26.2

Table 19. (continued)

Stomach content group	Predator Species: Offshore hake % wt S	Offshore hake % wt F	Pollock % wt S	Pollock % wt F	Red hake % wt S	Red hake % wt F	White hake % wt S	White hake % wt F	Ocean pout % wt S	Ocean pout % wt F
POLYCHAETA	-	-	0.1	-	1.2	5.1	0.4	0.1	4.1	5.9
CRUSTACEA	3.6	6.0	65.8	18.7	50.2	43.0	9.8	1.6	12.0	10.0
Anomura	-	-	-	-	5.7	3.2	0.2	-	0.4	-
Brachyura	-	-	-	-	-	9.3	-	0.3	3.9	-
Caridea	-	5.3	45.4	5.0	15.6	20.5	3.0	0.9	-	2.2
Euphausiacea	2.7	0.7	18.1	10.5	-	-	4.9	-	-	-
Mysidacea	-	-	-	-	-	-	-	-	-	-
Amphipoda	-	-	0.1	-	16.9	3.1	0.1	-	5.8	7.6
Other Crustacea	0.9	-	2.2	3.2	12.0	6.9	1.6	0.4	1.9	0.2
MOLLUSCA	-	1.2	0.5	-	0.1	5.6	5.9	0.5	4.0	-
Cephalopoda	-	1.2	0.3	-	-	3.0	5.9	0.5	-	-
Other Mollusca	-	-	0.2	-	0.1	2.6	+	-	4.0	-
ECHINODERMATA	-	-	-	-	-	0.3	-	-	73.2	-
Echinoidea	-	-	-	-	-	-	-	-	67.1	-
Ophiuroidea	-	-	-	-	-	-	-	-	6.1	-
Other Echinodermata	-	-	-	-	-	0.3	-	-	-	-
ASCIDIACEA	-	-	-	-	1.4	-	-	-	0.4	-
PISCES	96.4	92.5	28.9	76.0	36.4	27.9	79.4	96.6	+	0.4
Clupeidae	-	76.6	3.4	10.5	-	1.5	-	-	-	-
Gadidae	-	-	8.1	1.9	1.9	0.7	10.0	2.2	-	-
Scombridae	-	-	-	-	3.9	-	-	26.7	-	-
Scorpaenidae	-	-	-	0.5	-	-	-	-	-	-
Bothidae	-	-	-	-	-	-	-	-	-	-
Pleuronectidae	-	-	-	-	-	-	-	-	-	-
Other Pisces	96.4	15.9	17.4	63.1	30.6	25.7	69.4	67.7	-	0.4
OTHER PHYLA	+	-	0.3	0.7	1.1	1.5	+	+	0.8	18.9
ANIMAL REMAINS	-	0.3	4.4	4.4	8.8	16.3	4.5	1.2	4.9	64.8
SAND AND ROCK	-	-	-	0.2	0.8	0.3	-	+	0.6	-
No. of stomachs	22	76	202	141	139	302	201	73	210	24
Percent empty	45.5	56.6	20.3	12.1	23.7	11.9	39.3	31.5	23.3	25.0
$\bar{X}$ wt per stomach (g)	1.8	1.8	7.1	8.3	1.6	2.9	7.9	43.4	8.8	0.1
$\bar{X}$ predator length (cm)	37.1	28.5	39.2	48.1	31.5	29.4	49.6	45.5	53.0	32.3

Table 19. (continued)

Stomach content group	Butterfish % wt S	Butterfish % wt F	Redfish % wt S	Redfish % wt F	Sea raven % wt S	Sea raven % wt F	Longhorn sculpin % wt S	Longhorn sculpin % wt F	Fourspot flo % wt S	Fourspot flo % wt F
POLYCHAETA	0.6	0.1	0.2				0.6	3.0		0.2
CRUSTACEA	0.3	11.6	85.0	97.3	0.2	9.0	86.9	77.4	31.2	33.4
Anomura	-	-	-	-	-	0.4	6.9	2.8	1.1	-
Brachyura	-	-	-	-	-	7.8	37.2	30.7	21.6	3.[illegible]
Caridea	-	-	-	-	0.1	0.7	1.7	8.9	-	22.7
Euphausiacea	-	-	65.0	93.9	-	-	-	5.8	-	-
Mysidacea	-	-	-	-	-	-	-	-	-	-
Amphipoda	-	0.1	0.1	-	+	-	13.1	1.5	2.8	0.7
Other Crustacea	0.3	11.5	19.9	3.4	0.1	0.1	28.0	27.7	5.7	6.5
MOLLUSCA	-	-	-	-	1.3	71.1	-	2.7	52.3	17.1
Cephalopoda	-	-	-	-	1.3	71.1	-	-	51.7	17.[illegible]
Other Mollusca	-	-	-	-	-	-	-	2.7	0.6	-
ECHINODERMATA	-	-	-	-	-	-	-	-	-	-
Echinoidea	-	-	-	-	-	-	-	-	-	-
Ophiuroidea	-	-	-	-	-	-	-	-	-	-
Other Echinodermata	-	-	-	-	-	-	-	-	-	-
ASCIDIACEA	11.4	59.0	-	-	-	-	-	-	-	-
PISCES	-	-	10.7	-	98.4	19.8	9.2	6.3	6.1	31.2
Clupeidae	-	-	-	-	-	-	-	-	-	-
Gadidae	-	-	-	-	21.7	8.4	-	-	4.3	26.9
Scombridae	-	-	-	-	-	-	-	-	-	-
Scorpaenidae	-	-	-	-	-	-	-	-	-	-
Bothidae	-	-	-	-	-	-	-	-	-	-
Pleuronectidae	-	-	-	-	-	-	-	-	-	0.7
Other Pisces	-	-	10.7	-	76.7	11.4	9.2	6.3	1.8	3.6
OTHER PHYLA	76.4	8.0	-	-	+	0.1	0.1	0.4	0.5	0.4
ANIMAL REMAINS	11.3	21.3	4.1	2.7	-	-	2.7	10.1	9.6	17.5
SAND AND ROCK	-	-	-	-	0.1	-	0.5	0.1	0.3	0.2
No. of stomachs	153	178	159	52	51	31	205	174	463	348
Percent empty	6.5	18.5	39.6	36.5	39.2	48.4	19.5	37.9	59.6	27.0
$\bar{X}$ wt per stomach (g)	0.3	0.4	0.6	2.1	12.4	9.2	1.2	0.6	0.2	0.8
$\bar{X}$ predator length (cm)	11.2	12.7	28.0	26.7	29.0	26.8	23.7	23.1	25.3	25.6

Table 19. (continued)

Stomach content group	Predator Species: Witch flounder % wt S	Witch flounder % wt F	American plaice % wt S	American plaice % wt F	Yellowtail flounder % wt S	Yellowtail flounder % wt F
POLYCHAETA	61.6	63.7	2.5	2.7	35.1	15.7
CRUSTACEA	4.3	8.3	5.3	58.6	38.2	48.2
Anomura	-	-	-	36.8	-	-
Brachyura	-	1.6	-	-	-	-
Caridea	-	-	1.4	8.2	-	-
Euphausiacea	-	-	-	13.5	-	-
Mysidacea	-	-	-	-	-	-
Amphipoda	2.4	2.7	0.5	-	33.2	45.6
Other Crustacea	1.9	4.0	3.4	0.1	5.0	2.6
MOLLUSCA	0.3	15.8	2.1	4.0	0.6	1.3
Cephalopoda	-	12.5	-	-	-	-
Other Mollusca	0.3	3.3	2.1	4.0	0.6	1.3
ECHINODERMATA	20.0	-	83.2	29.1	1.2	-
Echinoidea	-	-	66.1	3.8	-	-
Ophiuroidea	-	-	17.1	25.3	-	-
Other Echinodermata	20.0	-	-	-	1.2	-
ASCIDIACEA	0.6	-	0.3	-	3.5	-
PISCES	2.6	0.2	1.1	0.7	2.4	-
Clupeidae	-	-	-	-	-	-
Gadidae	-	-	-	-	-	-
Scombridae	-	-	-	-	-	-
Scorpaenidae	-	-	-	-	-	-
Bothidae	-	-	-	-	-	-
Pleuronectidae	-	-	-	-	-	-
Other Pisces	2.6	0.2	1.1	0.7	2.4	-
OTHER PHYLA	0.7	4.0	0.4	0.3	4.9	-
ANIMAL REMAINS	9.8	7.9	2.8	4.6	9.2	14.7
SAND AND ROCK	0.1	0.1	2.3	-	4.9	20.1
No. of stomachs	416	248	508	152	551	66
Percent empty	11.1	9.7	48.2	40.8	18.1	40.9
$\bar{X}$ wt per stomach (g)	0.5	0.6	1.5	1.2	0.6	0.4
$\bar{X}$ predator length (cm)	44.4	42.4	28.7	24.5	29.3	31.1

Appendix Table 1. Stomachs collected during the spring and fall of 1972 by ecological area. Numbers in parenthesis represent the portion of the total which were empty. (S = spring, F = fall)

Species Collected	Middle Atlantic		Southern New England		Georges Bank		Gulf of Maine		Western Nova Scotia		TOTAL	
	S	F	S	F	S	F	S	F	S	F	S	F
Spiny dogfish	31 (13)	-	81 (12)	55 (10)	44 (7)	107 (27)	10 (0)	16 (3)	11 (7)	-	177 (39)	178 (40)
Goosefish	7 (4)	79 (40)	18 (6)	44 (18)	10 (4)	9 (5)	6 (3)	3 (1)	1 (0)	1 (0)	42 (17)	136 (64)
Atlantic cod	1 (0)	-	11 (0)	20 (2)	60 (0)	280 (23)	58 (2)	94 (10)	111 (3)	64 (5)	241 (5)	458 (40)
Haddock	-	-	2 (0)	-	28 (2)	78 (15)	56 (2)	84 (17)	67 (6)	92 (4)	153 (10)	254 (36)
Silver hake	112 (42)	85 (23)	64 (21)	18 (1)	-	43 (10)	97 (33)	2 (0)	8 (3)	-	281 (99)	148 (34)
Offshore hake	-	4 (1)	12 (4)	28 (13)	10 (6)	44 (29)	-	-	-	-	22 (10)	76 (43)
Pollock	2 (1)	-	-	-	80 (1)	29 (0)	59 (14)	74 (12)	63 (25)	38 (5)	202 (41)	141 (17)
Red hake	28 (4)	28 (4)	79 (22)	192 (23)	-	62 (9)	19 (5)	19 (0)	13 (2)	1 (0)	139 (33)	302 (36)
White hake	-	-	39 (12)	12 (5)	16 (10)	26 (6)	100 (48)	20 (8)	46 (9)	15 (4)	201 (79)	73 (23)
Ocean pout	-	-	120 (21)	9 (0)	90 (28)	15 (6)	-	-	-	-	210 (49)	24 (6)
Butterfish	-	20 (0)	152 (54)	91 (7)	1 (1)	61 (25)	-	1 (1)	-	5 (0)	153 (10)	178 (33)
Redfish	-	-	1 (1)	-	38 (10)	16 (7)	39 (20)	33 (10)	81 (32)	3 (2)	159 (63)	52 (19)
Sea raven	-	-	6 (3)	5 (2)	40 (17)	22 (11)	4 (0)	3 (1)	1 (0)	1 (1)	51 (20)	31 (15)
Longhorn sculpin	18 (1)	-	116 (9)	111 (43)	12 (0)	20 (4)	27 (21)	23 (12)	32 (9)	20 (7)	205 (40)	174 (66)
Fourspot flounder	51 (25)	1 (0)	365 (210)	277 (87)	44 (39)	67 (7)	3 (2)	3 (0)	-	-	463 (276)	348 (94)
Witch flounder	4 (0)	-	25 (10)	54 (19)	37 (5)	39 (0)	225 (22)	88 (3)	125 (9)	67 (2)	416 (46)	248 (24)
American plaice	-	-	3 (0)	1 (1)	159 (92)	12 (7)	229 (93)	95 (31)	117 (60)	44 (23)	508 (245)	152 (62)
Yellowtail flounder	169 (11)	-	306 (51)	40 (23)	-	25 (3)	27 (13)	-	49 (25)	1 (1)	551 (100)	66 (27)

Grand Total 7,213