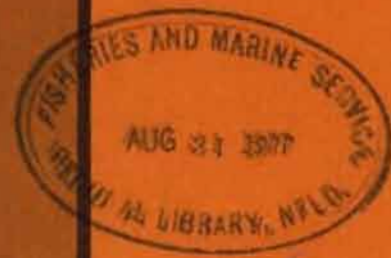


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**A. T. Cameron Cruise 157,
otter-trawl survey of the
southwestern North Atlantic,
February 1969**

by M. C. Mercer



FISHERIES RESEARCH BOARD OF CANADA

TECHNICAL REPORT NO. 199

1970



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FISHERIES RESEARCH BOARD OF CANADA

TECHNICAL REPORT NO. 199

A.T. CAMERON CRUISE 157, OTTER-TRAWL SURVEY
OF THE SOUTHWESTERN NORTH ATLANTIC, FEBRUARY 1969

by

M.C. Mercer

This is the twenty-third FRB Technical Report from the
Fisheries Research Board of Canada
Biological Station, St. John's, Nfld.

August 1970



INTRODUCTION

In February of 1969 the *A.T. Cameron* conducted an otter-trawl survey of the continental shelf and slope off the South Atlantic coast of the United States. This was the third cruise in a series to collect data on the migrant ommastrephid squid, *Illex illecebrosus* (LeSueur); results of the previous cruises have already been published (Mercer 1969 a, b).

This report summarizes landings of all fish and selected invertebrates and incidental observations on birds and mammals. Fish distribution and abundance inside the 100-fathom contour of this area have recently been described by Struhsaker (1969) and Anderson (1968) has tabulated landings from research trawl catches on the near-shore shrimping grounds. The present report includes data from deeper trawl sites. Bullis and Thompson (1965) have tabulated collections made by exploratory cruises of the Bureau of Commercial Fisheries in the tropical and subtropical waters of the Western North Atlantic.

SCIENTIFIC STAFF

M.C. Mercer (Scientist-in-Charge)	
P.W. Collins	E.M. LeGrow
G. Dawe	E.E. Squires
R.H. Hart	W.R. Squires
M. Hadley (observer from Memorial University of Newfoundland)	

All members of the scientific party except Hadley are on the staff of the St. John's Biological Station.

GENERAL OPERATION

The vessel sailed from St. Andrews, New Brunswick on February 9, 1969 and began fishing off Cape May on February 12. Transects of stations were occupied southwards to the shelf off Fort Pierce, Florida after which a day was spent surface longlining north of the Grand Bahama Island. All fishing operations were completed on February 23 and after a port call at Miami the vessel returned to St. John's, Newfoundland on March 5.

Positions of all fishing stations are plotted in Fig. 1 in which plankton sets can be located with reference to the trawl sites. Otter-trawl sets were made at 25-fathom intervals between 25 and 200 fathoms on previously selected transects. As in previous cruises of this series, no attempt was made to search for fish concentrations; however stations were scanned by sounder to find

fairly even bottom. All 53 otter-trawl sets were made during daylight hours using a lined #41-5 trawl as described by Mercer (1969b). Surface plankton tows were run during each otter-trawl set while vertical hauls were made during the hydrographic routine following each set.

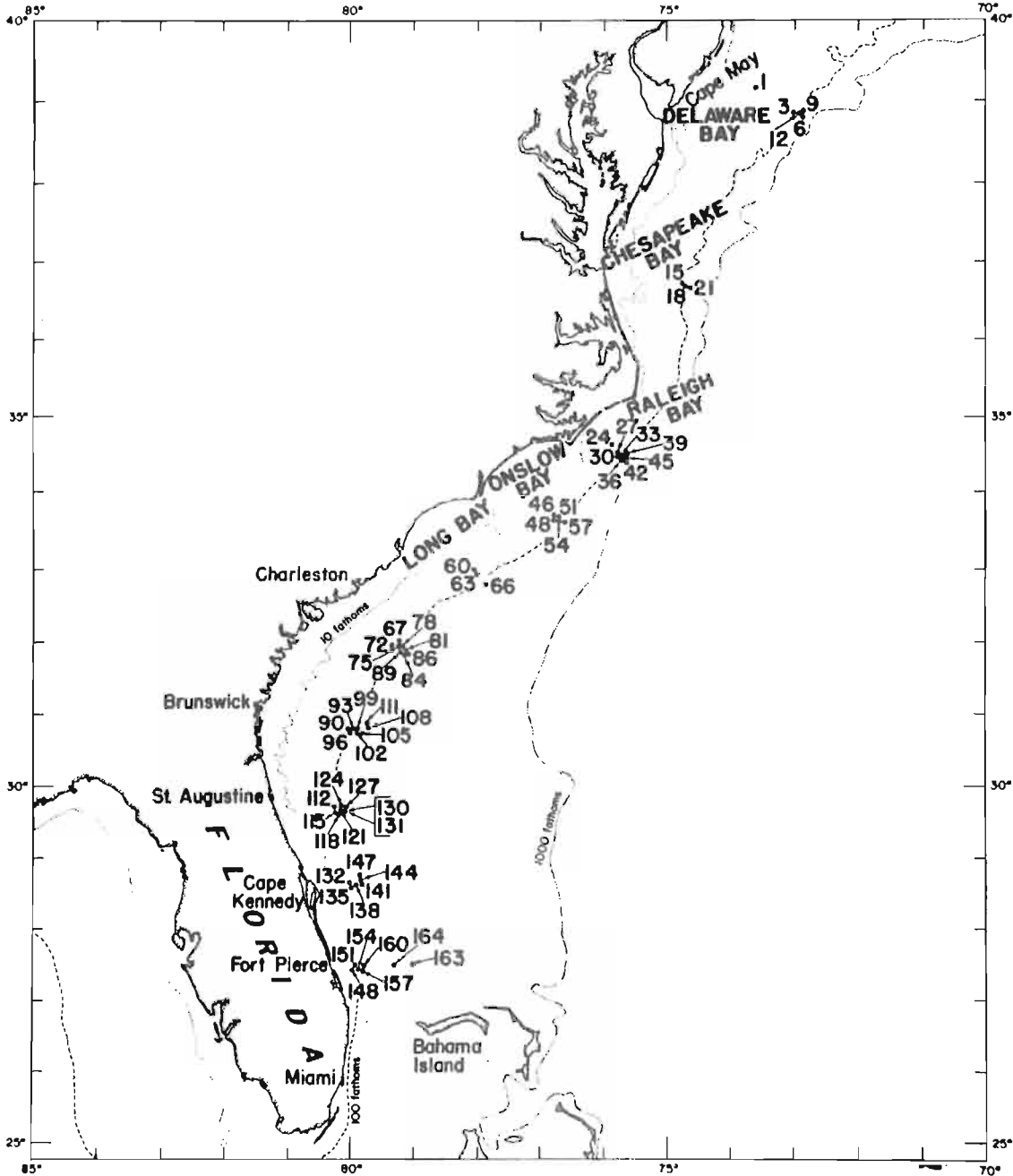


Fig. 1. Positions of fishing stations for A.T. Cameron cruise 157.

HYDROGRAPHY

Surface temperatures and salinities were taken and bathy-thermograph casts run 0-270 m for each otter-trawl set. Temperatures and salinities about 4 m off bottom, and temperatures at 270 m and at an intermediate depth between 270 m and bottom were obtained using Knudsen bottles with attached mercury thermometers. Temperature profiles for all transects south of Cape Hatteras are shown in Fig. 2; here a consistent thermal stratification obtained. Vertical mixing was complete off Cape May and Chesapeake Bay where temperatures were about 10 and 11 C respectively except over 50 m depths off Cape May where 4 C water was found.

CATCHES AND OBSERVATIONS

Catches of all fish and selected invertebrates are tabulated in Appendix 2. Only brief notes are given below.

Crustacea. A total of three Red crabs was taken in two sets off Cape May and Cape Charles where bottom temperatures were 6.7 and 10.9 C at collecting depths of 49-50 and 193-212 fathoms respectively.

Rock crabs were taken in 11 sets, mostly off Florida. Catches were all small, the largest being 15 specimens off Fort Pierce in 74-78 fathoms, bottom temperature 15.9 C.

Jonah crabs occurred in 25 sets, the largest catch comprising 35 specimens off St. Augustine in 143-156 fathoms, bottom temperature 8.9C.

American lobsters were taken in four sets, all north of Cape Hatteras. Total catch was 19 specimens.

Cephalopoda. Catches of long-finned squid (*Loligo pealei* and *L. plei*) were obtained in 40 sets, the largest catch being 116 lb off Cape May in 90-95 fathoms, bottom temperature 10.1 C. All catches south of Cape Hatteras were under 70 lb with fewest and smallest catches being taken off Georgia and Florida.

Catches of short-finned squid were obtained in 24 sets, the largest catch being 20 specimens off Onslow Bay in 124-128 fathoms, bottom temperature 14.6 C. Biological data will be reported elsewhere for *I. illecebrosus* and *I. oxygonius*.

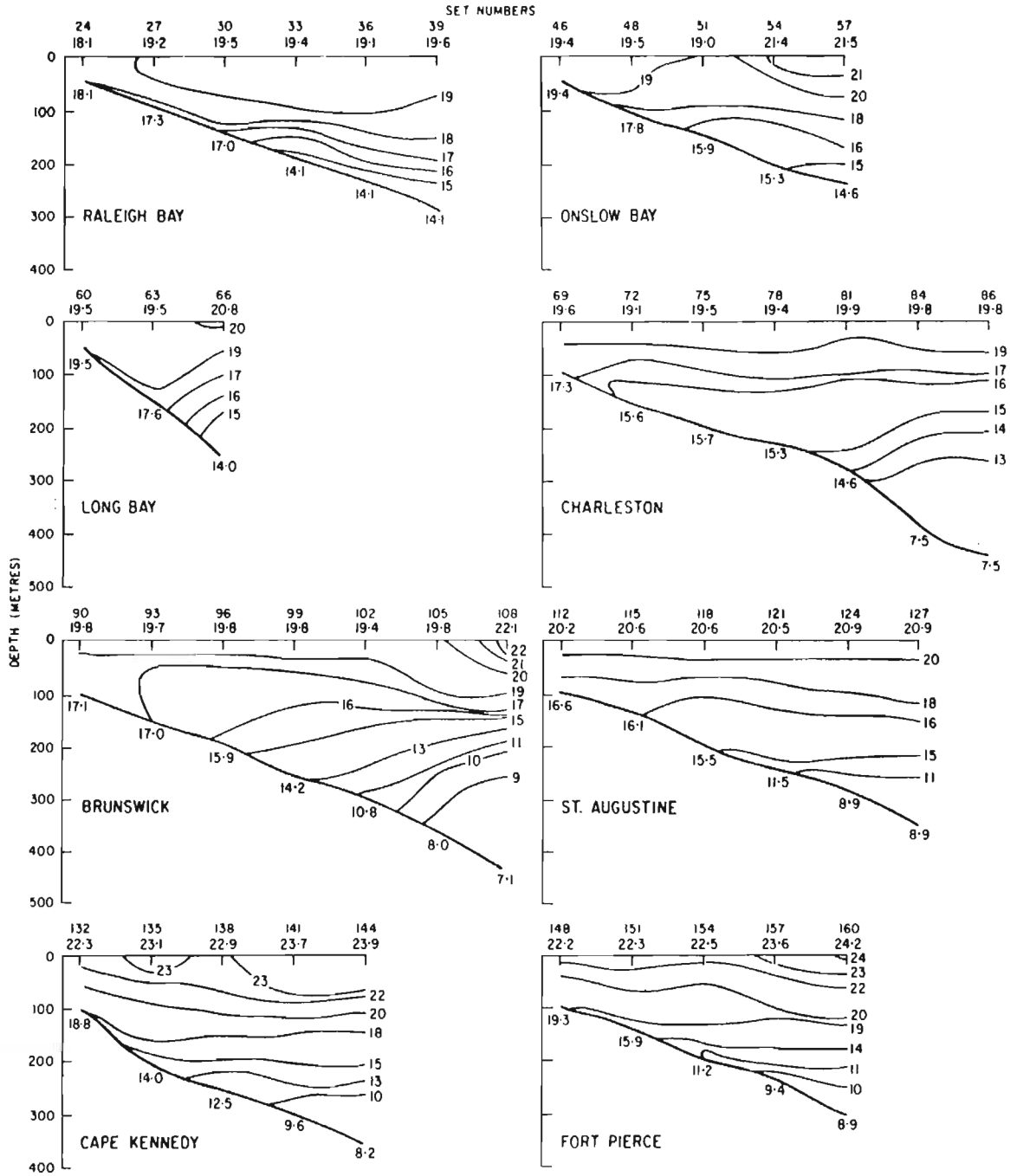


Fig. 2. Temperature (C) profiles for transects south of Cape Hatteras fished on A.T. Cameron cruise 157.

Fishes. There are 123 listings, 114 of these being identified to species; 60 families are represented. Common names employed are those adopted by the American Fisheries Society (Bailey, 1960) excepting for species not dealt with in this publication; in such cases common names were extracted from references used in identification.

Cetacea. Few porpoises and no mysticete whales were sighted. On February 16 about 50 *Tursiops truncatus* played about the vessel, riding the bow wave, from about 1730 to 1800 NST over 20 fathoms at 33°08'N, 78°00'W. During shooting of the gear for set 112 about 15 to 20 *Stenella plagiodon* approached the side of the vessel and after retrieval of the gear from set 154 about 15 specimens played about the vessel for several minutes.

Aves. A single Myrtle warbler, *Dendroica coronata coronata*, was taken off West Palm Beach during set 160 on February 22.

ACKNOWLEDGMENTS

In addition to their participation in the cruise Messrs W.R. Squires and P.W. Collins assisted in preparation of tables and figures and Mr E.M. LeGrow assisted in sorting and identifying fishes. I am also indebted to Mr Jon C. Staiger of the School of Marine and Atmospheric Sciences, University of Miami, for his identification of several tropical fish species as indicated in the tabulation of landings.

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Appendix 1

Set details for *A.T. Cameron* cruise 157

Table 1. Set details for A. T. Cameron cruise 157.

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
1	12	39°09'00"	73°37'30"	0925	30	21- <u>23</u> -25	3.8	4.09	33.44	33.49	41.5 OT
2	12	39°09'30"	73°37'45"	1014	1'36"	22-surface	3.8	4.09	33.44	33.49	1 m plankton net (vert.)
3	12	38°51'30"	72°58'30"	1411	30	49- <u>51</u> -52	9.5	10.10	33.30	33.21	41.5 OT
4	12	38°51'30"	72°58'30"	1411	30	surface	9.5	10.10	33.30	33.21	1 m plankton net (horiz.)
5	12	38°50'00"	72°59'00"	1504	2'48"	48-surface	9.5	10.10	33.30	33.21	1 m plankton net (vert.)
6	12	38°49'00"	72°54'00"	1600	30	73- <u>82</u> -90	10.1	10.15	35.02	35.05	41.5 OT
7	12	38°50'00"	72°54'00"	1607	16	surface	10.1	10.15	35.02	35.05	1 m plankton net (horiz.)
8	12	38°50'30"	72°53'00"	1644	7	70-surface	10.1	10.15	35.02	35.05	1 m plankton net (vert.)
9	12	38°53'30"	72°54'00"	1755	30	121- <u>133</u> -145	10.1	10.57	35.07	35.34	41.5 OT
10	12	38°53'30"	72°54'00"	1757	27	surface	10.1	10.57	35.07	35.34	1 m plankton net (horiz.)
11	12	38°52'00"	72°56'00"	1849	8'28"	125-surface	10.1	10.57	35.07	35.34	1 m plankton net (vert.)
12	12	38°53'00"	72°55'00"	2000	30	193- <u>203</u> -212	10.2	6.74	35.01	35.03	41.5 OT
13	12	38°53'00"	72°55'00"	2001	29	surface	10.2	6.74	35.01	35.03	1 m plankton net (horiz.)
14	12	38°51'30"	72°54'30"	-	8'02"	234-surface	10.2	6.74	35.01	35.03	1 m plankton net (vert.)
15	13	36°43'30"	74°45'00"	1353	30	49- <u>50</u> -50	11.6	10.93	35.50	-	41.5 OT

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
16	13	36°43'30"	74°45'00"	1353	30	surface	11.6	10.93	35.50	-	1 m plankton net (horiz.)
17	13	36°42'00"	74°45'30"	-	6'58"	48-surface	11.6	10.93	35.50	-	1 m plankton net (vert.)
18	13	36°42'30"	74°42'30"	1605	30	69- <u>74</u> -78	11.5	11.65	35.39	35.41	41.5 OT
19	13	36°42'30"	74°42'30"	1612	19	surface	11.5	11.65	35.39	35.41	1 m plankton net (horiz.)
20	13	36°41'00"	74°43'00"	1646	1'40"	83-surface	11.5	11.65	35.39	35.41	1 m plankton net (vert.)
21	13	36°41'30"	74°41'00"	1805	30	122- <u>131</u> -139	11.6	11.47	35.41	35.44	41.5 OT
22	13	36°41'30"	74°41'00"	1806	28	surface	11.6	11.47	35.41	35.44	1 m plankton net (horiz.)
23	13	36°39'30"	74°42'00"	-	-	120-surface	11.6	11.47	35.41	35.44	1 m plankton net (vert.)
24	14	34°39'00"	75°53'30"	0910	30	25- <u>26</u> -27	18.1	18.10	35.34	-	41.5 OT
25	14	34°39'00"	75°53'30"	0915	30	surface	18.1	18.10	35.34	-	1 m plankton net (horiz.)
26	14	34°38'00"	75°55'00"	0946	2'20"	23-surface	18.1	18.10	35.34	-	1 m plankton net (vert.)
27	14	34°31'00"	75°47'00"	1110	30	47- <u>49</u> -51	19.2	17.34	36.47	36.17	41.5 OT
28	14	34°31'00"	75°47'00"	1110	30	surface	19.2	17.34	36.47	36.17	1 m plankton net (horiz.)
29	14	34°29'30"	75°48'15"	1147	3'34"	48-surface	19.2	17.34	36.47	36.17	1 m plankton net (vert.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
30	14	34°30'30"	75°45'00"	1300	30	72- <u>74</u> -75	19.5	17.04	36.36	36.18	41.5 OT
31	14	34°30'30"	75°45'00"	1304	27	surface	19.5	17.04	36.36	36.18	1 m plankton net (horiz.)
32	14	34°28'00"	75°46'00"	-	2'59"	73-surface	19.5	17.04	36.36	36.18	1 m plankton net (vert.)
33	14	34°29'00"	75°43'00"	1443	30	99- <u>100</u> -100	19.4	14.14	36.38	35.90	41.5 OT
34	14	34°29'00"	75°43'00"	1443	30	surface	19.4	14.14	36.38	35.90	1 m plankton net (horiz.)
35	14	34°27'30"	75°44'00"	-	3'46"	98-surface	19.4	14.14	36.38	35.90	1 m plankton net (vert.)
36	14	34°27'30"	75°41'30"	1613	30	123- <u>125</u> -126	19.1	14.10	36.38	36.00	41.5 OT
37	14	34°27'30"	75°41'30"	1613	30	surface	19.1	14.10	36.38	36.00	1 m plankton net (horiz.)
38	14	43°26'00"	75°40'45"	-	3'26"	125-surface	19.1	14.10	36.38	36.00	1 m plankton net (vert.)
39	14	34°26'30"	75°41'00"	1755	30	147- <u>152</u> -157	19.6	14.05	36.38	36.13	41.5 OT
40	14	34°26'30"	75°41'00"	1756	28	surface	19.6	14.05	36.38	36.13	1 m plankton net (horiz.)
41	14	34°25'00"	75°42'00"	-	9'29"	152-surface	19.6	14.05	36.38	36.13	1 m plankton net (vert.)
42	14	34°25'00"	75°39'45"	1949	27	176- <u>199</u> -222	19.0	-	36.36	35.19	41.5 OT
43	14	34°25'00"	75°39'45"	1949	27	surface	19.0	-	36.36	35.19	1 m plankton net (horiz.)
44	14	34°26'30"	75°39'00"	-	12'44"	198-surface	19.0	-	36.36	35.19	1 m plankton net (vert.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
45	14	34°26'30"	75°39'00"	2225	70	surface	19.4	19.38	36.44	36.33	Light
46	15	33°42'30"	76°46'30"	0835	30	23- <u>25</u> -26	19.4	19.38	36.44	36.33	41.5 OT
47	15	33°43'15"	76°45'30"	0921	1'35"	23-surface	19.4	19.38	36.44	36.33	1 m plankton net (vert.)
48	15	33°41'30"	76°46'00"	1027	30	44- <u>48</u> -52	19.5	17.78	36.44	36.26	41.5 OT
49	15	33°41'30"	76°46'00"	1027	30	surface	19.5	17.78	36.44	36.26	1 m plankton net (horiz.)
50	15	33°42'45"	76°46'00"	1106	2'28"	50-surface	19.5	17.78	36.44	36.26	1 m plankton net (vert.)
51	15	33°41'00"	76°45'30"	1210	30	70- <u>73</u> -76	19.0	15.90	36.38	36.08	41.5 OT
52	15	33°41'00"	76°45'30"	1210	30	surface	19.0	15.90	36.38	36.08	1 m plankton net (horiz.)
53	15	33°42'15"	76°44'30"	-	4'10"	80-surface	19.0	15.90	36.38	36.08	1 m plankton net (vert.)
54	15	33°39'00"	76°43'00"	1610	30	97- <u>99</u> -100	21.4	15.26	36.33	36.02	41.5 OT
55	15	33°39'00"	76°43'00"	1610	30	surface	21.4	15.26	36.33	36.02	1 m plankton net (horiz.)
56	15	33°40'00"	76°40'00"	-	7'55"	110-surface	21.4	15.26	36.33	36.02	1 m plankton net (vert.)
57	15	33°37'30"	76°38'30"	1815	30	124- <u>126</u> -128	21.5	14.60	36.26	35.90	41.5 OT
58	15	33°37'30"	76°38'30"	1815	30	surface	21.5	14.60	36.26	35.90	1 m plankton net (horiz.)
59	15	33°36'00"	76°40'00"	1859	8'32"	132-surface	21.5	14.60	36.26	35.90	1 m plankton net (vert.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
60	17	32°59'00"	78°03'30"	1235	30	23- <u>25</u> -27	19.5	19.50	36.31	36.80	41.5 OT
61	17	32°59'00"	78°03'30"	1235	30	surface	19.5	19.50	36.31	36.80	1 m plankton net (horiz.)
62	17	33°00'45"	78°03'00"	-	0'57"	25-surface	19.5	19.50	36.31	36.80	1 m plankton net (vert.)
63	17	32°56'00"	78°01'00"	1440	30	70- <u>71</u> -72	19.5	17.55	36.27	36.36	41.5 OT
64	17	32°56'00"	78°01'00"	1440	30	surface	19.5	17.55	36.27	36.36	1 m plankton net (horiz.)
65	17	32°56'00"	77°58'00"	-	1'48"	74-surface	19.5	17.55	36.27	36.36	1 m plankton net (vert.)
66	17	32°47'00"	77°53'30"	1705	30	124- <u>125</u> -126	20.8	14.00	36.31	35.75	41.5 OT
67	17	32°47'00"	77°53'30"	1705	30	surface	20.8	14.00	36.31	35.75	1 m plankton net (horiz.)
68	17	32°47'00"	77°50'00"	-	6'08"	135-surface	20.8	14.00	36.31	35.75	1 m plankton net (vert.)
69	18	32°00'00"	79°15'00"	0850	30	45- <u>48</u> -51	19.6	17.34	36.33	36.29	41.5 OT
70	18	32°00'00"	79°15'00"	0850	30	surface	19.6	17.34	36.33	36.29	1 m plankton net (horiz.)
71	18	32°01'30"	79°14'30"	0921	2'42"	48-surface	19.6	17.34	36.33	36.29	1 m plankton net (vert.)
72	18	31°57'45"	79°13'00"	1035	30	74- <u>75</u> -75	19.1	15.59	36.31	36.20	41.5 OT
73	18	31°57'45"	79°13'00"	1035	30	surface	19.1	15.59	36.31	36.20	1 m plankton net (horiz.)
74	18	31°59'00"	79°12'30"	-	4'29"	78-surface	19.1	15.59	36.31	36.20	1 m plankton net (vert.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
75	18	31°56'00"	79°11'00"	1215	30	95- <u>98</u> -100	19.5	15.72	36.31	36.00	41.5 OT
76	18	31°56'00"	79°11'00"	1215	30	surface	19.5	15.72	36.31	36.00	1 m plankton net (horiz.)
77	18	31°57'30"	79°09'30"	-	3'20"	103-surface	19.5	15.72	36.31	36.00	1 m plankton net (vert.)
78	18	31°54'00"	79°10'00"	1352	30	123- <u>125</u> -127	19.4	15.28	36.29	35.93	41.5 OT
79	18	31°54'00"	79°10'00"	1352	30	surface	19.4	15.28	36.29	35.93	1 m plankton net (horiz.)
80	18	31°56'00"	79°08'45"	-	3'45"	123-surface	19.4	15.28	36.29	35.93	1 m plankton net (vert.)
81	18	31°53'30"	79°09'30"	1600	30	140- <u>145</u> -150	19.9	14.60	36.33	35.84	41.5 OT
82	18	31°53'30"	79°09'30"	1600	30	surface	19.9	14.60	36.33	35.84	1 m plankton net (horiz.)
83	18	31°55'00"	79°08'00"	-	-	153-surface	19.9	14.60	36.33	35.84	1 m plankton net (vert.)
84	18	31°53'00"	79°09'30"	1755	30	185- <u>193</u> -200	19.8	7.53	36.31	36.71	41.5 OT
85	18	31°53'00"	79°09'30"	1755	30	surface	19.8	7.53	36.31	36.71	1 m plankton net (horiz.)
86	18	31°53'30"	79°08'00"	1945	30	219- <u>227</u> -234	19.8	7.48	36.27	34.88	41.5 OT
87	18	31°53'30"	79°08'00"	1945	30	surface	19.8	7.48	36.27	34.88	1 m plankton net (horiz.)
88	18	31°52'30"	79°08'00"	-	-	240-surface	19.8	7.48	36.27	34.88	1 m plankton net (vert.)
89	18	31°53'00"	79°12'00"	2305	60	27	No temp. taken		-	-	IKMT

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
90	Feb. 19	30°48'30"	80°02'00"	0840	30	49- <u>52</u> -55	19.8	17.09	36.33	36.24	41.5 OT
91	19	30°48'30"	80°02'00"	0840	30	surface	19.8	17.09	36.33	36.24	1 m plankton net (horiz.)
92	19	30°50'00"	80°01'45"	0911	2'54"	48-surface	19.8	17.09	36.33	36.24	1 m plankton net (vert.)
93	19	30°48'30"	80°00'00"	1010	30	73- <u>75</u> -77	19.7	17.03	36.29	36.29	41.5 OT
94	19	30°48'30"	80°00'00"	1010	30	surface	19.7	17.03	36.29	36.29	1 m plankton net (horiz.)
95	19	30°50'00"	79°59'30"	1047	4'21"	73-surface	19.7	17.03	36.29	36.29	1 m plankton net (vert.)
96	19	30°47'30"	79°59'00"	1120	30	99- <u>102</u> -104	19.8	15.87	36.29	36.11	41.5 OT
97	19	30°47'30"	79°59'00"	1120	30	surface	19.8	15.87	36.29	36.11	1 m plankton net (horiz.)
98	19	30°49'00"	79°58'30"	1222	3'23"	98-surface	19.8	15.87	36.29	36.11	1 m plankton net (vert.)
99	19	30°46'00"	79°56'00"	1335	30	120- <u>124</u> -127	19.8	14.15	36.31	35.86	41.5 OT
100	19	30°46'00"	79°56'00"	1335	30	surface	19.8	14.15	36.31	35.86	1 m plankton net (horiz.)
101	19	30°47'30"	79°54'00"	-	4'29"	130-surface	19.8	14.15	36.31	35.86	1 m plankton net (vert.)
102	19	30°46'00"	79°53'30"	1525	30	150- <u>152</u> -153	19.4	10.77	36.31	35.37	41.5 OT
103	19	30°46'00"	79°53'30"	1525	30	surface	19.4	10.77	36.31	35.37	1 m plankton net (horiz.)
104	19	30°47'30"	79°54'00"	-	5'07"	148-surface	19.4	10.77	36.31	35.37	1 m plankton net (vert.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
105	19	30°46'00"	79°51'30"	1720	30	179- <u>184</u> -189	19.8	8.04	36.29	34.99	41.5 OT
106	19	30°46'00"	79°51'30"	1720	30	surface	19.8	8.04	36.29	34.99	1 m plankton net (horiz.)
107	19	30°48'00"	79°49'00"	1809	8'30"	195-surface	19.8	8.04	36.29	34.99	1 m plankton net (vert.)
108	19	30°49'00"	79°45'30"	1950	30	207- <u>212</u> -217	22.1	7.09	36.09	35.16	41.5 OT
109	19	30°49'00"	79°45'30"	1950	30	surface	22.1	7.09	36.09	35.16	1 m plankton net (horiz.)
110	19	30°51'00"	79°45'00"	2021	13'16"	240-surface	22.1	7.09	36.09	35.16	1 m plankton net (vert.)
111	19	30°51'00"	79°45'00"	2220	60	surface	No temp. taken		-	-	Light
112	20	29°41'00"	80°15'30"	0845	30	50- <u>52</u> -53	20.2	16.58	36.26	36.04	41.5 OT
113	20	29°41'00"	80°15'30"	0845	30	surface	20.2	16.58	36.26	36.04	1 m plankton net (horiz.)
114	20	29°42'30"	80°15'15"	0921	2'54"	48-surface	20.2	16.58	36.26	36.04	1 m plankton net (vert.)
115	20	29°40'00"	80°13'30"	1022	30	70- <u>72</u> -74	20.6	16.13	36.29	36.02	41.5 OT
116	20	29°40'00"	80°13'30"	1022	30	surface	20.6	16.13	36.29	36.02	1 m plankton net (horiz.)
117	20	29°41'30"	80°13'30"	1102	4'20"	73-surface	20.6	16.13	36.29	36.02	1 m plankton net (vert.)
118	20	29°40'00"	80°11'30"	1242	30	95- <u>99</u> -102	20.6	15.51	36.26	35.95	41.5 OT
119	20	29°40'00"	80°11'30"	1242	30	surface	20.6	15.51	36.26	35.95	1 m plankton net (horiz.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
120	Feb. 20	29°41'30"	80°11'00"	-	3'31"	98-surface	20.6	15.51	36.26	35.95	1 m plankton net (vert.)
121	20	29°39'00"	80°11'00"	1430	30	120- <u>124</u> -128	20.5	11.50	36.22	36.00	41.5 OT
122	20	29°39'00"	80°11'00"	1430	30	surface	20.5	11.50	36.22	36.00	1 m plankton net (horiz.)
123	20	29°41'00"	80°11'00"	-	2'33"	123-surface	20.5	11.50	36.22	36.00	1 m plankton net (vert.)
124	20	29°40'00"	80°10'00"	1610	30	143- <u>150</u> -156	20.9	8.91	36.27	35.01	41.5 OT
125	20	29°40'00"	80°10'00"	1610	30	surface	20.9	8.91	36.27	35.01	1 m plankton net (horiz.)
126	20	29°41'45"	80°10'30"	-	3'30"	152-surface	20.9	8.91	36.27	35.01	1 m plankton net (vert.)
127	20	29°39'00"	80°09'00"	1805	30	175- <u>178</u> -180	20.9	8.91	36.38	34.87	41.5 OT
128	20	29°39'00"	80°09'00"	1805	30	surface	20.9	8.91	36.38	34.87	1 m plankton net (horiz.)
129	20	29°40'30"	80°08'30"	1900	9'34"	192-surface	20.9	8.91	36.38	34.87	1 m plankton net (vert.)
130	20	29°40'30"	80°08'00"	2138	45	50	No temp. taken		-	-	IKMT
131	20	29°40'45"	80°08'15"	2323	75	surface	No temp. taken		-	-	Light
132	21	28°38'30"	80°02'30"	1005	30	45- <u>49</u> -52	22.3	18.78	-	-	41.5 OT
133	21	28°38'30"	80°02'30"	1005	30	surface	22.3	18.78	-	-	1 m plankton net (horiz.)
134	21	28°40'00"	80°02'15"	1047	3'07"	49-surface	22.3	18.78	-	-	1 m plankton net (vert.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
	Feb.										
135	21	28°39'30"	79°58'30"	1223	30	95- <u>99</u> -103	23.1	14.00	-	-	41.5 OT
136	21	28°39'30"	79°58'30"	1223	30	surface	23.1	14.00	-	-	1 m plankton net (horiz.)
137	21	28°41'30"	80°00'00"	-	3'32"	98-surface	23.1	14.00	-	-	1 m plankton net (vert.)
138	21	28°39'30"	79°54'45"	1450	30	120- <u>123</u> -125	22.9	12.50	-	-	41.5 OT
139	21	28°39'30"	79°54'45"	1450	30	surface	22.9	12.50	-	-	1 m plankton net (horiz.)
140	21	28°41'30"	79°54'30"	-	4'12"	123-surface	22.9	12.50	-	-	1 m plankton net (vert.)
141	21	28°40'00"	79°53'00"	1715	30	150- <u>152</u> -153	23.7	9.56	-	-	41.5 OT
142	21	28°40'00"	79°53'00"	1715	30	surface	23.7	9.56	-	-	1 m plankton net (horiz.)
143	21	28°41'45"	79°53'00"	1803	5'45"	148-surface	23.7	9.56	-	-	1 m plankton net (vert.)
144	21	28°41'30"	79°52'00"	2000	30	169- <u>172</u> -175	23.9	8.20	-	-	41.5 OT
145	21	28°41'30"	79°52'00"	2000	30	surface	23.9	8.20	-	-	1 m plankton net (horiz.)
146	21	28°44'00"	79°52'30"	2050	10'50"	195-surface	23.9	8.20	-	-	1 m plankton net (vert.)
147	21	28°44'00"	79°52'30"	2230	120	surface	No temp. taken		-	-	Light
148	22	27°27'00"	79°57'30"	0810	30	50- <u>52</u> -54	22.2	19.30	-	-	41.5 OT
149	22	27°27'00"	79°57'30"	0810	30	surface	22.2	19.30	-	-	1 m plankton net (horiz.)

Cont'd.

Table 1 (Cont'd.)

Set No.	Date 1969	Position		MP of set (NST)	Duration (min)	Depth range and mean (fath)	Temperature (°C)		Salinity ‰		Gear
		N. lat.	W. long.				Surf.	Bott.	Surf.	Bott.	
150	Feb. 22	27°29'00"	79°57'30"	0916	2'59"	48-surface	22.2	19.30	-	-	1 m plankton net (vert.)
151	22	27°27'00"	79°55'00"	1035	30	74- <u>76</u> -78	22.3	15.93	-	-	41.5 OT
152	22	27°27'00"	79°55'00"	1035	30	surface	22.3	15.93	-	-	1 m plankton net (horiz.)
153	22	27°27'00"	79°55'00"	1112	4'10"	73-surface	22.3	15.93	-	-	1 m plankton net (horiz.)
154	22	27°27'00"	79°53'00"	1237	30	100- <u>102</u> -104	22.5	11.16	-	-	41.5 OT
155	22	27°27'00"	79°53'00"	1237	30	surface	22.5	11.16	-	-	1 m plankton net (horiz.)
156	22	27°28'45"	79°52'00"	-	3'28"	98-surface	22.5	11.16	-	-	1 m plankton net (vert.)
157	22	27°27'45"	79°51'00"	1513	30	128- <u>131</u> -133	23.6	9.40	-	-	41.5 OT
158	22	27°27'45"	79°51'00"	1513	30	surface	23.6	9.40	-	-	1 m plankton net (horiz.)
159	22	27°30'00"	79°50'00"	-	4'18"	123-surface	23.6	9.40	-	-	1 m plankton net (vert.)
160	22	27°29'00"	79°49'00"	1745	30	152- <u>155</u> -158	24.2	8.94	-	-	41.5 OT
161	22	27°29'00"	79°49'00"	1745	30	surface	24.2	8.94	-	-	1 m plankton net (horiz.)
162	22	27°31'00"	79°48'00"	1839	8'40"	165-surface	24.2	8.94	-	-	1 m plankton net (vert.)
163	22	27°30'00"	79°01'00"	0345	630	5	No temp. taken		-	-	Shark longline
164	23	27°30'30"	79°20'00"	1445	509	5	No temp. taken		-	-	Shark longline

Appendix 2

Catches for *A.T. Cameron* cruise 157

Table 2. Cont'd.

Species \ Set No.	39	46	51	54	57	60	63
Barndoor skate (<i>Raja laevis</i>)							
<i>Breviraja plutonia</i>							
<i>Dactylobatus armatus</i>							
Dasyatidae Southern stingray (<i>Dasyatis americana</i>)		616 (11)					
Roughtail stingray (<i>Dasyatis centroura</i>)	90 (1)		4 (1)			72	
Smooth butterfly ray (<i>Gymnura micrura</i>)							
Clupeidae Gaspereau (<i>Alosa pseudoharengus</i>)							
American shad (<i>Alosa sapidissima</i>)							
Atlantic round herring (<i>Etrumeus sadina</i>)			1298	61	10.5		122
Argentinidae an argentine (<i>Glossanodon pygmaeus</i>)							
Unidentified Argentinidae and Chlorophthalmidae							

Table 2. Cont'd.

Species	Sei No.	138	141	144	148	154	157	160
Barndoor skate (<i>Raja laevis</i>)								
<i>Breviraja plutonia</i>			0.2 (1)	(2)	0.2 (1)			
<i>Dactylobatus armatus</i>								
Dasyatidae Southern stingray (<i>Dasyatis americana</i>)								
Roughtail stingray (<i>Dasyatis centroura</i>)								
Smooth butterfly ray (<i>Gymnura micrura</i>)								
Clupeidae Gaspereau (<i>Alosa pseudoharengus</i>)								
American shad (<i>Alosa sapidissima</i>)								
Atlantic round herring (<i>Etrumeus sadina</i>)							9	2 (13)
Argentinidae an argentine (<i>Glossanodon pygmaeus</i>)		<0.1 (2)				0.1 (4)	<0.1 (1)	
Unidentified Argentinidae and Chlorophthalmidae						0.1 (4)	<0.1 (6)	

Species \ Set No.	12	24	39	42	60	63	69
Gonostomidae Pearlsides (<i>Maurolicus pennanti</i>)							
Sternoptychidae a hatchetfish (<i>Polyipnus asteroides</i>)				0.1 (33)			
Transparent hatchetfish (<i>Sternoptyx diaphana</i>)							
Chauliodontidae Viperfish (<i>Chauliodus sloani</i>)				<0.1 (1)			
Synodontidae Inshore lizardfish (<i>Synodus foetens</i>)		0.1 (1)			1.5 (2)		2.5 (6)
Snakefish (<i>Trachinocephalus myops</i>)		0.1 (1)					
Largescale lizardfish (<i>Saurida brasiliensis</i>)						(1)	0.7 (1)
Offshore lizardfish (<i>Synodus poeyi</i>)							
Synodontidae sp.						0.5 (1)	
Myctophidae spp. Lanternfish	(2)		<0.1 (2)	<0.1 (1)			
Chlorophthalmidae Shortnose greeneye (<i>Chlorophthalmus agassizi</i>)							

Table 2. Cont'd.

Species	Set No.	72	84	86	90	99	102	105
Gonostomidae Pearlsides (<i>Maurolicus pennanti</i>)						<0.1 (1)	(1)	
Sternoptychidae a hatchetfish (<i>Polyipnus asteroides</i>)								
Transparent hatchetfish (<i>Sternoptyx diaphana</i>)				0.1 (12)				
Chauliodontidae Viperfish (<i>Chauliodus sloani</i>)								
Synodontidae Inshore lizardfish (<i>Synodus foetens</i>)								
Snakefish (<i>Trachinocephalus myops</i>)					1 (5)			
Largescale lizardfish (<i>Saurida brasiliensis</i>)								
Offshore lizardfish (<i>Synodus poeyi</i>)								
Synodontidae sp.		3 (3)			1 (2)			
Myctophidae spp. Lanternfish								0.1 (50)
Chlorophthalmidae Shortnose greeneye (<i>Chlorophthalmus agassizi</i>)			<0.1 (8)				(7)	

Numbers in brackets

108	124	132	138	141	144	148	151	154	160			
			<0.1 (1)		(3)							
				<0.1 (1)	0.1 (11)							
<0.1 (3)												
		3 (5)										
						1 (4)	1.5					
					0.1 (6)				(2)			
<0.1 (1)	<0.1 (2)			0.2 (9)	0.1 (6)			0.1 (4)	(6)			

Table 2. Cont'd.

Species	Set No.						
	148	151					
Longnose greeneye (<i>Parasudis truculentus</i>)							
Ariommidae <i>Ariomma</i> sp.		0.1 (1)					
Muraenidae Spotted moray (<i>Gymnothorax moringa</i>)							
Ophichthidae Palespotted eel (<i>Ophichthus ocellatus</i>)							
Spotted spoon-nose eel (<i>Mystriophis intertinctus</i>)							
Speckled worm eel (<i>Myrophis punctatus</i>)	(1)						
* <i>Ophichthus melanoporus</i>							
<i>Pisoodonophis cruentifer</i>	0.1 (1)						
Exocoetidae Atlantic flyingfish (<i>Cypselurus heterurus</i>)							
Gadidae Fourbeard rockling (<i>Enchelyopus cimbrius</i>)							
* <i>Physiculus fulvus</i>							

Species \ Set No.	1	3	6	9	12	15	18
Silver hake (<i>Merluccius bilinearis</i>)	2.5 (9)	1.0 (2)	9.5 (28)	80	186	2.5 (9)	2 (3)
Longfin hake (<i>Urophycis chesteri</i>)					9		
Spotted hake (<i>Urophycis regius</i>)		1.0 (2)	1.5 (2)			0.5 (1)	
Squirrel hake (<i>Urophycis chuss</i>)							
White hake (<i>Urophycis tenuis</i>)			2.5 (3)	7.5 (5)	23		
<i>Laemonema barbatula</i>							
Macrouridae Common grenadier (<i>Nezumia bairdi</i>)				(1)	2 (5)		
<i>Nezumia hildebrandi</i>							
<i>Hymenocephalus cavernosus</i>							
* <i>Coelorhynchus carminatus</i>							
Macrouridae sp.							

Table 2. Cont'd.

Species \ Set No.	108	115	118	121	124	135	138
Silver hake (<i>Merluccius bilinearis</i>)							
Longfin hake (<i>Urophycis chesteri</i>)							
Spotted hake (<i>Urophycis regius</i>)		0.4 (3)	18	13	1 (8)	2 (17)	1.0 (2)
Squirrel hake (<i>Urophycis chuss</i>)							1.8 (1)
White hake (<i>Urophycis tenuis</i>)							
<i>Laemonema barbatula</i>	0.2 (15)				<0.1 (1)		
Macrouridae Common grenadier (<i>Nezumia bairdi</i>)							
<i>Nezumia hildebrandi</i>	0.1 (4)				0.5 (9)		
<i>Hymenocephalus cavernosus</i>							
* <i>Coelorhynchus carminatus</i>							
Macrouridae sp.							

Numbers in brackets

54	60	66	75	78	99	102	112	115	148	151	157	160
3 (2)												
					1.5 (5)	(2)						(3)
			(1)									
								0.8 (1)	0.5 (1)			
	1 (1)											
								0.5 (2)	4	0.5 (3)		
		9 (1)										
												(6)
										0.3 (1)		
				1 (2)			1 (2)	0.5 (1)	(1)		0.3 (1)	

Table 2. Cont'd.

Species	Set No.	24	27	30	46	51	63	69
Priacanthidae Short bigeye (<i>Pristigenys alta</i>)						1.5 (1)		
Apogonidae * <i>Synagrops bella</i>								
Rachycentridae Cobia (<i>Rachycentron canadum</i>)					82 (3)			
Carangidae Bigeye scad (<i>Selar crumenophthalmus</i>)				0.5 (2)				
Saurel (<i>Trachurus trachurus</i>)								0.5 (2)
Almaco jack (<i>Seriola rivoliana</i>)		1 (1)						
Sciaenidae Weakfish (<i>Cynoscion regalis</i>)								
Spot (<i>Leiostomus xanthurus</i>)							(1)	
* Atlantic croaker (<i>Micropogon undulatus</i>)								
Mullidae Red goatfish (<i>Mullus auratus</i>)								
Sparidae Sheepshead (<i>Archosargus probatocephalus</i>)			5.5 (2)	21.5 (4)	13 (7)	8 (1)		

Numbers in brackets

63	69	72	75	86	93	99	105	108	112	115	118	121
7 (40)												
	(2)				0.2 (1)				3 (12)	0.1 (1)		
			0.2 (1)									
					0.5 (3)	0.1 (1)					0.5 (3)	0.5 (6)
							(1)	<0.1 (1)				
				1 (2)								
	0.5 (1)	(1)							33			

Table 2. Cont'd.

Species	Set No.	124	132	135	141	144	148	151
Scup (<i>Stenotomus chrysops</i>)			10				12.5	2.5
Chaetodontidae * Blue angelfish (<i>Holacanthus bermudensis</i>)								
Labridae Hogfish (<i>Lachnolaimus maximus</i>)								
Pearly razorfish (<i>Hemipteronotus novacula</i>)								
Uranoscopidae Lancer stargazer (<i>Kathetostoma albigutta</i>)			1 (1)					
Chaenichthyidae <i>Hypsicometes goboides</i>					1 (11)	(2)	0.2 (1)	
Zoarcidae Ocean pout (<i>Macrozoarces americanus</i>)								
Ophidiidae Fawn cusk-eel (<i>Lepophidium cervinum</i>)		0.1 (1)					0.5 (5)	0.2 (4)
Callionymidae * <i>Draconetta acanthopoma</i>								
Lepidopidae <i>Benthodesmus atlanticus</i>								
Scombridae Chub mackerel (<i>Scomber colias</i>)			472	1 (3)				2 (5)

Table 2. Cont'd.

Species	Set No.	1	3	6	9	15	18	24
Atlantic mackerel (<i>Scomber scombrus</i>)						0.2 (2)		
<i>Nesiarchus nasutus</i>								
Stromateidae Butterfish (<i>Poronotus triacanthus</i>)			65	5 (21)	1 (6)	505	0.5 (3)	
Scorpaenidae spp.†								
Triglidae Northern searobin (<i>Prionotus carolinus</i>)			5 (14)	3.5 (7)	0.5 (1)	70	2.5 (6)	36
Striped searobin (<i>Prionotus evolans</i>)						5 (3)		
* Shortwing searobin (<i>Prionotus stearnsi</i>)								
Spiny searobin (<i>Prionotus alatus</i>)								
Armored searobins (<i>Peristedion miniatum</i> and <i>gracile</i>) * (<i>gracile</i> by J. Staiger)								
Cottidae Longhorn sculpin (<i>Myoxocephalus octodecemspinosus</i>)		1 (3)						
Bothidae Gulf flounder (<i>Paralichthys albigutta</i>)								

†See end of table for *Helicolenus dactylopterus*.

Numbers in brackets

27	30	33	36	39	54	60	69	72	75	78	81	84
	0.1 (1)	4	139	1.5			31	37	31	2.5	13.5	15
							0.2 (3)			0.2 (1)		0.2 (13)
3 (10)	1 (2)					25	<0.5 (3)	(3)				
						0.5 (2)						
									0.1 (1)	0.1 (1)	0.1 (1)	
					0.1 (1)							

Table 2. Cont'd.

Species	Set No.	86	90	93	96	99	102	105
Atlantic mackerel (<i>Scomber scombrus</i>)								
<i>Nesiarchus nasutus</i>								
Stromateidae Butterfish (<i>Poronotus triacanthus</i>)			0.1 (1)	11.5	42	19.5	9	1 (6)
Scorpaenidae spp.†		<0.1 (6)		0.1 (1)			(2)	
Triglidae Northern searobin (<i>Prionotus carolinus</i>)								
Striped searobin (<i>Prionotus evolans</i>)								
* Shortwing searobin (<i>Prionotus stearnsi</i>)						0.1 (1)		
Spiny searobin (<i>Prionotus alatus</i>)								
Armored searobins (<i>Peristedion miniatum</i> and <i>gracile</i>) * (<i>gracile</i> by J. Staiger)		0.1 (1)					0.1 (1)	
Cottidae Longhorn sculpin (<i>Myoxocephalus octodecemspinosus</i>)								
Bothidae Gulf flounder (<i>Paralichthys albigutta</i>)					0.2 (1)			

†See end of table for *Helicolenus dactylopterus*.

Table 2. Cont'd.

Species	Set No.	154	157	160				
Atlantic mackerel (<i>Scomber scombrus</i>)								
<i>Nesiarchus nasutus</i>								
Stromateidae Butterfish (<i>Poronotus triacanthus</i>)		45	5.5	0.5 (3)				
Scorpaenidae spp.†								
Triglidae Northern searobin (<i>Prionotus carolinus</i>)								
Striped searobin (<i>Prionotus evolans</i>)								
* Shortwing searobin (<i>Prionotus stearnsi</i>)								
Spiny searobin (<i>Prionotus alatus</i>)								
Armored searobins (<i>Peristedion miniatum</i> and <i>gracile</i>) * (<i>gracile</i> by J. Staiger)		0.1 (1)		(4)				
Cottidae Longhorn sculpin (<i>Myoxocephalus octodecemspinosus</i>)								
Bothidae Gulf flounder (<i>Paralichthys albigutta</i>)								

†See end of table for *Helicolenus dactylopterus*.

Table 2. Cont'd.

Species	Set No.	27	30	33	36	46	48	51
Triacanthidae * <i>Hollardia</i> sp.					0.1 (1)			
Balistidae Gray triggerfish (<i>Balistes capriscaus</i>)		4 (1)				45	12 (2)	
Monacanthidae Planehead filefish (<i>Monacanthus hispidus</i>)			0.1 (1)	0.2 (1)		8 (33)	0.5 (1)	1.5 (3)
Scrawled filefish (<i>Alutera scripta</i>)						(1)		
Tetraodontidae Puffers (<i>Sphaeroides maculatus</i> and <i>Sphaeroides dorsalis</i>)		1 (2)						
Smooth puffer * (<i>Lagocephalus laevigatus</i>)								
Batrachoididae Atlantic midshipman (<i>Porichthys porosissimus</i>)								
Lophiidae Common angler (<i>Lophius americanus</i>)								
Antennariidae <i>Chaunax pictus</i>								
Ogcocephalidae Atlantic batfish (<i>Dibranchius atlanticus</i>)								
Spiny batfish (<i>Haliientichthys aculeatus</i>)		0.1 (1)						

Numbers in brackets

60	63	69	72	81	86	90	96	99	102	108	112	135
3.5 (1)												
2 (21)	<0.5 (1)	1 (7)	(1)	(1)								
1.0 (2)												
1.5 (1)												
							<0.1 (1)	0.1 (1)				<0.1 (1)
					0.5 (1)				5.5 (1)			
					0.2 (5)					0.2 (1)		
						0.1 (1)						
											0.2 (3)	

Table 2. Cont'd.

Species	Set No.	141	148	151	154			
Triacanthidae * <i>Hollardia</i> sp.								
Balistidae Gray triggerfish (<i>Balistes capriscus</i>)								
Monacanthidae Planehead filefish (<i>Monacanthus hispidus</i>)								
Scrawled filefish (<i>Alutera scripta</i>)								
Tetraodontidae Puffers (<i>Sphaeroides maculatus</i> and <i>Sphaeroides dorsalis</i>)								
Smooth puffer * (<i>Lagocephalus laevigatus</i>)								
Batrachoididae Atlantic midshipman (<i>Porichthys porosissimus</i>)			0.2 (2)	0.2 (2)	0.1 (2)			
Lophiidae Common angler (<i>Lophius americanus</i>)								
Antennariidae <i>Chaunax pictus</i>								
Ogcocephalidae Atlantic batfish (<i>Dibranchius atlanticus</i>)		<0.1 (1)	0.1 (2)					
Spiny batfish (<i>Haliientichthys aculeatus</i>)			(13)	0.1 (3)				

Table 2. Cont'd.

Species	Set No.	157	160				
Polka-dot batfish (<i>Ogcocephalus radiatus</i>)							
Invertebrates Short-finned squid (<i>Illex</i> spp.)	1 (3)						
Long-finned squid (<i>Loligo</i> spp.)							
American lobster (<i>Homarus americanus</i>)							
Jonah crab (<i>Cancer borealis</i>)	1 (6)	0.5 (3)					
Rock crab (<i>Cancer irroratus</i>)	0.2 (3)	(8)					
Red crab (<i>Geryon quinquedens</i>)							
Blackbelly rosefish (<i>Helicolenus dactylopterus</i>)							



