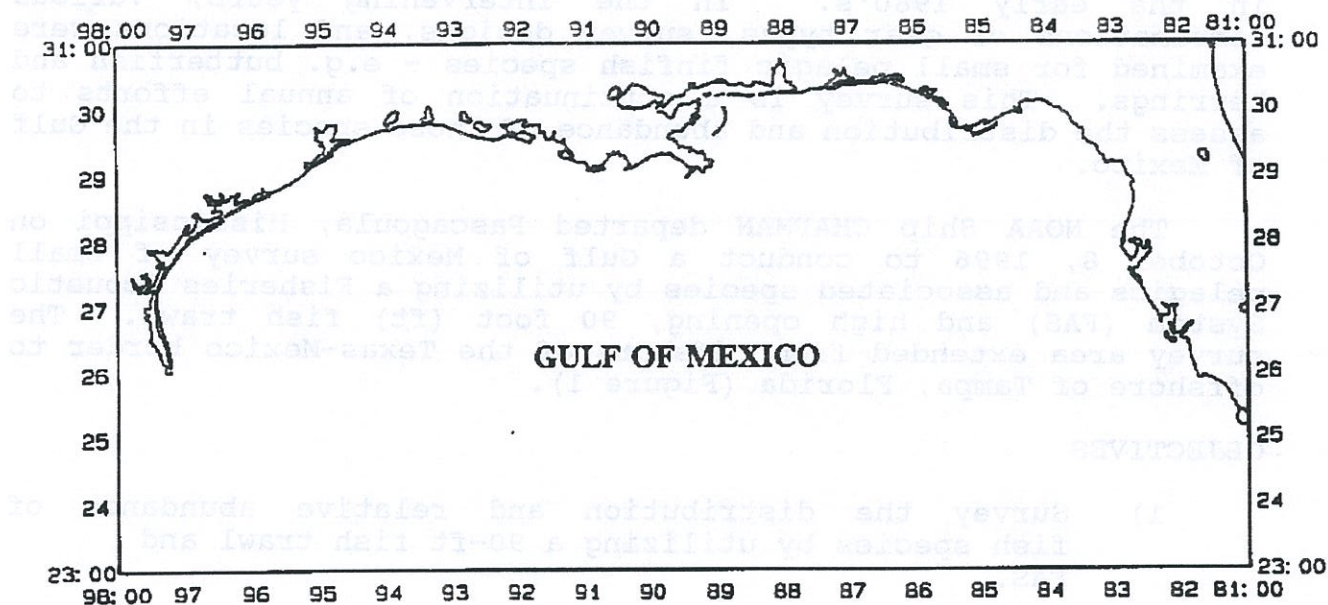


CRUISE RESULTS

Small Pelagics/Hydroacoustics Survey

NOAA Ship CHAPMAN Cruise CH-96-06 (76)

10/08-11/25/96



U.S. Department of Commerce

National Oceanic and Atmospheric Administration

National Marine Fisheries Service

Southeast Fisheries Science Center

Mississippi Laboratories

Pascagoula Facility

P.O. Drawer 1207

Pascagoula, MS 39568-1207

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U S DEPARTMENT OF COMMERCE
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CHAPMAN Cruise 96-06(76)
Small Pelagics/Hydroacoustics Survey

10/8/96 - 11/25/96

INTRODUCTION

The National Marine Fishery Service (NMFS), Mississippi Laboratories, small pelagic/latent resource program was initiated in the early 1980's. In the intervening years, various combinations of gear types, survey designs, and locations were examined for small pelagic finfish species - e.g. butterfish and herrings. This survey is a continuation of annual efforts to assess the distribution and abundance of those species in the Gulf of Mexico.

The NOAA Ship CHAPMAN departed Pascagoula, Mississippi on October 8, 1996 to conduct a Gulf of Mexico survey of small pelagics and associated species by utilizing a Fisheries Acoustic System (FAS) and high opening, 90 foot (ft) fish trawl. The survey area extended from offshore of the Texas-Mexico border to offshore of Tampa, Florida (Figure 1).

OBJECTIVES

- 1) Survey the distribution and relative abundance of fish species by utilizing a 90-ft fish trawl and FAS.
- 2) Conduct comparative trawling with the NOAA Ship OREGON II.
- 3) Collect length frequency data and biological samples of collected species.
- 4) Collect specimens of all species encountered offshore of Florida for the Naval Research Laboratory, Stennis Space Center, Bay St. Louis, Mississippi.
- 5) Collect ichthyoplankton east of 88° during Leg III as part of the Winter SEAMAP Ichthyoplankton Survey for striped mullet.
- 6) Collect environmental data at all trawling and ichthyoplankton locations.

METHODS

The small pelagic trawl used during the survey measured 90-ft on the head rope and 107-ft on the footrope. Mesh size of the trawl gradually reduced from 8-inch stretch mesh in the wings and leading meshes of the trawl body, to 2-inch mesh just ahead of the 1.75-inch mesh codend. The codend contained a 1/4-inch mesh liner. A 1.25-inch mesh fish funnel was attached at the start of the 2-inch webbing in the trawl body. The headrope was floated with twenty-four 10-inch CIES floats with 17 lb of flotation each, and a 9/16-inch cable with 3-inch rubber cookies was suspended by 12-inch drop chains from the footrope to serve as ground gear. The trawl was fished with 3.5 meter (m) Maguere "W" doors and equipped with a SIMRAD FS3300 scanning netsonde unit for evaluation and measurements while trawling.

The components of the FAS used to collect hydroacoustic data included a V-fin towed body, deck and tow cables, and onboard computer system. A 38 khz split beam echo sounder within the V-fin body collected data for computer recording and interpretation.

The SEAMAP bongo stations used a 61 cm bongo in an oblique cast, from the surface to within 1 fathom (fm) of the bottom using 0.333 mm mesh nets. Vessel speed for bongo tows was adjusted during the tow to maintain a 45 degree wire angle. The neuston tows consisted of a 1 x 2 m frames with 0.947 mm mesh net. Neuston tows were conducted for 10 minutes at a vessel speed of 1.5 knots to keep half the frame submerged in the water. All samples were preserved in formalin.

SURVEY DESIGN

Small pelagics:

Results from prior years research focusing on gear types, specific areas, and certain species indicated that numerous species of small pelagic fish are broadly distributed around the Gulf of Mexico. To adequately estimate the complete resource, a broad stratified random design survey was used to provide estimates of catch per unit of effort.

The survey area extended from the offshore shelf waters of the Texas-Mexico border to Tampa, Florida in depths from 5 to 150 fms. Stratified by depth, survey trawl sites and depths were randomly selected. Sites were surveyed for bottom obstructions prior to trawling operations. Tows were 30 minutes in duration at a speed between 3.5 and 4.0 knots and followed by a 5 minute pulse increase of ship's speed to flush the catch to the codend. At depths less than 100 fm tows were made perpendicular to the depth contour, while tows at greater depths or steep bottom profiles were made at an angle to minimize significant depth changes (greater than 10 fm).

Data from previous cruises showed most target species were in compact schools near the bottom during daylight and scattered in the water column at night. Consequently, the first trawl of the day usually began one hour after sunrise and the last tow of the day ended one hour before sunset.

Established SEAMAP procedures were followed to sort, enumerate and weigh the catch. Catch data were recorded on field data sheets. Length frequency measurements were taken of up to twenty specimens per species with electronic measuring boards.

Fishery Acoustic System:

The FAS V-fin was towed during daylight hours in transit between trawl stations to collect data on finfish aggregations and distribution.

Comparative tows with the OREGON II:

During Legs I and II, simultaneous, side-by-side paired tows were planned with the OREGON II between 5 and 150 fm. Previous cruises suggest that the 90-ft small pelagic trawl may better assess some species of groundfish at depths greater than 30 fms than the 40-ft SEAMAP trawl towed by the OREGON II.

Ichthyoplankton:

As part of the Winter SEAMAP Ichthyoplankton Survey, the CHAPMAN collected ichthyoplankton samples at preselected SEAMAP stations east of 88° W longitude. Ichthyoplankton stations are arranged on a systematic grid approximately 30 nautical miles apart.

Environmental Data:

A CTD cast was made at each trawl and ichthyoplankton station. Niskin bottles were used once a day to collect chlorophyll, salinity and dissolved oxygen samples from the surface, mid and bottom water depths.

RESULTS

Small Pelagics:

There were 106 trawl stations, including 34 comparative tows with the OREGON II. Catches were dominated by Peprilus burti (Gulf butterfish), Etrumeus teres (round herring), Stenotomus caprinus (longspine porgy), and Trichiurus lepturus (Atlantic cutlassfish). Table 1 contains a station listing of position, depth, total catch, and dominant species per station.

Fishery Acoustics System:

Approximately 90 hours of hydroacoustic data were collected from 543 nautical miles (Table 2) of transects between stations in daylight hours only. Analysis of hydroacoustic data is pending.

Comparative Tows With The OREGON II:

There were 34 comparative tows with the OREGON II in depths ranging from 8 to 89 fm. Tows were made at OREGON II sites, CHAPMAN sites, and between OREGON II sites in 30 to 50 fm. Analysis of comparative tow data is pending.

Ichthyoplankton:

There were eight ichthyoplankton stations completed. All samples were preserved in 10% formalin and returned to the NMFS, Mississippi Laboratories, Pascagoula, Mississippi.

Collected Specimens:

Collections of all finfish species with swim bladders were made during Leg III offshore of Florida. Eighteen species totaling 282 specimens were saved frozen for the Naval Research Laboratory, Stennis Space Center, Bay St. Louis, Mississippi.

CRUISE PARTICIPANTS

Leg 1 (10/8/96 - 10/23/96)

NAME	TITLE	ORGANIZATION
Rob Ford	Field Party Chief	NMFS Pascagoula, Miss.
Chris Gledhill	Fishery Biologist	NMFS Pascagoula, Miss.
Cliff Harper	Electronic Technician	NMFS Pascagoula, Miss.
Andre Debose	Biological Technician	Johnson Controls

Leg 2 (10/25/96 - 11/9/96)

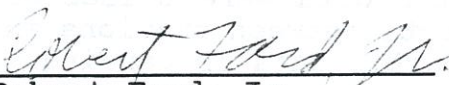
Rob Ford	Field Party Chief	NMFS Pascagoula, Miss.
Chris Gledhill	Fishery Biologist	NMFS Pascagoula, Miss.
Ken Wilkinson	Electronic Technician	Johnson Controls
Andre Debose	Biological Technician	Johnson Controls

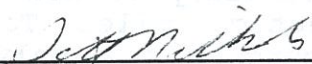
Leg 3 (11/12/96 - 11/25/96)

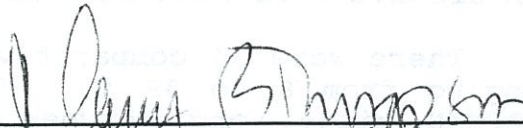
Rob Ford	Field Party Chief	NMFS Pascagoula, Miss.
Mark Grace	Fishery Biologist	NMFS Pascagoula, Miss.
Cliff Harper	Electronic Technician	NMFS Pascagoula, Miss.
Andre Debose	Biological Technician	Johnson Controls

Submitted By:

Approved By:


Robert Ford, Jr.
Field Party Chief


Scott Nichols, Director
Mississippi Laboratories


Bradford E. Brown, Director
Southeast Science & Research
Center

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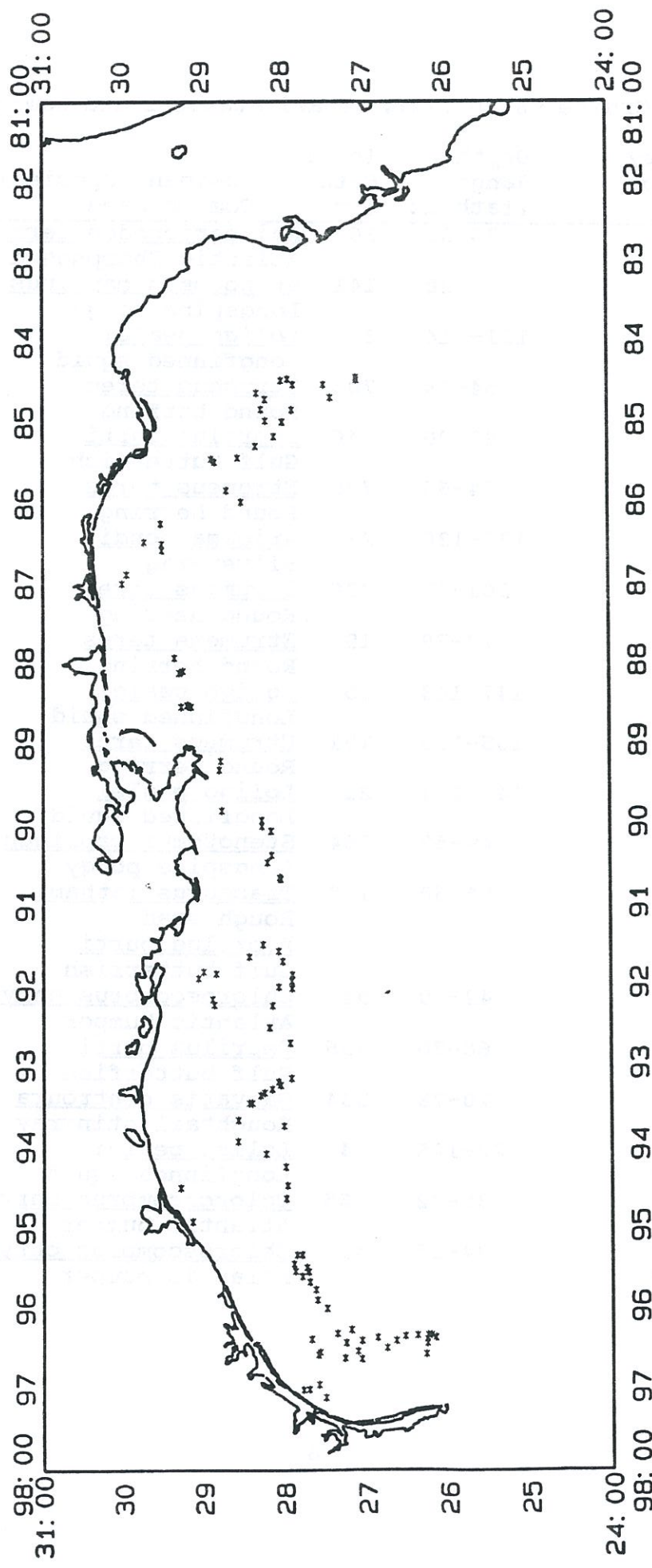


Figure 1. Station location for CHAPMAN Cruise 96-06 (76).

Table 1. CHAPMAN Cruise 96-06 (76). Trawl stations and dominant species data.

Station	Latitude/ Longitude	Depth Range (fathoms)	Total Catch (kg)	Dominant species/ Common Name	Per Cent of Catch by weight
2	26° 16" 96° 26"	35-33	26	<u>Rhizoprionodon terranova</u> Atlantic Sharpnosed Shark	72%
3	26° 17" 96° 34"	28	141	<u>Stenotomus caprinus</u> Longspine porgy	53%
4	26° 13" 96° 20"	121-114	8	<u>Loligo pealei</u> Longfinned squid	78%
5	26° 10" 96° 22"	54-58	703	<u>Etrumeus teres</u> Round herring	97%
6	26° 16" 96° 19"	80-90	146	<u>Peprilus burti</u> Gulf butterflyfish	59%
7	26° 23" 96° 20"	64-66	708	<u>Etrumeus teres</u> Round herring	97%
8	26° 32" 96° 20"	131-130	21	<u>Ariomma bondi</u> Silver-rag	40%
9	26° 39" 96° 24"	101-97	238	<u>Etrumeus teres</u> Round herring	61%
10	26° 46" 96° 29"	77-79	193	<u>Etrumeus teres</u> Round herring	59%
11	26° 52" 96° 21"	147-143	15	<u>Loligo pealei</u> Longfinned squid	47%
12	27° 04" 96° 24"	105-110	191	<u>Etrumeus teres</u> Round herring	87%
13	27° 12" 96° 16"	140-144	21	<u>Loligo pealei</u> Longfinned squid	93%
14	27° 04" 96° 38"	49-52	184	<u>Stenotomus caprinus</u> Longspine porgy	71%
15	27° 07" 96° 23"	56-60	148	<u>Trachurus lathami</u> Rough scad <u>Peprilus burti</u> Gulf butterflyfish	46% 46%
16	27° 16" 96° 37"	42-40	94	<u>Chloroscombrus chrysurus</u> Atlantic bumper	5%
17	27° 15" 96° 26"	66-70	336	<u>Peprilus burti</u> Gulf butterflyfish	75%
18	27° 22" 96° 19"	70-78	334	<u>Dasyatis centroura</u> Roughtail stingray	44%
19	27° 29" 96° 00"	120-126	34	<u>Loligo pealei</u> Longfinned squid	91%
20	27° 36" 96° 35"	30-32	365	<u>Chloroscombrus chrysurus</u> Atlantic bumper	73%
21	27° 34" 96° 33"	34-35	41	<u>Chloroscombrus chrysurus</u> Atlantic bumper	37%

Table 1. (Cont'd)

22	27° 40" 96° 23"	35-38	441	<u>Chloroscombrus chrysurus</u> Atlantic bumper	43%
23	27° 35" 96° 23"	85-100	42	<u>Etrumeus teres</u> Round herring	60%
24	27° 47" 97° 01"	8-7	46	<u>Scomber maculatus</u> Spanish mackerel	38%
25	27° 42" 97° 01"	10-9	69	<u>Chloroscombrus chrysurus</u> Atlantic bumper	41%
26	27° 30" 97° 07"	12-11	45	<u>Arius felis</u> Hardhead catfish	34%
27	27° 36" 95° 54"	93-101	136	<u>Trachurus lathami</u> Rough scad	41%
28	27° 37" 95° 46"	134-142	119	<u>Ariomma bondi</u> Silver-rag	88%
29	27° 41" 95° 40"	141-132	25	<u>Squatina dumerili</u> Atlantic angel shark	67%
30	27° 43" 95° 33"	114-105	46	<u>Trachurus lathami</u> Rough scad	46%
31	27° 47" 95° 36"	41-46	49	<u>Upeneus parvus</u> Dwarf goatfish	40%
32	27° 44" 95° 30"	83-89	364	<u>Trachurus lathami</u> Rough scad	46%
33	27° 52" 95° 33"	35-37	130	<u>Trichiurus lepturus</u> Atlantic cutlassfish	35%
34	29° 17" 94° 30"	8	90	<u>Pogonias cromis</u> Black drum	35%
35	29° 08" 94° 55"	8	9	<u>Anchoa hepsetus</u> Striped anchovy	23%
36	27° 53" 95° 27"	38-41	15	<u>Chloroscombrus chrysurus</u> Atlantic bumper	27%
37	27° 51" 95° 20"	56-67	695	<u>Peprilus burti</u> Gulf butterflyfish	96%
38	27° 47" 95° 20"	87-105	92	<u>Ariomma bondi</u> Silver-rag	34%
39	27° 59" 94° 39"	42-44	129	<u>Stenotomus caprinus</u> Longspine porgy	44%
40	27° 58" 94° 29"	49-53	1357	<u>Etrumeus teres</u> Round herring	94%
42	28° 14" 94° 06"	29-31	246	<u>Stenotomus caprinus</u> Longspine porgy	37%
43	28° 00" 93° 45"	48-50	327	<u>Peprilus burti</u> Gulf butterflyfish	51%
44	28° 04" 93° 12"	48-49	300	<u>Trichiurus lepturus</u> Atlantic cutlassfish	66%
45	27° 55" 93° 10"	73-80	58	<u>Peprilus burti</u> Gulf butterflyfish	86%
46	28° 03" 93° 15"	50-52	296	<u>Peprilus burti</u> Gulf butterflyfish	50%

Table 1. (Cont'd)

47	28° 09" 93° 18"	39-41	37	<u>Stenotomus caprinus</u>	36%
				Longspine porgy	
48	28° 14" 93° 21"	31-32	271	<u>Stenotomus caprinus</u>	77%
				Longspine porgy	
49	28° 17" 93° 22"	30	300	<u>Stenotomus caprinus</u>	65%
				Longspine porgy	
50	28° 26" 93° 28"	27	327	<u>Stenotomus caprinus</u>	28%
				Longspine porgy	
51	28° 24" 93° 28"	28-29	191	<u>Stenotomus caprinus</u>	31%
				Longspine porgy	
52	28° 34" 93° 40"	19-20	318	<u>Stenotomus caprinus</u>	66%
				Longspine porgy	
53	28° 34" 93° 56"	19-20	466	<u>Stenotomus caprinus</u>	29%
				Longspine porgy	
				<u>Trichiurus lepturus</u>	29%
				Atlantic cutlassfish	
54	27° 56" 92° 45"	103-115	115	<u>Loligo pealei</u>	30%
				Longfinned squid	
55	28° 11" 92° 32"	38-41	56	<u>Stenonotomus caprinus</u>	63%
				Longspined porgy	
56	28° 08" 92° 16"	42-45	273	<u>Peprilus burti</u>	74%
				Gulf butterfish	
57	28° 04" 92° 02"	53-56	146	<u>Etrumeus teres</u>	47%
				Round herring	
58	27° 54" 92° 03"	87-94	298	<u>Etrumeus teres</u>	85%
				Round herring	
59	27° 54" 91° 57"	90-95	55	<u>Trachurus lathami</u>	41%
				Rough scad	
60	27° 54" 91° 52"	106-109	5	<u>Torpedo nobiliana</u>	61%
				Atlantic torpedo	
61	29° 03" 91° 55"	8-7	118	<u>Peprilus burti</u>	29%
				Gulf butterfish	
62	28° 59" 91° 50"	8-9	98	<u>Peprilus burti</u>	40%
				Gulf butterfish	
63	28° 50" 91° 52"	14-13	91	<u>Stenotomus caprinus</u>	24%
				Longspine porgy	
64	28° 53" 92° 11"	15-14	156	<u>Micropogonias undulatus</u>	41%
				Atlantic croaker	
65	28° 51" 92° 15"	16-15	906	<u>Micropogonias undulatus</u>	47%
				Atlantic croaker	
66	28° 25" 91° 39"	30-33	217	<u>Peprilus alepidotus</u>	39%
				Harvestfish	
67	28° 01" 91° 43"	60	383	<u>Pristipomoides aquilonaris</u>	25%
				Wenchman	
68	28° 04" 91° 35"	62	94	<u>Peprilus burti</u>	58%
				Gulf butterfish	
69	28° 15" 91° 30"	40-42	221	<u>Peprilus burti</u>	58%
				Gulf butterfish	

Table 1. (Cont'd)

70	28° 02" 90° 41"	92-93	13	<u>Peprilus burti</u> Gulf butterfish	77%
71	28° 03" 90° 40"	87-89	19	<u>Peprilus burti</u> Gulf butterfish	56%
72	28° 12" 90° 29"	46-50	175	<u>Peprilus burti</u> Gulf butterfish	61%
73	28° 09" 90° 23"	80-85	24	<u>Peprilus burti</u> Gulf butterfish	41%
74	28° 09" 90° 05"	146-140	7	<u>Trichiurus lepturus</u> Atlantic cutlassfish	74%
75	28° 16" 89° 57"	108-101	734	<u>Peprilus burti</u> Gulf butterfish	100%
76	28° 16" 90° 02"	66	523	<u>Peprilus burti</u> Gulf butterfish	86%
77	28° 45" 89° 50"	36-41	454	<u>Trichiurus lepturus</u> Atlantic cutlassfish	86%
78	28° 34" 89° 22"	93-100	22	<u>Trachurus lathami</u> Rough scad	70%
79	28° 47" 89° 20"	53-54	211	<u>Trichiurus lepturus</u> Atlantic cutlassfish	76%
80	28° 46" 89° 14"	82-76	87	<u>Steindachneria argentea</u> Luminous hake	40%
81	29° 16" 88° 33"	37-40	143	<u>Stenotomus caprinus</u> Longspine porgy	78%
83	29° 11" 88° 32"	71-93	89	<u>Trichiurus lepturus</u> Atlantic cutlassfish	95%
84	29° 08" 88° 33"	105-127	42	<u>Trichiurus lepturus</u> Atlantic cutlassfish	69%
85	29° 17" 88° 08"	53-58	117	<u>Etrumeus teres</u> Round herring	61%
86	29° 14" 88° 06"	112-113	15	<u>Trichiurus lepturus</u> Atlantic cutlassfish	31%
87	29° 21" 87° 56"	52-56	112	<u>Trachurus lathami</u> Rough scad	56%
89	29° 57" 86° 53"	70-80	89	<u>Trichiurus lepturus</u> Atlantic cutlassfish	67%
90	29° 43" 86° 29"	66-69	164	<u>Peprilus burti</u> Gulf butterfish	85%
91	29° 30" 86° 35"	128-138	68	<u>Peprilus burti</u> Gulf butterfish	72%
94	28° 33" 85° 27"	99-101	15	<u>Pristipomoides aquilonaris</u> Wenchman	73%
95	28° 20" 85° 18"	105-119	54	<u>Peprilus burti</u> Gulf butterfish	42%
96	28° 06" 85° 11"	147-156	39	<u>Antigonia combatia</u> Shortspine boarfish	72%
98	27° 53" 84° 51"	121-126	27	<u>Saurida normani</u> Shortjaw lizardfish	67%

Table 1. (Cont'd)

99	27° 52" 84° 32"	57-64	305	<u>Etrumeus teres</u> Round herring	46%
100	27° 56" 84° 28"	44-46	125	<u>Decapterus punctatus</u> Round scad	69%
103	27° 05" 84° 29"	89-91	1	<u>Loligo pealei</u> Longfinned squid	67%
104	27° 24" 84° 42"	109-114	9	<u>Loligo pealei</u> Longfinned squid	93%
105	27° 29" 84° 32"	74-79	52	<u>Trachurus lathamii</u> Rough scad	41%
106	28° 18" 84° 39"	35-37	155	<u>Decapterus punctatus</u> Round scad	32%
107	28° 12" 84° 43"	38-43	45	<u>Etrumeus teres</u> Round scad	49%
108	28° 15" 84° 51"	49-56	96	<u>Trachurus lathamii</u> Rough scad	53%
109	28° 12" 84° 59"	84-90	5	<u>Peprilus burti</u> Gulf butterfish	78%
111	28° 41" 85° 51"	136-140	171	<u>Peprilus burti</u> Gulf butterfish	99%
112	28° 50" 85° 30"	76-77	46	<u>Peprilus burti</u> Gulf butterfish	27%
113	28° 53" 85° 27"	66-62	90	<u>Peprilus burti</u> Gulf butterfish	28%

Table 2. Acoustic transects surveyed during CHAPMAN Cruise 96-06.
(Transect numbers indicate trawl sites).

TRANSECT	DATE	START POSITION		DISTANCE NAUTICAL MILES
		LATITUDE	LONGITUDE	
3- 4	10-11-96	26 17.56'	96 36.04'	15.7
6- 7	10-12-96	26 18.25'	96 18.44'	7.0
8- 9	10-13-96	26 34.99'	96 21.27'	7.7
9-10	10-13-96	26 35.70'	96 22.52'	13.4
11-12	10-14-96	26 56.50'	96 23.90'	7.8
12-13	10-14-96	27 05.61'	96 21.06'	10.6
18-19	10-16-96	27 20.07'	96 15.69'	20.1
27-28	10-19-96	27 33.79'	95 54.79'	10.0
28-29	10-19-96	27 38.96'	95 43.04'	6.8
36-37	10-26-96	27 51.15'	95 25.63'	7.1
37-38	10-26-96	27 47.89'	95 19.28'	3.6
54-55	10-31-96	27 58.62'	92 43.89'	15.5
55-56	10-31-96	28 08.51'	92 31.32'	8.0
57-58	11-01-96	28 01.10'	92 00.02'	9.5
58-59	11-02-96	27 52.24'	92 01.15'	9.3
67-68	11-04-96	28 02.56'	91 40.23'	20.6
70-71	11-05-96	28 02.42'	90 39.75'	1.4
72-73	11-05-96	28 10.15'	90 26.05'	2.3
74-75	11-06-96	28 10.90'	90 03.91'	5.2
75-76	11-06-96	28 18.43'	89 57.72'	5.7
77-78	11-07-96	28 44.85'	89 46.06'	25.3
78-79	11-07-96	28 34.15'	89 19.09'	4.8
81-82	11-13-96	29 13.59'	88 32.19'	2.0
82-83	11-13-96	29 08.91'	88 30.57'	3.6
85-86	11-14-96	29 17.43'	88 05.00'	4.3
86-87	11-14-96	29 15.18'	88 03.37'	13.5
87-88	11-14-96	29 19.94'	87 53.92'	4.5
88-89	11-18-96	29 59.15'	86 59.40'	9.9
90-91	11-19-96	29 40.75'	86 30.39'	10.8
91-92	11-19-96	29 27.49'	86 37.37'	6.7
98-99	11-21-96	27 51.88'	84 53.02'	19.8
99-100	11-21-96	27 49.98'	84 34.50'	7.7
111-112	11-24-96	28 40.87'	85 53.20'	14.8

