U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Center
P. O. Drawer 1207
Pascagoula, MS 39567

FRS OREGON II Cruise 108

INTRODUCTION

The FRS OREGON II departed Pascagoula, MS June 17, 1980 to delineate snapper-grouper stocks in deeper offshore grounds off Puerto Rico, Culebra and St. Thomas Islands. Survey techniques included bottom longlines, West Indies arrowhead traps and hand reels fished from 100 to 375 fathoms. In addition, one surface longline set was completed and two large traps were fished in 238 fathoms for deep-water shrimp. A coral entanglement device was used to assess distribution of precious corals from 50 to 175 fathoms. One hundred and sixty-five stations were completed including 104 bottom longline sets, 12 fish trap, 23 handline, 1 surface longline set, 1 shrimp trap, and 24 coral entanglement stations. These stations netted 6,529 lbs of which 6,216 lbs came from bottom longlines. Represented in these catches were 32 families and 58 species of finfish.

OBJECTIVES

1. Evaluate availability and distribution of snapper/grouper resources in deep water (100-375 fathoms).

2. Determine if precious corals occur on offshore grounds off Culebra and St. Thomas Islands (50-175 fathoms).

3. Determine presence of deep-water shrimp north of Puerto Rico and St. Thomas.

GEAR

Bottom Longline

A standard bottom longline set consisted of about 160 hooks and 300 fathoms of groundline during the first 47 sets. These stations were made on the west and north coasts of Puerto Rico. Excessive gear loss forced a reduction to 200 fathoms of groundline and 100 hooks. Hook number per set varied due to vessel speed and handling problems during set out. Monafilament gangions were 2.5 feet in length with No. 7 or 9 circle tuna hooks and the groundline was 5/16" hardlay nylon trawl line. Bottom longline sets were soaked for 2 hours.

Surface Longline

Surface longlines used 100 fathoms of 5/16" hardlay nylon line with a hook gangion and float every 10 fathoms. Floats were connected to the mainline with 5 fathom drop lines which permitted the mainline to soak 5 fathoms below the surface. Gangions were made with 2 fathoms of 3/16" hardlay nylon connected to 1 fathom of 3/32" stainless steel leader with a 0/8 shark hook. Hooks were baited with squid and the set soaked from dusk to dawn.

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Handlines

Handlines used during the cruise were electric powered commercial snapper reels with 3/32 in stainless steel cable. Leaders were made from 200 lbs test monofilament with the three hooks 2 feet apart. Two or three pound weights were attached to the end of the leader, by a piece of cotton twine, to provide a means of breaking the leader free in the event the weights became snagged. Squid was used as bait.

Fish Traps

West Indies arrowhead traps were 6 ft by 4 ft by 18 in frames constructed of reinforcement rod and covered with 1-1/4" chicken wire. Traps were set on a single length of 1/2 in polyprolene line and were 30 ft apart. Trap sets were buoyed using a 1/2 in buoy line and float. Soak time was about 24 hrs.

Two large fish traps were used at one deep-water station (162 fathoms). These traps were constructed of heavy gauge pipe and were 8 ft by 6 ft by 2 ft with 2.5 inch stretch mesh webbing. Traps were set in the same manner as the West Indies arrowhead traps, but trap and buoy line were 1 in polyprolene. Soak time was 49 hrs.

Squid and fish parts were used for bait in both the West Indies and the large deep water traps. However, squid was the principal bait throughout the trapping efforts.

Shrimp Traps

Shrimp traps were large modified traps lined with burlap and used two 3" entrance funnels. Shrimp traps were buoyed in the same manner as the large fish traps and were allowed to soak 24 hrs. Equal portions of squid and fish were used as bait.

Coral Entanglement Gear

Coral entanglement gear consisted of a metal triangular frame 5 ft by 4 ft covered with 1 in stretch mesh webbing extending 10 ft behind the metal frame. The device was attached to the starboard trawl cable and allowed to drift on the bottom during bottom longline sets.

RESULTS

Bottom Longlines

Bottom longlines were fished along the west and north coast of Puerto Rico and the north coast of Culebra and St. Thomas Islands. Fishing depth varied between 100 and 175 fathoms (Fig 1). Bottom longline catches are listed in Tables 1 through 4. Commercially important species most commonly taken on the west coast of Puerto Rico included queen snapper (*Etelis oculatus*), wenchman snapper (*Pristipomoides macropthalmus*) and yelloweye snapper (*Lutjanus vivanus*). Grouper were caught less frequently on the west coast of Puerto Rico with the best catches occurring along the northwest coast in 160 to 190 fathoms. Yellowedge grouper (*Epinephelus flavolimbatus*) was the dominant grouper species taken in this section.

As fishing operations continued along the north coast of Puerto Rico, snapper catches decreased as grouper catches increased. Misty grouper (Epinephelus mystacinus) represented the grouper most frequently taken along the northern coast of Puerto Rico. Although fewer sets were made north of St. Thomas this area provided the highest catch rates of snapper and grouper and the lowest catch rates of sharks. In this area queen snapper and misty grouper were caught in canyons along the 100 fathom contour. They were the dominant snapper-grouper species caught and remain underutilized by area fishermen.

Wenchman snapper was the dominant finfish taken throughout the cruise.

Eleven species of shark were caught during the cruise. The Cuban dogfish (Squalus cubensis), smooth dogfish (Mustelus canis) and slope gulper (Centrophorus uyato) represented 90% by number and 84% by weight of the shark catch. Sharks were most abundant during night sets. Shipboard analysis of sharks stomachs indicate that garbage from ships traveling through the area represent a portion of their diet, as stomachs contained chicken, roast beef, cherries and beef tips.

A section of branching coral weighing approximately 2 lbs. was collected with the bottom longline gear near 18°36N-69°05W in 317 fathoms. This coral presently remains unidentified.

Surface Longline

No catch resulted from this set Future efforts with surface longlines should not be conducted with bottom longline fishing operations as these fishing techniques are not compatible, due to surface longline drift while tending bottom longline stations.

Handline

Twenty-three handline stations were completed between 25 and 104 fathoms and represented 14 hours of effort for 2 reels. Catches were low with jacks 35 lbs, grouper 7 lbs, snapper 2 lbs and other 0.2 lbs or 0.6 lbs per hour of commercially important species. Handline fishing becomes somewhat marginal in depths exceeding 100 fathoms because strong currents tend to lift the hooks off the bottom.

Fish Traps

Fish taken in West Indies arrowhead traps were generally small weighing 1 lb or less. Yelloweye snapper (Lutjanus vivanus) was the principal species caught in these traps. The smaller sized fish is indicative of the fishing depth as larger fish are generally taken in deeper water. Traps generally catch more reef fish species than do bottom longlines or handlines as the line fishing gear is more selective for larger fish.

Two shrimp traps were set off the northeast coast of Puerto Rico in 238 fathoms. The catch consisted of 14 isopods (Bathynomus sp.) weighing about 0.5 lbs and 9 shrimp (Nothostomus sp.) weighing about 0.5 lbs. The burlap liner tore loose elininating any further use of the traps for shrimp.

Coral Entanglement

Samples of crionoidea, hydroids, Serpulidae and gorgonians were collected. Also, black coral (Sticepathes sp.) was found east of San Juan, PR in 106 fathoms.

CRUISE PARTICIPANTS

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Mark Grace, Observer, Pascagoula, MS, 6/17-7/24/80
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Tom Dawley, Port Agent, Miami, FL, 6/19-7/22/80
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John Reintjes, Fishery Biologist, Beaufort, NC, 6/23-7/7/80
Mark Horvath, Fishery Biologist, Rutgers University, 6/23-7/7/80
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Zonia Gallegos, Fishery Biologist, Mayaguez, PR, 6/23-7/7/80
Robert Dixon, Fishery Biologist, Beaufort, NC, 7/8-18/80
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David Olsen, Fishery Biologist, St. Thomas, VI, 7/8-18/80
Joe La Place, Fishery Biologist, St. Thomas, VI, 7/8-18/80

CARIBBEAN DIGNITARIES ABOARD FOR ONE DAY DEMONSTRATION CRUISE - July 18

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Table 1.--Catch distribution by area and depth for bottom longline; all sets 2 hours duration.

West Coast of Puerto Rico, 27 sets

Depth	Snapper No. Lbs.	Grouper No. Lbs.	Shark No. Lbs.	Other No. Lbs.	Number	Total Pounds	Hooks
100-149	31-120	3-8	17-75	8-47	59	250	760
150-199	66-209	6-168	79-261	5-14	156	652	1507
200-249	7-70		54-185		61	255	537
250-299			36-169	1-2	37	171	599
300-349			46-153		46	153	431
350-375							
Totals	104-399	9-176	232-843	14-63	359	1481	3834

North Coast of Puerto Rico and Culebra Island, 69 Sets

100-149	46-61	7-76	36-171	7-42	96	350	1223
150-199	75-126	7-164	136-617	13-38	231	945	1801
200-249	15-79	5-298	186-740	13-43	219	1160	1533
250-299	5-43	1-19	221-968	1-3	228	1033	2379
300-349	1-21		42-215	3-3	46	239	485
350-375			30-205	2-1	32	206	191
Total	142-330	20-557	651-2916	39-130	852	3933	7612

North Coast of St. Thomas, 8 Sets

100-149	43-146	2-40	3-40	3-42	51	268	399
150-199	22-53	7-253	13-86		42	392	194
200-249							
250-299	8-91		13-49		21	140	203
300-349				1-2	1	2	
350-375							
Totals	73-290	9-293	29-175	4-44	115	802	796

Table 2.--Predominant components of bottom longline catches.

Species	Depth	Total Number	Total Weight	% Number of Total Catch	% Weight of Total Catch	Day/Night Most Frequently Taken
Snapper						
Etelis oculatus	101-334	81	647	6	10	Day
Pristipomoides macrophthalmus	101-261	188	204	14	3	Day
Lutjanus vivanus	115-164	35	148	3	2	Day
Grouper						
Epinephelus mystacinus	134-261	24	728	2	12	Day
Epinephelus flavolimbatus	136-194	8	168	1	3	Day
Shark						
Squalus cubensis	118-363	488	1160	37	19	Night
Mustelus canis	115-271	122	615	9	10	Night
Centrophorous uyato	255-314	192	1431	14	23	Night

Table 3.--Number and weight of all species taken during bottom longlining.

Species	No. of Individuals	Pounds
Snapper		
Pristipomoides macropthalmus	188	204.0
Etelis oculatus	81	647.0
Lutjanus vivanus	35	148.0
Lutjanus jocu	1	7.0
Lutjanus apodus	1	3.0
Ocyurus chrysurus	2	3.0
Rhomboplites aurorubens	7	19.0
Grouper		
Epinephelus guttatus	1	0.5
Epinephelus mystacinus	24	728.0
Epinephelus niveatus	2	4.0
Epinephelus flavolimbatus	8	168.0
Epinephelus itajara	1	60.0
Cephalopholis fulva	1	0.5
Sharks		
Etmopterus sp.	4	1.0
Etmopterus hillianus	3	0.25
Scyliorhinidae	10	6.0
Scyliorhinus retifer	2	0.5
Centrophorous sp.	2	17.0
Centrophorous uyato	192	1431.0
Squalus cubensis	488	1160.0
Mustelus canis	122	615.0
Heptrachias perlo	22	64.0
Sphyrna lewini	1	73.0
Galeus melastomes	20	7.0
Hexanchus vitulus	19	373.0
Dalatias licha	4	68.0
Other		
Rajidae	1	25.0
Chimaera cubana	6	24.0
Caulolatilus intermedius	1	0.3

Table 3.--Continued

Species	No. of Individuals	Pounds
Haemulon plumieri	1	1.0
Haemulon album	1	5.0
Odontoscion dentex	2	0.8
Ruvettus pretiosus	1	2.0
Sphoeroides nephelus	1	1.0
Seriola fasciata	3	18.0
Seriola rivoliana	7	123.0
Seriola dumerili	3	61.0
Polymixia lowei	4	1.0
Synodus sp.	1	0.3
Saurida normani	1	0.75
Muraenidae	6	11.0
Gymnotherax	8	16.0
Gymnothorax funebris	1	2.0
Gymnothorax ocellatus	10	16.0
Ophichthus sp.	7	16.0
Ophichthus spinicauda	1	4.0
Myrophis sp.	1	0.1
Conger esulents	1	3.0
Conger triporiceps	1	7.0
Coral, sponge, bryozoa	16	70.0

Table 4.--Bottom longline sets catching 20 pounds or more of snapper or grouper.

Station	Day or Night Station	Pounds		Depth	Position	
31704	Day	S	40	150	18°02.5N	67°25.5W
31707	Night	S	70	154	18°03.8N	67°38.3W
31708	Day	S	52	154	18°04.3N	67°28.2W
31710	Day	S	20	113	18°06.6N	67°28.1W
31711	Day	S	70	154	18°07.2N	67°30.2W
31716	Day	S	82	138	18°11.3N	67°28.4W
31729	Day	G	117	194	18°25.5N	67°14.2W
31734	Day	G	33	166	18°24.9N	67°14.6W
31742	Day	G	26	156	18°34.9N	77°10.9W
31746	Day	S	31	265	18°32.5N	66°55.2W
31751	Day	G	120	242	18°31.3N	66°43.1W
31756	Night	G	53	224	18°31.9N	66°30.6W
31762	Night	G	20	136	18°31.2N	66°22.0W
31771	Day	S	21	334	18°32.1N	66°12.3W
31773	Day	G	75	246	18°30.0N	66°10.8W
31778	Day	S G	35 50	207	18°30.1N	66°06.8W
31781	Night	G	44	194	18°31.0N	66°00.2W
31814	Day	S	20	189	18°29.1N	65°33.2W
31816	Day	S	20	242	18°30.8N	65°39.6W
31834	Day	S G	43 68	181	18°31.5N	65°23.4W
31844	Day	S G	46 39	146	18°34.2N	65°08.2W
31846	Day	S	36	88	18°34.8N	65°06.4W
31853	Day	S G	51 253	159	18°35.0N	65°03.5W
31855	Day	S	91	262	18°36.1N	65°06.5M
31864	Day	S	59	95	18°34.8N	65°03.7W

Table 5.--Catch distribution from West Indies arrow head traps by depth and species.

Depth	Hrs. Soaked	*Lutjanus vivanus*	*Lutjanus buccanella*	*Rhomboplites aurorubens*	*Mycteroperca tigris*	*Epinephelus guttatus*	*Epinephelus morio*	*Holocetrus ascersionis*	*Holocentrus rufus*	*Haemulon striatum*	*Balistes capriscus*	*Canthidermis sufflamen*	*Chaetodon capistratus*	*Chaetodon sedentarius*	*Gymnothorax moringa*	*Panulirus argus*
		# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.	# Lbs.
35-39	65	28-9	6-7		2-2	2-4		4-1		2-.3			2-.15			2-2
40-44	76	33-25	4-4	5-2			2-23	10-3								
45-49	24	3-1									3-2			1-.03		
50-54																
55-59	52	30-21	7-7			5-9		5-1	4-2			1-5			1-5	
60-64																
65-69	21	20-22	36-30													

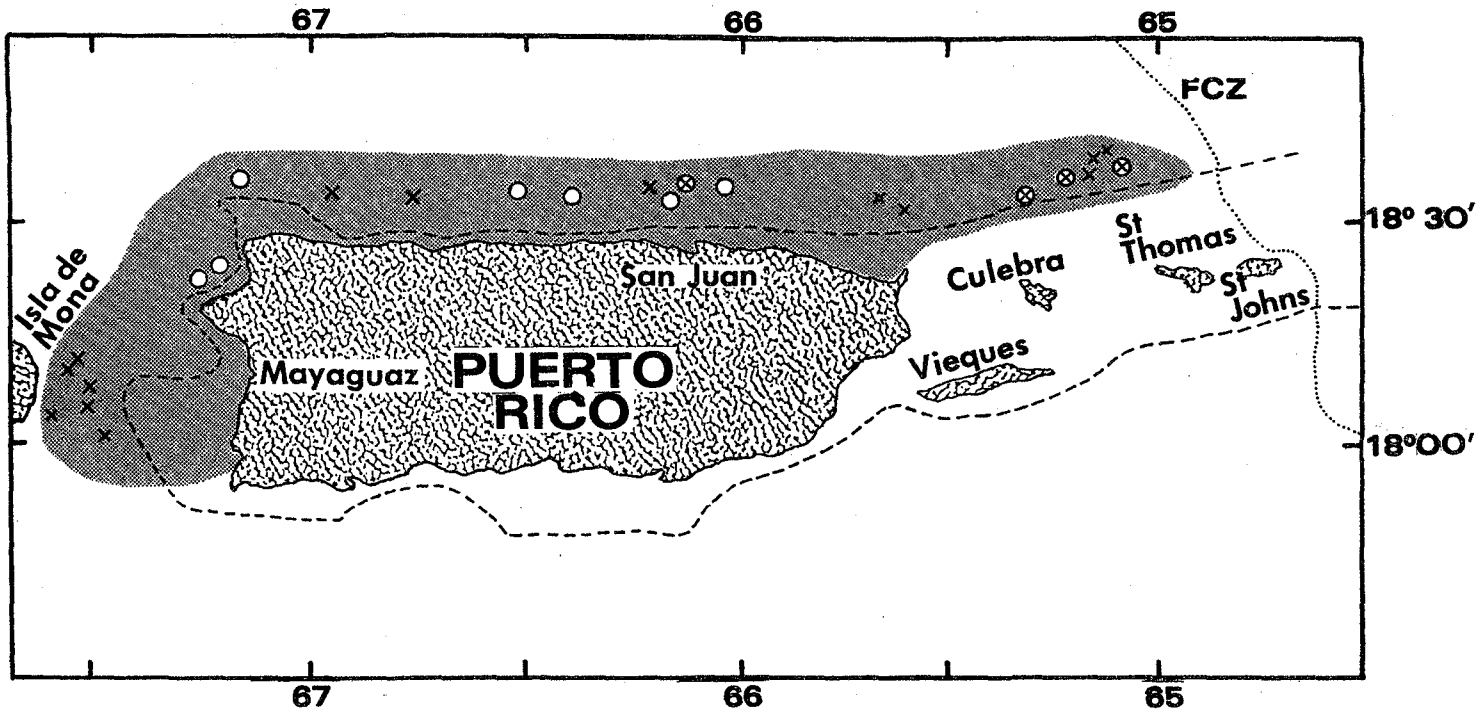

Figure 1.--Survey area for OREGON II Cruise 108 is represented by the shaded portion with dashed line representing the 100 fathom contour. Bottom longline sets catching more than 20 lbs are represented by an X for snapper and an O for grouper. Those areas in which more than 20 pounds of snapper and grouper were caught are represented by a ⊗.