



**BOTTOM  
LONGLINE  
FISHING  
OFF  
LOUISIANA'S  
COAST:**

**Techniques  
for  
Profits**

**Jerald Horst  
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BOTTOM LONGLINE FISHING

OFF

LOUISIANA'S COAST

Techniques for Profits

Prepared for

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and  
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## INTRODUCTION

The commercial snapper, grouper, and tilefish fisheries in Louisiana have grown rapidly in recent years. The state's snapper landings have increased more than sixfold in the last decade from an average of 186,996 lb per year in the 1970s to 1,214,576 lb in 1985. Prices have simultaneously increased from an average of \$0.51 per lb in the 1970s to an average of \$2.08 per lb in 1985. Similarly, grouper landings have increased from an average of 5,163 lb per year in the 1970s (average price \$0.17 per lb) to 551,556 lb in 1985 (average price \$1.39 per lb). Tilefish had no recorded landings in the state in 1983; in 1985, 47,394 lb were landed at an average dockside price of \$0.84 per lb.

Louisiana fishermen and seafood dealers who traditionally have been involved primarily with the shrimp fishery are showing an increasing interest in fishery diversification. The increase in prices and the demonstrated availability of snappers, groupers, and tilefish have attracted both local and out-of-state fishermen to fish for them off Louisiana. In spite of this interest, little information is available about the gear, fishing techniques, and profitability of the snapper, grouper, and tilefish fisheries. The purpose of this project was to augment a similar exploratory longline fishing study conducted by the Coastal Fisheries Institute of Louisiana State University in the spring of 1984 ("Exploratory Bottom Longline Fishing Off Louisiana's Coast", by David Bankston and Jerald Horst, CFI Technical Series Report No. 1) when these fisheries were nearly unexploited, and participation was minimal. This study will supply more detailed and up-to-date information to Louisiana fishermen concerning the mechanics of these fisheries.

The objectives of the current study were to

1. identify the fishery resources available for bottom longlining off Louisiana
2. evaluate the effectiveness of bottom longlines in harvesting these resources
3. identify the most productive areas for bottom longlining
4. evaluate the potential profitability of a typical, large, bottom longline vessel

## METHODS

### Vessel Description

The vessel used in this project was a 58-ft fiberglass snapper boat, the Betty Jean II, out of the port of Tarpon Springs, Florida. The beam was 22 ft, and the hull had an 8-ft draft when laden. The vessel was powered by a 190-hp Cummings diesel engine with 4.5:1 reduction gearing. Fuel capacity was 4,000 gal, and freshwater capacity 2,000 gal.

The wheelhouse and cabin were located aft (Figure 1), and the longline reel and work area were forward of the cabin. As auxiliary fishing gear the vessel also carried three snapper reels known as "bandits" (Figure 2). The entire deck was covered by a permanent metal awning.

Electronic equipment on board included radar, a Loran C unit, a paper depth recorder, and a chromoscope.

### Gear

The bottom longline (Figure 3) used in the study consisted of segments of 1/8-in. galvanized and stainless steel cables. Each cable was weighted at each end with an anchor attached to the mainline by a snood and a snap-on connector. The cable groundline was fished in 1- and 2-mile lengths. The shorter lines were usually used to test a new

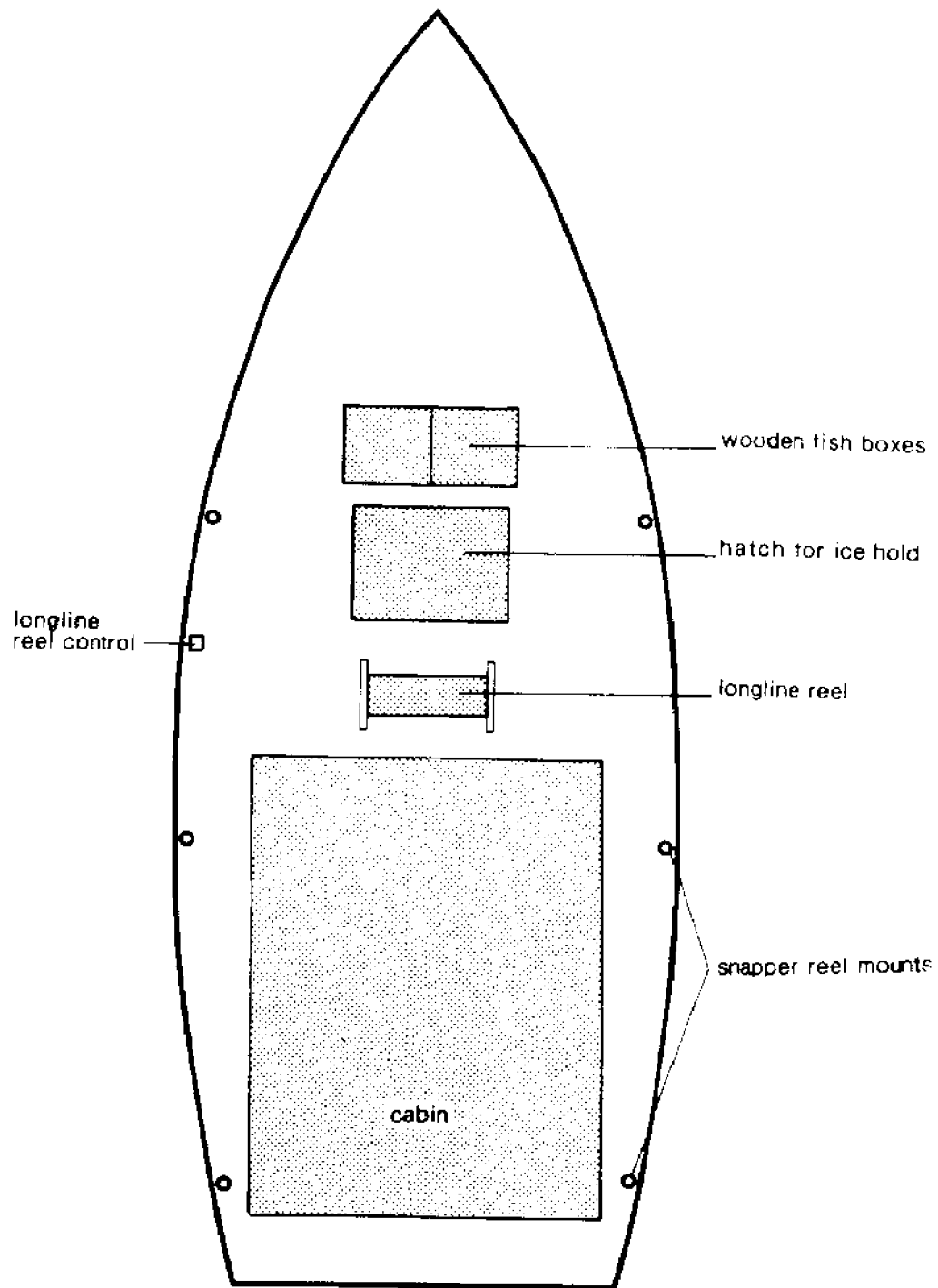


Figure 1. Longline vessel deck layout.

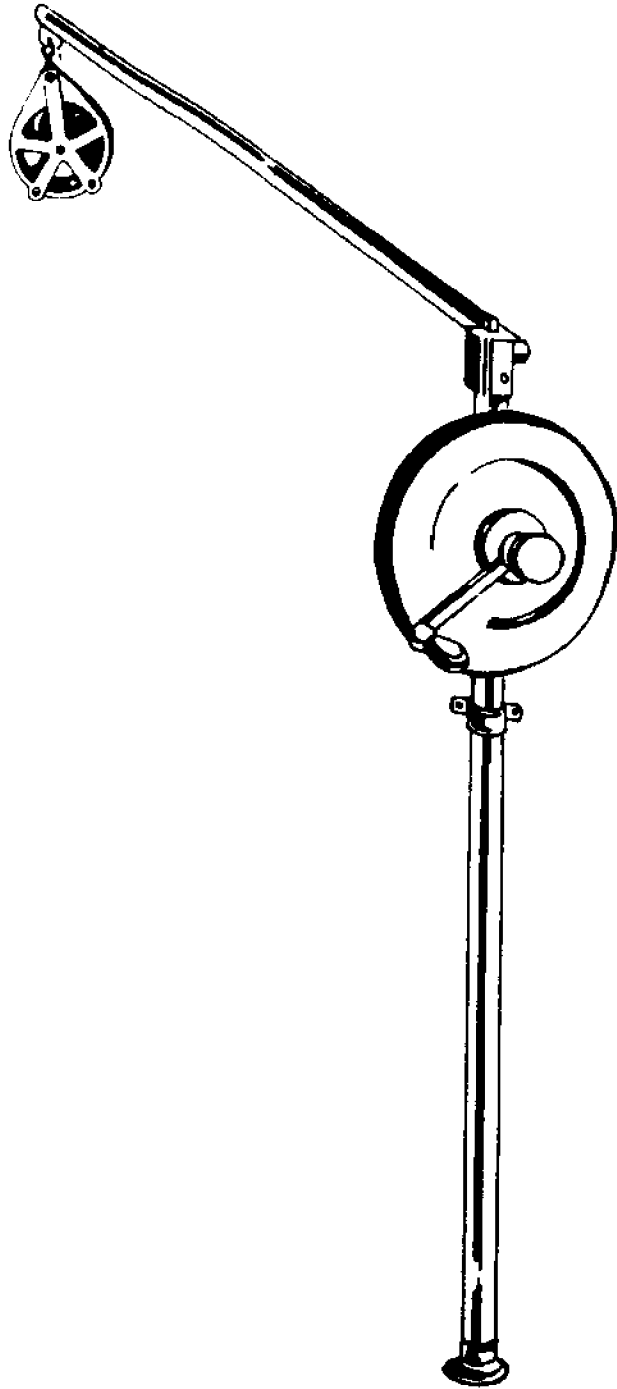


Figure 2. Snapper reel or bandit.



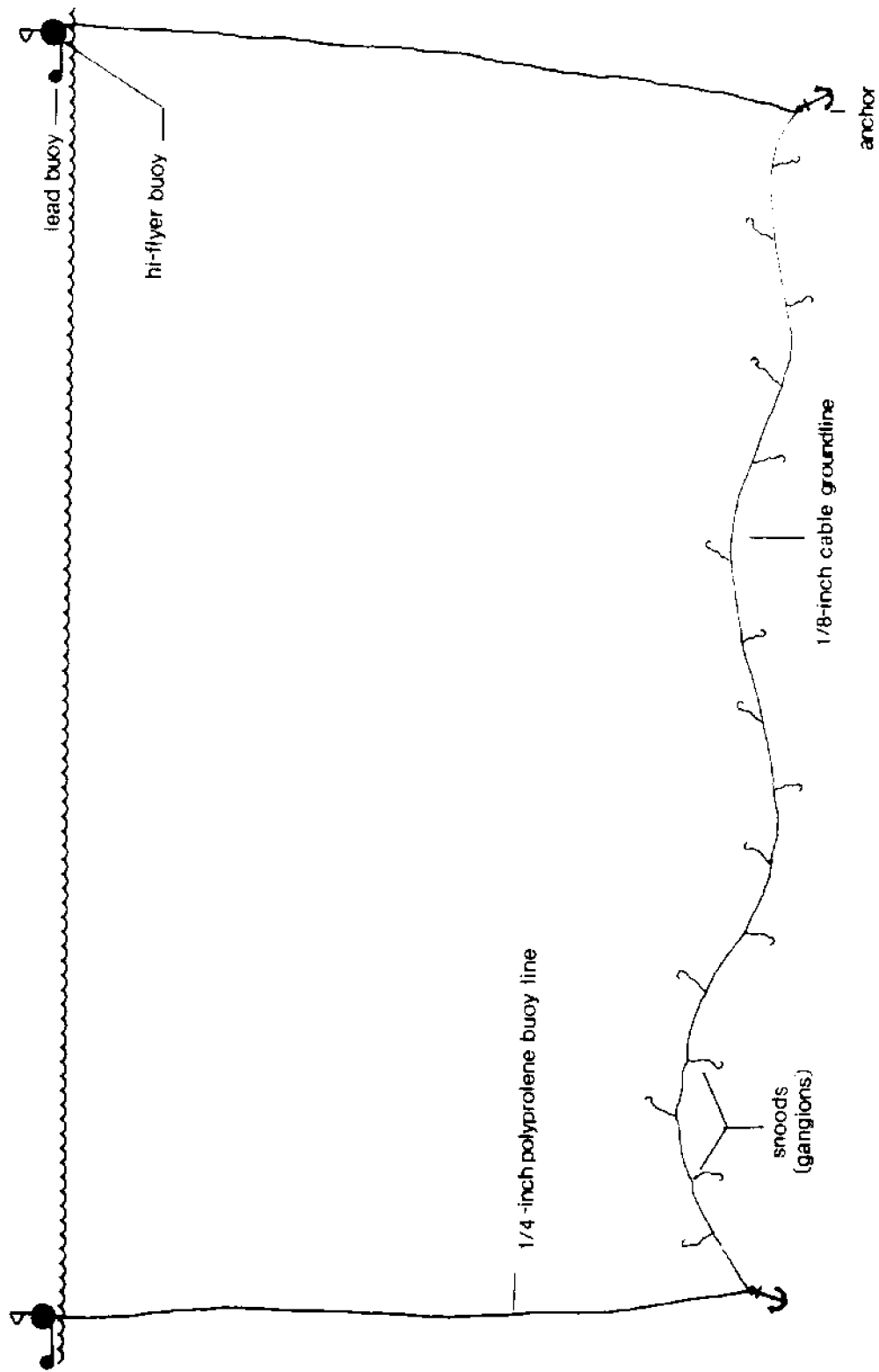


Figure 3. Bottom longline components.

fishing area. Buoy lines of  $\frac{1}{2}$ -in. polypropylene rope and varying lengths were stored on the vessel for use in different water depths. Generally, buoy lines were 20 to 60 fathoms longer than the recorded water depth.

A buoy assembly, consisting of a main high-flyer buoy and a smaller lead buoy, was tied to the terminal end of the buoy rope. A colorful flag was tied to the pole on the high-flyer buoy to make it easier to find. For late afternoon sets, a light was taped to the high-flyer buoy so it could be seen after dark.

Snoods (gangions) were constructed of 400-lb test monofilament (Figure 4). Loops were crimped into the line for installation of hooks (Number 4 circle hooks were used) and snap-on connectors (snaps). Each snood was approximately 40 in. long, including the snap.

A variety of baits were used; Spanish sardines were put on the hooks whole while the other baits were cut up in pieces of  $1\frac{1}{2}$ -2 in. Some of the softer baitfish (especially mullet) were moderately to heavily salted after they were cut up. This preserved and toughened the bait, making baiting easier and prolonging the life of the bait on the hook.

The hooks were rebaited as the longline was retrieved and were stored in plastic fish baskets. The snoods were draped over the edge of the baskets with the hooks on the inside and the snaps on the outside. Each basket held 150-200 baited snoods.

The longline reel was centered on the deck immediately forward of the wheelhouse. The reel was hydraulically driven and controlled with a variable-speed switch on the port rail (Figure 1). The reel was also equipped with a level wind mechanism. The longline was paid out and picked up through blocks hanging from the metal awning frame (Figure 5).

The other type of gear used in this fishing effort was the snapper

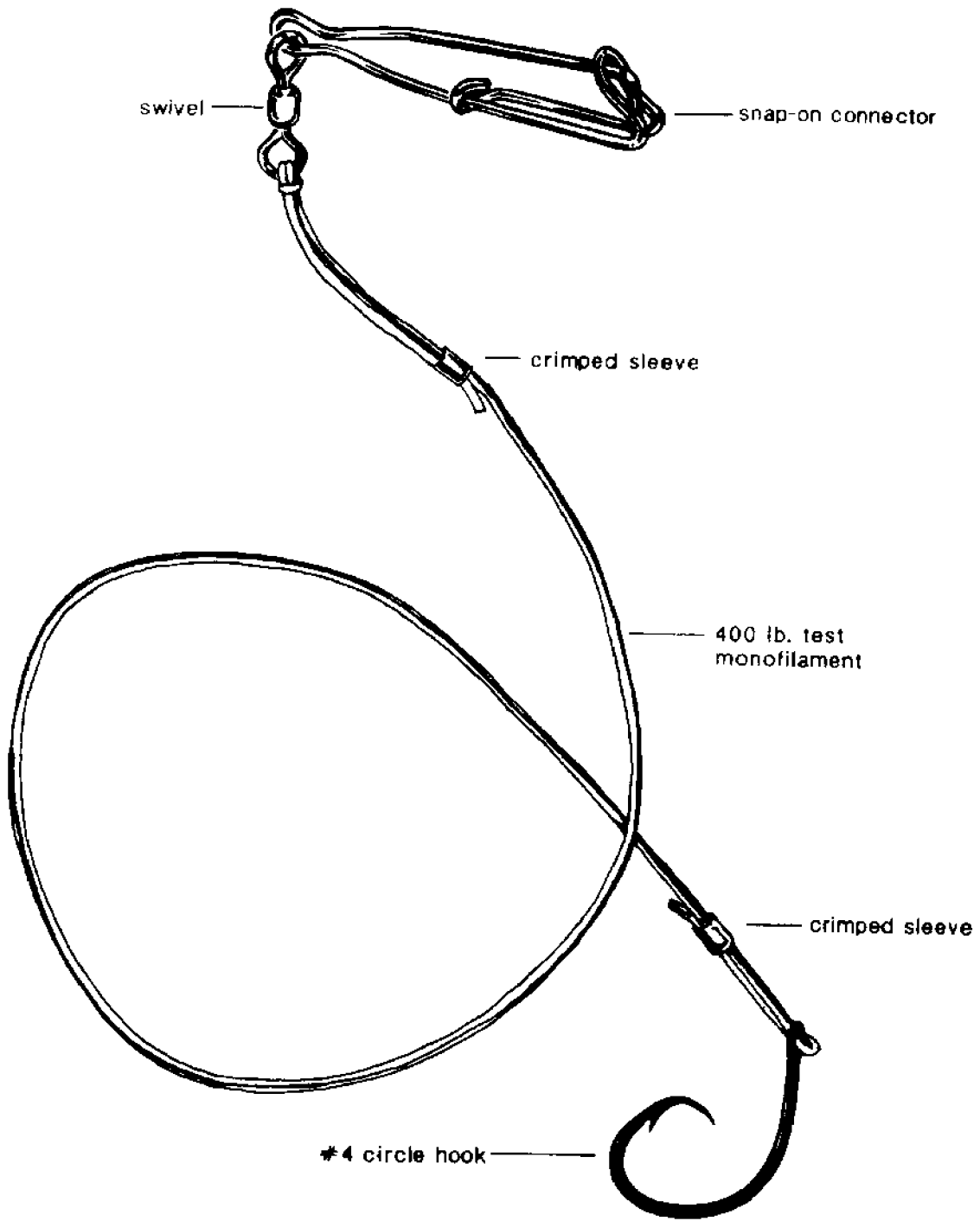


Figure 4. Snood or gangion.

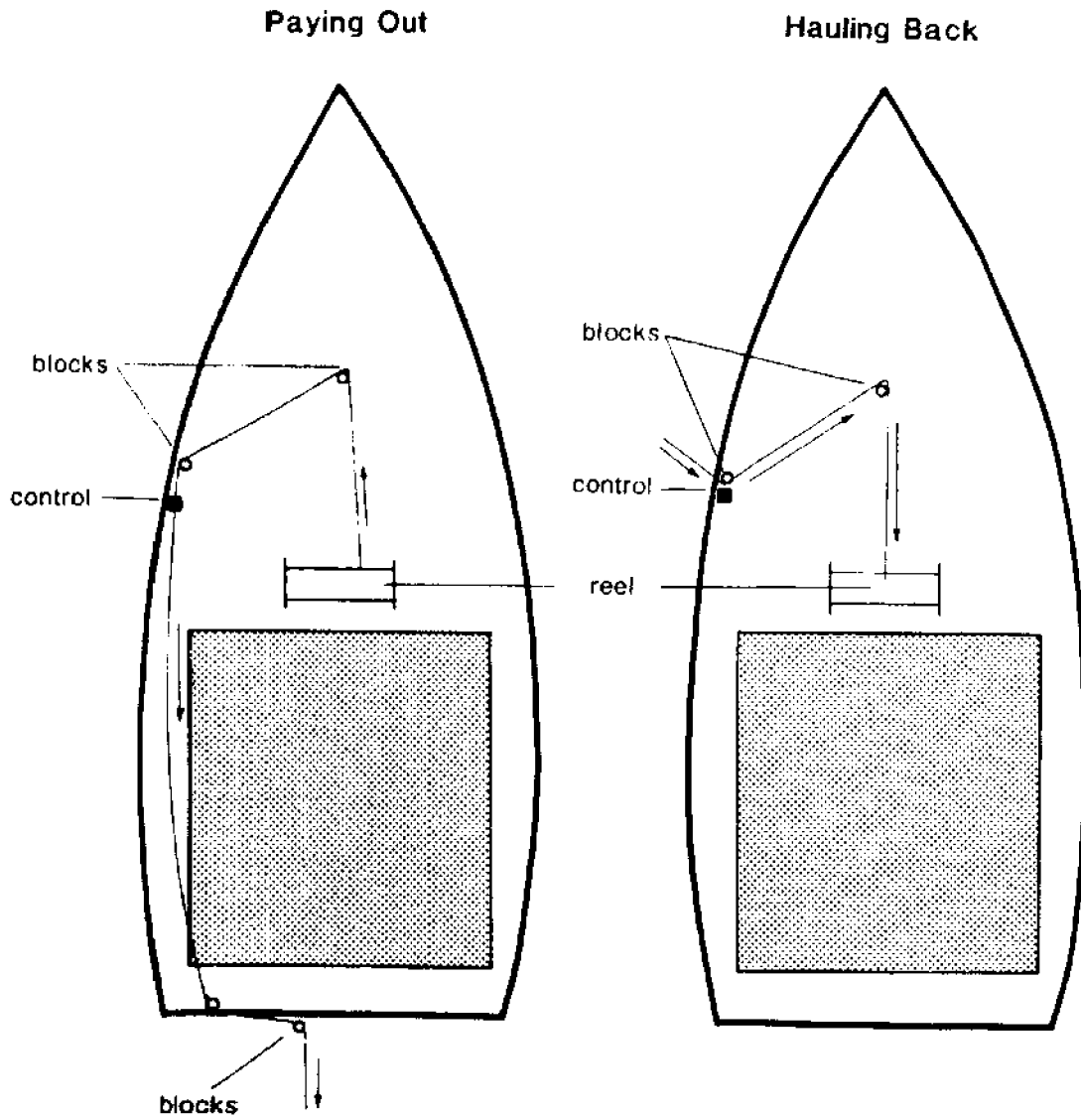


Figure 5. Deck configuration while setting and retrieving the longline.

reel or bandit (Figure 2). The vessel was equipped with three manual snapper reels, spooled with either 300-lb test monofilament or small-diameter stainless steel cable. A ground rig (Figure 6) was attached to a snap-on connector on the end of the snapper reel line. Ground gear is constructed many different ways, depending on each fisherman's preference. On this vessel, the hooks were attached to the leaders, and the leaders were attached to the swivels with crimped metal sleeves. However, many fishermen dispense with crimped sleeves altogether, preferring to use twisted double strands of lighter-test monofilament for leaders between the hooks and swivels.

Essential auxiliary equipment for a longlining operation includes gaffs, a supply of knives, a baiting table, a whetstone, a grappling hook, a supply of gloves, and cable-splicing equipment.

#### Fishing Techniques

The entire crew (captain and three deckhands) was involved in both setting out and retrieving the longline. The longline was set while the vessel was moving forward at approximately 5 knots. While the captain steered the course, one deckhand was stationed by the longline reel control on the port rail (Figure 5) to maintain proper payout speed of the cable. The other two deckhands were at the stern snapping the prebaited snoods approximately 20-25 ft apart onto the groundline. Payout of 2 miles of cable plus the buoy lines took 30-35 minutes.

Retrieving the gear was a somewhat slower procedure. One deckhand was stationed at the longline reel control where he controlled reel speed while unsnapping incoming snoods. Snoods with hooked fishes were placed in wooden fish boxes built onto the deck. Empty snoods were dropped on the nearby baiting table where a second deckhand rebaited them and placed

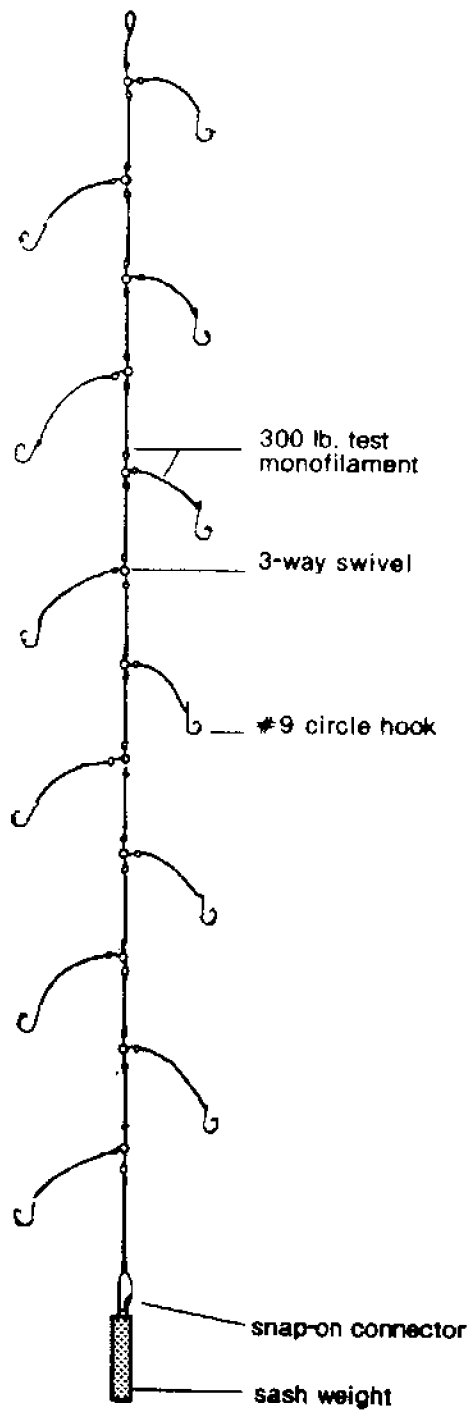


Figure 6. Ground gear for snapper reel.

them in baskets. The third deckhand removed the hooks from the fish, gutted and washed the fish, and assisted the second deckhand in rebaiting the snoods. The captain was responsible for maintaining the vessel's position directly over the line being hauled in. Failure to maintain this position drags the longline and either hangs it up on the bottom or tears the fish off the hooks.

Soak time varied from one to five hours, and two to three hours was the most common set time. Only snapper reels were fished at night; longlines were never used. If the vessel was not traveling to a new fishing location during the night and could not be anchored because the water was too deep, it was allowed to drift free. A crewman was always kept on watch when the vessel drifted because most of the deep fishing waters are located in or near commercial shipping lanes.

## RESULTS AND DISCUSSION

### Catch Characteristics

This study consisted of two experimental fishing trips lasting a total of 22 days. The first trip was 12 days long (24 September through 5 October 1985), and the second trip was 10 days long (10 October through 19 October 1985). Longlining was the primary fishing method used on both trips and snapper reels the secondary method.

A total of 1,273 salable fish weighing 8,313 lb (round weight) were caught. By-catch consisted primarily of giant snake eels (237), sharks (211), hakes (77), and moray eels (31). The cruise log (Appendix) shows the location and catch of each set.

The three target species, yellowedge grouper (*Epinephelus flavolimbatus*), red snapper (*Lutjanus campechanus*), and golden tilefish (*Lopholatilus*

chamaeleonticeps), accounted for 80% of the salable catch by weight (Table 1) and 52% by numbers. The vermilion snapper (B-liner), the species (549) caught most often, comprised 43% of the catch by number but only 8% of the catch by weight. Snapper reels, rather than longlines, caught most of the vermilion snappers.

As in the 1984 exploratory fishing project, tilefish were found in the deepest water. During this study, the optimal depth for tilefish yield by weight was 172 fathoms (as compared with 144 fathoms in 1984), while the optimal depth for tilefish yield by numbers was 167 fathoms (as compared with 134 fathoms in 1984). Tilefish were captured on sets as shallow as 70 fathoms and as deep as 218 fathoms.

Yellowedge grouper yields were greatest at 78 fathoms for weight and 98 fathoms for numbers of fish. This was quite a bit shallower than the 110 fathoms and 130 fathoms, respectively, found in the 1984 study. Yellowedge groupers were caught from 39 to 187 fathoms, although very few were caught at either extreme. There are two possible explanations for the differences between the 1984 project and the present study in depths of optimum yellowedge grouper yield. First, the 1984 study was more exploratory in nature, and fishing locations were random. The current study was directed more toward demonstrating the economic feasibility of bottom longlining, so only known productive bottoms were fished. Second, the skills, abilities, and fishing-area preferences of the boat captain participating in the 1984 study were probably different from those of the one participating in 1985, although these differences are more often reflected in fishing style and technique than in pounds of fish produced.

Red snappers prefer shallower water, and no snappers were caught in water deeper than 104 fathoms. The best depth for production by weight



Table 1. Species, weights, and catch depths of salable fish from both trips.

	Number caught	Total weight (lb)	Average weight (lb)	Weight range (lb)	Depth range where caught (fathoms)
Yellowedge Grouper <u>Epinephelus flavolimbatus</u>	304	3415.6	11.2	1.4-28.2	39-187
Snowy Grouper <u>Epinephelus niveatus</u>	12	279.0	23.3	12.3-34.5	110-218
Warsaw Grouper <u>Epinephelus nigritus</u>	1	27.8	27.8	27.8	49-51
Red Hind <u>Epinephelus guttatus</u>	2	7.4	3.7	1.5-5.9	27-30
Rock Hind <u>Epinephelus adscensionis</u>	2	5.2	2.6	2.4-2.8	30
Scamp <u>Myctoperca phenax</u>	7	36.9	5.3	1.8-10.5	27-63
Black Grouper <u>Myctoperia bonaci</u>	1	39.0	39.0	39.0	47-50
Golden Tilefish <u>Lopholatilus chamaeleonticeps</u>	182	1434.2	7.9	1.8-24.0	70-218
Red Snapper <u>Lutjanus campechanus</u>	172	1833.3	10.7	1.1-24.7	26-104
Vermilion Snapper <u>Rhomboplites aurorubens</u>	549	658.8	1.2	0.1-4.1	26-70
Red Porgy <u>Pagrus pagrus</u>	7	15.3	2.2	1.5-3.4	45-47
Knobbed Porgy <u>Calamus nodosus</u>	3	8.1	2.7	1.9-3.4	30
Gray Triggerfish <u>Balistes caprisicus</u>	5	26.3	5.3	3.5-7.8	30
Greater Amberjack <u>Seriola dumerili</u>	23	478.6	20.8	0.7-71.0	30-173
Tripletail <u>Lobotes surinamensis</u>	3	47.0	15.7	6.3-20.9	27-30

was 48 fathoms and for production by numbers, 44 fathoms.

Vermilion snappers (a schooling species) were caught almost exclusively over large rock banks, the tops of which were 26-47 fathoms below the surface. These banks were located in deep waters, often over 100 fathoms deep.

Longline catch rates (Table 2) were a little lower than those found in 1984. Catch rates are measured in pounds of salable fish caught per hook per hour of soak time. The longline catch rate for the entire study period was 0.098 lb per hook hour compared with 0.144 lb per hook hour in the 1984 effort. This may be attributed to differences in fishing techniques between the two captians, in choices of fishing areas, in fish availability, in seasons (the 1984 fishing trips took place during the spring), or in a combination of these factors. Snapper reel catch rates averaged 1.238 lb per hook hour in this study (Table 3).

The average weight of a tilefish caught during this study was 7.9 lb, and yellowedge groupers averaged 11.2 lb. In the 1984 study, tilefish averaged 6.6 lb, and yellowedge groupers averaged 9.7 lb. When the U.S. Bureau of Commercial Fisheries made its early exploratory bottom longlining cruises for new fisheries resources in the Gulf of Mexico in 1967-68, average weights of 5.9 lb for tilefish and 10.3 lb for yellowedge grouper were recorded.

Red snappers ranged in weight from 1.1 to 24.7 lb (average 10.7 lb) during the study period. Vermilion snappers, which are smaller fish seldom exceeding 4 lb, weighed an average of 1.2 lb.

Table 4 illustrates the relationship of catch to soak time. Because of the limited number of sets made (72), the correlation between pounds per hook and length of soak is not clear. Pounds per hook appear to

Table 2. Longline catch per effort for both trips.

Date	Set no.	No. of hooks	Soak time (min)	Catch (lb)	Hook hours	Lb/hook hour
9/24/85	L-9/24-I	394	85	49	558	.088
9/24/85	Day total			49	558	.088
9/25/85	L-9/25-I	372	60	40	372	.107
9/25/85	L-9/25-II	489	107	19	872	.022
9/25/85	Day total			59	1244	.047
9/26/85	L-9/26-I	202	82	13	276	.047
9/26/85	L-9/26-II	193	95	68	306	.222
9/26/85	L-9/26-III	205	88	153	301	.508
9/26/85	Day total			234	983	.238
9/27/85	L-9/27-I	180	155	135	465	.290
9/27/85	L-9/27-II	209	167	9	582	.015
9/27/85	L-9/27-III	414	186	250	1283	.195
9/27/85	L-9/27-IV	400	89	126	593	.212
9/27/85	L-9/27-V	76	115	5	145	.034
9/27/85	L-9/27-VI	177	780	101	2301	.044
9/27/85	Day total			626	5369	.117
9/28/85	L-9/28-I	197	150	27	493	.055
9/28/85	L-9/28-II	333	140	164	777	.211
9/28/85	Day total			191	1270	.150
9/29/85	L-9/29-I	413	120	45	826	.054
9/29/85	L-9/29-II	434	145	19	1049	.018
9/29/85	L-9/29-III	210	168	40	588	.068
9/29/85	L-9/29-IV	257	249	5	1067	.004
9/29/85	Day total			109	3530	.031
9/30/85	L-9/30-I	186	196	20	608	.033
9/30/85	L-9/30-II	200	180	25	600	.042
9/30/85	L-9/30-III	400	188	42	1253	.034
9/30/85	L-9/30-IV	431	100	75	718	.104
9/30/85	Day total			162	3179	.051
10/2/85	L-10/2-I	411	155	29	1062	.027
10/2/85	L-10/2-II	404	118	10	795	.013
10/2/85	L-10/2-III	717	130	330	1554	.212
10/2/85	Day total			369	3411	.108
10/3/85	L-10/3-I	362	120	47	724	.065
10/3/85	L-10/3-II	380	138	98	874	.112
10/3/85	L-10/3-III	469	245	73	1915	.038
10/3/85	L-10/3-IV	405	200	65	1350	.015
10/3/85	L-10/3-V	379	230	99	380	.261
10/3/85	L-10/3-VI	469	145	71	1133	.063
10/3/85	Day total			453	6376	.071
10/4/85	L-10/4-I	320	155	166	827	.201
10/4/85	L-10/4-II	430	170	174	1218	.143
10/4/85	L-10/4-III	424	205	75	1449	.052
10/4/85	L-10/4-IV	373	165	183	1026	.178
10/4/85	L-10/4-V	718	120	312	1436	.217
10/4/85	Day total			910	5956	.153
10/5/85	L-10/5-I	142	100	0	237	.000
10/5/85	Day total			0	237	.000
Trip 1 Total				3162	32,013	
Average						0.099

Table 2. (Continued)

Date	Set no.	No. of hooks	Soak time (min)	Catch (lb)	Hook hours	Lb/hook hour	
10/12/85	L-10/12-I	147	160	27	392	.069	
10/12/85	L-10/12-II	376	235	180	1473	.122	
10/12/85	L-10/12-III	590	152	264	1495	.177	
10/12/85	L-10/12-IV	395	92	160	606	.264	
10/12/85	Day total			631	3966	.159	
10/14/85	L-10/14-I	660	150	14	1650	.008	
10/14/85	L-10/14-II	341	182	36	1034	.035	
10/14/85	L-10/14-III	184	83	59	254	.232	
10/14/85	L-10/14-IV	410	155	130	1059	.123	
10/14/85	Day total			239	3097	.077	
10/15/85	L-10/15-I	601	192	89	1923	.046	
10/15/85	L-10/15-II	271	188	136	849	.160	
10/15/85	L-10/15-III	457	140	171	1066	.160	
10/15/85	L-10/15-IV	505	223	234	1877	.125	
10/15/85	L-10/15-V	437	164	218	1194	.183	
10/15/85	L-10/15-VI	205	200	74	683	.108	
10/15/85	Day total			922	7592	.121	
10/16/85	L-10/16-I	205	270	123	923	.133	
10/16/85	L-10/16-II	428	222	131	1584	.083	
10/16/85	L-10/16-III	401	162	157	1083	.145	
10/16/85	L-10/16-IV	175	195	101	569	.178	
10/16/85	L-10/16-V	322	235	218	1261	.173	
10/16/85	L-10/16-VI	186	210	133	651	.204	
10/16/85	L-10/16-VII	406	180	31	1218	.025	
10/16/85	L-10/16-VIII	411	200	14	1370	.010	
10/16/85	Day total			908	8659	.105	
10/17/85	L-10/17-I	412	160	131	1099	.119	
10/17/85	L-10/17-II	437	215	70	1566	.045	
10/17/85	L-10/17-III	186	210	58	651	.089	
10/17/85	L-10/17-IV	425	135	180	956	.188	
10/17/85	Day total			439	4272	.103	
10/18/85	L-10/18-I	427	190	92	1352	.068	
10/18/85	L-10/18-II	211	210	35	739	.047	
10/18/85	L-10/18-III	402	275	73	1843	.040	
10/18/85	L-10/18-IV	399	338	76	2248	.034	
10/18/85	L-10/18-V	257	145	43	621	.069	
10/18/85	L-10/18-VI	166	126	71	349	.203	
10/18/85	L-10/18-VII	429	168	5	1201	.004	
10/18/85	Day total			395	8353	.047	
10/19/85	L-10/19-I	657	175	158	1916	.082	
10/19/85	L-10/19-II	416	222	206	1539	.134	
10/19/85	L-10/19-III	390	133	132	865	.153	
10/19/85	Day total			496	4320	.115	
Trip 2 Total					4030	41,159	
Average						0.098	
Both Trips Total					7192	73,172	
Average						0.098	

Table 3. Snapper reel catch rates.

Trip #1						
Date	Number of sets	Number of reels	Fishing time (min.)	Catch (lb)	Hook hours	Pounds per hook hour
9/25/85	B-9/25-I	12	95	27	19	1.421
9/30/85	B-9/30-I	12	270	187	54	3.463
10/1/85	B-10/1-I	12	90	23	18	1.278
10/1/85	B-10/1-II	36	279	293	167	1.754
10/2/85	B-10/2-I	36	78	59	47	1.255
10/2/85	B-10/2-II	36	25	17	15	1.133
10/2/85	B-10/2-III	36	45	29	27	1.074
10/2/85	B-10/2-IV	36	170	<u>111</u>	<u>102</u>	<u>1.088</u>
Trip #1 Total Average				746	449	1.661
Trip #2						
10/10/85	B-10/10-I	36	120	32	72	0.444
10/11/85	B-10/11-I	36	131	56	79	0.709
10/12/85	B-10/12-I	36	120	29	72	0.403
10/13/85	B-10/13-I	36	150	154	90	1.711
10/13/85	B-10/13-II	36	95	32	57	0.561
10/13/85	B-10/13-III	36	90	<u>32</u>	<u>54</u>	<u>0.593</u>
Trip #2 Total Average				335	424	0.790
Both Trips Total Average				1081	873	1.238

Table 4. Catch per hook in relation to soak time.

Soak time (minutes)	Number of sets	Pounds per hook
30-60	1	0.108
61-90	6	0.229
91-120	8	0.234
121-150	11	0.252
151-180	18	0.312
181-210	14	0.273
211-240	8	0.393
241-270	2	0.291
over 271	4	0.195

increase as soak time is increased, at least through the 151-180 minute soak period. This is comparable with the results of the 1984 study, which also showed that catch increased the longer the line was soaked up until about 151 minutes.

#### Costs and Revenues

The fish were sold at the end of each of the two trips. Prices declined somewhat during the study period, so prices were lower at the second sale. Because almost all snappers, groupers, and tilefish are sold in the fresh market, prices vary considerably with short-term supply.

Snappers brought the highest prices, ranging from \$2.00 to \$2.35 per lb, depending upon the size of the fish. Groupers brought the second highest prices at \$1.40 to \$1.60 per lb. Warsaw groupers generally are priced substantially lower and scamp occasionally higher than other groupers. Tilefish sold for \$1.00 per lb and vermilion snappers brought \$1.25 to \$1.75 per lb, depending on the size of the fish; larger fish were more valuable. The average price paid for the entire catch from both trips was \$1.49 per lb.

The prices received for the catch from this study were about as low as could be expected for bottom-longline-caught fish. Prices are generally lowest during summer and fall and highest during winter and spring. Prices quoted in Table 5 were for gutted fish. All other fish weights in this report are "in the round" or ungutted. Weight loss through gutting is 5%-7% for most species captured in this effort.

Revenue for both trips was \$11,219.20, not including the sale of shark fins (Table 5). Trip expenses (Table 6) were \$6,022.12, leaving an after-trip profit of \$5,196.88. From this amount, lost gear was replaced

Table 5. Dockside fish prices and trip revenues.

Trip #1			
Species	Pounds (gutted)	Price per pound (\$)	Total received
Grouper	1821	1.60	\$2,913.60
Tilefish	797	1.00	797.00
Red snapper			
over 10 lb	160	2.20	352.00
4-10 lb	56	2.35	131.60
2-4 lb	124	2.35	291.40
Vermilion snapper			
over 2 lb	238	1.75	416.50
under 2 lb	118	1.25	147.50
Knobbed porgy	8	0.60	4.80
Triggerfish	21	0.25	5.25
Amberjack	132	0.35	46.20
Total earnings from Trip #1			\$5,105.85
Trip #2			
Species	Pounds (gutted)	Price per pound (\$)	Total received
Grouper	1746	1.40	\$2,444.40
Warsaw grouper	26	1.00	26.00
Red snapper			
over 10 lb	1196	2.00	2,392.00
4-10 lb	137	2.20	301.40
2-4 lb	25	2.20	55.00
Vermilion snapper	322	1.25	402.50
Red porgy	9	0.60	5.40
Amberjack	237	0.45	106.65
Total earnings from Trip #2			\$6,113.35
Total earnings from both trips			\$11,219.20



Table 6. Trip expenses.

Item	Quantity	Price (\$)	Total Cost (\$)
Diesel fuel	2400 gal	0.90/gal	2160.00
Lube oil	4 gal	2.00/gal	8.00
Ice	41 blocks	7.00/block	287.00
	17 blocks	6.00/block	102.00
Groceries	--	1907.12	1907.12
<b>Bait</b>			
Spanish sardines	1000 lb	0.26/lb	260.00
bluefish	1000 lb	0.15/lb	150.00
bluefish	1500 lb	0.38/lb	570.00
mackerel	600 lb	0.38/lb	228.00
mullet	600 lb	0.20/lb	120.00
herring	200 lb	0.25/lb	50.00
squid	240 lb	0.75/lb	180.00
<b>Total Expenses</b>			<b>\$6,022.12</b>

(very little was lost), and the crew, captain, and vessel owner shared the rest.

Although the profit from these two trips certainly was not high, at least a profit was earned. The steady increase in the number of vessels entering the bottom longline fishery off Louisiana shows that the potential for making a more substantial profit does exist.

During 1983 and 1984, bottom longlining was considered to be a seasonal fishery. Low shrimp prices and high operating costs made offshore shrimping a difficult and not very profitable enterprise during the winter months, so conversion to bottom longlining was seen as an alternative.

Participation in the bottom longline fishery of converted shrimp vessels has not increased, however. Improved shrimp prices and, since early 1986, much lower diesel fuel prices, have kept shrimp vessels shrimping. Concurrently, though, landings of grouper, snapper, and to a lesser degree, tilefish, have continued to increase, with the production coming from vessels specializing in the reef fish fishery. Increased participation in this fishery is coming from three sources: relocation of out-of-state vessels to Louisiana ports, more transient vessels landing their catches in Louisiana because of the improved price structure, and the buying, construction, or conversion of vessels specifically for this fishery by Louisiana residents.

Red snapper landings in Louisiana are still the highest of the species addressed in this study, but grouper and tilefish landings are showing the most growth (grouper landings increased 105% from 1984 to 1985). Snappers bring the highest price per pound, are located in shallower waters nearer the shore (rarely over 75 fathoms), and can be

caught with a wide variety of gear, such as snapper reels, longlines, and buoy lines. Red snapper prices increased 25% in 1985, from an average of \$1.67 per lb to an average of \$2.08 per lb. Current prices average about \$0.69 per lb higher than grouper prices. These high prices will continue to focus the efforts of fishermen on snappers whenever possible.

The average dockside price of groupers increased 31% between 1984 and 1985 to \$1.39 per lb. Through 1 September 1986, grouper prices had not fallen below \$1.40 per lb, so the 1986 average price is expected to show an increase over the 1985 price. Although groupers are found over a wide range of depths and bottom types, the most desirable species (yellowedge and snowy groupers) are generally found farther offshore in deeper waters between 50 and 140 fathoms. Efficient gear types are also more limited. Snapper reels are not very effective gear for yellowedge groupers; buoy lines are extremely effective but are not usually fished in waters deeper than 75 fathoms; and longlines are effective in deep waters but are expensive and easily lost.

Tilefish are found much deeper than either snappers or groupers. The best yield occurs from 120 to 180 fathoms and as far offshore as 80 miles. Tilefish are the least exploited of the target species investigated in this project because fishing for them requires a very seaworthy vessel equipped with a good longline reel. Tilefish are also the lowest-priced fish of the target species, averaging \$0.84 per lb in 1985 (an increase of 47% from 1984). Since snapper and grouper bring higher prices, are located in shallower waters nearer shore, and can be fished with more types of gear, tilefish landings may not increase dramatically in the near future.

If current trends continue (i.e., increasing dockside prices, low

fuel prices, and large catches), the snapper, grouper, and tilefish fisheries will probably continue to grow, becoming even larger components of Louisiana's commercial offshore fishing industry.

APPENDIX

Cruise Log



Set Number	Loran C and Set Direction	Seas Ft.	Depth Fath.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-9/24-I	28525.0 4682.7 NW to 28526.0 46691.4	1-2	152 to 69	mud, steep upslope	394	mullet	8:35 a.m.	1 hr. 25 min	2 yellowedge grouper	49	1 smooth dogfish 85 giant snake eels	
L-9/25-I	27889.9 46789.5 NW to 26888.8 46794.0	1-2	21 to 22	soft mud with shells	372	mullet	11:15 a.m.	1 hr.	2 red snapper	40	43 Atlantic sharp-nose sharks	sharks were up to 30 lbs each
B-9/25-I*	26957.8 46699.7	1-2	39	small rock rise on flat bottom	12 1 reel	bluefish and Spanish sardine	8:20 p.m.	1 hr. 35 min	3 red snapper 3 vermilion snapper 1 yellowedge grouper	20 3 4	1 sand tiger shark	
L-9/25-II	26957.9 46699.2 NW to 26957.4 46704.1	1-3	41 to 39	level clay with sand, one rock pile	489	mullet	10:25 p.m.	1 hr. 47 min	1 red snapper 2 yellowedge grouper	3 6	5 Atlantic sharp-nose sharks 7 sandbar sharks 1 tiger shark	lost one grouper and 2 small sharks to sharks
L-9/26-I	27363.1 45664.9 NW to 26862.6 45667.6	1-2	60 to 63	level with some rises, firm with rock and some coral crust	202	mullet	7:36 a.m.	1 hr. 22 min	1 yellowedge grouper 1 scump	4 9		
L-9/26-II	26821.9 46629.9 E-NE 26831.8 46630.0	1-3	139 to 119	edge of large rise, firm with rock and coral	193	mullet	12:55 p.m.	1 hr. 35 min	4 yellowedge grouper 2 tilefish	65 13		
L-9/26-III	26813.4 46631.5 NE to 26822.5 46631.1	3-4	146 to 131	edge of large rise, firm with rock and coral	205	mullet, bluefish, Spanish sardine	3:35 p.m.	1 hr. 28 min	9 yellowedge grouper 4 tilefish	130 23	1 Cuban dogfish	
L-9/27-I	26815.0 46632.6 NE to 26824.1 46632.2	4-6	162 to 124	edge of large rise, rugged firm with heavy rock and some coral	180	bluefish, mullet, Spanish sardine	8:35 a.m.	2 hr. 35 min	3 yellowedge grouper 3 snowy grouper 3 tilefish	46 73 16		
L-9/27-II	26813.0 46630.8 NE to 26824.1 46630.7	4-6	148 to 128	fairly rough, firm with rock and coral	209	bluefish, mullet, Spanish sardine	9:20 a.m.	2 hr. 47 min	2 tilefish	9		cable hung up, cut and retrieved from other end.

\* B denotes snapper reel fishing effort

Set Number	Loran C and Set Direction	Seas Ft.	Depth Path.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-9/27-III	24812.3 44631.8 E-NE to 24820.6 44631.2	4-6	157 to 115	gradual slope, firm with rock and coral	414	bluefish mullet, mackerel	10:29 a.m.	3 hr. 6 min	13 yellowedge grouper 1 snowy grouper 8 tilefish	180 18 52	1 Cuban dogfish 1 southern hake 2 giant snake eels 1 moray eel	
L-9/27-IV	24848.0 44630.5 W-SW to 24826.5 44630.5	3-4	102 to 122	hard bottom, rock, coral, some clay	400	mackerel, bluefish, Spanish sardine	5:07 p.m.	1 hr. 29 min	4 yellowedge grouper 2 tilefish 1 amberjack	44 8 44	1 Cuban dogfish 5 moray eels	
L-9/27-V	24827.7 44631.3 E-NE to 24839.5 44631.2	3-4	110 to 115	rolling-irregular, hard bottom, rock	253	mackerel, bluefish	6:00 p.m.	1 hr. 55 min see com- ments	6 yellowedge grouper 1 snowy grouper 1 tilefish	87 14 5	3 silky sharks 1 chain dogfish 1 southern hake 1 moray eel	line broke, only got 1,500 ft. with tile- fish. rest of line re- trieved next morn- ing after 13 hr. soak had all grouper on it. lost 3 grouper's, about 50 lbs. to crabs.
L-9/28-I	24832.5 44630.8 W-SW to 24822.7 44630.9	2-4	110 to 132	firm with rock and coral	197	mackerel, Spanish sardines	9:30 a.m.	2 hr. 30 min	2 yellowedge grouper 2 tilefish	16 11	1 southern hake	
L-9/28-II	24832.5 44631.8 E-NE to 24844.9 44633.9	3-4	117 to 154	irregular, rock and coral	333	Spanish sardine, mackerel	10:31 a.m.	2 hr. 20 min	8 yellowedge grouper 1 snowy grouper 6 tilefish	109 17 38	1 southern hake 8 moray eels	
L-9/28-III	24685.8 44662.8 E-SE to W-SW to 24675.2 44662.7 U-shaped set	3-5	80 to 102	rock, coral and mud	414	mackerel, Spanish sardine	6:10 p.m.		8 yellowedge grouper	41	1 Cuban dogfish 2 sixgill sharks 1 spiny chuck scorpion fish 1 giant snake eel	



Set Number	Loran C and Set Direction	Seas Pt.	Depth Fath.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-9/29-I	26388.6 46721.4 N-NW to 26388.8 46725.8	5-7	41 to 43	level, mud firm	413	mackerel Spanish sardine	9:48 a.m.	2 hr.	3 red snapper 1 yellowedge grouper	41 4	3 silky sharks 1 Atlantic sharpnose sharks 2 giant snake eels	
L-9/29-II	26392.1 46724.4 N-NW to 26373.2 46729.1	4-6	41 to 40	level, firm mud	434	Spanish sardine	2:32 p.m.	2 hr. 25 min	1 red snapper	19	1 silky shark 2 Atlantic sharpnose sharks 3 giant snake eels	
L-9/29-III	26389.2 46718.3 E-NE 26400.4 46718.6	4-6	45	level, firm mud	210	Spanish sardine	3:36 p.m.	2 hr. 48 min	2 red snapper	40	2 Atlantic sharpnose sharks 2 Florida smooth-hound sharks 1 rock sea bass	
L-9/29-IV	26409.6 46719.7 N-NW to 26409.9 46721.6	4-6	44 to 43	level, firm mud	257	Spanish sardine mackerel	4:11 p.m.	4 hr. 9 min	1 yellowedge grouper	5	3 Atlantic sharpnose sharks 3 Florida smooth-hound sharks	in oilfield supply vessel both buoys, the buoy lines and some ground line. Line was dragged up with grappling hook.
L-9/30-I	26431.9 46593.1 W-SW to 26422.1 46593.6	3-5	57 to 59	firm with coral patches	186	mackerel	7:29 a.m.	3 hr. 16 min	3 red snapper 4 yellowedge grouper	10 10		
L-9/30-II	26423.9 46692.1 46689.5 N-NW to 26423.9 46692.1	5-7	58 to 63	firm mud with some coral	200	mackerel	8:23 a.m.	3 hr.	1 red snapper 6 yellowedge grouper	3 22		
L-9/30-III	26430.2 46691.4 S-SE to 26426.5 46686.5	5-7	57 to 70	mostly firm mud with some coral and rock. soft mud on deep end.	400	mackerel	9:00 a.m.	3 hr. 8 min	5 red snapper 1 vermillion snapper 3 yellowedge grouper	16 1 25	1 spinycheek scorpionfish	

Set Number	Loran C and Set Direction	Seas Pt.	Depth Path.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-9/30-IV	26216.5 46691.4 W-SW to 26295.4 46691.6	5-7	67 to 69	level, moderately firm mud with some coral	431	mackerel	5:20 p.m.	1 hr. 40 min.	9 yellowedge grouper	75	8 giant snake eels	
B-9/30-I	26154.3 46687.3	6-8	30	top of rock bank	12 1 reel	bluefish, Spanish sardine	11:00 p.m.	4 hr. 30 min.	17 red snapper 93 vermilion snapper 1 scamp 1 rock hind 1 red hind 1 knobbed porgy 1 gray triggerfish 1 tripletail 4 gray triggerfish	34 121 3 3 6 2 4 6 23		
B-10/1-I	26154.3 46687.3	5-7	30	top of rock bank	12 1 reel	bluefish, Spanish sardine	7:30 p.m.	1 hr. 30 min.				
B-10/1-II	26153.9 46688.0	3-5	30	top of rock bank	36 3 reels	bluefish, Spanish sardine	9:30 p.m.	4 hr. 39 min.	10 red snapper 69 vermilion snapper 2 scamp 1 rock hind 2 knobbed porgy 1 tripletail 14 amberjack	31 145 18 2 2 6 21 70	2 silky sharks 2 tomtates 18 1 squirrel fish 2 1 horse eye jack 6 1 moray eel	
B-10/2-I	26151.5 46688.4	3-5	27	top of rock bank	36 3 reels	bluefish Spanish sardine	1:17 a.m.	1 hr. 18 min.	6 red snapper 5 vermilion snapper 1 red hind 1 tripletail	23 14 2 20	1 silky shark 1 moray eel	
L-10/2-I	26213.4 46692.2 W-SW to 26293.0 46692.3	3-5	69 to 66	slightly irregular, shelly mud, some rock	411	mackerel	9:00 a.m.	2 hr. 35 min.	2 yellowedge grouper	29	6 giant snake eels 1 bearded brotula	
L-10/2-II	26202.4 46693.0 E-NE to 26222.7 46692.7	3-5	64 to 71	almost level, shelly mud	404	mackerel	10:02 a.m.	1 hr. 58 min.	1 red snapper	10	1 silky shark 1 giant snake eel	
L-10/2-III	26147.9 46684.1 S-SE to 26148.3 46674.4	2-4	60 to 104	moderately soft shelly mud with small rock piles	717	Spanish sardine, mackerel, bluefish, amberjack	4:05 p.m.	2 hr. 10 min.	2 red snapper 17 yellowedge grouper 2 amberjack	34 195 103	1 silky shark 5 Cuban dogfish 2 Florida smooth- hound sharks 2 southern hake 1 bonito 3 giant snake eels	

Set Number	Locan C and Set Direction	Seas Ft.	Depth Fath.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
B-10/2-II	26149.3 46687.4	2-4	26	top of rock bank	36 3 reels	mullet, bonito	8:50 p.m.	25 min	1 red snapper 19 vermilion snapper	2 15		
B-10/2-III	26151.3 46688.8	2-4	27	top of rock bank	36 3 reels	mullet, bonito	10:00 p.m.	45 min	2 red snapper 19 vermilion snapper 1 scamp	5 22 2	2 squirrelfish 1 tomate 2 horse eye jacks	
B-10/2-IV	26161.0 46689.9	2-4	27	top of rock bank	36 3 reels	mullet, bonito	11:40 p.m.	2 hr. 50 min	12 red snapper 54 vermilion snapper	39 72	1 squirrelfish 2 tomates 3 horse eye jacks 1 moray eel	
L-10/3-I	26150.7 46678.3 N-NW to 26151.2 46683.4	1-2	89 to 74	level, moderately soft mud with shells	362	Spanish sardine bluefish, mackerel	8:42 a.m.	2 hr.	7 yellowedge grouper	47	1 Florida smooth- hound shark 2 southern hake 7 giant snake eels	
L-10/3-II	26145.2 46683.4 S-SE to 26145.0 46678.4	1-2	73 to 89	level, moderately soft mud with shells	380	Spanish sardine bluefish	9:18 a.m.	2 hr. 18 min	7 yellowedge grouper	98	1 Florida smooth- hound shark 6 giant snake eels	1 tilefish damaged by sharks
L-10/3-III	26140.6 46676.1 E-NE to 26161.5 46676.1	1-2	97 to 100	level, moderately soft mud	469	Spanish sardine, amberjack	10:11 a.m.	4 hr. 5 min	3 yellowedge grouper 1 tilefish	70 3	2 Florida smooth- hound sharks 5 giant snake eels	
L-10/3-IV	26141.8 46678.4 N-NW to 26139.4 46679.4 U-shaped set	2-3	88 to 78	level, moderately firm mud with shells	405	Spanish sardine	1:10 p.m.	3 hr. 20 min	4 yellowedge grouper	65	1 southern hake 6 giant snake eels	
L-10/3-V	26137.5 46678.5 N-NW to 26137.4 46683.5	2-3	88 to 70	level, with rise at end of set, moder- ately firm mud with shells	379	Spanish sardine bluefish	1:45 p.m.	3 hr. 50 min	9 yellowedge grouper 2 tilefish	93 6	1 Florida smooth- hound shark 3 giant snake eels	
L-10/3-VI	26134.6 46683.6 S-SE to 26134.5 46678.9	2-3	76 to 86	Gentle slope, mod, rock and coral	469	Spanish sardine	4:15 p.m.	2 hr. 25 min	10 yellowedge grouper 3 tilefish	63 8	1 Florida smooth- hound shark	

Set Number	Loran C and Set Direction	Seas Ft.	Depth Path.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-10/4-I	26698.3 46636.7 E-NE to 26616.2 46637.0	1-2	198 to 189	rolling, firm clay	320	Spanish sardine	7:05 a.m.	2 hr. 35 min	1 snowy grouper 10 tilefish	27 139	1 silky shark 1 southern hake 11 gulf hake 1 giant snake eel	
L-10/4-II	26715.6 46637.5 W-SW to 26794.9 46637.5	1-2	182 to 218	rolling slope, moderately firm mud	430	Spanish sardine	8:03 a.m.	2 hr. 50 min	1 snowy grouper 20 tilefish	12 162	1 broadband dogfish 1 southern hake 13 gulf hake 1 spiny cheek 1 scorpion fish 1 moray eel 1 southern hake 5 gulf hake	
L-10/4-III	26696.3 46636.2 E-NE to 26618.5 46636.5	1-2	209 to 198	gently rolling to level soft mud	424	Spanish sardine	8:40 a.m.	3 hr. 25 min	7 tilefish	75		
L-10/4-IV	26722.5 46648.3 W-SW 26701.0 46638.2	1-2	171 to 176	very gentle roll, mud firmer at upper end of set	373	Spanish sardine	1:45 p.m.	2 hr. 45 min	28 tilefish	133	5 broadband dogfish 1 sevengill shark 5 gulf hake 2 giant snake eels	
L-10/4-V	26693.3 46639.2 E-NE 26702.4 46638.8 U-shaped set	2-3	187 to 159	rough, rock and mud	718	Spanish sardine	3:55 p.m.	2 hr.	2 yellowedge grouper 2 snowy grouper 36 tilefish	35 52 235	4 broadband dogfish 1 Cuban dogfish 1 southern hake 6 gulf hake	line hung and broke. lost 1/3 of 2 mile cable.
L-10/5-I	28438.4 46730.6 S-SE to 28437.6 46728.4	2-4	42 to 51	rolling, hard clay	142	Spanish sardine	6:25 p.m.	1 hr. 40 min			6 Atlantic sharpnose sharks 3 silky sharks 1 scalloped hammerhead shark 3 blackfin turia	
B-10/10-I	27262.9 46628.4	2-3	47	hard	36 3 reefs	squid	8:45 p.m.	2 hr.	23 vermillion snapper 1 red porgy	30 2	3 smooth dogfish 5 frigate mackerel	dragged anchor
B-10/11-I	26736.1 46672.5	2-4	34	shell, mud and coral	36 3 reefs	squid	8:49 p.m.	2 hr. 11 min	70 vermillion snapper	50	3 frigate mackerel	
L-10/12-I	26638.9 26717.5 E-NE	1-2	161 to 165	rolling, mud with clay patches	147	Spanish sardine	7:35 a.m.	2 hr. 40 min	3 tilefish	27	1 southern hake 1 giant snake eel	

Set Number	Loran C and Set Direction	Seas Ft.	Depth Path.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-10/12-II	46638.6 26721.8 S-SE to 26736.0 46637.7 U-shaped NET	1-2	161 to 197	rolling, mud with clay patches	376	Spanish sardine	8:10 a.m.	3 hr. 55 min	14 tilefish	186	5 southern hake	
L-10/12-III	46639.6 26700.2 E-NE	2-4	138 to 173	rolling slope, rock coral and mud with shells	590	Spanish sardine	11:05 a.m.	2 hr. 32 min	4 yellowedge grouper 1 snowy grouper 13 tilefish 1 amberjack	59 35 127 47	2 smooth dogfish 2 Cuban dogfish 6 southern hake 1 giant snake eel 6 southern hake	
L-10/12-IV	26793.2 46741.8 E-NE to 26714.9 46740.9	2-4	145 to 183	rolling, rock and mud	395	Spanish sardine	4:22 p.m.	1 hr. 32 min	1 yellowedge grouper 1 snowy grouper 15 tilefish	74 31 115	1 b	
B-10/12-I	26737.1 46573.1	0-1	33	top of rock bank with coral and shell	36 3 reels	squid	8:00 p.m.	2 hr.	3 red snapper 25 vermilion snapper	11 18	1 frigate mackerel	
B-10/13-I	26735.4 46570.1	0-1	45	hard, coral head	36 3 reels	squid	8:00 a.m.	2 hr. 30 min	4 red snapper 89 vermilion snapper 1 scamp 3 red porgy	21 97 3 7		
B-10/13-II	26735.4 46670.1	0-1	45	hard, coral head	36 3 reels	squid	11:05 a.m.	1 hr. 35 min	1 red snapper 26 vermilion snapper 1 red porgy	26 3 3	1 finetooth shark 2 croaker fish	
B-10/13-III	26735.7 46669.9	1-2	47	hard	36 3 reels	squid	8:00 p.m.	1 hr. 30 min	53 vermilion snapper 2 red porgy	29 7		
L-10/14-I	26566.5 46692.5 N-NW to 26558.0 46698.1	2-4	52 to 61	rolling, rock and hard mud	660	Spanish sardine bluefish	10:40 a.m.	2 hr. 30 min	2 yellowedge grouper	14	6 smooth dogfish 6 giant snake eels	broke line, retrieved from other end
L-10/14-II	26579.5 46699.5 W-SW to 26562.7 46700.2	2-4	50 to 53	hard, irregular rock	341	bluefish Spanish sardine	12:05 p.m.	3 hr. 2 min	4 yellowedge grouper	30	5 smooth dogfish	
L-10/14-III	26673.0 46693.4 W to 26664.8 46693.7	2-3	50 to 51	irregular, hard, coral	184	bluefish Spanish sardine	5:34 p.m.	1 hr. 23 min	3 red snapper 1 yellowedge grouper	44 15		

Set Number	Loran C and Set Direction	Seas Ft.	Depth Fath.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-10/14-IV	26470.0 46194.0 W-SW to 26168.3 46194.8 U-shaped set	2-4	49 to 52	Irregular, hard, coral	410	Spanish sardines	7:40 p.m.	2 hr. 35 min	7 red snapper 3 yellowedge grouper	103 27	12 smooth dogfish 1 moray eel	also caught 4 very small wrenchman snappers - too small to sell.
L-10/15-I	26656.7 46489.4 N-NW to 26667.7 46697.3	1-3	49 to 51	Irregular, hard, coral	601	bluefish, Spanish sardines	6:18 a.m.	3 hr. 12 min	4 red snapper 3 yellowedge grouper	50 39	1 smooth dogfish 2 wrenchman snap- pers	
L-10/15-II	26666.6 46695.4 W-SW to 26663.1 46638.7	2-3	49 to 51	Irregular, hard, coral	271	bluefish Spanish sardines	7:12 a.m.	3 hr. 8 min	6 red snapper 2 yellowedge grouper 1 warsaw grouper	37 21 28	1 tigershark 1 wrenchman snapper 1 rock sea bass	
L-10/15-III	26650.9 46637.7 N-N4 to 26652.6 46637.9 U-shaped set	2-3	50 to 51	Irregular, hard,	457	bluefish	12:33 p.m.	2 hr. 20 min	3 red snapper 12 yellowedge groupers	41 130	2 moray eels	
L-10/15-IV	26659.7 46636.6 W-SW to 26669.2 46636.2 V-shaped set	2-3	48 to 50	Irregular, hard, coral	505	bluefish	1:52 p.m.	3 hr. 43 min	2 red snapper 12 yellowedge grouper	30 204	1 cusk eel 1 shark	
L-10/15-V	26638.6 46618.5 N-NW U-shaped set	1-2	48 to 51	Irregular, hard, coral	437	bluefish, Spanish sardines	4:09 p.m.	2 hr. 44 min	4 red snapper 16 yellowedge grouper	56 162	3 smooth dogfish 5 finetooth sharks 1 rock sea bass 3 giant snake eels	
L-10/15-VI	26649.0 46645.7 W-SW to 26648.1 46645.1	1-2	48 to 50	Irregular, hard, coral	205	bluefish	4:49 p.m.	3 hr. 20 min	4 red snapper	74		
L-10/16-I	26640.5 46648.3 N-NW to 26640.1 46700.8	calm	48 to 52	first half irregular, hard, coral, rest mud with shell and rock	205	bluefish	5:25 a.m.	4 hr. 30 min	1 red snapper 8 yellowedge grouper 1 amberjack	5 73 45	2 smooth dogfish	

Set Number	Loran C and Set Direction	Seas Ft.	Depth Fath.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-10/16-11	26672.6 46698.5 N-NW to 26671.9 46703.8	calm	48 to 50	first half irregular, hard, coral, rest mud with shell and rock	428	bluefish, Spanish sardines	5:55 a.m.	3 hr. 42 min	4 red snapper 5 yellowedge grouper	77 54	3 Atlantic sharp- nose sharks 4 smooth dogfish 1 smalltail shark 2 sharks? 9 giant snake eels	
L-10/16-III	26673.8 46696.5 N-NW	1-2	48 to 50	irregular, coral and rock	401	bluefish	12:30 p.m.	2 hr. 42 min	3 red snapper 10 yellowedge grouper	47 108	1 Atlantic sharp- nose sharks 2 smooth dogfish 2 giant snake eels 1 moray eels	
L-10/16-IV	26673.1 46699.8 W-SW to 26661.0 46699.7	1-2	50 to 51	irregular, hard, coral	175	bluefish	1:10 p.m.	3 hr. 15 min	8 yellowedge grouper	101		
L-10/16-V	26676.0 46696.3 N-NW to 26676.1 46701.3	calm	47 to 50	irregular, hard, coral	322	bluefish	1:53 p.m.	3 hr. 55 min	5 red snapper 3 yellowedge grouper 1 black grouper 1 amberjack	96 30 39 53	1 finetooth shark 1 smalltail shark 1 moray eel 3 giant snake eels	
L-10/16-VI	26661.9 46700.3 E-NE to 26672.9 46700.3	1-2	51 to 52	hard, coral	186	bluefish	5:10 p.m.	3 hr. 30 min	3 red snapper 9 yellowedge grouper	46 87	1 shark?	
L-10/16-VII	26678.4 46697.0 N-NW to 26680.7 46699.4	1-2	49 to 51	first half hard, rest softer	406	bluefish	6:50 p.m.	3 hr.	1 red snapper 2 yellowedge grouper	18 13	1 smooth dogfish 1 hammerhead shark? 1 dusky flounder 3 southern hake 7 moray eels 1 giant snake eel?	
L-10/16-VIII	26684.7 46696.3 W-SW to 26655.5 46698.6	1-2	49 to 51	hard mud	411	bluefish	7:40 p.m.	3 hr. 20 min	1 red snapper	14	2 smooth dogfish 3 southern hake	
L-10/17-I	26681.0 46699.0 E-NE to 26660.2 46699.5 U-shaped set	4-6	49 to 51	hard	412	bluefish	12:30 p.m.	2 hr. 40 min	1 red snapper 11 yellowedge grouper	14 117		

Set Number	Locan C and Set Direction	Seas Ft.	Depth Path.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-10/17-II	26660.8 46700.6 E-NE to 26664.5 46701.2 U-shaped set	5-6	50 to 51	rolling	437	bluefish	1:40 p.m.	3 hr. 35 min	9 yellowedge grouper	70	2 giant snake eels	
L-10/17-III	26677.2 46699.9 E-NE to 26671.3 46599.3	5-6	50	hard	186	bluefish	2:43 p.m.	3 hr. 30 min	1 red snapper 2 yellowedge grouper	10 39	1 bushful crab	
L-10/17-IV	26669.7 46698.8 W-SW to 26559.5 46701.6	5-7	48 to 52	hard, coral	425	bluefish	4:40 p.m.	2 hr. 15 min	5 red snapper 7 yellowedge grouper 1 scamp	98 75 7	2 giant snake eels 2 bushful crabs	
L-10/18-I	26657.2 46599.2 N-NW 26657.3 46704.2	2-4	49 to 52	scattered rock and coral - some mud and shells	427	bluefish	4:45 a.m.	3 hr. 10 min	3 red snapper 3 yellowedge grouper	62 30	3 smooth dogfish 1 sandbar shark 8 giant snake eels 1 bushful crab	
L-10/18-II	26661.5 46599.8 N-NW to 26661.2 46702.2	3-5	51 to 52	half scattered rock and coral, half mud and shells	211	bluefish	5:40 a.m.	3 hr. 30 min	1 red snapper 2 yellowedge grouper	21 14	4 giant snake eels	
L-10/18-III	26655.0 46694.3 N-NW to 26655.1 46704.0	5-7	50 to 54	half scattered rock and coral, half hard mud and shell	402	bluefish	6:10 a.m.	4 hr. 35 min	3 red snapper 1 yellowedge grouper	59 14	1 rock sea bass 9 giant snake eels	
L-10/18-IV	26652.9 46700.6 N-NW to 26630.7 46700.8 U-shaped set	5-7	49 to 51	irregular, hard, coral	399	bluefish	11:52 a.m.	5 hr. 38 min	2 red snapper 3 yellowedge grouper	45 31	6 smooth dogfish 1 sandbar shark 13 giant snake eels	
L-10/18-V	26669.9 46692.3 W-SW 26659.2 46703.3	3-5	50 to 52	rolling, hard mud	257	bluefish	1:04 p.m.	2 hr. 25 min	5 red snapper 1 yellowedge grouper	34 9	1 scalloped herringhead shark	



Set Number	Loran C and Set Direction	Seas Ft.	Depth Path.	Bottom Description	No. Hooks	Bait	Time Set	Soak Time	Catch	lbs.	Bycatch	Comments
L-10/18-VI	26671.3 46702.0 W-SW to 26661.2 46702.0	3-5	50	mud and shell	166	bluefish	4:30 p.m.	2 hr. 6 min	4 red snapper	71	1 smooth dogfish 4 giant snake eels	
L-10/18-VII	26648.8 46700.3 N-NW to 26645.9 46699.8 U-shaped set	3-5	52	hard mud, scattered rock and coral	429	bluefish	4:40 p.m.	2 hr. 48 min	1 yellowedge grouper	5	3 smooth dogfish 1 smalltail shark 22 giant snake eels	
L-10/19-I	26673.0 46702.0 W-SW to 26661.8 46699.4 V-shaped set	3-5	49 to 52	muddy shell	657	bluefish	6:14 a.m.	2 hr. 55 min	5 red snapper 4 yellowedge grouper	100 58	1 smooth dogfish 1 smalltail shark 1 sandbar shark 1 scalloped ham- merhead shark 1 southern hake 1 rock sea bass 1 sand scorpion 4 giant snake eels	
L-10/19-II	26661.9 46694.8 S-SE to 26660.9 46692.8 U-shaped set	3-5	50 to 53	hard, coral	416	bluefish	7:10 a.m.	3 hr. 42 min	6 red snapper 6 yellowedge grouper 1 amberjack	67 84 55		
L-10/19-III	26657.8 46692.5 E-NE to 26633.8 46692.0 U-shaped set	3-5	51 to 54	hard, coral	390	bluefish	11:58 a.m.	2 hr. 13 min	3 red snapper 5 yellowedge groupers 1 amberjack	39 47 46	2 rock sea bass 1 giant snake eels	