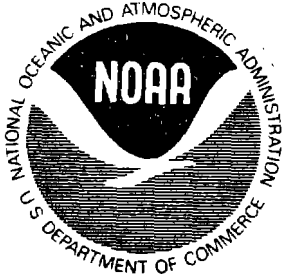


**NOAA TECHNICAL MEMORANDUM  
NMFS- SEFC- 122**



**A DESCRIPTIVE SURVEY OF THE  
BOTTOM LONGLINE FISHERY IN  
THE GULF OF MEXICO**

**BY  
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**SEPTEMBER, 1983**

**This TM series is used for documentation and timely communication of preliminary results, interim reports, or special purpose information, and have not received complete formal review editorial control, or detailed editing.**

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## INTRODUCTION

The Gulf of Mexico red snapper-grouper fishery had its origin off the northwestern coast of Florida some 15 or 20 years prior to the Civil War. The fishery was small and limited primarily to craft fishing nearby waters. The catch was sold to such area markets as New Orleans, Mobile and Pensacola, for local consumption. It was not until the early 1870's, when the first packing house was built in Pensacola, that the fishing really started on a large scale. A revolution occurred in the fishery when schooners began bringing in ice from Maine as early as 1868 however, natural ice soon became too expensive to use because of increased shipping costs. In 1895, ice manufacturing plants began production at economical prices, and vessels were modified to carry it, thus extending their fishing range and increasing the catch potential.

During the ensuing years, technology has advanced, markets have expanded; and enterprising fishermen have become more diversified in the development and use of different types of gear. The hand-held hook line and sinker, which was dropped to the bottom was, later supplemented by a small rail davit with a motor attached, and became known as a "One Armed Bandit", or "Bandit Rig". Bandit rig craft fished throughout the Gulf of Mexico for many years. During the late 1970's the use of bottom longlines commenced. By the end of 1981 this type of gear was [well established] use by the majority of the snapper/grouper fishing fleet.

The bottom longline is a much more efficient type of gear than its predecessors, the bandit rig and hand line. Its rapid increase in use became a cause for concern for the Gulf of Mexico Fishery Management Council, whose members are charged with the proper management of the reef fish resource. The possibility that the use of this gear could lead to overfishing of reef fish stocks concerned Council members as well as representatives of the fishing industry. This concern was amplified by the apparent numbers of shrimp fishermen who were converting to bottom longlining.

Adverse market conditions, changes in seasonal abundance, and restricted waters have made bottom longlining appear as an attractive interim activity to a great many shrimp fishermen. In addition to these factors, the physical nature of shrimp trawlers is such that converting one to longlining is simple and relatively inexpensive. Reconversion back to shrimping is also simple, and allows these fishermen to participate in both fisheries. This is especially evident in the Western Gulf. Bottom longlining is not looked upon as a replacement for shrimping; rather, it is considered to be a supplemental fishery, which allows for more year-round employment and a source of additional income,

The National Marine Fisheries Service (NMFS), at the request of the Gulf of Mexico Fishery Management Council conducted this survey to provide base line information on the bottom longline fishery. This information will be extremely useful for the Gulf of Mexico Reef Fish Fishery Management Plan.

#### **SURVEY METHODOLOGY**

The survey was conducted in the three main areas of concentration for this fishery :the eastern Gulf off St. Petersburg, Florida, the northern Gulf off Panama City, Florida and in the western Gulf off the south Texas area (Figure 1). The survey utilized three methods to collect information on the longline fishery:

1. **Observers.** Observers were NMFS employees. They went to sea aboard the longline vessels and recorded daily information on effort, area, gear, species and size composition of the catch.
2. **Interviews.** Interviews of longline vessel crews and captains were performed by NMFS personnel in each fishing area. Approximately 15 percent of the trips were interviewed. Interview information was basically the same as that collected by observers; however, catch was recorded in total estimated pounds by species, without regard to size of fish, and ex-vessel price per pound was determined.

3. Landings Statistics - Port agents employed by the Fishery Information Management Division, Miami Laboratory, Southeast Fisheries Center, collected landings information from all seafood dealers operating along the Gulf Coast. This information is available by state, port or area, and reflects the landings purchased by each dealer monthly for each species. The port agents also collected and maintained current records of operating units (fishermen, craft, and gear used) for each fishery within their area of responsibility.



FIGURE 1

MAJOR BOTTOM LONGLINE FISHING GROUNDS

DESCRIPTION OF THE FISHERY

**Fishing Craft.** The majority of craft engaged in the bottom longline fishery were converted shrimp trawlers, ranging in length from 35 to 80 feet, averaging 55 feet. In addition to the trawlers, there were snapper boats (built specifically to fish for snapper and grouper) as well as private charter boats which usually only engage in recreational fishing. All of the longline fishing trips were commercial working trips. The charter boats were commercial fishing while longlining (not carrying paying passengers at the time).

Each of the three major locations in the Gulf reflected variations in the characteristics of its fishing fleet, both in physical description of craft and predominant methods of gear construction and operation. Following Table 1 is a brief synopsis illustrating these differences as they occurred in each of the different areas.

VESSEL AND BOAT OPERATING UNITS BY AREA

TABLE 1

AREA	TYPE CRAFT	NUMBER ENGAGED	SIZE RANGE	AVERAGE LENGTH	AVERAGE CREW SIZE*
			(FEET)	(FEET)	
EASTERN GULF	SHRIMP TRAWLERS	72	55-85	60	4.0
	SNAPPER/GROUPER BOATS	70	30-50	40	3.5
	CHARTER BOATS	20	30-50	40	3.5
	TOTAL	162			
NORTHERN GULF	SHRIMP TRAWLERS	25	50-75	60	4.0
	SNAPPER/GROUPER BOATS	19	30-45	40	3.5
	CHARTER BOATS	7	30-45	40	3.5
	OUTBOARD	4	24	24	2.0
	TOTAL	55			
WESTERN GULF	SHRIMP TRAWLERS	85	55-85	65	4.6
	TOTAL	85			

\*INCLUDES CAPTAIN



**Eastern Gulf (St. Petersburg Florida Area)**

The majority of fishing craft operating out of the St. Petersburg, Florida area are longline and/or bandit rig vessels. Approximately 45 percent of this fleet are converted shrimp trawlers. Most of the older craft have wooden hulls, although an occasional steel hull can still be seen. The newer vessels are predominantly fiberglass. The average overall length, all craft considered, is approximately 40 feet. There were 162 of these craft operating out of the St. Petersburg area during the 1982 season. The average trip was of 9 days duration. Crew size averaged 3.5 persons, including captain.

Prior to 1981 the predominant method of reef fishing was through use of the electric reels, commonly known as "Bandit Rigs". Bottom longlines first came into heavy use during 1991, by the vessels using the bandit rigs. Virtually every longline vessel is also equipped with these rigs. Vessels using bottom longlines tend to fish in waters deeper than 40 fathoms. Bandit rig boats usually work in 40 to 60 fathom depths. There are occasions when the two will overlap in the same area, and conflicts result.

The fishing grounds begin approximately 50 miles offshore, along the 20 fathom line, and progress westerly for nearly another hundred miles, to the 140-160 fathom curve. The northern end of these grounds tends to blend into the southernmost area fished by the Panama City vessels, roughly at about 29° latitude, which lies approximately 60 miles south of Cape San Blas. (Fishermen from Panama City report that occasionally they can see the lights of some of the St. Petersburg vessels on clear nights.) These grounds are on the Florida Shelf and range southward to the area of the Dry Tortugas.

**Northern Gulf (Panama City Florida Area)**

The bottom longline fishing fleet operating in the northern Gulf consisted of approximately 55 craft. This fleet was composed of a wide variety of boat types. There were converted shrimp trawlers, snapper/grouper boats, charter boats, and even outboard motorboats represented. Sizes ranged from 75 foot shrimpers down to 24 foot outboards. Panama City was the major port for this activity, but the nearby ports of Appalachicola, Destin, Niceville and Pensacola also hosted smaller fleets of fishing craft.

This is the area of the Gulf where fishing for reef fish actually began, during the middle 1800's. Fishing began as bottom handlining, eventually yielding to "bandit rigs" and bottom longlines. Incidents of the use of longlines were noted as early as 1978-79; however, this type of gear enjoyed its heaviest and most widespread use during the 1982 season, expanding about 3-fold since the late 1970's.

This fleet appeared to be made up of more highly versatile craft, which could change quickly from one gear type to another, duplicating effort in different fisheries (shrimp trawling, surface longlining, trolling and, recreational chartering). Several of these vessels continued bottom longlining operations on a year-round basis, despite the varied activities of their companions.

The grounds most favored by this fishing fleet lie approximately 60 miles southwest of Panama City. They lie in a generally west northwest/east southeast direction, meandering slightly more southward at the eastern end. Depths fished ranged from 30 to about 150 fathoms, averaging around 100 fathoms overall.

Most of the trips from these ports averaged 4.8 days in duration. At one extreme were a very few 10 day trips reported, while at the other extreme there were one day trips. A 24 foot outboard boat could make a trip from port to fishing grounds in less than 4 hours. If fishing was good, the boat could soon be loaded to capacity and return to port, all within a 24 hour period.

#### Western Gulf (Texas Area)

The Texas bottomline vessel fleet operated primarily out of the Aransas Pass-Brownsville/Port Isabel area. This fleet was composed entirely of commercial shrimp trawlers, which ranged in length from 55 to 85 feet. Texas vessels have traditionally based their operations upon the availability of penaeid shrimp. Closed shrimp seasons and cyclic variations in abundance have resulted in approximately 85 vessels converting to operate in the bottom longline fishery. Unlike northern and eastern Gulf areas, the Texas longline fishery ceases completely when shrimp are available. In 1982 there were no vessels working longlines from May through late December.

Texas shrimpers began rigging their vessels to fish longlines during the late 1970's and 1980. In early 1981 the number of vessels as well as the catch increased considerably, as fishermen sought alternative activities to help offset poor economic conditions in the shrimp fishery. Of the three groups of bottom longline vessels operating in the Gulf of Mexico, these were the largest in size. The average length of the Texas vessels was approximately 70 feet, compared with size averages of about 40 feet in other areas. Texas vessels using bottom longlines were also equipped with bandit rigs. This rig, however, is used primarily to sample for more promising fishing drops. Whenever a "hotspot" was indicated by the bandit rig, the longlines were set.

The fishing grounds most extensively used were concentrated southeast of Aransas Pass, along the 50 fathom line. Fishing depths ranged from 50 to over 170 fathoms. These grounds were oriented loosely in a northeast/southwest direction for approximately 300 miles, terminating in an area known as "The Flower Gardens", which was approximately 110 miles southeast of Galveston. The southern extremity of these grounds was in an area known as "Steamer Rock", which was located northeast of Port Isabel. One of the favorite fishing locations was southeast of Aransas Pass, in 42-48 fathoms where large concentrations of grouper have been reported. The average trip was of 10 days duration during the 1982 season.

The information in Table 2 was collected through interviews of a random sampling of fishing craft operators in the three major fishing areas. It is intended to give a general overview of the logistical aspects of the fleet.

TABLE 2.

OPERATIONAL REQUIREMENTS BY TYPE OF CRAFT

	<u>LARGE TRAWLER</u> (56-75 Feet)	<u>SNAPPER/GROUPER BOAT</u> (36-55 Feet)	<u>SMALL CRAFT</u> (24-35 Feet)
LENGTH OF TRIP	9-12 DAYS	5-7 DAYS	1-3 DAYS
FUEL	800-1000 GALLONS DIESEL	700-800 GALLONS DIESEL	175-200 GAL. GASOLINE 200-300 GAL. DIESEL
ICE	5000-7000 POUNDS	2000-4000 POUNDS	800-1200 POUNDS
BAIT	4000 POUNDS	1000-1200 POUNDS	350-600 POUNDS

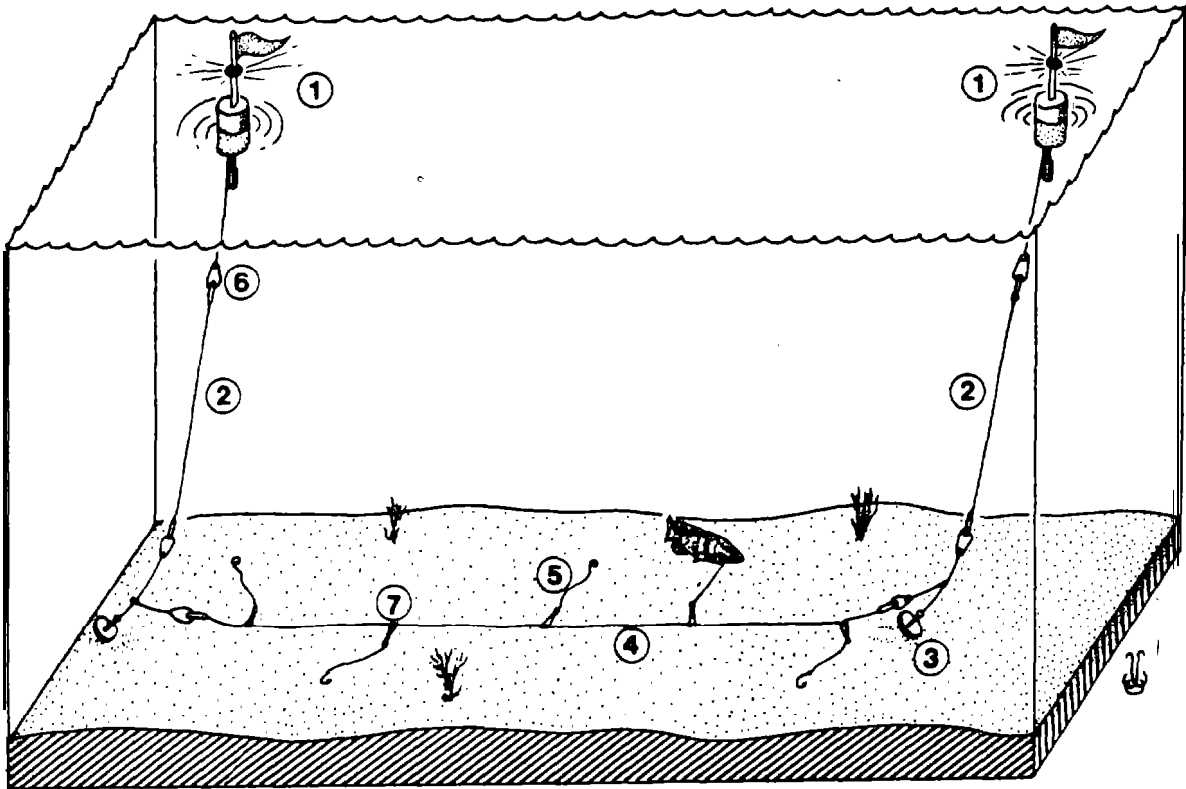
## DESCRIPTION OF LONGLINE FISHING OPERATIONS

Fishing operations were conducted with a crew of 3-4 (including the captain). The line was deployed by dropping one end overboard. This end had an anchor, float line with float, flag staff, radar reflector and a light. The vessel moved forward at a slow speed, about 3-7 knots, while one person controlled the speed of the line being released. If the vessel moved too fast the line became too tight, and a slower pace was required. The objective was to get the line out as quickly as possible. While the line was being set, one crewman handed the prebaited gangions to a third crewman, who snapped them into place at regular intervals on the groundline. The last end to go overboard was equipped in the same way as the first end. Spacing of the gangions varied considerably. If there was a good show of fish from an area, hooks would be set about 10-12 feet apart. Fishermen sampling an unknown area set hooks from 20 to 50 feet apart.

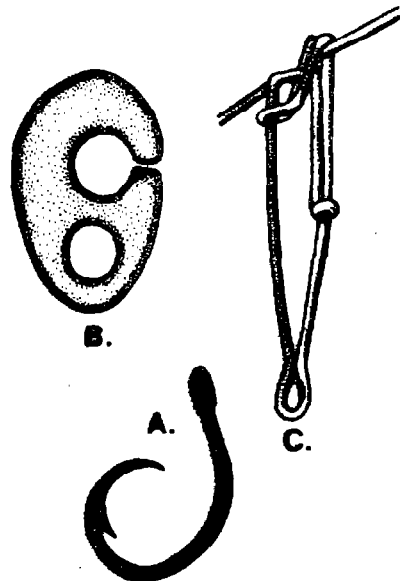
Soak time varied from 1½ to about 3 hours during the daytime and 9 to 14 hours overnight in the Eastern and Western Gulf areas. Fishermen in the Northern Gulf area reported that lines left on the bottom more than 2-3 hours often caught fish that were infested with parasitic isopods.

Retrieval of the line was essentially a reverse of the setting operation. As the groundline was brought in, one person controlled line speed, one person unsnapped gangions from the groundline and handed them to the third person, who placed hooks with fish on them in one area of the deck, and hooks without fish back into the cans or tubs. Vessel speed during retrieval of gear was about 2-3 knots, or half of deployment speed. Hooks were again baited and hung in place for the next deployment. Most of the bottom longlines were from 1 to 6 miles in length. The groundlines were made up of several shorter sections which were connected with either snaps or brummel hooks. Buoy and anchor lines were also attached with brummel hooks for quick and easy attachment or removal. A vessel using a 1 mile long line averaged setting and retrieving it about 5 times a day. Some vessels set 2 to 3 lines at a time. A typical fishing day was 18 hours; however, some vessels worked on a 24 hour basis. NMFS observers reported that this was a very labor intensive fishing operation. Crewmen were constantly busy baiting hooks, unhooking and gutting fish, setting and recovering lines, etc.

FIGURE 2 Illustrates the setup of a typical bottom longline, along with inserts to clarify gear details.



1. MARKER BUOY WITH FLAGS, LIGHT, & RADAR REFLECTOR
2. BUOY LINE- POLYPROPYLENE
3. ANCHOR- MUSHROOM OR OTHER
4. MAINLINE- STEEL, POLYPROPYLENE, OR MONOFILAMENT
5. GANGIONS- MONOFILAMENT, 30" LONG, 10 TO 50 FEET APART, WITH CIRCLE HOOK (INSERT A.)
6. BRUMMEL HOOKS (INSERT B.)
7. LINE SNAPS (INSERT C.)



Smaller boats may store groundline in tubs or garbage cans, while the larger vessels normally used a large- spool or drum. Those working out of cans used hydraulic or electric winches and pothaulers to retrieve line. Leaders with baited hooks were stored ready to be snapped onto the outgoing groundline by either hanging them from a tub, line, or "magazine" (a magazine is a series of short sections of PVC tubing cut and glued together in rows, staggered somewhat like the pipes in an organ). This keeps each separate and ready for fast attachment or removal with a minimum of tangling.

**Hooks** - Tuna circle hooks, sizes 4, 6, 7 and 8 or Mustad "sure hold" Japanese hooks are most frequently used.

**Bait** - Bait may be mullet, eels, skate, pollock, Spanish mackerel, Spanish sardines cigar minnows, or squid, depending upon seasonal availability. Wholesale bait dealers deliver fresh and frozen bait directly to fishing vessels, buying large quantities. Vessels on long trips often run out of bait, and use less desirable species they catch on their longlines, as- bait. Species normally utilized as bait often -include- dolphin, sharks, barracuda, amberjack, and tilefish. Prices paid for most baits purchased ranged from 8 to 15 cents per pound for mullet, and 25 to 45 cents for-Spanish sardines.

**Gear Types In Use** - The only gear types observed or reported in use in this fishery were bottom longlines and the usually present bandit rigs. Despite many inquiries in each area, there were no reported uses of any roller trawls or buoy rigs.

These interviews provided data for Tables 3-8. Tables 3, 5, and 7 are effort tables. They show trip number (30 trips were interviewed at random and some vessels were interviewed more than once), number of days fished, total number of crew, including captain, total number of hooks fished per day, and the total catch for the trip which the interview covered. Totals and averages are provided at the bottom of each column.

Tables 4, 6, and 8 are catch tables. They provide a listing of the catch, by species, from the 30 interviewed trips, with a total of pounds caught which matches the total catch column in the appropriate effort tables. Thus, Tables 3 and 4 show the effort and catch from the Eastern Gulf, 5 and 6 represent the Northern Gulf, and 7 and 8 the Western Gulf.

#### OBSERVER TRIPS

The information collected by observers at sea provided data for Tables 9-14. This series of tables was different in both format and source from the preceding interview table series. None of the observer trips were represented in the Dockside Interview group, and vice-versa.

The observer tables were divided into two categories, the first of which illustrates the rate of catch (Hook Rate) while the second provides size distribution by species.

The hook rate tables (Tables 9-11) were set up in a series of vertical columns. Each column represented one fishing day for one individual vessel. The Eastern and Western Gulf tables each actually represent one complete fishing trip for one vessel. The northern Gulf table is composed of the results of six different fishing trips performed by six different vessels. A larger sample size would have been desirable; however, funding and personnel availability resulted in a limited number of observer trips. Also, this was just to be a pilot study which would help determine if a more internal study was desirable.

Tables 12-14 classify the fish into small, medium and large size categories, and thus provide some perspective on the sizes of fish being caught. Observers recorded this information as soon as the fish came on deck, before they had been gutted or iced. These tables and the Hook Rate Tables were prepared from data collected on the same trips.

**TABLE 3**                      INTERVIEWS OF 30 BOTTOM LONGLINE TRIPS: EASTERN GULF

<u>TRIP NO.</u>	<u>DAYS FISHED</u>	<u>NO. CREW</u>	<u>TOTAL HOOKS PER DAY</u>	<u>TOTAL CATCH</u>
1	13	3	1,000	2,863
2	16	5	250	9,041
3	10	4	200	1,398
4	7	2	100	1,209
5	1	3	3,000	1,163
6	14	4	800	11,855
7	11	4	350	2,286
8	10	3	1,000	3,422
9	20	3	600	3,008
10	16	5	1,800	10,067
11	6	3	1,800	2,154
12	12	4	300	3,379
13	1	3	3,000	1,050
14	6	4	500	2,827
15	6	2	300	810
16	20	4	800	9,410
17	2	3	3,000	1,383
18	3	4	3,000	2,266
19	9	3	800	3,496
20	1	5	1,600	1,236
21	4	4	600	1,344
22	16	4	700	1,963
23	2	5	800	1,556
24	5	2	150	1,370
25	6	5	3,000	3,364
26	7	3	50	1,370
27	12	4	400	5,620
28	3	2	2,400	1,678
29	12	4	1,800	3,089
30	11	3	700	3,172
TOTAL	262	107	34,200	98,849
AVG.	8.7	3.5	1,140	3,294



**TABLE 4**      **TOTAL CATCH BY SPECIES FROM THE 30 INTERVIEWED TRIPS IN TABLE 3**

<u>SPECIES</u>	<u>TOTAL POUNDS CAUGHT</u>	<u>AVERAGE POUNDS PER TRIP</u>
Amberjack	25	0.8
Dolphin	56	1.8
Grouper:		
Black	10,191	339.7
Red	33,612	1,120.4
Speckled Hind	375	12.5
Scamp	419	13.9
Snowy	28,860	962.0
Warsaw	883	29.4
Yellowfin	21,874	729.1
Porgy	113	3.7
Shark	138	4.6
Snapper:		
Gray	89	2.9
Mangrove	224	7.4
Red	634	21.1
Tilefish:		
Gray	217	7.2
Golden	1,089	36.3
Wahoo	51	1.7

**TABLE 5**      **INTERVIEWS OF 30 BOTTOM LONGLINE TRIPS: NORTHERN GULF**

<u>TRIP NO.</u>	<u>DAYS FISHED</u>	<u>NO. CREW</u>	<u>TOTAL HOOKS PER DAY</u>	<u>TOTAL CATCH</u>
1	5	4	2,800	4,200
2	4	3	1,800	3,400
3	10	3	3,300	8,383
4	5	3	1,300	2,342
5	3	4	1,200	1,540
6	2	4	2,400	1,857
7	3	3	1,425	2,304
8	5	5	3,000	1,492
9	5	4	2,000	3,798
10	6	4	2,000	3,702
11	6	4	1,900	6,100
12	3	4	2,000	3,000
13	4	3	2,500	3,168
14	10	6	2,500	7,744
15	7	5	3,750	8,239
16	9	4	2,500	7,274
17	6	3	2,800	2,888
18	6	4	3,600	6,930
19	4	4	1,560	3,205
20	2	4	2,800	1,250
21	4	3	1,800	3,890
22	4	3	1,400	2,350
23	4	4	1,200	2,881
24	4	4	1,600	3,260
25	4	3	1,800	4,082
26	5	4	2,400	2,712
27	5	3	1,300	2,029
28	3	5	2,200	1,505
29	1	4	1,250	1,302
30	5	3	1,500	3,770
TOTAL	144	114	66,085	110,597
AVERAGE	4.8	3.8	2,202	3,686

**TABLE 6**      **CATCH BY SPECIES FROM THE 30 INTERVIEWED TRIPS IN TABLE 5**

<u>SPECIES</u>	<u>TOTAL POUNDS CAUGHT</u>	<u>AVERAGE POUNDS PER TRIP</u>
Amberjack	1,562	52.0
Cobia	39	1.3
Dolphin	34	1.1
Grouper:		
Black	63	2.1
Scamp	67	2.2
Warsaw	2,964	98.8
Yellowfin	90,339	3011.3
Snapper:		
Cubera	100	3.3
Mangrove	5	0.1
Red	10,819	360.6
Vermillion	4	0.1
Sharks	745	24.8
Swordfish	4	0.1
Tilefish:		
Golden	3,741	124.7
Gray	111	3.7

**TABLE 7**                    **INTERVIEWS OF 30 BOTTOM LONGLINE TRIPS: WESTERN GULF**

<u>TRIP NO.</u>	<u>DAYS FISHED</u>	<u>NO. CREW</u>	<u>TOTAL HOOKS PER DAY</u>	<u>TOTAL CATCH</u>
1	9	4	700	3,757
2	12	5	4,000	10,697
3	3	4	2,500	2,210
4	3	4	1,000	1,352
5	9	5	1,875	7,249
6	5	4	600	4,992
7	10	5	2,000	8,956
8	10	5	1,000	3,980
9	10	5	1,000	7,280
10	10	4	2,000	6,535
11	10	4	800	6,197
12	10	4	2,000	2,229
13	10	4	800	4,425
14	10	6	800	5,691
15	3	5	1,350	4,182
16	7	5	700	7,402
17	10	5	1,400	3,247
18	12	6	4,000	11,616
19	12	4	1,350	6,972
20	12	4	700	8,735
21	10	4	1,400	3,732
22	10	6	1,000	5,556
23	10	5	800	4,378
24	10	5	1,000	5,100
25	7	4	700	8,125
26	6	4	600	4,168
27	8	5	1,250	4,364
28	3	6	1,000	7,080
29	3	3	800	3,974
30	12	5	800	16,010
TOTAL	256	139	39,925	180,191
AVERAGE	8.5	4.6	1,330	6,006 Lb.

**TABLE 8**     **CATCH BY SPECIES FROM THE 30 INTERVIEWED TRIPS IN TABLE 7**

<u>SPECIES</u>	<u>TOTAL POUNDS CAUGHT</u>	<u>AVERAGE POUNDS PER TRIP</u>
Grouper:		
Black	328	10.9
Jewfish	640	21.3
Yellowfin	32,559	1,085.3
Warsaw	7,626	254.2
Sharks	46	1.5
Snapper:		
Red	138,818	4,627.2
Tilefish:		
Golden	174	5.8
	<hr/>	
TOTAL	180,191	

TABLE 9

DAILY HOOK RATE - NUMBER OF FISH PER 100 HOOKS  
EACH COLUMN REPRESENTS ONE FISHING DAY FOR ONE VESSEL

EASTERN GULF

DAY NO.	01	02	03	04	05	06	07	08	09	10
NO. OF HOOKS	600	100	900	1100	700	1000	1400	800	900	800
NO. OF SETS	3	1	4	5	4	4	5	3	4	5
SOAK TIME/SET	2-3 hr.	1 hr.	1-2 hr.	2-3 hr.	1-3 hr.	3-15 hr.	4-14 hr.	3-5 hr.	1-2 hr.	1-14 hr.
<u>SPECIES:</u>										
BONITO	.16									
DOLPHIN				.09						
EELS, MORAY	.33		.11		.28	0.1	.07			
GROUPER:										
BLACK							.21	0.2		.25
RED		1.0				0.2				
SP. HIND	.33						.07			.12
YELLOWFIN	.66		5.1	4.0	5.1	7.3	2.9	3.7	1.3	3.0
LING					.85	0.6	.14	.25	.44	.12
LIZARDFISH	.16									
PORGY	.05									.25
SHARK	.16		.11	.09		0.2		.12		
SNAPPER, RED	.33									.25
SWORDFISH							.07			
TILEFISH, GOLDEN,			.33	.09	.28	0.2	.21	.37		
"    , GRAY			3.7	2.1	1.28	3.1	.92	.87	1.0	1.5
TUNA, BLACKFIN										
WAHOO									.11	

\*This table represents one complete fishing trip for one vessel.

TABLE 10

DAILY HOOK RATE - NUMBER OF FISH PER 100 HOOKS  
EACH COLUMN REPRESENTS ONE FISHING DAY FOR ONE VESSEL

NORTHERN GULF

DAY NO.	01	02	03	04	05	06	07	08	09	10
NO. OF HOOKS	300	300	300	600	700	300	600	600	600	2500
NO. OF SETS	9	8	10	6	6	8	12	12	12	5
SOAK TIME/SET	1-2 hr.	1-2 hr.	1-2 hr.	2 hr.	2 hr.	2 hr.	1-2 hr.	1-2 hr.	1-2 hr.	2-3 hr.
<b>SPECIES:</b>										
AMBERJACK	1.0									
DOGFISH										.84
EELS		2.0								.08
<b>GROUPEL:</b>										
BLACK		1.6								
SNOWY				.05						
WARSAW				.05	.28	1.0				
YELLOWFIN	3.0	2.3	19.0	29.1	13.0	31.0	13.5	7.6	8.0	3.6
LING										1.32
POLLOCK		.33								
SHARKS	1.0	3.0								0.2
<b>TILEFISH:</b>										
GOLDEN		.33		12.8	2.4	33.3	7.5	3.5	1.8	5.16
GRAY						.66				

\*This table represents six fishing trips by six different vessels.

**TABLE 11**

**DAILY HOOK RATE - NUMBER OF FISH, PER 100 HOOKS**  
**EACH COLUMN REPRESENTS ONE FISHING DAY FOR ONE VESSEL**

WESTERN GULF

DAY NO.	01	02	03	04	05	06	07	08	09
NO. OF HOOKS	1800	2600	2900	3100	2400	1900	3800	3000	3000
NO. OF SETS	7	6	6	5	6	6	4	5	5
SOAK TIME/SET	2 hr.	1-2 hr.	1-2 hr.	1½ hr.	1½ hr.	1½ hr.	1 hr.	1-2 hr.	1-2 hr.
<b>SPECIES:</b>									
<b>GROUPEL:</b>									
WARSAW			.03				.02		
YELLOWFIN	.05	.19	.06	.12	.16	.63	1.0	.56	.83
SCORPIONFISH	.22	.11	.10						
SHARKS	1.2	1.0	.48	.45	.41	.21	.05		
<b>SNAPPER:</b>									
RED	2.0	1.8	1.5	.83	.79	.73	1.07	1.1	1.4

**\*This table represents one complete fishing trip for one vessel.**



The Gulf of Mexico Fishery Management Council, as well as representatives of the fishing industry have expressed interest and concern over the size fish being taken by bottom longlines. Yellowfin grouper, for example, may attain lengths of three feet, and weights of 50 pounds or more. Red Snapper can also reach approximately the same dimensions. These species require from 15 to 20 years to grow to the above sizes.

Analysis of age and growth was beyond the scope and intent of this survey, however, there was a need for some perspective on the sizes of fish being caught.

The second set of tables in the Observer Series (Tables 12-14) classify the fish into small, medium and large size categories. Observers recorded this information as soon as the fish came on deck, before they had been gutted or iced. These tables and the Hook Rate Tables were prepared from data collected on the same trips.

EASTERN GULF

TABLE 12

TOTAL NUMBER OF FISH BY SPECIES AND SIZE

SPECIES	SMALL UNDER 6 LB.	MEDIUM 6-14 LB.	LARGE OVER 14 LB.	TOTAL BY SPECIES	AVERAGE DAILY CATCH ALL SIZES COMBINED
BONITO			1	1	.07
DOLPHIN		1		1	.07
EELS, MORAY	6			6	.46
GROUPER:					
BLACK	4	1	1	6	.46
RED		5	5	10	.76
SP. HIND		1	5	6	.46
YELLOWFIN	98	172	56	326	25.07
LING	25			25	1.92
LIZARDFISH	1			1	.07
PORGY	13			13	.1
SHARK	8	1	5	14	1.07
SNAPPER:					
RED		3	3	6	.46
SWORDFISH		1		1	.07
TILEFISH:					
GOLDEN	5	7	3	15	1.15
GRAY	93	50	1	144	11.07
TUNA:					
BLACKFIN			1	1	.07
WAHOO			1	1	.07

\*This table represents a 10-day fishing trip by one vessel (correlates with Table 9).

NORTHERN GULF

TABLE 13

TOTAL NUMBER OF FISH BY SPECIES AND SIZE

6 Vessel Trips  
10 Fishing Days

SPECIES	SMALL UNDER 6 LB	MEDIUM 6-14 LB.	LARGE OVER 14 LB.	TOTAL BY SPECIES	AVERAGE DAILY CATCH ALL SIZES COMBINED
AMBERJACK			3	3	0.3
DOGFISH	11	10		21	2.1
EELS	6			6	0.6
GROUPER:					
GAG			5	5	0.5
SNOWY			3	3	0.3
WARSAW			8	8	0.8
YELLOWFIN	39	340	317	696	69.6
LING	33			33	3.3
POLLOCK	1			1	0.1
SHARKS		4	13	17	1.7
TILEFISH:					
GOLDEN	213	87	13	313	31.3
GRAY		2		2	0.2

\*This table represents six fishing trips by six different vessels for a total of 10 fishing days (correlates with Table 10).

WESTERN GULF

TABLE 14 TOTAL NUMBER OF FISH BY SPECIES AND SIZE

<u>SPECIES</u>	<u>SMALL UNDER 6 LB.</u>	<u>MEDIUM 6-14 LBS.</u>	<u>LARGE OVER 14 LBS.</u>	<u>TOTAL BY SPECIES</u>	<u>AVERAGE DAILY CATCH ALL SIZES COMBINED</u>
GROUPER:					
WARSAW			2	2	.22
YELLOWFIN	41	40	29	110	12.2
SCORPIONFISH	10			10	1.1
SHARKS		68	26	94	7.2
SNAPPER:					
RED	2	15	298	315	35.0

This table represents a 9-day fishing trip by one vessel (correlates with Table 11).

### PRICE STRUCTURE BY SPECIES

The species which had enjoyed the greatest demand, and brought the highest prices was red snapper, Lutjanus campechanus. In 1982, ex-vessel prices paid for this species ranged from \$1.25 to \$2.35 per pound, and averaged \$2.00 per pound. Red snapper has traditionally been a "status" species, and has consistently brought prices disproportionately higher than any other species of reef fish.

Grouper holds second place in the scale of demand for fishes of the reef fish community. The yellowfin grouper, Epinephelus flavolimbatus, volume leader of all species-taken in the entire bottom longline fishery, brought ex-vessel prices ranging from 9.75 to \$1.40 per pound, and averaged \$1.05.

Tables 15-17 illustrate the basic price structure, by species, for the three fishing areas. The sources of this data are the Fishery Information Management Division field offices in each area.. This data is derived from the packing house purchase reports.

**TABLE 15**      **LANDINGS AND EX-VESSEL PRICE, BY SPECIES - EASTERN GULF**

<u>SPECIES</u>	<u>PRICE RANGE</u>	<u>AVERAGE PRICE</u>
Amberjack	.25 - .35	.30
Dolphin	.55 - .65	.60
Grouper:		
Black	.90 -1.20	1.15
Jewfish	.25 - .50	.44
Red	.90 -1.10	1.05
Scamp	1.20 -1.65	1.38
Speckled hind	.90 -1.10	1.05
Snowy	.90 -1.10	1.05
Warsaw	.35 -1.15	.58
Yellowfin	.95 -1.35	1.02
Perch, sand	.20 - .35	.26
Porgy	.45 - .65	.55
Snapper:		
Lane	1.15 -1.25	1.21
Mangrove/gray	1.20 -1.35	1.29
Mutton	1.05 -1.30	1.15
Red	2.15 -2.30	2.17
Vermillion	1.55 -1.75	1.70
Yellowtail	.85 -1.05	.98
Sharks	.08 - .30	.20
Tilefish, golden	.35 - .60	.52
Tilefish, gray	.25 - .60	.45
Triggerfish	.35 - .40	.37
Wahoo	.72 - .94	.80

**TABLE 16**      LANDINGS AND EX-VESSEL PRICE, BY SPECIES - NORTHERN GULF

<u>SPECIES</u>	<u>PRICE RANGE</u>	<u>AVERAGE PRICE</u>
Amberjack	.10 - .50	.35
Cobia	.70 - .90	.80
Dolphin	.55 - .65	.60
Eels, cusk	.35 - .60	.48
Grouper:		
Black	.90 -1.20	1.15
Scamp	1.20 -1.65	1.38
Warsaw	.50 -1.25	.75
Yellowfin	.75 -1.45	1.13
Hake	.25 - .60	.52
Porgy	.30 - .75	.53
Sharks	.08 - .25	.18
Snapper:		
Cubera	.50 - .85	.75
Mangrove	.50 -1.75	1.27
Red	1.30 -2.35	1.93
Vermillion	.60 -2.00	1.22
Tilefish:		
Golden	.50 -1.10	.73
Gray	.25 - .60	.45

TABLE 17 LANDINGS AND EX-VESSEL PRICE, BY SPECIES - WESTERN GULF

<u>SPECIES</u>	<u>PRICE RANGE</u>	<u>AVERAGE PRICE</u>
Grouper:		
Black	.90 -1.20	1.15
Jewfish	.25 - .45	.40
Warsaw	.35 -1.00	.55
Yellowfin	.40 -1.05	.71
Sharks	.20 - .50	.44
Snapper, red	2.15 -2.30	2.20
Tilefish:		
Golden	.35 - .55	.50



### MARKETING THE CATCH

Approximately 60 percent of the bottom longline catch was sold to restaurants and wholesale firms serving local (Florida) area markets. The majority of the Western Gulf catch was sold to markets in Houston and San Antonio, Texas. When demand was great enough, shipments were made to Florida from Texas. Many of the packing houses that bought these fish provided a retail sales counter, where they could sell at top prices directly to the public. The remaining portion of this catch was shipped to markets in Birmingham, Atlanta, Chicago, Pensacola, and, as a last resort, New York. Shipments to the New York market have a long track record of lowest monies received, and even losses to the shipping dealer. New York, however, appeared to be the best market for tilefish. The Atlanta market demand increased during the fall and winter months, when stormy seas in the South Atlantic caused reduced catches from those coastal states.

Seasonal demand, related directly to Southern and Central Florida's tourist trade, increased sharply during the December-Easter Period. Catches were lowest at this time, due to winter storms, and prices for fish reached their highest peak. Prices declined after Easter, and reached their lowest levels from August-October. The prices that rose and fell so frequently at the fisherman's level seldom showed any change at the retail level. An exception to this rule would be in case of a local "glut" of a particular species, when dealers were trying to reduce inventory levels, or certain pack houses which offered fixed prices throughout the year.

"Independent" fishermen (those not under contract to sell their catch to any particular buyer) tended to receive highest prices for their catch by direct sales to restaurants. This method of selling, however, has proven to be quite time consuming for the fishermen. When prices declined, many of the independents would stop commercial operations and offer their boats for charter trips. During periods of low prices, much more effort was spent fishing areas known for the best catches of red snapper.

#### THE INFLUENCE OF FISH SIZE ON PRICE

Fish size exerted a considerable influence on salability of the catch, particularly for red snapper and grouper. There was widespread concern throughout this fishery that the larger individuals of these species were being dangerously depleted in number, and that future populations may suffer as the result. This concern was also expressed for the smaller fishes, generally under 5 pounds. Fishermen tried to avoid the small fish by moving to other locations when they showed up in the catch in large numbers. Many dealers refused to buy the small fish, thereby underscoring the fishermen's desire to avoid them.

Sales of large size grouper and snapper tended to suffer, particularly if these fish exceeded about 20 pounds. When red snapper were filleted, a portion of the outer skin was customarily retained in order for the seller to "prove" that the fish was actually a red snapper, and not some other species which may have been accidentally substituted. The larger size fish made this type of filleting very difficult. The larger grouper became harder to handle if over 20-30 pounds. Prices on the larger fish would often be several cents per pound lower than the above favored sizes.

#### ACKNOWLEDGMENTS

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**REFERENCES**

**CAPTIVA, Francis J. 1955. Longline Gear Used in Yellowfin Tuna Exploration. Commercial Fisheries Review. 17 (10). (October, 1955).**

**CARPENTER, James S. 1965. A Review of the Gulf of Mexico Red Snapper Fishery. United States Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Circular 208, 35 pages.**

**CODY, Terry J., Billy E. Fuls, Gary C. Matlock and C. E. Bryan. 1981, Assessment of Bottom Longline Fishing off the Central Texas Coast. Texas Parks and Wildlife Department, Coastal Fisheries Branch. Management Data Series No. 22, 51 pages.**

**JARVIS, Norman D. 1935. Fishery for Red Snappers and Groupers in the Gulf of Mexico. U.S. Department of Commerce, Bureau of Fisheries, Investigational Report No. 26; Volume 1. 29 pages.**

**TASHIRO, Joseph E. and Susan E. Coleman. 1977, The Cuban Grouper and Snapper Fishery in the Gulf of Mexico. Marine Fisheries Review, Vol. 39, No. 10, October, 1977, 6 pages.**

**APPENDIX**

**THE COST OF A 10 DAY FISHING TRIP FOR A 65 FOOT VESSEL**

<u>ITEM</u>	<u>VOLUME</u>	<u>COST</u>
Fuel	800 gal. @ \$1.05	= \$840.
Ice	93 bars. @ 4.50	= 418
Bait	4,000 lb. @ .36	= 1,440.
Groceries		600.
Gear loss(34 gangions @ 1.50)		51.
	<b>TOTAL</b>	<b>\$3,349.</b>
<b>Vessel landings:</b>		
	5,557 lb. red snapper @ \$2.00/lb:	\$11,114.
	992 lb. yellow edge grouper @ .90 lb.	892.
	<b>TOTAL</b>	<b>\$12,006.</b>
40% of gross receipts to vessel owner		4,802.
60% of gross receipts to Captain		7,204.
Captain deducts trips costs		3,349.
	<b>NET RECEIPTS REMAINING</b>	<b>\$3,855.</b>

**Captain and crew share remaining \$3,855, with most of the crew receiving 20% each. First mate usually receives 25%. Captain could receive additional 5% off the top of the gross receipts.**

**NOTE:**

**This example was only intended to be an approximation of the distribution of cost and return of a fishing trip. Nearly every vessel will vary in its practice of this distribution.**