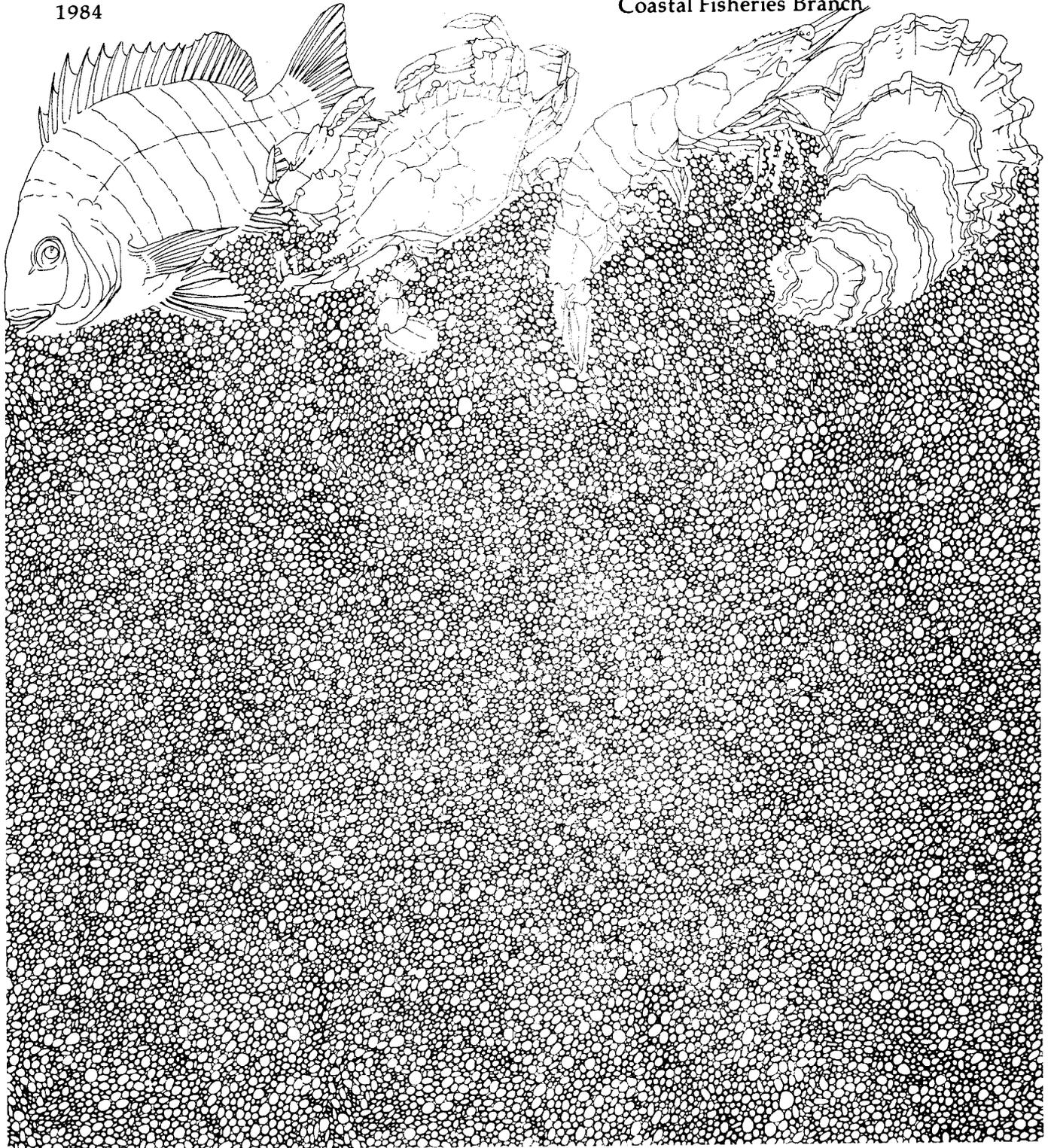


# HARVEST BY TEXAS HEADBOAT FISHERMEN DURING SEPTEMBER 1982-MAY 1983

by L.W. McEachron, P. Campbell and K. Meador

Management Data Series Number 58  
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## ACKNOWLEDGEMENTS

We would like to thank the personnel of the Texas Parks and Wildlife Department who collected the data and to the boat captains and crews who allowed us to accompany them on trips to gather necessary information. Thanks also go to Bill Mercer for drawing the figures, to Tom Heffernan, Roy Johnson, Ed Hegen, Gary Saul and Al Green for reviewing the manuscript and to Nancy Ziegler and Pam Dalton for typing it.

This study was jointly funded by the Texas Parks and Wildlife Department and the U.S. Department of Interior, Fish and Wildlife Service, under D. J. 15.605, Project Number F-33-R-2.

## ABSTRACT

Twelve Gulf and 9 bay headboats (>10 people/boat) in three Texas coastal areas were surveyed from 1 September 1982 to 14 May 1983. The Gulf headboat harvest was ~415,000 fish; the majority (85%) were red snapper (Lutjanus campechanus). Mean number of fishermen/trip (+ 1 SE) for Gulf headboats ranged from  $25.3 \pm 3.0$  in the lower Laguna Madre area to  $50.1 \pm 6.3$  in the Galveston-Freeport area. Mean fishing time/trip ( $h \pm 1 SE$ ) ranged from  $3.8 \pm 0.1$  in the lower Laguna Madre to  $4.5 \pm 0.2$  in the Galveston-Freeport area. Bay headboat fishermen harvested ~61,000 fish of which 78% were sand seatrout (Cynoscion arenarius). Mean number of fishermen/trip (+ 1 SE) for bay headboats ranged from  $13.6 \pm 1.2$  in the lower Laguna Madre area to  $21.4 \pm 2.6$  in the Galveston-Freeport area. Mean fishing time/trip ( $h \pm 1 SE$ ) ranged from  $2.5 \pm 0.1$  in the lower Laguna Madre area to  $3.1 \pm 0.1$  in the Aransas-Corpus Christi area.

## INTRODUCTION

The headboat segment of the Texas coastal charter fishery is an economically important portion of the coastal fishery. The Texas Parks and Wildlife Department (TPWD) has surveyed various segments of the Gulf and bay headboat fishery from September 1978 through August 1982 (McEachron 1983, 1984; McEachron and Matlock 1983). Headboat fishermen surveyed during this period exerted 49% of the fishing pressure and accounted for 61% of the total harvest of the charter industry (McEachron 1984).

The harvest estimates of fish landed by Gulf headboats surveyed for this report are only a portion of the entire Gulf headboat harvest. Boats included in previous studies were headboats actively seeking red snapper (Lutjanus campechanus) around reefs and underwater structures and headboats fishing in open waters actively seeking other species such as king mackerel (Scomberomorus cavalla). Gulf headboat surveys during 1978-79 showed that the activity and harvest of "snapper" boats contributed more information with greater efficiency and, therefore, were selected for continued monitoring (McEachron 1983).

Prior to 15 May 1983, headboat surveys were not a part of the TPWD routine Creel Monitoring Program. Analyses of the 1978-1982 headboat data by McEachron (1984) indicated that headboat harvest and effort could be estimated using the same seasons (15 May-20 November and 21 November-14 May) as in the routine Creel Monitoring Program. Therefore, a comprehensive headboat survey including all Gulf and bay headboats, was incorporated into the routine Creel Monitoring Program beginning 15 May 1983. Data collection and reporting are simplified and headboat survey efficiency is improved by taking advantage of prior knowledge of the fishery.

This paper provides estimates of harvest by Gulf and bay headboats during 1 September 1982-14 May 1983.

The objectives of this survey were to:

- (1) determine the harvest, species composition, size and catch per effort of economically important finfishes caught by sport fishermen on Gulf headboats; and,
- (2) determine the harvest, species composition, size and catch per effort of economically important finfishes caught by sport fishermen on bay headboats.

## MATERIALS AND METHODS

The catch of chartered fishing headboats was determined in the Galveston Bay/Freeport area (Area 1), Aransas Bay/Corpus Christi Bay area (Area 2) and lower Laguna Madre area (Area 3) of the Texas coast (Figure 1).

Headboats were inventoried using the Fish Guide License list of TPWD and by personally contacting marinas, bait stands and commercial fishing guide services in each area of sport fishing activity (Appendix A).

A headboat was defined as a boat, operated by a guide and crew, that carried >10 people for a fee. From this 29 boat inventory, nine headboats fished exclusively in the bays and 20 fished primarily in the Gulf. The 15 Gulf headboats that consistently fished Gulf reefs and other Gulf structures, and that actively reported seeking red snapper were selected for inclusion in this study. However, three Gulf headboats would not cooperate with the TPWD and, therefore, were not surveyed. The inventory was updated as boats entered or left the fishery. The areas that headboats fished were divided into:

1. Gulf: that area seaward of the barrier islands and the pass entrances; and,
2. Bay: that area shoreward of the barrier islands and the pass entrances.

Each month, one randomly selected Gulf headboat was boarded on 3 randomly selected days in Area 1, and boarded on 2 randomly selected days in Areas 2 and 3. Bay headboats were boarded on 2 randomly selected days/month in each area.

Headboat surveys were conducted aboard the vessel during fishing. All fish retained were counted and identified (Hoese and Moore 1977). The total length of up to 100 individuals on each trip of each species was measured to the nearest mm. A list of fishes identified in this study is presented in Appendix B (Robins et al. 1980). The number of sport fishermen and fishing time (nearest 0.5 h) were recorded for each trip. Catch rates (retention rates) were calculated for selected species, and total catch rate of all fishes combined after each trip was calculated by dividing the total number of fish by the product of the number of fishermen and fishing time. Mean total length for each species was calculated by adding the individual total lengths and then dividing by the total number of fish measured.

All harvest and activity data were summarized according to the findings of McEachron (1984). He found significant differences for Gulf headboat harvest and activity means among areas, but not among months. Gulf area means were weighted, while monthly means were pooled. Significant differences in Bay headboat harvest and activity means among areas and among months resulted in weighted summaries being used (McEachron 1984). A weighted coastwide mean catch rate was calculated using an estimate of total fishing pressure (total trips X No. fishermen/trip X mean fishing time/trip) for each boat type in each area. A weighted coastwide mean for number of fishermen/trip or mean fishing time/trip was determined using the total number of estimated trips for each boat type in each area.

Harvest during the period 1 September 1982-14 May 1983 was estimated for Gulf headboats by multiplying the mean catch on each trip in an area by the number of boat trips. Coastwide harvest was the summation of harvest in each area. For bay headboats, harvest was similarly calculated except that the estimates were made separately for September-December 1982 and 1 January-14 May 1983, and then summed. These periods were selected based on the findings of McEachron and Matlock (1983). The number of boat trips made in each area was estimated according to McEachron (1984) and is based on mean number of trips per boat in each area for 1981-82. Standard error of estimates were calculated according to Cochran (1967).

## RESULTS

Headboat fishermen landed ~476,000 fish during 1 September 1982-14 May 1983. Gulf headboats accounted for 87% of these landings. Red snapper dominated the Gulf landings and sand seatrout (Cynoscion arenarius) dominated the bay landings. Sixty-two percent of the headboats were located in Area 1 and 19% of the headboats were located each in Area 2 and Area 3.

## Gulf Headboats

An estimated 613 Gulf headboat trips were made from 1 September 1982 to 14 May 1983 (Table 1). Seventy-four percent of the trips were reported in Area 1. The mean number of fishermen/trip ranged from  $25.3 \pm 3.0$  fishermen/trip in Area 3 to  $50.1 \pm 6.3$  fishermen/trip in Area 1. Mean fishing time/trip ranged from  $3.8 \pm 0.1$  h/trip in Area 3 to  $4.5 \pm 0.2$  h/trip in Area 1.

Gulf headboat fishermen harvested ~415,000 fish (Table 2). Red snapper constituted 35% of the catch. Forty-five other species comprised the rest of the landings; the number of species observed varied among areas (Table 2; Appendix C, Table 1). Area 1 accounted for ~85% of the landings.

Mean catch rates ranged from  $2.52 \pm 0.45$  fish/man-h in Area 2 to  $4.92 \pm 0.95$  fish/man-h in Area 3 (Table 3). Red snapper mean catch rates ranged from  $0.82 \pm 0.18$  red snapper/man-h in Area 2 to  $4.81 \pm 0.94$  red snapper/man-h in Area 3. All other individual species catch rates in all areas were  $\leq 0.16 \pm 0.05$  fish/man-h except for vermilion snapper (Rhomboplites aurorubens) ( $1.48 \pm 0.37$  fish/man-h) in Area 2.

Mean total lengths of fishes measured on Gulf headboats varied from area to area (Table 4). Lengths of red snapper ranged from 190 mm to 775 mm in Area 1, from 235 mm to 905 mm in Area 2 and from 210 mm to 900 mm in Area 3.

## Bay Headboats

Bay headboats made 1129 trips during 1 September 1982-14 May 1983 (Table 1). Approximately 50% of these trips were made in each of the two seasons. Forty-eight percent of the trips were reported in Area 1. The majority (57-60%) of the trips in Areas 1 and 2 were made during September-December, whereas, the majority (66%) of the trips in Area 3 were made during 1 January-14 May. Approximately 19 fishermen/trip were observed on bay headboats coastwide averaged over both seasons. Bay headboats averaged approximately 3 fishing h/trip.

Sport fishermen on bay headboats landed approximately 61,000 fish (Table 5). Seventy-nine percent of these landings were reported during September-December. Sand seatrout constituted 78% of the overall landings. Thirteen other species comprised the rest of the landings; the total number of species observed varied in each area (Table 5; Appendix C, Table 2).

The overall mean catch rate was 3.5 times higher in the September-December period than in the 1 January-14 May period (Table 6). Total mean catch rates in Areas 1 and 2 were generally higher during September-December (1.21-2.19 fish/man-h) than during 1 January-14 May (0.20-0.46 fish/man-h). However, in Area 3 the total mean catch rate was 50% higher in the 1 January-14 May period (0.92 fish/man-h) than in the September-December period (0.60 fish/man-h). Catch rates for sand seatrout were greater (0.28 and 1.28 fish/man-h) than catch rates for any other species during both periods. Mean catch rates of the other species were  $< 0.15 + 0.07$  fish/man-h in all areas during both seasons except for kingfish (Menticirrhus sp.) ( $0.21 + 0.07$  fish/man-h) and "other" fishes ( $0.34 + 0.23$  fish/man-h) in Area 3 during 1 January-14 May.

Mean total lengths of fishes measured varied from area to area (Table 7). Sand seatrout ranged from 145 mm to 380 mm in Area 1, from 215 mm to 425 mm in Area 2, and from 190 mm to 405 mm in Area 3.

#### DISCUSSION

Headboat fishing time, carrying capacity and species composition reported in this study are similar to those reported by McEachron (1983, 1984) and McEachron and Matlock (1983). Few boats have entered or left the fishery since 1978. One bay headboat left the fishery in Area 2, and two Gulf headboats have been added in Area 1, indicating relative stability of this segment of the charter boat industry. In addition, the mean number of fishermen/trip during the same time period has varied little (McEachron 1984). Therefore, it is reasonable to expect that headboat fishing pressure has changed little because each boat has a limited carrying capacity and limited run time to the fishing grounds.

Headboat catches in this study should be considered minimum harvest estimates because of difficulty in surveying all headboats. McEachron (1984) discussed the difficulties in obtaining comprehensive headboat surveys, primarily because of lack of owner cooperation, unsurveyed night trips and trips where the headboats are reserved by a business or an individual for their sole use. For example, during 1980-1982 approximately 14% of the owner reported trips were not surveyed due to being either private charters or night trips (McEachron 1984). The headboat harvest in this study could be as much as 43% greater for Gulf headboats and 11% greater for bay headboats because of survey difficulties (McEachron 1984).

The findings of McEachron (1984) indicate that harvest and activity estimates of the charter fishery, including headboats, can be obtained efficiently through incorporation in the existing routine sport-boat creel monitoring program. Therefore, subsequent reports on harvest and activity of the charter fishery will follow the data standards and seasonal differentiation characteristics of the routine creel monitoring program (McEachron and Green 1983).

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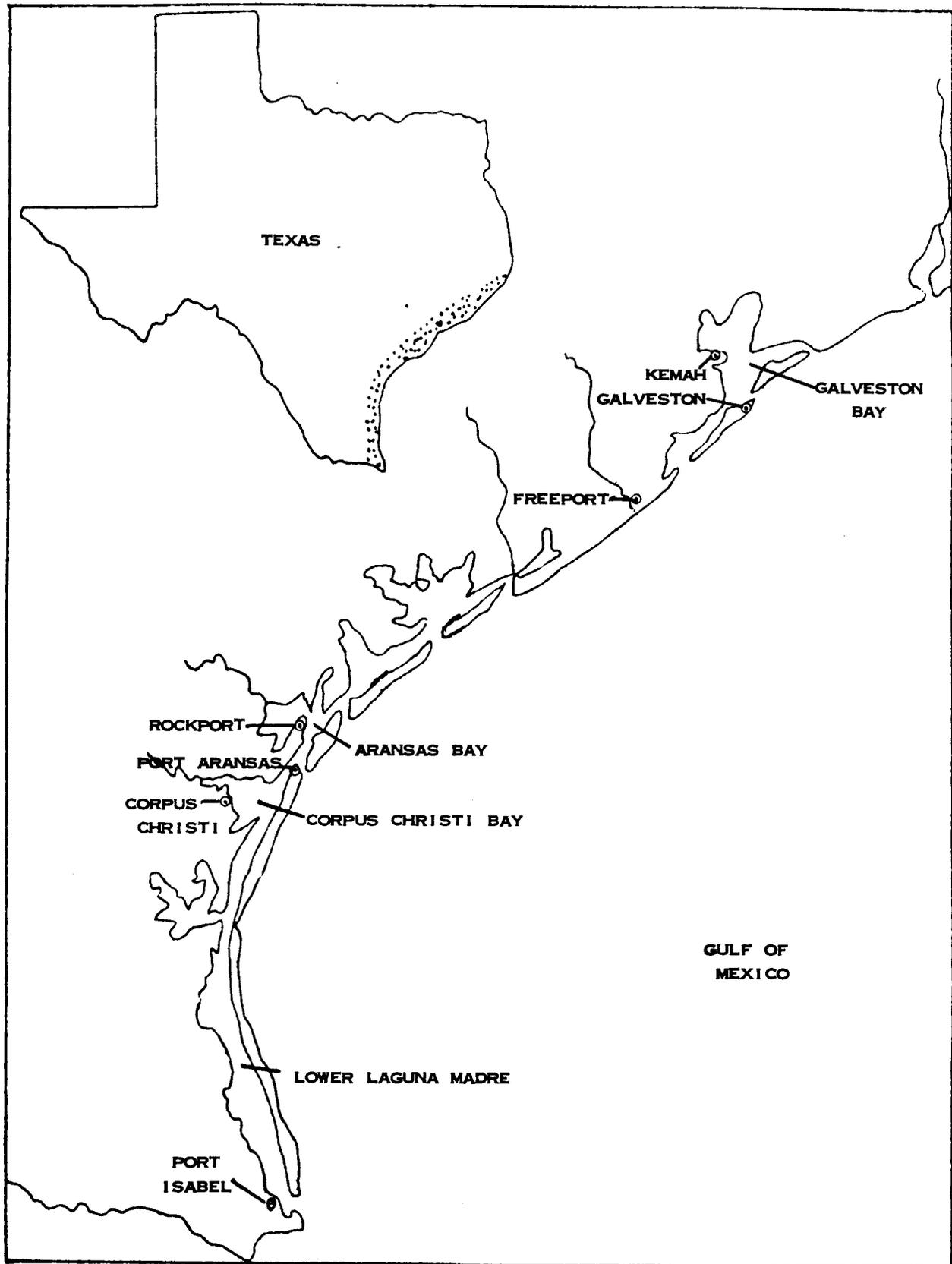


Figure 1. Map of Texas coast with main centers of headboat activity (1 September 1982-14 May 1983). Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi; Area 3 = lower Laguna Madre.

Table 1. Number of boats, No. of trips, No. of fishermen/trip (+ 1SE) and fishing time/trip (h + 1SE) on Gulf and bay headboats in three areas of the Texas coast (1 September 1982-14 May 1983).

Boat type	Area <sup>a</sup>			Total
	1	2	3	
Gulf				
1 September-14 May				
Boats	10	1	1	12
Total trips	455	74	84	613
Fishermen/trip	50.1 + 6.3	32.2 + 3.3	25.3 + 3.0	44.5 + 3.3 <sup>b</sup>
Fishing time/trip	4.5 + 0.2	3.9 + 0.1	3.8 + 0.1	4.3 + 0.1 <sup>b</sup>
Bay				
1 September-31 December				
Boats	3	3	3	9
Total trips	328	158	105	591
Fishermen/trip	15.6 + 3.0	20.6 + 2.0	10.2 + 2.1	16.0 + 1.0 <sup>b</sup>
Fishing time/trip	3.1 + 0.2	3.1 + 0.1	2.4 + 0.2	2.9 + 0.1
1 January-14 May				
Boats	3	3	3	9
Total trips	218	120	200	538
Fishermen/trip	30.2 + 8.7	18.0 + 4.7	15.4 + 2.1	22.0 + 1.9 <sup>b</sup>
Fishing time/trip	2.8 + 0.2	3.0 + 0.1	2.5 + 0.1	2.7 + 0.1
Bay total				
Boats	3	3	3	9
Total trips	546	278	305	1129
Fishermen/trip	21.4 + 2.6	19.5 + 1.6	13.6 + 1.2	18.8 + 0.7 <sup>b</sup>
Fishing time/trip	3.0 + 0.1	3.1 + 0.1	2.5 + 0.1	2.8 + 0.1 <sup>b</sup>

<sup>a</sup> Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi;  
Area 3 = lower Laguna Madre.

<sup>b</sup> Weighted means based on number of trips occurring in seasons and within areas.

Table 2. Total fish harvest (No.) by sport fishermen on Gulf headboats in the Gulf of Mexico off three areas of the Texas coast (1 September 1982-14 May 1983). Number of surveys is in parenthesis.

Species	Area <sup>a</sup>			Total <sup>b</sup> (35)
	1 (17)	2 (11)	3 (7)	
Red snapper	310,356	7644	36,145	354,145
Vermilion snapper	10,784	16,139	0	26,923
Greater amberjack	819	814	<500	1641
Sharks sp.	1092	<500	<500	1148
Lane snapper	7235	<500	<500	7390
Triggerfish sp.	3595	<500	<500	3725
Sea basses	683	<500	<500	1308
Other fishes	18,109	503	<500	18,814
Total <sup>b</sup>	353,035	25,663	36,767	415,465

<sup>a</sup> Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi;  
Area 3 = lower Laguna Madre

<sup>b</sup> Due to rounding of numbers totals may not exactly equal individual totals.

Table 3. Mean catch rate (No./man-h  $\pm$  1SE) of selected species of Gulf fishes retained by sport fishermen on Gulf headboats in three areas off the Texas coast (1 September 1982-14 May 1983). Number of surveys is in parenthesis.

Species	Area <sup>a</sup>			Total <sup>b</sup> (35)
	1 (17)	2 (11)	3 (7)	
Red snapper	2.94 $\pm$ 0.47	0.82 $\pm$ 0.18	4.81 $\pm$ 0.94	2.90 $\pm$ 0.28
Vermilion snapper	0.15 $\pm$ 0.07	1.48 $\pm$ 0.37	0.00	0.24 $\pm$ 0.04
Greater amberjack	0.01 $\pm$ 0.01	0.10 $\pm$ 0.03	<.01	0.02 $\pm$ 0.01
Shark sp.	0.01 $\pm$ 0.01	<.01	0.01 $\pm$ 0.01	0.01 $\pm$ 0.01
Lane snapper	0.08 $\pm$ 0.02	<.01	0.02 $\pm$ 0.02	0.07 $\pm$ 0.01
Triggerfish sp.	0.07 $\pm$ 0.03	0.01 $\pm$ 0.01	0.01 $\pm$ 0.01	0.06 $\pm$ 0.02
Sea basses	0.01 $\pm$ 0.01	0.04 $\pm$ 0.01	0.03 $\pm$ 0.02	0.01 $\pm$ 0.01
Other	0.16 $\pm$ 0.05	0.06 $\pm$ 0.02	0.04 $\pm$ 0.02	0.14 $\pm$ 0.03
Total <sup>c</sup>	3.40 $\pm$ 0.46	2.52 $\pm$ 0.45	4.92 $\pm$ 0.95	3.42 $\pm$ 0.35

<sup>a</sup> Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi;  
Area 3 = lower Laguna Madre.

<sup>b</sup> Weighted averages for all species, except total, due to significant differences among areas (McEachron 1984).

<sup>c</sup> Due to rounding of numbers, totals may not exactly equal individual species totals.

Table 4. Size range and mean total length (nearest 5 mm + 1SE) of fishes retained by fishermen and measured on Gulf headboats in the Gulf of Mexico off three areas of the Texas coast during 1 September 1982-14 May 1983. Number of fish measured is in parenthesis; ND indicates none measured.

Species	Area 1		Area 2		Area 3	
	Size range	Length	Size range	Length	Size range	Length
African pompano	ND	ND	290-510 (6)	410 + 28	ND	ND
Almaco jack	ND	ND	345-760 (19)	505 + 23	ND	ND
Atlantic bonito	120-645 (2)	380 + 186	ND	ND	ND	ND
Atlantic croaker	200-250 (2)	225 + 18	ND	ND	250-325 (11)	290 + 7
Atlantic sharpnose shark	980-1020 (3)	1000 + 9	920-965 (2)	940 + 16	ND	ND
Atlantic spadefish	235-360 (21)	300 + 6	ND	ND	ND	ND
Bearded brotula	ND	ND	560-610 (2)	585 + 18	ND	ND
Bigeye	ND	ND	260-285 (2)	270 + 9	ND	ND
Bluefish	355-540 (5)	445 + 27	ND	ND	ND	ND
Blue runner	305-570 (46)	405 + 12	330-415 (3)	380 + 21	ND	ND
Cobia	795-905 (2)	850 + 39	855 (1)	855	ND	ND

Table 4. (Cont'd.).

Species	Area 1		Area 2		Area 3	
	Size range	Length	Size range	Length	Size range	Length
Creole-fish	ND	ND	270-340 (8)	310 ± 9	ND	ND
Dog snapper	ND	ND	660 (1)	660	ND	ND
Florida smoothhound	ND	ND	870 (1)	870	ND	ND
Gafftopsail catfish	580-635 (2)	610 ± 19	ND	ND	ND	ND
Gray snapper	215-255 (3)	235 ± 10	305-430 (5)	385 ± 19	380-1100 (2)	740 ± 255
Gray triggerfish	205-540 (67)	355 ± 8	360-555 (11)	470 ± 17	285-490 (3)	420 ± 55
Greater amberjack	330-535 (25)	420 ± 12	265-1215 (120)	605 ± 17	875 (1)	875
King mackerel	675-1200 (3)	905 ± 127	860 (1)	860	ND	ND
Knobbed porgy	265-375 (20)	305 ± 7	260-395 (15)	330 ± 10	225-315 (2)	270 ± 32
Lane snapper	215-390 (126)	275 ± 3	ND	ND	230-350 (10)	280 ± 10

Table 4. (Cont'd.).

Species	Area 1		Area 2		Area 3	
	Size range	Length	Size range	Length	Size range	Length
Little tunny	ND	ND	630-655 (3)	640 ± 6	ND	ND
Pigfish	155-255 (10)	225 ± 10	ND	ND	ND	ND
Pinfish	225-350 (3)	280 ± 30	ND	ND	ND	ND
Queen triggerfish	ND	ND	480-605 (3)	530 ± 32	ND	ND
Rainbow runner	ND	ND	610 (1)	610	ND	ND
Red drum	825-1080 (15)	960 ± 15	ND	ND	ND	ND
Red snapper	190-775 (1575)	300 ± 1	235-905 (789)	350 ± 2	210-900 (700)	330 ± 2
Requiem sharks	845-1305 (19)	1025 ± 30	ND	ND	ND	ND
Rock sea bass	210-270 (2)	240 ± 21	270 (1)	270	ND	ND
Rock hind	290-345 (2)	320 ± 19	305-395 (6)	345 ± 11	220-365 (3)	315 ± 39

Table 4. (Cont'd.).

Species	Area 1		Area 2		Area 3	
	Size range	Length	Size range	Length	Size range	Length
Sandbar shark	ND	ND	ND	ND	730-940 (3)	870 ± 56
Sand seatrout	235-390 (30)	335 ± 7	ND	ND	ND	ND
Scamp	285-395 (7)	340 ± 12	285-875 (49)	475 ± 19	330-700 (7)	450 ± 53
Short bigeye	ND	ND	230 (1)	230	ND	ND
Silver seatrout	270-390 (84)	325 ± 3	ND	ND	335-340 (2)	340 ± 2
Spanish mackerel	410-580 (3)	480 ± 42	ND	ND	ND	ND
Squirrelfish	ND	ND	280-335 (6)	300 ± 8	ND	ND
Tattler	ND	ND	170 (1)	170	ND	ND
Tomtate	180-255 (45)	215 ± 3	225-270 (6)	250 ± 7	ND	ND
Vermillion snapper	190-340 (238)	240 ± 2	215-515 (873)	310 ± 2	ND	ND
Warsaw grouper	480-1085 (5)	675 ± 98	ND	ND	720-880 (3)	775 ± 43
Yellowedge grouper	ND	ND	325-500 (4)	385 ± 34	180-580 (5)	395 ± 58

Table 5. Total fish harvest (No.) by season (1 September-31 December; 1 January-14 May) by sport fishermen on bay headboats in three areas of the Texas coast (1 September 1982-14 May 1983). Number of surveys is in parenthesis.

Area <sup>a</sup>	Sand seatrout	Atlantic croaker	Kingfish sp.	Other	Total <sup>b</sup>
Area 1					
1 Sept-31 Dec (7)	21,746	1935	500	984	24,830
1 Jan-14 May (5)	1395	785	785	610	3575
Total (12)	23,141	2720	982	1594	28,405
Area 2					
1 Sept-31 Dec (9)	19,940	<500	1106	1138	22,405
1 Jan-14 May (6)	1524	0	<500	<500	2268
Total (15)	21,464	<500	1466	1522	24,673
Area 3					
1 Sept-31 Dec (5)	1260	<500	<500	<500	1533
1 Jan-14 May (9)	2260	<500	1200	3260	6740
Total (14)	3520	<500	1431	3281	8273
Total					
1 Sept-31 Dec (21)	42,946	2177	1534	2143	48,768
1 Jan-14 May (20)	5179	805	2345	4254	12,583
Total (41)	48,125	2982	3879	6397	61,351

<sup>a</sup> Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi; Area 3 = lower Laguna Madre.

<sup>b</sup> Due to rounding of numbers totals may not exactly equal individual species totals.

Table 6. Mean catch rate (No./man-h  $\pm$  1SE) of selected species of bay fishes retained by sport fishermen on bay headboats in three areas of the Texas coast (1 September 1982-14 May 1983). Number of surveys is in parenthesis.

Area <sup>a</sup>	Sand seatrout	Atlantic croaker	Kingfish sp.	Other	Total <sup>b</sup>
Area 1					
1 Sept-31 Dec (7)	1.00 $\pm$ 0.39	0.15 $\pm$ 0.07	0.01 $\pm$ 0.01	0.05 $\pm$ 0.04	1.21 $\pm$ 0.35
1 Jan-14 May (5)	0.06 $\pm$ 0.06	0.07 $\pm$ 0.06	0.04 $\pm$ 0.03	0.03 $\pm$ 0.02	0.20 $\pm$ 0.11
Area 2					
1 Sept-31 Dec (9)	1.95 $\pm$ 0.58	0.02 $\pm$ 0.01	0.11 $\pm$ 0.04	0.11 $\pm$ 0.05	2.19 $\pm$ 0.60
1 Jan-14 May (6)	0.32 $\pm$ 0.21	0.00	0.07 $\pm$ 0.02	0.08 $\pm$ 0.04	0.46 $\pm$ 0.20
Area 3					
1 Sept-31 Dec (5)	0.48 $\pm$ 0.20	0.01 $\pm$ 0.01	0.04 $\pm$ 0.02	0.01 $\pm$ 0.01	0.60 $\pm$ 0.21
1 Jan-14 May (9)	0.37 $\pm$ 0.19	<.01	0.21 $\pm$ 0.07	0.34 $\pm$ 0.23	0.92 $\pm$ 0.31
Total <sup>c</sup>					
1 Sept-31 Dec (21)	1.28 $\pm$ 0.31	0.09 $\pm$ 0.02	0.05 $\pm$ 0.01	0.07 $\pm$ 0.02	1.50 $\pm$ 0.18
1 Jan-14 May (20)	0.28 $\pm$ 0.11	0.04 $\pm$ 0.02	0.09 $\pm$ 0.01	0.11 $\pm$ 0.04	0.42 $\pm$ 0.06

<sup>a</sup>Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi; Area 3 = Lower Laguna Madre.

<sup>b</sup>Due to rounding of numbers totals may not exactly equal individual species totals.

<sup>c</sup>Weighted averages for all species, except sand seatrout, due to significant differences among areas (McEachron 1984).

Table 7. Size range and mean total length (nearest 5 mm + 1SE) of fishes retained by fishermen and measured on bay headboats in three areas of the Texas coast during 1 September 1982-14 May 1983. Number of fish measured is in parenthesis; ND indicates none measured.

Species	Area 1		Area 2		Area 3	
	Size range	Length	Size range	Length	Size range	Length
Atlantic croaker	150-285 (49)	205 + 5	220-305 (12)	255 + 9	155-290 (2)	220 + 48
Black drum	240-865 (13)	465 + 40	280-965 (16)	720 + 60	ND	ND
Gafftopsail catfish	ND	ND	490 (1)	490	445 (1)	445
Gulf kingfish	ND	ND	235-315 (6)	275 + 11	ND	ND
Pigfish	ND	ND	220-260 (4)	235 + 3	215-305 (14)	245 + 6
Pinfish	ND	ND	155-165 (3)	160 + 3	ND	ND
Red snapper	ND	ND	ND	ND	275 (1)	275
Sand seatrout	145-380 (298)	270 + 2	215-425 (664)	295 + 1	190-405 (140)	290 + 3
Sheepshead	ND	ND	ND	ND	270-380 (13)	305 + 9
Silver perch	ND	ND	175-180 (3)	180 + 1	ND	ND

Table 7. (Cont'd.).

Species	Area 1		Area 2		Area 3	
	Size range	Length	Size range	Length	Size range	Length
Southern flounder	275-400 (2)	340 ± 44	305-375 (2)	340 ± 25	360 (1)	360
Southern kingfish	235-395 (19)	305 ± 10	220-375 (73)	280 ± 4	200-375 (51)	305 ± 5
Spot	195-250 (3)	220 ± 13	ND	ND	ND	ND
Spotted seatrout	ND	ND	280-435 (44)	335 ± 5	ND	ND

Appendix A. List of inventoried Gulf and bay headboats  
(1 September 1982-14 May 1983).

Table 1. List of inventoried Gulf and bay headboats in three areas of the Texas coast (1 September 1982-14 May 1983). Name in parenthesis is city where boat is docked.

Boat type	Area <sup>a</sup>	Headboat name	Headboat code No.
Gulf	1	Bearcat (Freeport)	88
		Bluefin (Galveston) <sup>b</sup>	98
		Capt. Casey (Freeport)	90
		Cobia (Freeport)	97
		Lady Lori (Freeport)	89
		Miss Tamara (Freeport)	96
		Miss Vickie (Freeport)	94
		Nancy Ann (Galveston) <sup>b</sup>	99
		New Buccaneer (Galveston)	84
		Old Buccaneer (Galveston)	85
		Ranger V (Galveston)	93
		Texun II (Galveston)	87
		2	Dolphin (Port Aransas) <sup>c</sup>
	Kingfisher (Port Aransas) <sup>c</sup>		95
	Pelican (Port Aransas) <sup>c</sup>		84
	Pisces (Port Aransas) <sup>c</sup>		94
	Scat Cat (Port Aransas)		92
	Wharf Cat (Port Aransas)		83
	3	Hospitality (Port Isabel) <sup>d</sup>	87
		Thunderbird (Port Isabel)	82
	Bay	1	Dixie Queen (Galveston)
Judy Beth (Kemah)			95
Kemah Clipper (Kemah)			81
2		Capt. Clark (Corpus Christi)	89
		Star Trek (Corpus Christi)	91
		Whooping Crane (Rockport)	81
3		Albatros (Port Isabel)	83
		Danny B. (Port Isabel)	84
		Laguna Queen (Port Isabel)	81

<sup>a</sup>Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi; Area 3 = lower Laguna Madre.

<sup>b</sup>Private charter and TPWD personnel were not allowed on boat.

<sup>c</sup>Boat not actively seeking red snapper or fishing Gulf structures.

<sup>d</sup>Not included in this survey because of lack of owner cooperation.

Appendix B. List of common and scientific names of fishes identified on headboats (1 September 1982-14 May 1983).

Table 1. List of common and scientific names of species identified on bay and Gulf headboats in Texas during 1 September 1982-14 May 1983<sup>a</sup>.

Common name	Scientific name
African pompano	<u>Alectis ciliaris</u>
Almaco jack	<u>Seriola rivoliana</u>
Atlantic bonito	<u>Sarda sarda</u>
Atlantic croaker	<u>Micropogonias undulatus</u>
Atlantic spadefish	<u>Chaetodipterus faber</u>
Bearded brotula	<u>Brotula barbata</u>
Bigeye	<u>Priacanthus arenatus</u>
Black drum	<u>Pogonias cromis</u>
Bluefish	<u>Pomatomus saltatrix</u>
Blue runner	<u>Caranx crysos</u>
Cobia	<u>Rachycentron canadum</u>
Creole-fish	<u>Paranthias furcifer</u>
Dog snapper	<u>Lutjanus jocu</u>
Gafftopsail catfish	<u>Bagre marinus</u>
Gray snapper	<u>Lutjanus griseus</u>
Greater amberjack	<u>Seriola dumerili</u>
Hardhead catfish	<u>Arius felis</u>
Kingfish sp.	
Southern kingfish	<u>Menticirrhus americanus</u>
Gulf kingfish	<u>Menticirrhus littoralis</u>
King mackerel	<u>Scomberomorus cavalla</u>
Knobbed porgy	<u>Calamus nodosus</u>
Lane snapper	<u>Lutjanus synagris</u>
Little tunny	<u>Euthynnus alletteratus</u>
Pigfish	<u>Orthopristis chrysoptera</u>
Pinfish	<u>Lagodon rhomboides</u>
Rainbow runner	<u>Elagatis bipinnulata</u>
Red drum	<u>Sciaenops ocellatus</u>
Red snapper	<u>Lutjanus campechanus</u>
Sand seatrout	<u>Cynoscion arenarius</u>
Sea basses sp.	
Rock hind	<u>Epinephelus adscensionis</u>
Rock sea bass	<u>Centropristis philadelphia</u>
Scamp	<u>Myctoperca phenax</u>
Warsaw grouper	<u>Epinephelus nigritus</u>
Yellowedge grouper	<u>Epinephelus flavolimbatus</u>
Sharks sp.	
Atlantic sharpnose shark	<u>Rhizoprionodon terraenovae</u>
Florida smoothhound shark	<u>Mustelus norrisi</u>
Sandbar shark	<u>Carcharhinus plumbeus</u>
Unidentified requiem shark	<u>Carcharhinidae</u>

Table 1. (Cont'd.).

Common name	Scientific name
Sheepshead	<u>Archosargus probatocephalus</u>
Short bigeye	<u>Pristigenys alta</u>
Silver perch	<u>Bairdiella chrysoura</u>
Silver seatrout	<u>Cynoscion nothus</u>
Southern flounder	<u>Paralichthys lethostigma</u>
Spanish mackerel	<u>Scomberomorus maculatus</u>
Spot	<u>Leiostomus xanthurus</u>
Spotted seatrout	<u>Cynoscion nebulosus</u>
Squirrelfish	<u>Holocentrus ascensionis</u>
Tattler	<u>Serranus phoebe</u>
Tomtate	<u>Haemulon aurolineatum</u>
Triggerfish sp.	
Gray triggerfish	<u>Balistes capriscus</u>
Queen triggerfish	<u>Balistes vetula</u>
Unidentified lefteye flounder	<u>Bothidae</u>
Unidentified porgy	<u>Sparidae</u>
Vermilion snapper	<u>Rhomboplites aurorubens</u>

<sup>a</sup>Common and scientific names according to Robins (1980).

Appendix C. Percent of "other" fishes retained  
on headboats.

Table 1. Percent of "other" fishes retained by Gulf headboat fishermen in the Gulf of Mexico off three areas of the Texas coast (1 September 1982-14 May 1983).

Species	Area <sup>a</sup>			Total
	1	2	3	
African pompano	0	8	0	1
Almaco jack	0	26	0	2
Atlantic bonito	<1	3	0	<1
Atlantic croaker	<1	0	64	2
Atlantic spadefish	14	0	0	13
Bearded brotula	0	3	0	1
Bigeye	1	4	0	1
Black drum	<1	0	0	<1
Bluefish	5	0	0	5
Blue runner	36	4	0	32
Cobia	<1	1	0	<1
Creole-fish	0	11	0	1
Dog snapper	0	1	0	<1
Gafftopsail catfish	<1	0	0	<1
Gray snapper	<1	0	12	<1
King mackerel	<1	1	0	<1
Knobbed porgy	3	21	12	5
Little tunny	0	1	0	<1
Pigfish	1	0	0	1
Pinfish	1	0	0	1
Rainbow runner	0	1	0	<1
Red drum	2	0	0	2
Sand seatrout	8	0	0	7
Short bigeye	0	1	0	<1
Silver seatrout	14	0	12	13
Spanish mackerel	<1	0	0	<1
squirrelfish	<1	7	0	<1
Tattler	0	<0	0	<1
Tomtate	7	7	0	7
Unidentified lefteye flounder	<1	0	0	<1
Unidentified porgy	<1	0	0	<1

<sup>a</sup> Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi; Area 3 = lower Laguna Madre.

Table 2. Percent of "other" fishes retained by bay headboat fishermen in three areas of the Texas coast (1 September 1982-14 May 1983).

Species	Area <sup>a</sup>			Total
	1	2	3	
Black drum	57	19	0	13
Gafftopsail catfish	3	1	1	1
Hardhead catfish	23	0	0	3
Pigfish	6	14	88	54
Pinfish	0	4	0	1
Red snapper	0	0	1	1
Sheepshead	0	0	8	5
Silver perch	0	6	0	2
Southern flounder	8	2	1	2
Spot	3	0	0	1
Spotted seatrout	0	54	1	17

<sup>a</sup>Area 1 = Galveston-Freeport; Area 2 = Aransas-Corpus Christi; Area 3 = lower Laguna Madre.

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