The U.S. Gulf of Mexico Charter Boat Industry: Activity Centers, Species Targeted, and Fisheries Management Opinions

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Introduction

In managing fish stocks, management agencies need information on the various sectors of the recreational fishing industry. Access to some nearshore and offshore fishing resources requires the use of a boat. The three major means of accessing offshore recreational fishing involve private boats, party (or head) boats, and charter boats. Because of the disaggregate nature of the marine recreational fishing industry, understanding the total picture is difficult (Dubose and Radonski, 1984). Partitioning the industry offers a better approach to collecting data required by managers in support of decision making.

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ABSTRACT—The charter boat industry in U.S. Gulf of Mexico provides access to offshore fishing opportunities for about 570,000 passengers per year on 971 boats. A 25% random sample of charter boat operators was interviewed during 1987-88 to determine species targeted, percent time committed to targeting each species, and reactions to existing catch restrictions. Three-fourths of the charter boat fleet was in Florida, 13% in Texas, 5% in Louisiana, 4% in Alabama, and 2% in Mississippi. Responses were diverse regarding species focus within the region. Species of dominant importance included groupers, Epinephelus *sp. and* Mycteroperca sp. *(Fla.); snapper,* Lutjanus campechanus *(Ala., Fla., Miss., and La.); king mackerel,* Scomberomorus cavalla *(Miss., Tex., Ala. and Fla.); spotted seatrout,* Cynoscion nebulosus *(Tex. and La.); and red drum,* Sciaenops ocellatus *(Tex. and La). Catch restrictions were generally supported with higher levels of opposition to restricted high effort fish and/or one fish or closed fishery limits.*

Recent regulatory notices define a charter boat as "a vessel whose operator is licensed by the U.S. Coast Guard to carry paying passengers and whose passengers fish for a fee" (54 FR 29564). Most charter boats charge a group rate (generally >$300 for 6 passengers but sometimes offer a lower price for 3 or 4), restrict their carrying capacity to 6 passengers plus 2 crew members, and operate only when chartered by a person or group. Charter boat businesses are found in coastal areas adjacent to tourism destinations, major urban areas, and commercial fishing ports (Fraser et al., 1977). Charter boats generally solicit public business for offshore fishing trips. Charter boats operating in the Gulf of Mexico average in size from 26 feet in Texas to 42 feet in Alabama (Ditton et al., 1988; Holland and Milon, 1989). Most boats have twin engines with horsepower ratings ranging from 100 to 500.

Stock assessments reveal that many fish populations have declined dramatically as have numbers and sizes of fish caught (Bohnsack, 1989; Goodyear, 1988; Ralston, 1987; Russ and Alcala, 1989). Saltwater anglers, including those using charter boats, participated in a virtually unregulated recreational fishery prior to the 1980's (Ditton, et al., 1992). The classic tragedy of a common property resource (Hardin, 1968; Swanson et al., 1978) unfolded with dramatic increases in commercial and recreational harvest, electronic fish finders that enhance fish targeting capabilities, and an increasing number of anglers (Loomis and Ditton, 1988; Snepenger and Ditton, 1985).

In response, the Gulf of Mexico Fishery Management Council, for example, adopted fishery management plans (FMP) for reef fish (50 CFR 641), mackerels (50 CFR 642), red drum (50 CFR 653), and Atlantic billfishes (50 CFR 644) to regulate commercial and recreational fisheries including charter boat operators and customers. Fishery management councils make decisions based on their understanding of how fishing pressure will be modified and how potential regulations will impact each fishing sector. FMP's are required to provide "a description of the fishery, including, but not limited to, the number of vessels involved . . . the species of fish involved and their location, the costs likely to be incurred in management . . . any recreational interests in the fishery . . . [and] areas in which fishing was engaged in . . ." (16 U.S.C. 1853a). This information was not available when some regulations were promulgated.

An example of fisheries management actions affecting charter boats is the FMP and amendments for coastal migratory pelagics (50 CFR 642) impacting king mackerel, *Scomberomorus cavalla*, fishing. Before 1985, there were no limits on king mackerel in Fed-

eral waters. On 22 Sept. 1985, Gulf charter boat operators were restricted to a possession limit of 3 king mackerel per person per trip, excluding captain and crew or 2 king mackerels per person per trip including captain and crew, whichever is the greater (50 FR 34840). On 24 Aug. 1987, all charter boat operators targeting king mackerel were required to register with the National Marine Fisheries Service (NMFS) and obtain a king mackerel permit to target and retain this species. From 16 Dec. 1987 through 30 June 1988; 17 Dec. 1988 through 30 June 1989; 21 May 1990 through 30 June 1990; and 20 Dec. 1990 to 30 June 1991, NMFS implemented a zero bag limit prohibiting retention as recreational allocations were achieved. In addition, beginning July 1989 (54 FR 29564), selected charter boats were required to maintain daily fishing records and submit them weekly.

Harvest restrictions have the potential to impact charter boat businesses because of relatively high charter fees and their impact on angler expectations of catching fish. Charter boat businesses have nourished expectation for years with advertisements emphasizing catch. In a survey of 321 charter boat anglers, about half said "to catch a lot of fish" was at least a moderately important reason for taking their trip (Holland, 1988). "Wanting to catch a particular fish" was another important motivation for 64 percent of the anglers.

Fisheries regulations have been partially responsible for charter business failures (Ditton and Loomis, 1985; Ditton and Vize, 1987). Restrictions now exist on Spanish mackerel, *Scomberomorus maculatus*; red snapper, *Lutjanus campechanus*; grouper, *Epinephelus* sp. and *Mycteroperca* sp.; amberjack, *Seriola dumerili;* cobia, *Rachycentron canadum;* and red drum, *Sciaenops ocellatus*. Also, states have enacted regulations to restrict harvest in their waters (Gissendanner, 1982; Matlock, 1982). Discussions are continuing regarding the need for additional restrictions and closures to prevent overfishing and rebuild stocks (NMFS, 1990). In the face of proliferating fishing regulations in the Gulf, the main responses available to charter operators are to quit the charter business, resist current and new fishing regulations, and/or target other species. However, few offshore species have escaped regulation.

Managers need to know when and where charter boat fishing occurs so they can estimate potential economic and social impacts of fishery management rules. Charter boats are not only an important segment of the marine recreational fishing industry but an important component of the tourism economy in some communities (Manfredo et al., 1988; Roehl et al., 1989). Areas such as Islamorada, Panama City Beach, Destin, Orange Beach, South Padre Island, and Port Aransas receive significant direct and indirect economic impacts from fishing. Information on the regional distribution and numbers of charter boats would enhance understanding of the role of charter boats in tourism.

Previous research on charter boats has focused primarily on local economic impacts (Bell et al., 1982; Prochaska and Morris, 1977; Samples et al., 1984; Taylor et al., 1982). Other studies have focused primarily on catch data from specific areas (Brusher and Palko, 1985; Brusher et al., 1984; McEachron and Matlock, 1983). There have been a series of studies with a statewide focus but these are geographically and temporally scattered making comparisons and conclusions inconsistent (Ditton et al., 1978; Etzold et al., 1977; Falk et al., 1983; Lichtkoppler et al., 1987; Marshall and Lucy, 1981). Browder et al. (1978) published a more detailed picture of the charter boat industry, but it was limited to the Gulf coast of Florida. They studied charter boat activity centers, social and economic characteristics of operators, and the species targeted by season. This approach was partially replicated by Ditton et al. (1988) and Holland and Milon (1989) to portray charter boat characteristics and actions in the U.S. Gulf of Mexico. The data presented in this paper were taken from these two studies.

In 1985, the Gulf States Marine Fisheries Initiative program (MARFIN) was created to enhance the quantity and quality of available data on recreational and commercial fishing in the Gulf. Christmas et al. (1985) noted the following research needs: 1) "it is imperative to improve the marine recreational fisheries data base"; 2) "much of the information needed...to access the nature and impact of recreational fishing on these resources does not exist"; 3) "This situation is hindering and, in some cases, preventing the optimum use of the Gulf's fishing resources"; 4) "Accurate information on...recreational Charter and Party boats in the Gulf region ...does not exist or is not readily available even though such information would be a valuable tool for management purposes."

Because of inadequate knowledge of the industry, the importance of total economic and resource impacts and the need to understand the effect of increasing fishery management regulations, a Gulfwide study of the charter boat industry was undertaken in 1986. This paper describes the size and distribution of the charter fleet in the U.S. Gulf of Mexico, species targeted by state, estimated fishing pressure, and operator opinions on current regulations for select species.

Methods

Whereas the population of charter boats is constantly changing, estimates placed the number in the U.S. Gulf at between 800 and 1,000. The sampling frame was derived from the 1985 and 1986 charter boat lists maintained by the NMFS Southeast Fisheries Center, an inventory of charter boats maintained by the NMFS Southeast Regional Office and Panama City Laboratory, and on-site information provided by charter operators, NMFS, and project personnel. The final sample frame listed 971 boats. Charter boats were stratified by activity centers and randomly sampled. Letters or phone calls were used to contact operators to explain the intent of the survey and encourage participation. Sample sizes varied with the boat population in each state ranging from a 25 percent sample of the 736 charter boats in Florida to 66 percent of the 18 charter boats in Mississippi.

A 19-page interview schedule was developed to collect information on the operator's background and demographics, boat description, species information, operating policy, boat operation, business structure, community ties, and opinions on current regulations. The interview schedule was pretested and revisions made as a result of the pretest. In this paper, we focus on data concerning species targeted, percent time committed to targeting each species, and attitudes toward current catch restrictions on select species. First, for each boat sampled, operators were given a list of 23 species and asked to indicate which were targeted during each of the previous 12 months. Second, they were asked "what percent of your fishing time was devoted to targeting each of these species" during each of four 3-month periods. Percent time targeting selected species for each 3-month-period was additive to 100%. Finally, using a 5-point balanced Likert-type scale, operators were asked if they supported or opposed current recreational catch restrictions on six species.

Charter boat operators in Texas, Mississippi, and Alabama were interviewed by trained field personnel during May through August 1987. Operators in Florida were interviewed during February through July 1988. Each interview took 30-40 minutes per boat. In some cases, prior-contacted operators were unavailable and alternative captains were substituted. Interviews were completed with 145 of 736 charter boats in Florida, 19 of 38 in Alabama, 10 of 21 in Mississippi, 21 of 48 in Louisiana, and 50 of 128 in Texas. The overall final sample was 25% of the known population of charter boats.

Results

Three-fourths of the charter boats were located in Florida, 13% in Texas, and 11% in the northern Gulf states (Table 1; Fig. 1). Major activity centers in Florida were Key West, Islamorada, Naples, Ft. Myers Beach, Boca Grande, Clearwater, Panama City/Panama City Beach, Destin, and Pensacola. The three highest concentrations of charter boats were Destin, the Panama City/Panama City Beach area, and Islamorada. Major activity centers in the other four states included Orange Beach (Alabama), Grand Isle-Chauvin-Cocodrie-Houma (Louisiana), Port Aransas (Texas), and South Padre Island-Port Isabel (Texas).

Table 1.—Distribution of population of charter boats in the U.S. Gulf of Mexico by state and area.

State and area	Population No.	Percent
Texas		
1 Port Isabel-Port Aransas	90	
2. Rockport-Port Arthur	38	
Subtotal	128	13.2%
Northern Gulf states		
3. Louisiana	48	4.9
4. Mississippi	21	2.2
5. Alabama	38	3.9
Florida		
6. Panhandle	198	
7. West Peninsula	332	
8. Keys	206	
Subtotal	736	75.8
Grand total	971	100.0

By extrapolation, we estimated that charter boats made 142,000 trips/year and carried about 568,000 passengers during the previous 12 months. State extrapolations estimated 118,202 trips and 472,897 passengers for Florida; 12,813 trips and 51,252 passengers for Texas; 5,011 trips and 20,045 passengers for Louisiana; 3,975 trips and 15,900 passengers for Alabama; and 1,924 trips and 7,695 passengers for Louisiana. The mean number of trips per year was fairly consistent ranging from 93 in Mississippi to 128 in Florida with a weighted Gulfwide mean of 122 charter trips per year. Gulfwide, 63% of the trips were full-day trips and 33% of the passengers went between April

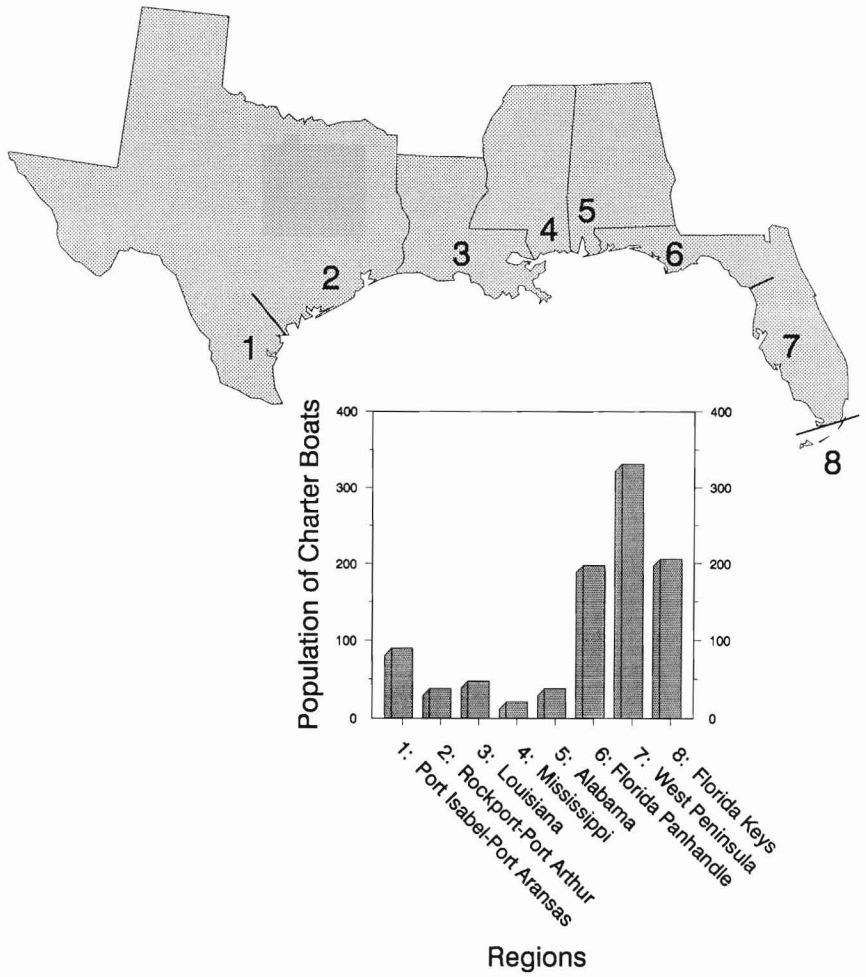

Figure 1.—Regional distribution of charter boats in the U.S. Gulf of Mexico.

and June, the heaviest season. A full 83% of the passengers utilized boats docked in Florida. Assuming 90% of the passengers fished for 5 hours of fishing/full day trip and 2.5 hours/half day trip, an estimated total of 2,085,000 hours of fishing was attributable to 511,000 anglers on charter boats annually.

The degree of species dependency varied across the region (Table 2). Most notable is the contrast between charter boats in Texas, Louisiana, and Alabama where 79%, 63%, and 47% of the boats, respectively, targeted <4 species, compared with Mississippi and Florida boats where 0 and 9%, respectively, targeted <4 species. In Mississippi, 50% of the boats targeted ≥8 species, while 56% targeted ≥8 species in Florida.

The species targeted by most (>500) boats include king mackerel, snapper, groupers, dolphin, *Coryphaena hippurus*; shark, *Carcharhinus* sp., and cobia (Table 3). Species sought by >350 but <500 boats included spanish mackerel; wahoo, *Acanthocybium solanderi*; sailfish, *Istiophorus platypterus*; blue marlin, *Makaira nigricans*; great barracuda, *Sphyraena barracuda*; blackfin tuna, *Thunnus atlanticus*; and white marlin, *Tetrapterus albidus*. Spotted seatrout, *Cynoscion nebulosus*, and red drum were relatively important to charter boat operators in Texas and Louisiana but only targeted by about 15 percent of the operators in Florida. Species targeted by most Florida operators included grouper, king mackerel, snapper, amberjack, dolphin, bonito, *Sarda sarda;* and shark. Since operators targeted several species, columns in Table 3 are not additive and hence percents would be meaningless.

Table 3.—Number of charter boats operating from Texas, Louisiana, Mississippi, Alabama (1986-87), Florida (1987-88), and the U.S. Gulf of Mexico by species targeted.

	Number of charter boats					
Species	Tex.	La.	Miss.	Ala.	Fla.	U.S. Gulf
Amberjack	5	6	4	15	539	569
Barracuda	5	2	2	2	371	382
Blackfin tuna	5	6	0	3	365	379
Blue marlin	9	2	0	2	388	401
Bluefin tuna	5	0	2	0	87	94
Bluefish	0	2	8	5	249	264
Bonito	9	0	8	7	481	505
Cobia	7	15	10	12	458	502
Dolphin	16	9	8	7	504	544
Flounder	5	0	0	2	156	163
Grouper	9	2	8	15	597	631
King mackerel	47	13	14	25	597	696
Ladyfish	2	0	2	3	191	198
Red drum	58	34	10	10	110	222
Sailfish	9	2	2	3	394	410
Shark	12	4	10	3	481	510
Snapper	26	21	8	32	562	649
Spanish mackerel	2	0	12	13	435	462
Spotted seatrout	65	32	4	3	99	203
Swordfish	2	0	2	2	116	122
Wahoo	5	2	2	3	411	423
White marlin	7	2	2	3	359	373
Yellowfin tuna	5	2	2	2	232	243

Estimates of mean percent time spent targeting each species by charter operators quantified the degree of variability across the region (Table 4). Each state has a few species that dominate targeting time such as spotted seatrout in Texas and Louisiana with red drum and snapper also strong; king and spanish mackerel in Mississippi; snapper and king mackerel in Alabama; and grouper, snapper, dolphin, and king mackerel in Florida. The table lists aggregate means for each state's sample of boats, and consequently reported averages may not reflect the individual actions of any one boat. Another indication of the extent of targeting diversity is the number of species receiving ≥2 percent of mean targeting time/state. Texas and Louisiana have 5 species that meet this criteria, Alabama, 8; Mississippi, 13; and Florida, 15.

An estimate of effort units by the population of charter boats revealed the Florida fleet dominated with 84% overall (Table 5). Species with the highest overall effort were (in descending order): Grouper, snapper, king mackerel, dolphin, amberjack, and spotted seatrout. These 6 species accounted for most (68%) of the estimated effort. Grouper, snapper, and amberjack received most of the effort in the Panhandle and Peninsula sections of Florida, king mackerel in the Panhandle and Keys of Florida, dolphin in the Florida Keys (and relatively little in the rest of the state), and spotted seatrout and red drum in Texas and Louisiana. Snapper was the dominant species in Alabama, and king mackerel, Spanish mackerel, and snapper received most of the effort by Mississippi operators.

As a final indication of orientation toward selected species, operators were asked to express opposition or support for current catch restrictions. At the time of the data collection, the following restrictions (Federal EEZ limits unless otherwise noted) were in place relative to charter fishing operations: King mackerel, three fish bag limit excluding captain and crew; Spanish mackerel, 12-inch fork length minimum size and four-fish bag limit; red snapper, 12-inch fork length minimum size limit with a five undersize fish tolerance and various state size and bag limits; cobia, 33-inch fork length minimum size; red drum, a one-fish EEZ bag limit existed which was reduced to zero on 1 Jan. 1988 and, at the state level, various size limits, bag limits, and closed seasons existed; spotted seatrout, no EEZ limits existed but various size and bag limits were operable at the state levels; bluefin tuna, annual retention of one bluefin greater than 77 inches fork

Table 2.—Distribution of number of species targeted by the number of charter boats in the U.S. Gulf of Mexico during a 1-year period by state.

No. of species targeted	Tex.		La.		Miss.		Ala.		Fla.		U.S. Gulf	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	18	13.8	5	10.4	0	0.0	4	10.5	17	2.3	44	4.5
2	36	27.8	14	29.2	0	0.0	4	10.5	29	3.9	83	8.5
3	49	37.8	11	22.9	0	0.0	6	15.8	23	3.1	89	9.2
4	5	3.8	5	10.4	2	10.0	4	10.5	23	3.1	39	4.0
5	5	3.8	2	4.2	2	10.0	4	10.5	52	7.1	65	6.7
6	5	3.8	0	0.0	2	10.0	4	10.5	46	6.3	57	5.9
7	3	2.3	0	0.0	4	20.0	4	10.5	41	5.5	52	5.4
8	3	2.3	0	0.0	2	10.0	0	0.0	23	3.1	28	2.9
9	3	2.3	9	18.7	0	0.0	2	5.3	35	4.7	49	5.0
10	0	0.0	2	4.2	2	10.0	0	0.0	41	5.5	45	4.6
>10	3	2.3	0	0.0	6	30.0	6	15.8	406	55.1	421	43.3
Totals	130[1]	100.0	48	100.0	20	100.0	38	99.9	736	100.0	972	100.0

[1]Because No.'s are extrapolated, there is some rounding error which accounts for slight deviations from state total No. reported in other tables.

Table 4.—Estimated mean percent time targeting selected species by charter boat operators in Texas, Louisiana, Mississippi, Alabama and Florida.

	Texas (n=48)		Louisiana (n=21)		Mississippi (n=9)		Alabama (n=21)		Florida (n=128)	
Species	$\bar{X}$	S.E.	$\bar{X}$	S.E.	$\bar{X}$	S.E.	$\bar{X}$	S.E.	$\bar{X}$	S.E.
Amberjack	0.5	0.3	0.8	0.5	0.9	0.8	5.5	2.1	7.7	0.9
Barracuda	0.3	0.3	0.0	0.0	0.8	0.8	0.2	0.2	3.3	0.7
Blackfin tuna	0.2	0.1	0.3	0.2	0.0	0.0	0.3	0.2	2.1	0.4
Blue marlin	1.4	0.8	0.0	0.0	0.0	0.0	0.2	0.2	2.8	0.6
Bluefin tuna	0.2	0.2	0.0	0.0	1.4	1.4	0.0	0.0	0.2	0.1
Bluefish	0.0	0.0	0.1	0.1	3.4	1.8	0.6	0.4	0.9	0.2
Bonito	0.8	0.5	0.0	0.0	2.0	1.1	1.2	0.7	3.8	0.9
Cobia	0.5	0.4	2.4	1.0	3.3	1.3	2.4	1.1	3.1	0.6
Dolphin	1.1	0.6	1.2	0.7	2.0	1.2	0.8	0.4	9.9	1.4
Flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	0.2
Grouper	2.0	0.7	0.0	0.0	2.2	1.2	5.0	1.7	15.6	1.8
King mackerel	11.3	2.6	3.4	1.4	11.3	4.4	12.1	3.3	9.3	1.2
Ladyfish	0.0	0.0	0.0	0.0	2.5	1.7	0.5	0.4	0.7	0.2
Red drum	17.3	3.0	14.0	3.5	6.2	2.9	2.2	1.2	1.4	0.5
Sailfish	0.8	0.5	0.0	0.0	2.8	2.8	0.5	0.3	6.8	1.1
Shark	0.4	0.2	1.0	0.9	3.7	1.7	0.5	0.4	5.6	1.1
Snapper	9.6	3.3	14.9	4.3	6.8	4.8	45.7	7.5	12.2	1.3
Spanish mackerel	0.2	0.2	0.0	0.0	10.3	4.7	2.7	1.0	3.7	0.6
Spotted seatrout	32.7	4.9	42.0	7.9	3.8	2.9	5.0	4.6	2.6	0.8
Swordfish	0.1	0.1	0.0	0.0	1.4	1.4	0.2	0.2	0.3	0.1
Wahoo	0.6	0.5	0.0	0.0	0.9	0.9	0.3	0.2	2.6	0.5
White marlin	1.1	0.8	0.0	0.0	2.8	2.8	0.5	0.3	2.4	0.7
Yellowfin tuna	0.2	0.2	0.0	0.0	1.4	1.4	0.2	0.2	0.7	0.2

length with no limits on smaller fish.

The majority of operators supported fishery regulations except in the case of closures or one-fish limits. There was 60% support for catch restrictions overall with a 78% support level for cobia minimum size limits (Table 6). There were greater levels of support in Mississippi and Alabama for all 6 species. Most opposition was in Texas and Alabama for red snapper minimum size and possession limits, Louisiana for the red drum one-fish limit, and Florida for king and Spanish mackerel and red drum regulations. The relatively high opposition to king and Spanish mackerel restrictions in Florida was probably a reaction to the closure of the recreational fishery for these two species between 16 Dec. 1987 and 30 June 1988 when the recreational allocation had been reached. Because of migratory pattern for these species, this closure affected Florida operators more than those in other States. Red drum opposition also reflected a total closure in effect for several months as well as the one-fish bag limit for Louisiana anglers.

Table 5.—Estimated effort units for species targeted by charter boats by state and region.

	Texas		Louisiana		Mississippi		Alabama		Florida		U.S. Gulf	
Species	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Amberjack	2[1]	0.1	5	0.2	4	0.6	82	4.0	4,150	8.8	4,243	7.5
Barracuda	2	0.1	0	0.0	2	0.3	<1	0.0	1,224	2.6	1,229	2.2
Blackfin tuna	1	0.0	2	0.1	0	0.5	1	0.1	767	1.6	771	1.4
Blue marlin	13	0.3	0	0.0	0	0.0	<1	0.0	1,086	2.3	1,100	1.9
Bluefin tuna	1	0.0	0	0.0	3	0.5	0	0.0	17	0.1	21	<0.1
Bluefish	0	0.0	<1	0.0	27	4.3	3	0.1	224	0.5	255	0.5
Bonito	7	0.2	0	0.0	16	2.5	8	0.4	1,828	3.9	1,859	3.3
Cobia	4	0.1	36	2.0	33	5.2	29	1.4	1,420	3.0	1,522	2.7
Dolphin	18	0.5	11	0.5	16	2.5	6	0.3	4,990	10.5	5,041	9.0
Flounder	0	0.0	0	0.0	0	0.0	<1	0.0	125	0.3	126	0.2
Grouper	18	0.5	0	0.0	18	2.9	75	3.7	9,313	19.7	9,424	16.8
King mackerel	531	13.3	44	2.0	158	25.0	303	15.0	5,552	11.8	6,588	11.7
Ladyfish	0	0.0	0	0.0	5	0.8	2	0.1	134	0.3	141	0.3
Red drum	1,003	25.0	476	21.0	62	9.8	22	1.0	154	0.3	1,717	3.0
Sailfish	7	0.2	0	0.0	6	1.0	2	0.1	2,679	5.7	2,694	4.8
Shark	5	0.1	4	0.2	37	5.9	2	0.1	2,694	5.7	2,742	4.9
Snapper	249	6.2	312	14.0	90	14.3	1,462	71.0	6,856	14.5	8,969	16.0
Spanish mackerel	<1	0.0	0	0.0	124	19.7	35	1.7	1,610	3.4	1,770	3.2
Spotted seatrout	2,126	53.1	1,344	60.0	15	2.4	15	0.7	257	0.5	3,757	6.7
Swordfish	<1	0.0	0	0.0	3	0.5	<1	0.0	35	<0.1	40	0.1
Wahoo	3	0.1	0	0.0	2	0.3	1	0.1	1,069	2.3	1,075	1.9
White marlin	8	0.2	0	0.0	6	1.0	2	0.1	862	1.8	878	1.5
Yellowfin tuna	1	0.0	0	0.0	3	0.5	<1	0.0	162	0.3	167	0.3
Total	3,999	100.0	2,234	100.0	630	100.0	2,050	100.0	47,208	100.0	56,129	100.0

[1]Effort units were calculated by multiplying the population of charter boats in each state (Table 1) by the mean percent time targeted for each species by the sample of charter boat captains in each state (Table 4).

Discussion

It appears there has been overall evenhandedness in controlling harvest throughout the U.S Gulf of Mexico. However, red drum limits have had a greater impact on Mississippi, Louisiana, and Texas operators, and mackerel closures have more seriously affected some Florida operators. Florida charter boats target the widest variety of species (50% of Florida operators fish for ≥12 species) with 77% of the effort focused on 7 species. These operators have more flexibility than those in other areas in targeting substitutes for restricted species. The Alabama and Mississippi charter boat operators are less varied. Notably, 79% of Alabama operators and 50% of Mississippi operators target ≤7 species. More specifically, 86% of the Alabama effort focused on two species, and 75% of the Mississippi effort focused on five species. In the western Gulf (Louisiana and Texas), targeting is concentrated with 63% of Louisiana operators and 79% of Texas operators targeting ≤3 species with 95% of Louisiana effort and 91% of Texas effort focused on three species. The inability of operators in some regions to substitute alternative species could lead to increased business failures.

In designing an allocation scheme, FMP's should consider factors such as economic and social consequences and dependence on the fishery by present participants and coastal communities (50 CFR 602.14 sect. c, iv). The Magnuson Fishery Conservation and Management Act of 1976 (16 USC 1801-1882), section 1851a4 states "Conservation and management measures shall not discriminate between residents of different states. If . . .

Table 6.—Percent of charter boat operators supporting or opposing catch restrictions for selected species in the U.S. Gulf of Mexico by state.

	Texas (n=49)		La. (n=19)		Miss. (n=9)		Alabama (n=19)		Florida (n=132)		U.S. Gulf (n=228)	
Species	%S[1]	%O[2]	%S	%O	%S	%O	%S	%O	%S	%O	%S	%O
Bluefin tuna	NA[3]		NA		NA		NA		50	11		
Cobia	67	7	66	22	78	11	84	0	70	14	78	14
King mackerel	72[4]	11	74	5	89	11	95	5	47	47	62	33
Red drum	88	8	75	25	89	11	84	11	47	25	61	21
Red snapper	49	18	58	11	88	0	79	21	61	14	65	12
Spanish mackerel	68	5	53	5	75	13	90	10	55	31	59	21
Spotted seatrout	79	14	75	20	100	0	69	5	NA			

[1]%S = Percent of operators supporting restrictions.
[2]%O = Percent of operators opposing restrictions.
[3]NA = Not asked.
[4]Residual percents are captains who were neutral.

necessary . . . allocation shall be fair and equitable to all such fishermen. . . and carried out in such a manner that no particular individual, corporation or other entity acquires an excessive share of such privileges." Section 1851a6 goes on to say: "Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishing resources, and catches." The data reported in this study establish a perspective from which decisions on these issues can begin to be made.

Each species-specific catch restriction will likely have differential impacts due to regional differences in species preference or dependence. Snapper dominates targeting in Alabama; king mackerel, Spanish mackerel, and snapper are the focus in Mississippi; spotted seatrout, red drum, and snapper are the primary targets in Louisiana, and spotted seatrout, red drum, and king mackerel are the dominant species in Texas. This information can be used to understand why opposition to existing and proposed management actions varies from one area to another.

Although the scope of charter fishing in the Gulf of Mexico is substantial (particularly in Florida), it is secondary to private boats. Estimates for the five Gulf states indicate that 44% of saltwater anglers fished from private boats and 23% from charter/party boats (USFWS, 1988, 1989). The National Marine Fisheries Service (NMFS, 1986) Marine Recreational Fishery Statistics Survey estimated the proportion of all trips in the U.S. Gulf of Mexico by private boats was 48% and 7% for charter/party boats. About 68% of the total number of fish caught was taken by anglers in private boats. Regulatory measures may be more effective with private boat owners since they account for a larger proportion of harvest. Also, private boat owners have greater latitude in coping with new regulations and their impacts than charter boat operators. Private boat operators do not have to "justify" a $400 fee with a sizeable catch, nor do they need to earn a living through fishing.

The economic benefits to charter operators and community businesses (hotels, restaurants, gas stations, bait shops, ice distributors, etc.) are substantial. By extrapolating expenditures per angler from a survey of 315 charter boat customers (Holland, 1988), we estimated $146 million in total direct expenditures by charter boat anglers in the U.S. Gulf of Mexico. Hiring a charter boat for a day of deep-sea fishing offers a desired vacation option, especially for inland residents. For most anglers, charter/party boat fishing is their only opportunity to experience offshore fishing or to access certain offshore gamefish. Although most highly developed in Florida, deep-sea fishing promotion is being increasingly developed as a tourist attraction in other Gulf states.

This paper provides baseline information on the current distribution of charter businesses in the U.S. Gulf of Mexico and their species targeting focus. The level of support for fishing regulations reported by operators indicates they understand the threatened condition of the resource. Further, they appear willing to support and abide by regulations, but report higher opposition to species closures and one or two fish bag limits for high-focus species. However, given the dynamics of stock deterioration and recovery, changes are likely in the charter boat industry. This study should be replicated over time to provide trend information regarding target species, effort, and attitudes regarding current and proposed regulations. This could provide a source of empirical information on how charter fishing businesses and anglers are likely to react to changing fisheries regulations in different areas of the Gulf. However, these data do not allow us to quantitatively predict the economic impact that proposed or existing regulations will have or are having on charter businesses and coastal economies. To determine this, we need a more definitive understanding of angler catch rate elasticities for species or species complexes. We need to know more about angler willingness and ability to substitute other species as targets. Understanding variations in angler satisfaction levels with reduced retention of targeted species must also be improved. These topics deserve priority in future research initiatives.

Acknowledgments

This research was supported by the Gulf of Mexico Marine Fisheries Initiative (MARFIN) administered by the National Marine Fisheries Service, NOAA. Additional funding support was provided by the Texas Agriculture Experiment Station and the University of Florida, Division of Sponsored Research. We appreciate the review comments of Robert G. Muller and Ronald L. Schmied. Also, we acknowledge the efforts of our coinvestigators John R. Stoll and J. Walter Milon, field interviewers and project support staff, and, most importantly, the charter boat operators who voluntarily answered our questions.

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