

**SOUTH CAROLINA  
MARINE RECREATIONAL  
FISH AND SHELLFISH  
FISHERY SURVEYS,  
1988**

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and  
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**PART I: COOPERATIVE  
SOUTH CAROLINA/NATIONAL MARINE  
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MARINE RECREATIONAL FISHERY  
STATISTICS SURVEY,  
1988**

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**INTRODUCTION**

South Carolina's marine resources are one of the state's most valuable assets. The 190 mile beachfront combined with rivers, creeks and estuaries offers an extremely diversified range of angling opportunities and outdoor experiences. Most anglers desire a diverse set of outcomes from their fishing experience and overall satisfaction may depend on a variety of factors other than catching fish. In addition to the social benefits of fishing, recent studies (Rockland and Southwick, 1990) identify sport fishing as an important business enterprise. Data for 1985 show that \$27.2 billion were spent directly on fishing related activities (saltwater and freshwater) by fishermen ages 16 and older, generating a total economic output of \$70.6

billion (Rockland and Southwick, 1990). Recent information suggests that recreational saltwater anglers annually spend \$187-\$200 million in South Carolina (Low, et.al, 1986; Low and Waltz, 1988).

Historically, saltwater fishing participation in South Carolina has been thought to approach 400,000 anglers per year. The state's growing coastal population is placing an increasing demand on marine resources, particularly in estuarine areas. In order for the Marine Resources Division (MRD) to properly conserve and manage these resources, detailed knowledge of fishery participation, catch and effort is needed. Since July 1987, MRD in cooperation with NMFS has conducted the Marine Recreational Fishery Statistics Survey (MRFSS) in South Carolina. The cooperative survey adopted overall methodology previously used by NMFS for the collection of regional statistics. Several procedures were modified and the number of MRFSS interviews was increased three-fold to improve the reliability of catch estimates at the state level. MRD personnel collected on-site interviews and conducted supplemental MRD sampling on an opportunistic basis. This report describes the survey effort and results for 1988.

**METHODOLOGY**

Survey methodology has been described by U.S. Dept. of Commerce (1987) and Low and Waltz (1988). The procedures used to derive expanded trip and catch estimates are explained in Witzig (1988). A

telephone survey is used to obtain information on participation and an on-site intercept survey (creel census) is used to collect catch, effort and demographic data. Information from the two surveys is combined to estimate total catch, effort and participation for two-month periods (waves) and three fishing modes (charterboat, shore fishing and fishing from a privately owned or rented vessel).

MRD personnel conducted the creel census at coastal public access points. The sampling schedule (provided by a NMFS subcontractor) was based on historical effort distribution by wave and fishing mode. Access sites were weighted by a usage rate factor and then chosen at random. Heavily used sites were more likely to be selected in this process. Within the private/rental mode, sample sizes were divided equally between the three major geographical areas of the state (Low and Waltz, 1988). Sampling was allocated approximately 60% on weekends and 40% on weekdays.

On a scheduled sampling day, the creel clerk proceeded to one of the sites. Upon collection of 30 interviews or judgment that further effort would be unproductive, the clerk then proceeded to another. Upon completion of the NMFS quota for the day, the clerk would continue with supplemental MRD sampling. Survey responses were voluntary and the personnel identity of all anglers was confidential.

Interviews were conducted with anglers who had completed fishing, except in the case of shore (pier, bridge, surf and

bank) fishermen, where one-half of the interviews for a particular day could be based on incomplete fishing trips. Each angler represented one interview. Interviews were conducted in accordance with procedures and guidelines established in the Intercept Interviewer Training Manual (1988 revision), using the 1988 finfish intercept questionnaire (OMB No. 0648-0052), 1988 finfish intercept coding form and 1988 Marine Resources Division form (appendix 1, 2 and 3).

Numbers of fish caught by species and disposition, hours spent fishing, species preferences, and general area fished were routinely reported. When feasible, up to 10 fish from all priority species were measured and weighed per catch.

During May-September three additional questions were incorporated into the survey (Appendix 4). The questions were asked of private boat and shore anglers to solicit their opinions on a proposed South Carolina saltwater fishing license.

## RESULTS AND DISCUSSION

### Annual Overview

During Jan - Dec 1988, a total of 6204 South Carolina households were contacted in the NMFS telephone survey, including 464 fishing households. An estimated 508,000 anglers made 1,759,000 saltwater fishing trips in South Carolina during 1988. Of these fishermen 32.9% were residents of coastal counties, 20.3% were non-coastal residents, and 46.8% were out-of-state residents. Most of the fishing trips (56.8%) were made by coastal residents

(Table 1). Out-of-state residents accounted for 26.3% of the effort and non-coastal residents took 16.9% of the total trips. Most of the fishing effort was in the private/rental boat mode (893,506 trips), followed by shore fishing (755,194 trips) and charterboat fishing (110,676 trips). In the private/rental fishing mode, most of the effort was attributed to coastal residents (69.6%), with the remainder split almost equally between non-coastal and out-of state residents. Coastal residents made 48.9% of the shore based fishing trips, out-of-state visitors 31.1% and non-coastal residents 20.0%. Most of the fishing trips on charterboats were made by out-of-state residents (75.9%), with non-coastal and coastal residents accounting for 15.8% and 8.3%, respectively.

Estimates for 1988 represent a 43% increase in the number of saltwater anglers and a 29% increase in the number of saltwater fishing trips over 1987 (Figures 1 and 2). Estimates derived from this survey have tended to fluctuate greatly from year to year, making interpretation difficult. If the anomalously high figures for 1982 and 1984 are removed, average annual participation is approximately 415,000 saltwater anglers, while the average number of saltwater trips taken was 1,358,000 per year. A trend line (1982 and 1984 were excluded) suggests that average annual participation has increased at a rate slightly less than 1% a year, while effort has increase approximately 3% per year.

Most anglers (86%)

interviewed in the survey were males. Anglers ranging from 20-39 years of age accounted for 51% of the males and 56% of the females interviewed. Youths under 16 years old accounted for 8%, while senior citizens greater than the age of 65 represented only 2% of the total.

King mackerel and red drum were the two most targeted species in 1988 (Table 2). Thirty-six percent (36%) of the anglers did not indicate any particular species preference.

The total recreational catch for 1988 was estimated to be 6,870,000 finfish, a 7% increase over the catch in 1987. Catches are broken down by species and fishing area in Table 3 and by species and disposition in Table 4. Estimates for the two previous years are also provided for comparison.

Landings of offshore pelagic species (dolphins, tunas, little tunny and bonito) continued to decrease. The 1988 estimated catch of these species was only 26% of the 1986 level. With the exception of bluefish and jack crevalle, catches of coastal pelagics increased or remained steady. King mackerel catches were up 63%, while catches of Spanish mackerel increased by 46% over 1987 estimates. Catches of bluefish were down 21% from catches of 1987. In 1988, landings of commonly caught offshore bottomfish were comparable to 1987 estimates. Black seabass continued to be the state's most important offshore bottom species. Notable increases in the catches of grunts have been seen since 1986.

Catches of inshore fish have varied widely since 1986.



Table 1. Estimated effort (in numbers of trips) in South Carolina during 1988 by wave and mode. No sampling is done during wave 1 (January - February).

Mode	Coastal Residents	Non-coastal Residents	Out-of-State Residents
Wave 2 (March-April)			
Shore	26,193	11,641	14,552
Charterboat	0	0	0
Private Boat	23,101	3,891	4,377
Wave 3 (May-June)			
Shore	88,996	41,774	32,693
Charterboat	2,928	6,317	23,882
Private Boat	175,177	34,163	34,890
Wave 4 (July-August)			
Shore	95,525	28,368	77,995
Charterboat	3,625	4,967	22,889
Private Boat	171,797	36,538	46,773
Wave 5 (September-October)			
Shore	123,177	49,078	85,315
Charterboat	2,603	6,225	37,240
Private Boat	121,259	30,492	30,728
Wave 6 (November-December)			
Shore	35,150	19,812	24,925
Charterboat	0	0	0
Private Boat	130,862	23,504	25,954

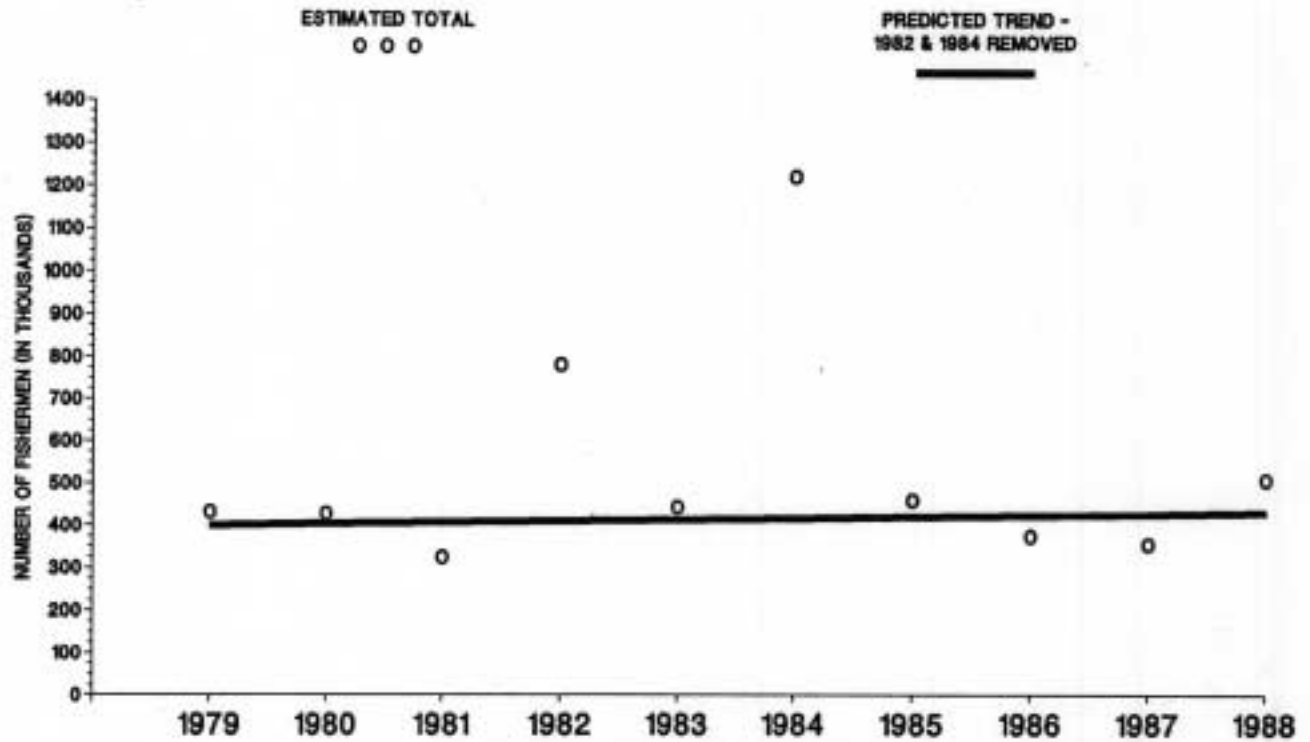


Figure 1. NUMBER OF PARTICIPATING MARINE RECREATIONAL FISHERMEN  
FROM 1979 TO 1988

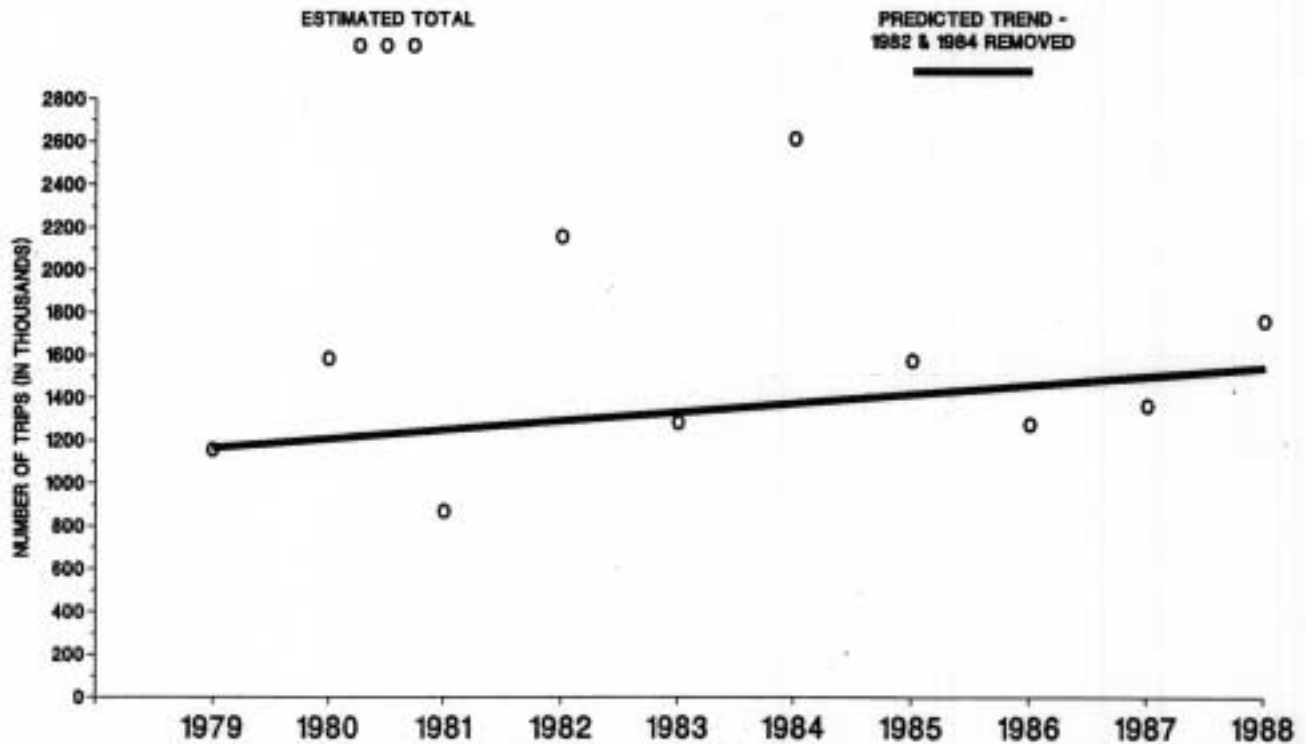


Figure 2. NUMBER OF TRIPS MADE BY RECREATIONAL FISHERMEN  
FROM 1979 TO 1988

Table 2. Top ten targetted finfish species during 1988.

Species	Percent	Rank
Anything	36.8%	
King mackerel	12.7%	1
Red drum	11.4%	2
Spotted seatrout	8.0%	3
Spot	5.3%	4
Flounders	4.9%	5
Sharks	4.6%	6
Spanish mackerel	3.4%	7
Sheepshead	2.4%	8
Black sea bass	2.3%	9
Cobia	2.0%	10

Table 3. Estimated catch (thousands of fish) of South Carolina recreational fishermen by fishing zone during 1988. Numbers are shown in thousands. Column totals are not necessarily additive due to rounding.

Species	Inshore	Coastal	Offshore
<u>Offshore Pelagics</u>			
Dolphin			26
Little tunny/bonito			18
Tunas/mackerels			3
<u>Offshore Bottomfish</u>			
Black sea bass	177	65	509
Sea basses			19
Groupers	1		2
Red snapper			1
Vermillion snapper			25
Red porgy			27
Other porgies			2
White grunt			6
Grunts			50
Triggerfish	<1	<1	1
Scup			<1
<u>Coastal Pelagics</u>			
King mackerel		5	112
Spanish mackerel	3	35	63
Bluefish	78	56	4
Jack crevalle	10	<1	2
Blue runner		1	1
Amberjacks			10
Barracuda		2	23
<u>Inshore Gamefish</u>			
Red drum	497	13	<1
Spotted seatrout	362	3	<1
Summer flounder	35	11	1
Southern flounder	87	14	<1
Flounders	13	4	
Weakfish	1		
Striped bass	3		
<u>Inshore Bottomfish</u>			
Kingfishes	79	350	6
Spot	685	1273	1
Croaker	184	67	
Black drum	10	2	4
Sheepshead	33	22	19
Pompano		56	
Other drums		1	



Table 3 (cont).

Species	Inshore	Coastal	Offshore
<u>Miscellaneous</u>			
Dogfish sharks	<1	<1	
Sharks	99	51	11
Skates/rays	27	9	
Eels	23	<1	
Freshwater catfish	<1		
Saltwater catfish	468	20	8
Toadfish	107	10	2
Searobins	9	19	<1
Pigfish	87	22	7
Pinfish	429	46	34
Silver perch	33		
White perch	5		
Puffers	6		
Others	58	40	58
TOTAL	3613	2200	1057

Table 4. Estimated total catch (in thousands of fish) by South Carolina recreational fishermen in 1986 - 1988. NR = none reported. Column and row totals are not necessarily additive due to rounding.

Species	Removed	Released	1988 Total	1987 Total	1986 Total
<u>Offshore Pelagics</u>					
Dolphin	26	0	26	<30	72
Little tunny/bonito	6	11	18	<30	34
Tunas/mackerels	1	0	1	<30	65
<u>Offshore Bottomfish</u>					
Black sea bass	284	467	750	732	531
Sea basses	<1	<1	<1	<30	<30
Grouper	3	<1	4	<30	<30
Vermillion snapper	24	<1	25	<30	<30
Other snappers	1	0	1	<30	<30
Red porgy	26	1	27	<30	<30
Other porgies	15	2	17	47	NR
Grunts	19	37	55	<30	NR
Triggerfish	1	<1	2	<30	<30
<u>Coastal Pelagics</u>					
King mackerel	116	<1	117	71	254
Spanish mackerel	90	12	101	69	163
Bluefish	79	60	139	117	159
Jack crevalle	6	6	12	63	69
Blue runner	2	1	2	<30	NR
Amberjacks	8	2	3	<30	33
Jacks	NR	NR	NR	<30	<30
Barracuda	9	16	25	<30	62
<u>Inshore Gamefish</u>					
Red drum	258	253	511	509	196
Spotted seatrout	300	67	367	444	576
Summer flounder	47	0	47	45	NR
Southern flounder	100	2	102	65	206
Flounders	3	14	17	30	NR
Weakfish	1	0	1	<30	78
<u>Inshore Bottomfish</u>					
Kingfishes	268	167	435	474	1,049
Spot	1,857	102	1,960	757	1,863
Croaker	141	111	252	227	616
Black drum	15	<1	16	<30	<30
Sheepshead	72	3	75	<30	70
Pompano	38	17	56	98	159
<u>Miscellaneous</u>					
Sharks	81	81	162	391	207
Skates/rays	3	33	36	45	32
Eels	9	15	24	<30	<30

Table 4 (cont).

Species	Removed	Released	1988 Total	1987 Total	1986 Total
Herrings	0	0	NR	<30	57
Catfishes	241	270	511	631	253
Toadfish	11	108	118	198	138
Searobins	0	29	29	<30	<30
Pigfish	27	90	117	95	<30
Pinfish	120	375	495	677	173
Silver perch	11	22	33	<30	<30
Mulletts	0	0	NR	90	84
Puffers	0	6	6	<30	70
Others	41	130	171	204	-
Total			6,870	6,416	7,527

In 1988 catches of red drum were essentially identical to catches in 1987, while the spotted seatrout catch has continued to decline since 1986. Flounder landings (especially southern flounder) improved over the 1987 level. Catches of spot and croaker were up from 1987 levels, while kingfish and pompano landings decreased. Sheepshead landings increased significantly in 1988, while shark landings were down 59% from 1987. Catches of most miscellaneous species, with the exception of pigfish, were also lower than 1987 estimates.

#### Shore Mode

A total of 721 shore-based anglers were interviewed. Although sampling was conducted at 26 sites, six locations accounted for 75% of the interviews (Table 5). Most anglers interviewed (83%) were fishing from piers, docks and bridges. Approximately 20% of these interviews were based on incomplete trips. Unless noted, all summary tables and discussion are based on interviews from completed as well as uncompleted fishing trips.

Most shore anglers (60%) had no target species. The percentage was similar between areas and waves, except in the northern region during wave 6. During November - December the majority of shore anglers (mostly pier fishermen) targeted the fall run of spot. Shore anglers expressing a preference listed spot, flounders, sharks, red drum, spotted seatrout and kingfishes in descending order of popularity. Species preference varied with region and wave

(Table 6).

Based on completed trips only, anglers in the northern region averaged the highest average number of hours fished per trip (Table 7). The typical trip in the north lasted 4.3 hours, while average trip duration in the central and southern areas was 2.4 and 2.9 hours, respectively. Most of the sampling in the north was at fishing piers requiring a fee to fish. Anglers willing to pay may represent a more dedicated group, willing to stick it out for longer periods of time. Anglers in the northern region also appeared to expend more effort in fall fishing as indicated by the average number of trips taken in the previous two month period (Table 7). Fall is the peak of the oceanic pier fishery. Elsewhere, except for the anomalously high figure for wave three in the central area, most shore-based effort, took place in summer and fall.

The average catch per angler and per angler hour (Table 7) indicated that anglers were most successful in the northern region and least successful in the central region. Overall catch rates for each region are given below:

	Average	
	Fish/hr	Fish/Angler
North	2.25	9.33
South	0.59	1.79
Central	0.31	0.75

Fishing success for the six most commonly preferred species in aggregate (spot, flounders, sharks, red drum, spotted seatrout and kingfishes) followed the same trend (Table 7). Unsuccessful

Table 5. Numbers of interviews collected by site during 1988 in the shore mode.

SITE	WAVE						TOTAL
	1	2	3	4	5	6	
NORTHERN REGION							
Kingfisher Pier		10	15	31	36	33	125
Cherry Grove Pier			9	37		20	66
Myrtle Beach. St. Pk.				1	23	21	45
Cherry Grove, 53rd Ave.					20		20
Pawleys Is., S. Shore				5			5
Huntington Beach. St. Pk.				4			4
Cherry Grove Boat Ramp					3		3
Capt. Dick's Marina				1			1
Subtotal		10	24	79	82	74	269
CENTRAL REGION							
Breach Inlet	11	1	3	61	33	34	143
Wappoo Cut Boat Ramp	4	2					6
Limehouse Bridge		1		5			6
Shem Creek		5					5
Live Oak Boat Ramp					3		3
Wild Dunes Yt. Cb.		2					2
Bowens Island		2					2
Charleston Battery			1			1	2
Church Creek Bridge			1				1
Subtotal	15	13	5	66	36	35	170
SOUTHERN REGION							
Broad River Pier		16	23	5	25	3	72
C. C. Haigh	11	29	1	6	23		70
Paradise Pier		1	28	20	17		66
Hunting Is. Lagoon	3	26				9	38
Port Royal Pier			9	12	2	6	29
Russ Point	3						3
Station Creek					2		2
Hilton Head Bridges		1					1
South Beach Marina					1		1
Subtotal	17	73	61	43	70	18	282

Table 6. Target species of shore-based anglers during 1988.  
Values are percentages.

WAVE 1				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything		47	59	53
Spotted seatrout		33	12	22
Spot		7	29	19
Red drum		13		6

WAVE 2				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	40	39	52	49
Spot	10	15	32	27
Red drum		23	3	5
Spotted seatrout		23	4	7
Shark			5	4
Bluefish	40			4
Kingfishes	10			1
Black sea bass			3	2
Flounder			1	1

WAVE 3				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	75	40	72	71
Shark		40	13	11
Flounder	4		10	8
Kingfishes	13		2	5
Red drum		20		1
Pinfish			3	2
King mackerel	8			2

WAVE 4				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	82	73	75	77
Flounder	3	14	15	9
Shark		4	10	4
Spot	6			3
Kingfishes	5			2
Spotted seatrout		5		2
Black drum		4		1
Red drum	3			1
King mackerel	1			1



Table 6 (cont.)

WAVE 5

SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	55	67	78	65
Flounder	10	11	6	9
Spot	13	11		8
Red drum	7		2	4
Bluefish	6	1		3
Sheepshead	5	11		4
Spotted seatrout			5	2
Kingfishes			3	1
Shark			3	3
Florida pompono	1		1	1
King mackerel	3			1

WAVE 6

SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Spot	73	44	17	57
Anything	19	41	61	31
Kingfishes	5			3
Red drum			22	3
Flounder		9		2
Pinfish		6		2
Bluefish	3			2

Table 7. Fishing effort and relative fishing success for the shore mode in 1988.

-----						
Northern Region						
Wave	1	2	3	4	5	6
-----						
Hrs. Fished *	-	42	94	217	228	244
Hrs. Fished	-	66	130	310	327	290
Mean Hrs./Trip *	-	8.4	6.3	3.8	4.0	4.3
No. Anglers *	-	5	15	57	57	60
No. Anglers	-	10	24	80	82	75
No. Anglers with 0 catches *	-	1	8	25	25	3
Finfish Catch (Numbers)						
Top Six Species -		10	82	285	39	1684
Total(All Species) -		15	100	343	196	1874
Average Catch						
Per Hr.	-	0.2	0.8	1.1	1.7	6.5
Per Angler	-	1.5	4.2	4.3	2.4	25.0
Mean Trips during previous two months -		3.2	4.2	2.4	4.4	6.1
-----						
Central Region						
Wave	1	2	3	4	5	6
-----						
Hrs. Fished *	25	21.5	8.5	173	46	58
Hrs. Fished	27	21.5	13.5	189	75	86
Mean Hrs./Trip *	1.8	1.6	2.8	3.0	1.8	2.3
No. Anglers *	14	13	3	57	26	25
No. Anglers	15	13	5	66	36	34
No. Anglers with 0 catches *	14	12	2	32	25	17
Finfish Catch (Numbers)						
Top Six Species 0		1	1	12	1	13
Total(All Species) 0		1	11	74	14	26
Average Catch						
Per Hr.	0.0	0.1	0.8	0.4	0.2	0.3
Per Angler	0.0	0.1	2.2	1.1	0.4	0.8
Mean Trips during previous two months 1.9		2.7	15.7	4.1	3.1	4.5

\* Completed trips only

Table 7 (cont). Fishing effort and relative fishing success for the shore mode in 1988.

Wave	Southern Region					
	1	2	3	4	5	6
Hrs. Fished *	38	175	145	110.5	193.5	44
Hrs. Fished	46	223	190.5	143	205	50
Mean Hrs./Trip *	2.5	3.1	3.0	3.0	3.2	2.7
No. Anglers *	17	59	48	37	66	16
No. Anglers	19	75	61	41	69	18
No. Anglers with 0 catches *	13	37	34	26	34	10
Finfish Catch (Numbers)						
Top Six Species	35	374	17	26	27	28
Total(All Species)	60	385	59	47	149	33
Average Catch						
Per Hr.	1.3	1.7	0.5	0.3	0.7	0.7
Per Angler	3.2	3.8	1.0	1.2	2.2	1.8
Mean Trips during previous two months	1.9	2.6	2.6	4.3	4.9	3.2

\* Completed trips only

anglers (no catch) were most commonly intercepted in the central region, where 74% of the anglers caught no fish. The nonsuccess rate was 63% in the south and 32% in the northern region.

Even though sampling was conducted during wave one (January - February) in the central and southern region, the high negative response rate encountered in the telephone survey precluded any expansions of the data for that period (Table 8). The six most preferred species (see above) accounted for approximately 77% of the total catch by number, with spot alone constituting 58%. Inshore gamefish (red drum and spotted seatrout) accounted for 1.6% of the total numbers caught. Miscellaneous species (excluding sharks), the bulk of the undesirable and discarded species, represented approximately 15% of the total catch.

#### Charterboat Mode

During March-December 1988, 829 interviews were obtained from charterboat anglers, including 34 MRD interviews (Table 9). The southern region accounted for 39% of the interviews. The central and the northern regions made up the remaining 36% and 25%, respectively. Most of the interviews were obtained at a few key sites. These sites represent marinas with well established chartering services. The chartering services are well advertized, typically book for several charterboats well in advance, have up-to-date, reliable schedules, and have been very cooperative in helping creel clerks schedule

sampling days. Charterboats from other marinas and independent charters have been difficult to contact, unreliable with frequent cancellations and changes, and thus impractical to sample. At least 44 charterboats were represented in the interviews.

Approximately 46.2% of the anglers spent 3 hours or less fishing, 44.3% spent 3.5 to 6 hours fishing, while 9.5% fished for over 6 hours. Shorter ( $\leq 3$ hr) trips were most common in the central and southern regions, while 21% of all trips in the north involved 6 hours or more of fishing. Most anglers (86%) reported fishing more than three miles offshore, 9.6% fished in coastal waters (0-3mi offshore) and 4.4% fished in inland waters. Most (94%) of the coastal and inland trips occurred in the southern area. Some effort was spent on artificial reefs during 45.7% of the total number of angler trips. Artificial reef fishing was most common in the central and southern region (47% and 34% respectively) and least common (6%) in the northern area.

About 43% of the charterboat fishermen reported no target species, including anglers seeking any bottom species as well as any surface species. When a preference was reported, king mackerel, black sea bass/sea bass, Spanish mackerel, bluefish, amberjacks, and sharks were the top six species groups in descending order. Spanish mackerel was often reported as an alternative target for king mackerel; however, it was seldom the primary target of the trip. King mackerel fishing dominated most waves in

Table 8. Estimated total catch in the shore mode by wave, as provided by NMFS. Catches are shown in thousands of fish.

Species	Mar- Apr.	May- June	July- Aug.	Sep.- Oct.	Nov.- Dec.	Total
<u>Offshore Bottomfish</u>						
Black sea bass		2		1	6	9
<u>Coastal Pelagics</u>						
King mackerel		2				2
Spanish mackerel				10		10
Bluefish	<1	9	22	21	<1	53
Atlantic spadefish				4		4
<u>Inshore Gamefish</u>						
Red drum			12	25	1	39
Spotted seatrout				3		3
Sheepshead			1	4		5
Summer flounder		5				5
Southern flounder	<1	15	5	1	4	25
Flounders		5				5
Seatrout				1		1
<u>Inshore Bottomfish</u>						
Kingfishes	<1	142	75	42	103	363
Spot	215	6	234	12	1072	1539
Croaker		7	16	50	3	76
Pompano			15	41		56
<u>Miscellaneous</u>						
Lizardfish				5		5
Sharks	3	20	20	9		52
Pigfish			3	4		6
Pinfish		33	57	25	8	123
Skates/rays	4	1	1	7		14
Eels	<1	7	4	10	<1	23
Freshwater catfishes			13			13
Saltwater catfishes	<1	36	12	62		110
Toadfish		9	10	3		22
Searobins	<1	3		3	16	23
Puffers	1	2				3
Others		49		3		52

Table 9. Numbers of interviews collected by site during 1988 in the charterboat mode.

SITE	WAVE						TOTAL
	1	2	3	4	5	6	
NORTHERN REGION							
Capt. Dick's Marina		32	104	54	80	14	284
Georgetown Landing			4			5	9
Harbor Gate Marina				3			3
Total	0	32	108	57	80	19	296
CENTRAL REGION							
Bohicket Marina		35	14	60	35	32	176
Wild Dunes Yt. Clb.			3	6		23	32
Buzzards Roost				1			1
Total	0	35	17	67	35	55	209
SOUTHERN REGION							
Harbortown Marina		6	46	22	44	24	142
Shelter Cove Marina			56	19	5	8	88
South Beach Marina				29	6		35
Fripp Is. Marina		4	20	1		6	31
Palmetto Bay Marina		22					22
Paradise Pier			6				6
Total	0	88	91	57	50	38	324



all regions except the southern (Table 10). Anglers in the southern region indicated a wider diversity of targets and also were most likely to target "anything". Most of the charterboat effort (85%) was general trolling directed at coastal pelagics (mostly mackerels). Approximately 8% of the effort was offshore bottomfishing (mainly for black sea bass and groupers) and approximately 2% was Gulfstream fishing (for tunas and sailfish). Many trips initially targeted a specific species (e.g. king mackerel) and ended bottomfishing for black sea bass, if mackerel fishing was slow.

Sampling was conducted during wave 1 (January - February), however because of low participation rates, no estimates were derived for that period. The average fishing time per charter statewide was 3.6 hours. Trip duration was highest in the northern region and lowest in the southern (Table 11). For most anglers, charterboat fishing was seldom pursued on a routine basis. Although some charterboats attract repeat business, commonly on an annual basis, most passengers are one time customers.

Charterboat fishing success is difficult to evaluate because of multispecies effort during many trips. Overall regional catch rates for king mackerel based on trips targeting king mackerel, spanish mackerel and "anything" were as follows. Catch rates for pelagics (including king mackerel) and bottomfish species were based on total trips.

#### Number of Fish/Trip North Cent South

King mackerel	1.96	.53	.07
Pelagics	2.34	.89	1.50
Bottomfish	4.54	1.86	.94

The average number of king mackerel caught per directed trip was greatest in the northern region and declined progressively to the south. This is partly reflected in the fact that anglers in the south made fewer trips directed at mackerel. The catch rate for aggregated pelagic species was more uniform, but still greatest in the northern region. Bottomfish catch rates also declined to the south. Anglers reporting no catch (Table 11) represented 32% and 33% of the participants questioned in the southern and central regions respectively, but were only 6% in the northern region.

Although sampling was conducted during waves 2 and 6, no expanded estimates were derived for these periods because of the low response rate to the telephone survey. King mackerel accounted for 27% and black sea bass 31% of the total catch (Table 12). The six most commonly targeted species in aggregate accounted for 74% of the catch by number. Approximately 27% of the total catch was released alive.

#### Private/Rental Boat Mode

Creel clerks obtained 1,577 interviews (including MRD interviews) in the private/rental boat mode. Sampling was conducted at 32 sites and was evenly distributed between the northern, central and southern districts (Table 13). Most of

Table 10. Target species of charterboat anglers during 1988. Values are percentages of responding anglers in each district.

WAVE 2				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	44	60	56	54
Bluefish			22	12
King mackerel	47	11		12
Black seabass		18	12	11
Amberjack			7	4
Grouper		11		3
Tuna	9			2
Spotted seatrout			3	2

WAVE 3				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	56	35	64	58
King mackerel	44	65	29	39
Cobia			1	1
Spanish mackerel			6	2

WAVE 4				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
Anything	21	36	32	30
King mackerel	70	55		42
Spanish mackerel			39	12
Shark			25	8
Sailfish		9		3
Black sea bass/sea bass	9			3
Tarpon			<2	<1
Bluefish			<2	<1
Mackerel			<2	<1

WAVE 5				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
King mackerel	72	89		54
Anything	28		82	38
Amberjack		11	12	6
Bluefish			6	2

Table 10 (cont.)

WAVE 6				
SPECIES	NORTH	CENTRAL	SOUTH	TOTAL
King mackerel		69		34
Anything	100	9	63	43
Black sea bass/sea bass		15	26	16
Spotted seatrout			8	3
Tuna		7		4
Red drum			3	<1

Table 11. Fishing effort and relative fishing success for the charterboat mode in 1988. There was no sampling during wave 1 (January - February).

Wave	Northern Region				
	2	3	4	5	6
Hrs. Fished	157.5	548.5	220.5	473.5	102.0
Mean Hrs./Trip	4.9	5.1	3.9	6.1	5.4
No. Anglers Interviewed	32	108	57	78	19
No. Anglers targeting mackerels/general trolling	29	108	52	74	9
No. Anglers with 0 catches	0	3	16	0	0
Finfish Catch (Numbers)					
King mackerel	80	252	54	139	7
All pelagics	114	298	67	200	8
All bottomfish	339	463	49	216	268
Inshore fish	-	-	-	-	-
Sharks	2	-	1	2	-
All fish	455	761	117	418	276
Mean Trips during previous two months	0	0.05	0	0	0

Wave	Central Region				
	2	3	4	5	6
Hrs. Fished	76.5	48.0	255.5	160.0	177.5
Mean Hrs./Trip	1.7	2.8	3.6	4.6	3.2
No. Anglers Interviewed	45	17	70	35	55
No. Anglers targeting mackerels/general trolling	21	17	61	31	43
No. Anglers with 0 catches	19	4	28	10	13

Table 11(cont.)

Central Region (cont.)

Finfish Catch (Numbers)					
King mackerel	-	5	27	7	52
All pelagics	-	19	76	34	69
All bottomfish	141	9	72	34	156
Inshore fish	-	-	1	-	-
Sharks	-	-	1	-	-
All fish	141	28	150	68	225
Mean Trips during previous two months	0.31	0	9.2	1.0	0.08

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	Southern Region				
Wave	2	3	4	5	6
Hrs. Fished	253.5	331.5	178.0	122.5	88.0
Mean Hrs./Trip	2.3	3.5	2.0	2.4	2.3
No. Anglers Interviewed	111	95	89	50	38
No. Anglers targeting mackerels/general trolling	49	90	41	41	24
No. Anglers with 0 catches	45	11	15	34	17
Finfish Catch (Numbers)					
King mackerel	-	14	1	3	-
All pelagics	222	204	136	23	9
All bottomfish	111	213	1	-	34
Inshore fish	14	7	7	8	38
Sharks	-	21	24	-	-
All fish	347	445	168	31	81
Mean Trips during previous two months	0.05	0.06	0	0	0

Table 12. Estimated total catches in the charterboat mode by wave, as provided by NMFS. Catches are shown in thousands of fish.

Species	May- June	July- Aug.	Sep.- Oct.	Total
<u>Offshore Pelagics</u>				
Dolphin	<1		3	4
Little tunny/bonito	1	1	8	10
Tunas/mackerels	1			1
<u>Offshore Bottomfish</u>				
Black sea bass	93	8	8	109
Red porgy	2	1	10	13
Other snappers	7	2	9	19
Groupers	<1		1	1
White grunt	<1			<1
Triggerfish	<1	<1	1	1
Sea basses	<1		1	2
Other grunts	1	5	2	8
<u>Coastal Pelagics</u>				
King mackerel	42	15	40	97
Spanish mackerel	25	12	3	39
Bluefish	4	<1	<1	4
Jack crevalle	1	2	1	4
Blue runner	3			3
Amberjacks	<1	1	6	6
Barracuda	1	6	5	12
<u>Inshore Gamefish</u>				
Red drum	<1	<1		<1
Spotted seatrout	1			1
<u>Inshore Bottomfish</u>				
Southern flounder	<1			<1
<u>Miscellaneous</u>				
Sharks	3	3	<1	6
Catfishes		<1	2	2
Toadfish		<1		<1
Pinfish	<1		4	4
Pigfish	<1			<1
Searobin	<1			<1



Table 13. Numbers of interviews collected by site during 1988 in private/rental mode.

SITE	WAVE						TOTAL
	1	2	3	4	5	6	
NORTHERN REGION							
Murrells Inlet Ramp	6	84	82	60	47	32	311
Cherry Grove Ramp		3	22	37	25	42	129
South Island			13	15	16		44
Georgetown City Ramp						14	14
Capt. Dick's Marina					1		1
Total	6	87	117	112	89	88	499
CENTRAL REGION							
Remley Point Ramp	8	25	16	25	41	36	151
Wappoo Bridge Ramp		24	37	25	6	6	98
Wild Dunes Ramp	4	7	16	24	4	16	71
Shem Creek Ramp		18	17	20	4		59
Folly Beach Ramp	1	21			5	12	39
Sol Legare Ramp			37				37
Breach Inlet Ramp	2	1			8	12	23
Limehouse Bridge Ramp		4		7	2	5	18
Bohicket Marina				1	8		9
Live Oak Ramp		1		3	4		8
Dawhoo Bridge Ramp					6		6
Tolers Cove Marina				6			6
Leads Ave. Ramp				6			6
Buzzards Roost Marina				1			1
Toogoodoo River Ramp					1		1
Total	15	101	123	118	89	87	533
SOUTHERN REGION							
C. C. Haigh Ramp	11	25	32	24	14	4	110
Port Royal Ramp	1	13	5	47	10	29	105
Russ Point Ramp	4	28	12	16	30	7	97
E. C. Glen Ramp	7		37	2	10	4	60
Broad River Ramp		7	30	7	10	4	58
Station Creek Ramp					24	33	57
All Joy Ramp	3		7	11		5	26
Fripp Is. Marina Ramp			16	7			23
Harbortown Marina			1	3			4
Ft. Frederick Ramp		3					3
Sams Point Ramp			1				1
South Beach Marina				1			1
Total	36	76	141	118	98	86	545

the interviews were obtained at public boat landings, with a very small number from wet slip marinas. No interviews were obtained from anglers leaving private access points.

Most (71.5%) of the anglers interviewed were fishing on inland (estuarine) waters. Approximately 18.4% of the anglers fished waters from 0 to 3 miles offshore and 10.1% fished greater than 3 miles offshore. The distribution of fishing effort by area was similar in each district. About 36.2% of the offshore oceanic angler trips were made to artificial reefs. Of the total offshore trips, 52.5% in the northern district and 42.1% in the southern district were made to artificial reefs. Slightly less than 12% of the offshore trips in the central district were to artificial reefs.

Approximately 26.1% of the anglers did not specify a target species. A few listed "any bottomfish" or "any surface species", but the majority targeted "anything". Red drum, spotted seatrout, king mackerel, sharks and flounders were the top five preferences in descending order. Sheepshead and cobia came in a very close sixth and seventh. Species preference varied with the time of year (wave) and region (Table 14). Sheepshead were common target species in the winter and early spring, especially in the central and southern regions. Cobia were an extremely popular target species in spring and early summer at a few sites in the southern region. King and Spanish mackerel and flounders were targeted mainly during the warmer summer months on into fall. King mackerel and

flounders were important target species in the northern region, while Spanish mackerel were most often targeted in the central and southern areas. Shark fishing was a summer activity that increased in popularity from the northern to the southern part of the state. Red drum and spotted seatrout were important fall and winter target species in all regions.

The average private/rental boat angler spent 3.78 hrs./trip fishing (Table 15). Average fishing time per trip was much greater in the northern district (4.50 hrs./trip), while anglers in the central and southern districts spent 3.50 hrs./trip and 3.45 hrs./trip, respectively. Fishermen claimed to take more trips in the central district and less trips in the northern district, with the majority of the effort being expending in the fall.

The average catch per angler trip, based on all trips, is given below by district for various species groups and all species combined:

	North	Cent	South
Red drum and	0.24	0.96	0.88
Spotted seatrout			
Top seven	0.54	1.24	1.28
targets			
All species	5.27	3.20	3.46

Anglers in the northern district caught the most fish per trip, however, when fishing success is viewed as the anglers' ability to catch more desirable species, the northern district ranked last (Table 15). The southern and central districts showed similar and. [continue](#)