Appendix C. Human Environment. Regulatory Amendment 12 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Note: The following information is taken from Snapper Grouper Amendment 18B; references are included in Amendment 18B.

Economic Description of the Commercial Fishery

Additional information on the commercial snapper grouper fishery is contained in previous amendments [Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2007), Amendment 15B (SAFMC 2008), and Amendment 16 (SAFMC 2008)] and is incorporated herein by reference.

Vessel, Harvest, and Revenue (1993-2010)

The golden tilefish portion of the snapper grouper fishery has seen a declining trend in the total number of trips taken and the number of vessels participating in the fishery since 1993 (Table 3-1). Snapper Grouper Amendment 6 (SAFMC 1993) reduced the quota of golden tilefish from approximately 1.8 million pounds to about 600,000 pounds. From 1993 to 1996, approximately 100 vessels per year participated in the fishery. By 2009 and 2010, that number had been reduced by approximately 50%. Regulatory actions in Amendment 6 (SAFMC 1993) account for the decrease in dealers that purchased golden tilefish from 1993 to 1994. From 1994 until 2010, there was a gradual trend in reducing the number of federally permitted snapper grouper dealers. The last year, 2010, saw only 13 dealers purchasing golden tilefish.

Table 3-1 also tracks changes over time in the dockside price per pound as well as total annual dockside revenue for golden tilefish. The columns labeled with "(nominal $)" indicate the price paid per pound or the overall annual revenue of golden tilefish using the value of that year's dollar. The columns labeled with "(2010 $)" indicate the price paid per pound or the overall annual revenue of golden tilefish using the value of the dollar in 2010. Dollar comparisons from one year to the next should only be made with dollar values in the "(2010 $)" columns as they are all on the same scale. Higher values in landings were associated with the larger landings in the earlier years of the time series where it was not unusual for landings to be valued at $1,000,000 or greater (2010 $). However, the higher total revenue figures in the early years were partially due to the greater number of pounds landed. When the price per pound is compared across years, there is a gradual trend shifting upwards over time. In 1993 the average price per pound paid for golden tilefish was $2.20 (2010 $). By 2010, that amount had increased to $3.02 (2010 $), or an increase of about 37% in price per pound value. This increase lead to the value of the 2010 fishery being the first time since 2000 that the fishery total revenue was greater than$1,000,000, in spite of lower quotas.

Table 3-1. Golden tilefish sector statistics, 1993-2010.

Year	Trips with a least one lb of GT	Number of Vessels that landed GT	Avg # trips taken per vessel	Number of Dealers that purchased GT	GT lbs, gutted weight	Dockside price per pound (nominal $)	Dockside price per pound (2010 $)	GT revenue (nominal $)	GT revenue (2010 $)
1993	869	107	8	90	1,190,353	$1.46	$2.20	$1,747,252	$2,636,670
1994	767	99	8	25	751,649	$1.69	$2.48	$1,266,321	$1,863,218
1995	688	102	7	19	623,048	$1.78	$2.54	$1,093,914	$1,565,187
1996	518	96	5	24	365,547	$2.01	$2.79	$707,401	$983,129
1997	554	91	6	22	346,966	$1.78	$2.42	$574,138	$780,026
1998	462	84	6	19	419,622	$1.85	$2.48	$763,541	$1,021,439
1999	553	84	7	20	520,650	$1.97	$2.58	$1,019,049	$1,333,792
2000	715	97	7	14	706,373	$2.10	$2.66	$1,467,817	$1,858,690
2001	472	87	5	20	437,705	$2.03	$2.49	$867,138	$1,067,671
2002	570	86	7	22	393,783	$2.07	$2.51	$792,300	$960,343
2003	397	65	6	20	309,851	$2.04	$2.42	$627,546	$743,696
2004	343	67	5	18	279,485	$2.09	$2.42	$572,598	$660,977
2005	358	66	5	15	324,127	$2.41	$2.69	$768,694	$858,261
2006	339	61	6	19	366,974	$2.40	$2.60	$894,157	$967,145
2007	595	67	9	15	285,431	$2.83	$2.97	$764,811	$804,331
2008	370	57	6	18	300,241	$2.68	$2.71	$769,115	$778,949
2009	384	49	8	14	313,311	$2.55	$2.60	$770,172	$782,805
2010	352	51	7	13	369,556	$3.02	$3.02	$1,097,989	$1,097,989

Source: NMFS Logbooks, October 19, 2011.

The 2009 and 2010 golden tilefish seasons were greatly truncated compared to previous years (Table 3-2). From October 2006 through July 2009, the quota was taken up earlier, by about a month sooner each subsequent year. In 2010 the season lasted only until mid April. Even averaged out across all five years in the series shown in Table 3-2, the majority of the quota was landed by the end of March.

Table 3-2. Golden tilefish landings in pounds (gw) by month, 2006-2010.

Month	Year 2006	2007	2008	2009	2010	Avg % by month	Cum % by month
January	26,605	34,105	73,243	86,393	106,000	20%	20%
February	16,602	48,914	37,872	61,961	142,923	19%	39%
March	23,370	47,668	40,025	68,952	94,493	17%	56%
April	47,427	56,296	63,085	46,042	9,137	14%	69%
May	68,986	15,397	49,190	12,717	-	9%	78%
June	44,829	4,814	5,936	30,016	-	5%	83%
July	13,714	5,498	7,583	7,154	16,796	3%	86%
August	32,030	30,513	19,088	-	-	5%	91%
September	42,667	41,701	162	6	70	5%	97%
October	50,696	455	34	26	138	3%	100%
November	49	70	103	-	-	0%	100%
December	-	-	3,921	43	-	0%	100%

Source: NMFS Logbooks, October 19, 2011.

Similarly, in Table 3-3 the value of the fishery closely tracks the landings, indicating there is minimal fluctuation in the value of fish caught in terms of its dockside price per pound regardless of when in the season it is caught. While the price per pound fluctuates between seasons, it is relatively stable within a given season. Based on information shown in Tables 3-2 and 3-3, the overall length of the season does not seem to influence the dockside value of the fish. Based on these data, it is not possible to tell what leads to price per pound fluctuations between years.

Table 3-3. Golden tilefish landings revenue by month, 2006-2010.

Month	Year 2006	2007	2008	2009	2010	Avg % by month	Cum % by month
January	$60,832	$89,672	$191,172	$214,782	$345,992	21%	21%
February	$40,340	$133,881	$79,580	$129,883	$404,508	18%	39%
March	$57,063	$123,328	$114,210	$155,892	$275,368	17%	56%
April	$122,665	$129,215	$159,353	$134,248	$31,055	13%	70%
May	$169,631	$41,993	$119,230	$31,609	-	8%	78%
June	$92,881	$14,436	$16,261	$83,222	-	5%	83%
July	$29,482	$17,460	$21,785	$20,370	$40,649	3%	86%
August	$82,121	$92,639	$54,888	-	-	5%	91%
September	$111,017	$120,631	$411	$24	$158	5%	97%
October	$128,079	$1,397	$101	$55	$258	3%	100%
November	$47	$158	$385	-	-	0%	100%
December	-	-	$11,740	$87	-	0%	100%

Source: NMFS Logbooks, October 19, 2011.

Table 3-4 shows the number of vessels for each year that landed at least one pound of golden tilefish aggregated into landings value groupings that allows one roughly to see the distribution of landings value while still maintaining confidentiality. Only one grouping in the table, $5,001 to $25,000 for 2006 had confidential information. In order to account for all participating vessels, the values from that grouping were added to those of the $1,001 - $5,000 grouping. All dollar value groupings in Table 3-4 are in nominal, non-inflated dollars.

Prior to 2007, at least 50% of all vessels that had at least one pound of golden tilefish, regardless of the total number of participating vessels, had less than $1,000 revenue from the fishery. A number of years had closer to 60% of the vessels with landings values less than $1,000. Roughly 9% to 22% of the vessels had annual revenue over $25,000 from the golden tilefish portion of the snapper grouper fishery with a few exceptions. Between 1993 and 2003 roughly 40% of vessels had landings revenue between $100 and $5,000. Beginning in 2004, vessels earning in that range increased to about 60% of the participating vessels.

Table 3-4. Total annual revenue from golden tilefish by numbers of vessels, 1993-2010.

Year	Up to $100	$100.01 - $1,000	$1,000.01 - $5,000	$5,000.01 - $25,000	More than $25,000	Total Vessels
1993	35	24	11	15	22	107
	33%	22%	10%	14%	21%	100%
1994	28	25	12	16	18	99
	28%	25%	12%	16%	18%	100%
1995	31	28	15	14	14	102
	30%	27%	15%	14%	14%	100%
1996	30	26	15	14	11	96
	31%	27%	16%	15%	11%	100%
1997	30	27	16	10	8	91
	33%	30%	18%	11%	9%	100%
1998	23	26	11	12	12	84
	27%	31%	13%	14%	14%	100%
1999	29	23	12	6	14	84
	35%	27%	14%	7%	17%	100%
2000	22	34	15	12	14	97
	23%	35%	15%	12%	14%	100%
2001	26	26	12	12	11	87
	30%	30%	14%	14%	13%	100%
2002	25	24	17	11	9	86
	29%	28%	20%	13%	10%	100%
2003	19	21	8	6	11	65
	29%	32%	12%	9%	17%	100%
2004	13	24	13	9	8	67
	19%	36%	19%	13%	12%	100%
2005	14	21	13	12	6	66
	21%	32%	20%	18%	9%	100%
2006	19	17	15	*conf.	10	61
	31%	28%	25%	-	16%	100%
2007	9	22	14	15	7	67
	13%	33%	21%	22%	10%	100%
2008	12	23	10	6	6	57
	21%	40%	18%	11%	11%	100%
2009	9	16	11	5	8	49
	18%	33%	22%	10%	16%	100%
2010	4	11	15	10	11	51
	8%	22%	29%	20%	22%	100%

(In 2010 dollars)
*confidential – data are combined with the "$1,000.01 - $5,000" category
Source: NMFS Logbooks, October 19, 2011.

Table 3-5 shows efficiency of targeting golden tilefish for the years 2006 – 2010 for vessels that landed at least one pound of golden tilefish. Vessels are aggregated according to the same groupings as in Table 3-4 based on the total value of the landed golden tilefish catch for that vessel for that year. Golden tilefish appear to be no more valuable per pound, on average, than the other fish sold on trips where golden tilefish were landed as indicated by the fact that the percent of pounds landed made up by golden tilefish was very close to the percent of the total value of the trips where golden tilefish were caught. It appears that vessels whose annual landings of golden tilefish is greater than $25,000 are adept at targeting the species with roughly 80-90% of landings comprised by golden tilefish on these trips. In general, participants in the golden tilefish portion of the snapper grouper fishery who have revenues greater than $5,000 tend to be longline vessels (reference Table 3-6). Many of the vessels landing up to $5,000 annually are not targeting golden tilefish specifically, but primarily land them as they are bottom fishing with hook and line or bandit gear for snappers and groupers, in general. All dollar value groupings in Table 3-5 are in nominal, non-inflated dollars.

Table 3-5. Average percent of pounds and value of the total catch of golden tilefish on trips by vessels where at least one pound of golden tilefish was caught by annual landings value groupings, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Number of vessels	Total Pounds	Percent of Overall Total Lbs
2006	Up to $100	19	430	0%
	$100.01 - $1,000	17	3,047	1%
	$1,000.01 - $5,000	15	18,607	5%
	$5,000.01 - $25,000	conf.*	conf.*	
	More than $25,000	10	344,890	94%
	Total	61	366,974	
2007	Up to $100	9	146	0%
	$100.01 - $1,000	22	2,380	1%
	$1,000.01 - $5,000	14	12,364	4%
	$5,000.01 - $25,000	15	57,505	20%
	More than $25,000	7	213,037	75%
	Total	67	285,431	
2008	Up to $100	12	273	0%
	$100.01 - $1,000	23	4,036	1%
	$1,000.01 - $5,000	10	13,408	4%
	$5,000.01 - $25,000	6	25,397	8%
	More than $25,000	6	257,126	86%
	Total	57	300,241	

Table 3-5. Continued. Average percent of pounds and value of the total catch of golden tilefish on trips by vessels where at least one pound of golden tilefish was caught by annual landings value groupings, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Number of vessels	Total Pounds	Percent of Overall Total Lbs
2009	Up to $100	9	182	0%
	$100.01 - $1,000	16	2,152	1%
	$1,000.01 - $5,000	11	10,807	3%
	$5,000.01 - $25,000	5	38,045	12%
	More than $25,000	8	262,125	84%
	Total	49	313,311	
2010	Up to $100	4	84	0%
	$100.01 - $1,000	11	1,223	0%
	$1,000.01 - $5,000	15	11,701	3%
	$5,000.01 - $25,000	10	31,607	9%
	More than $25,000	11	324,941	88%
	Total	51	369,556	

Source: NMFS Logbooks, October 19, 2011.

In each year from 2006 through 2010 roughly 10-20% of the vessels participating in the fishery account for 75-94% of the landings (Tables 3-5 and 3-6). Typically, these vessels use longline gear to land golden tilefish. Conversely, the majority of vessels with landings in the fishery harvest relatively small amounts. There is a significant hook and line component, however, even with the current regulations requiring a 300 lb trip limit after 75% of the ACL is caught, a number of longline vessels in the past have continued to fish the lower 300 lb trip limit which adds to the total annual revenue of longline vessels. All dollar value groupings in Table 3-6 are in nominal, non-inflated dollars.

Table 3-6. Pounds of golden tilefish landed by vessels in each annual value grouping, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Total Pounds Landed by All Vessels	Percent of Total Landings
2006	Up to $100	2,401	0%
	$100.01 - $1,000	19,844	2%
	$1,000.01 - $5,000	185,753	21%
	$5,000.01 - $25,000	conf.*	conf.*
	More than $25,000	686,159	77%
	Total	894,157	

Table 3-6. Continued. Pounds of golden tilefish landed by vessels in each annual value grouping, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Total Pounds Landed by All Vessels	Percent of Total Landings
2007	Up to $100	2,176	0%
	$100.01 - $1,000	22,675	3%
	$1,000.01 - $5,000	115,329	15%
	$5,000.01 - $25,000	193,795	25%
	More than $25,000	430,835	56%
	Total	764,811	
2008	Up to $100	3,803	0%
	$100.01 - $1,000	19,788	3%
	$1,000.01 - $5,000	65,004	8%
	$5,000.01 - $25,000	58,332	8%
	More than $25,000	622,188	81%
	Total	769,115	
2009	Up to $100	1,779	0%
	$100.01 - $1,000	21,206	3%
	$1,000.01 - $5,000	18,439	2%
	$5,000.01 - $25,000	198,694	26%
	More than $25,000	530,053	69%
	Total	770,172	
2010	Up to $100	1,615	0%
	$100.01 - $1,000	29,795	3%
	$1,000.01 - $5,000	89,934	8%
	$5,000.01 - $25,000	249,798	23%
	More than $25,000	726,847	66%
	Total	1,097,989	

*confidential – data are combined with the "$1,000.01 - $5,000" category
Source: NMFS Logbooks, October 19, 2011.

Vessels, Harvest, and Revenue by Gear (1993-2010)

The longline fishery dominates commercial landings of golden tilefish. Longline landings from 1993 through 2010 ranged from a low of 86% in 2007 to a high of 99% in 1993 (Table 3-7). In recent years, the longline fishery accounted for 93-95% of all golden tilefish landings. Clearly, the 300 lb trip limit was not enough to keep longline vessels out of the fishery. The total number of vessels for each year is less than the sum of the vessels by gear type as often vessels will land golden tilefish using multiple gears.

Table 3-7 shows by year the average landings, both pounds and value, for all vessels that participated in the fishery by gear. The average annual pounds landed by vessels using hook and line gear ranged from a low of 215 lbs in 1996 to a high of 774 lbs in 2010. Conversely, the average annual pounds landed by vessels using longline gear ranged from a low of 9,504 lbs in 1996 to a high of 30,234 lbs in 2006. Other gears that were used to land golden tilefish included fish traps, spears, and gill nets among others and landings from other gears made up a very small portion of the overall landings in each year.

Table 3-7. Golden tilefish sector statistics by gear, 1993-2010.

Year	Gear	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Vessels	Avg. Annual lbs (gw) by Vessel	Avg. Annual Revenue by Vessel (nominal $)	Avg. Annual Revenue by Vessel (2010 $)
1993	H & L	13,312	1%	$19,362	$29,218	61	218	$317	$479
	Longline	1,175,917	99%	$1,726,233	$2,604,951	48	24,498	$35,963	$54,270
	Other	1,123	0%	$1,657	$2,501	9	125	$184	$278
	Total	1,190,353		$1,747,252	$2,636,670	107	11,125	$16,329	$24,642
1994	H & L	18,339	2%	$30,655	$45,104	63	291	$487	$716
	Longline	731,683	97%	$1,232,983	$1,814,166	43	17,016	$28,674	$42,190
	Other	1,627	0%	$2,683	$3,947	8	203	$335	$493
	Total	751,649		$1,266,321	$1,863,218	99	7,592	$12,791	$18,820
1995	H & L	20,251	3%	$35,918	$51,392	72	281	$499	$714
	Longline	602,582	97%	$1,057,660	$1,513,314	35	17,217	$30,219	$43,238
	Other	216	0%	$336	$481	4	54	$84	$120
	Total	623,048		$1,093,914	$1,565,187	102	6,108	$10,725	$15,345
1996	H & L	13,540	4%	$28,259	$39,273	63	215	$449	$623
	Longline	351,646	96%	$678,416	$942,847	37	9,504	$18,336	$25,482
	Other	361	0%	$726	$1,010	4	90	$182	$252
	Total	365,547		$707,401	$983,129	96	3,808	$7,369	$10,241
1997	H & L	27,742	8%	$50,282	$68,313	71	391	$708	$962
	Longline	318,772	92%	$522,970	$710,509	25	12,751	$20,919	$28,420
	Other	451	0%	$885	$1,202	4	113	$221	$301
	Total	346,966		$574,138	$780,026	91	3,813	$6,309	$8,572
1998	H & L	24,262	6%	$44,139	$59,047	55	441	$803	$1,074
	Longline	393,479	94%	$715,730	$957,480	27	14,573	$26,509	$35,462
	Other	1,881	0%	$3,671	$4,912	8	235	$459	$614
	Total	419,622		$763,541	$1,021,439	84	4,995	$9,090	$12,160

Table 3-7. Continued. Golden tilefish sector statistics by gear, 1993-2010.

Year	Gear	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Vessels	Avg. Annual lbs (gw) by Vessel	Avg. Annual Revenue by Vessel (nominal $)	Avg. Annual Revenue by Vessel (2010 $)
1999	H & L	25,167	5%	$50,136	$65,621	56	449	$895	$1,172
	Longline	490,425	94%	$959,015	$1,255,216	22	22,292	$43,592	$57,055
	Other	5,058	1%	$9,898	$12,955	13	389	$761	$997
	Total	520,650		$1,019,049	$1,333,792	84	6,198	$12,132	$15,878
2000	H & L	36,493	5%	$77,264	$97,839	63	579	$1,226	$1,553
	Longline	666,420	94%	$1,382,013	$1,750,036	27	24,682	$51,186	$64,816
	Other	3,459	0%	$8,540	$10,814	19	182	$449	$569
	Total	706,373		$1,467,817	$1,858,690	97	7,282	$15,132	$19,162
2001	H & L	21,928	5%	$41,627	$51,254	57	385	$730	$899
	Longline	414,884	95%	$823,644	$1,014,119	28	14,817	$29,416	$36,219
	Other	892	0%	$1,866	$2,298	11	81	$170	$209
	Total	437,705		$867,138	$1,067,671	87	5,031	$9,967	$12,272
2002	H & L	39,463	10%	$77,611	$94,073	64	617	$1,213	$1,470
	Longline	349,833	89%	$705,723	$855,404	24	14,576	$29,405	$35,642
	Other	4,487	1%	$8,965	$10,866	12	374	$747	$906
	Total	393,783		$792,300	$960,343	86	4,579	$9,213	$11,167
2003	H & L	15,869	5%	$31,788	$37,671	50	317	$636	$753
	Longline	293,671	95%	$595,113	$705,261	17	17,275	$35,007	$41,486
	Other	311	0%	$645	$765	8	39	$81	$96
	Total	309,851		$627,546	$743,696	65	4,767	$9,655	$11,441
2004	H & L	22,062	8%	$47,496	$54,827	49	450	$969	$1,119
	Longline	257,360	92%	$524,924	$605,944	22	11,698	$23,860	$27,543
	Other	conf.	conf.	conf.	conf.	conf.	conf.	conf.	conf.
	Total	279,485		$572,598	$660,977	67	4,171	$8,546	$9,865

Table 3-7. Continued. Golden tilefish sector statistics by gear, 1993-2010.

Year	Gear	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Vessels	Avg. Annual lbs (gw) by Vessel	Avg. Annual Revenue by Vessel (nominal $)	Avg. Annual Revenue by Vessel (2010 $)
2005	H & L	33,854	10%	$81,428	$93,996	51	664	$1,597	$1,843
	Longline	288,688	89%	$683,323	$762,942	16	18,043	$42,708	$47,684
	Other	1,585	0%	$3,944	$4,403	11	144	$359	$400
	Total	324,127		$768,694	$858,261	66	4,911	$11,647	$13,004
2006	H & L	32,180	9%	$78,455	$84,859	54	596	$1,453	$1,571
	Longline	332,578	91%	$811,305	$877,530	11	30,234	$73,755	$79,775
	Other	2,216	1%	$4,397	$4,756	8	277	$550	$595
	Total	366,974		$894,157	$967,145	61	6,016	$14,658	$15,855
2007	H & L	38,921	14%	$113,021	$118,861	56	695	$2,018	$2,123
	Longline	245,477	86%	$648,832	$682,359	16	15,342	$40,552	$42,647
	Other	1,033	0%	$2,958	$3,111	6	172	$493	$518
	Total	285,431		$764,811	$804,331	67	4,260	$11,415	$12,005
2008	H & L	19,746	7%	$49,694	$50,329	46	429	$1,080	$1,094
	Longline	279,312	93%	$716,302	$725,461	13	21,486	$55,100	$55,805
	Other	1,183	0%	$3,119	$3,159	11	108	$284	$287
	Total	300,241		$769,115	$778,949	57	5,267	$13,493	$13,666
2009	H & L	13,745	4%	$35,852	$36,440	36	382	$996	$1,012
	Longline	298,975	95%	$733,103	$745,128	13	22,998	$56,393	$57,318
	Other	591	0%	$1,218	$1,238	5	118	$244	$248
	Total	313,311		$770,172	$782,805	49	6,394	$15,718	$15,976
2010	H & L	24,774	7%	$72,408	$72,408	32	774	$2,263	$2,263
	Longline	343,673	93%	$1,021,981	$1,021,981	22	15,622	$46,454	$46,454
	Other	1,109	0%	$3,600	$3,600	7	158	$514	$514
	Total	369,556		$1,097,989	$1,097,989	51	7,246	$21,529	$21,529

*confidential – data are combined with the "Longline" category
Source: NMFS Logbooks, October 19, 2011.

3.3.1.3 Vessels, Harvest, and Revenue by State (1993-2010)

Table 3-8 shows golden tilefish landings by state from 1993 through 2010. Landings from Georgia are combined with Florida because in many years there were no landings from Georgia. Landings from Georgia are confidential in nearly all years in which they occurred. In every year in the time series, except 1993 and 2004, Florida had more landings than all the other states combined. The highest concentration of landings percentages have been in Florida since 2007. In each of the last four years of the time series, Florida landed at least 86% of the entire golden tilefish quota.

Since 2007, the negative economic impacts of shortened seasons are proportionately less on Florida compared to other states. In fact, more fish are caught in Florida the shorter the season. The quota has remained the same for the past several years while the stock has been rebuilding. Consequently, the fact that there are more fish means the fish are caught more quickly in the season. Golden tilefish are more plentiful further north in their range in late summer and fall. When the golden tilefish portion of the snapper grouper fishery closes earlier in the calendar year as has been happening in recent years, vessels from the Carolinas did not land proportionally as much fish as in previous years unless they are willing to migrate south to participate in the fishery off the east coast of Florida when it occurs there when the fishery opens each year in January.

Table 3-8. Golden tilefish sector statistics by state, 1993-2010.

Year	State	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Participating Vessels	Avg. Annual lbs (gw) by State	Avg. Annual Revenue by State (nominal $)	Avg. Annual Revenue by State (2010 $)
1993	NC	100,037	8%	$166,163	$250,747	18	5,558	$9,231	$13,930
	SC	127,144	11%	$175,521	$264,867	21	6,054	$8,358	$12,613
	GA/FL-East	586,591	49%	$863,121	$1,302,482	60	9,777	$14,385	$21,708
	Other	376,580	32%	$542,447	$818,573	24	15,691	$22,602	$34,107
	Total	1,190,353		$1,747,252	$2,636,670	107	11,125	$16,329	$24,642
1994	NC	120,723	16%	$238,652	$351,144	22	5,487	$10,848	$15,961
	SC	145,879	19%	$227,819	$335,204	10	14,588	$22,782	$33,520
	GA/FL-East	421,528	56%	$698,187	$1,027,287	60	7,025	$11,636	$17,121
	Other	63,519	8%	$101,663	$149,583	16	3,970	$6,354	$9,349
	Total	751,649		$1,266,321	$1,863,218	99	7,592	$12,791	$18,820
1995	NC	72,420	12%	$136,087	$194,716	28	2,586	$4,860	$6,954
	SC	140,636	23%	$233,166	$333,618	11	12,785	$21,197	$30,329
	GA/FL-East	409,180	66%	$723,450	$1,035,122	57	7,179	$12,692	$18,160
	Other	812	0%	$1,210	$1,732	14	58	$86	$124
	Total	623,048		$1,093,914	$1,565,187	102	6,108	$10,725	$16,184
1996	NC	53,762	15%	$128,220	$178,198	18	2,987	$7,123	$9,900
	SC	64,579	18%	$85,054	$118,206	11	5,871	$7,732	$10,746
	GA/FL-East	194,913	53%	$396,414	$550,927	49	3,978	$8,090	$11,243
	Other	52,293	14%	$97,713	$135,799	26	2,011	$3,758	$5,223
	Total	365,547		$707,401	$983,129	96	3,808	$7,369	$10,241

1997	NC	35,774	10%	$80,576	$109,471	18	1,987	$4,476	$6,082
	SC	112,019	32%	$128,247	$174,236	12	9,335	$10,687	$14,520
	GA/FL-East	195,538	56%	$360,597	$489,908	50	3,911	$7,212	$9,798
	Other	3,634	1%	$4,718	$6,410	23	158	$205	$279
	Total	346,966		$574,138	$780,026	91	3,813	$6,309	$8,572
1998	NC	17,861	4%	$41,670	$55,745	16	1,116	$2,604	$3,484
	SC	101,498	24%	$165,725	$221,701	11	9,227	$15,066	$20,155
	GA/FL-East	241,860	58%	$457,050	$611,426	44	5,497	$10,387	$13,896
	Other	58,403	14%	$99,096	$132,568	19	3,074	$5,216	$6,977
	Total	419,622		$763,541	$1,021,439	84	4,995	$9,090	$12,160
1999	NC	5,021	1%	$10,580	$13,848	15	335	$705	$923
	SC	103,666	20%	$193,600	$253,395	9	11,518	$21,511	$28,155
	GA/FL-East	372,019	71%	$745,325	$975,525	47	7,915	$15,858	$20,756
	Other	39,944	8%	$69,544	$91,023	24	1,664	$2,898	$3,793
	Total	520,650		$1,019,049	$1,333,792	84	6,198	$12,132	$15,878
2000	NC	16,481	2%	$49,742	$62,988	13	1,268	$3,826	$4,845
	SC	134,142	19%	$247,132	$312,942	6	22,357	$41,189	$52,157
	GA/FL-East	529,985	75%	$1,124,114	$1,423,460	58	9,138	$19,381	$24,542
	Other	25,764	4%	$46,830	$59,300	29	888	$1,615	$2,045
	Total	706,373		$1,467,817	$1,858,690	97	7,282	$15,132	$19,162
2001	NC	16,574	4%	$31,185	$38,397	12	1,381	$2,599	$3,200
	SC	121,440	28%	$222,640	$274,128	7	17,349	$31,806	$39,161
	GA/FL-East	270,355	62%	$561,346	$691,163	50	5,407	$11,227	$13,823
	Other	29,336	7%	$51,966	$63,983	29	1,012	$1,792	$2,206
	Total	437,705		$867,138	$1,067,671	87	5,031	$9,967	$12,272

2002	NC	2,637	1%	$6,098	$7,508	14	188	$436	$528
	SC	156,879	40%	$285,292	$351,269	7	22,411	$40,756	$49,400
	GA/FL-East	207,892	53%	$453,433	$558,293	47	4,423	$9,648	$11,694
	Other	26,375	7%	$47,477	$58,457	27	977	$1,758	$2,131
	Total	393,783		$792,300	$975,527	86	4,579	$9,213	$11,167
2003	NC	14,764	5%	$40,600	$48,115	11	1,342	$3,691	$4,374
	SC	114,368	37%	$208,494	$247,084	10	11,437	$20,849	$24,708
	GA/FL-East	170,143	55%	$358,720	$425,115	29	5,867	$12,370	$14,659
	Other	10,576	3%	$19,731	$23,383	23	460	$858	$1,017
	Total	309,851		$627,546	$743,696	65	4,767	$9,655	$11,441
2004	NC	35,929	13%	$94,190	$108,728	6	5,988	$15,698	$18,121
	SC	93,357	33%	$170,761	$197,117	8	11,670	$21,345	$24,640
	GA/FL-East	112,661	40%	$243,286	$280,837	42	2,682	$5,793	$6,687
	Other	37,537	13%	$64,361	$74,295	17	2,208	$3,786	$4,370
	Total	279,485		$572,598	$660,977	67	4,171	$8,546	$9,865
2005	NC	688	0%	$1,227	$1,243	12	57	$102	$114
	SC	55,652	17%	$118,732	$120,250	8	6,957	$14,842	$16,571
	GA/FL-East	203,836	63%	$514,703	$521,285	41	4,972	$12,554	$14,016
	Other	63,951	20%	$134,031	$135,745	15	4,263	$8,935	$9,977
	Total	324,127		$768,694	$778,523	66	4,911	$11,647	$13,004
2006	NC	1,840	1%	$3,988	$4,313	9	204	$443	$479
	SC	109,290	30%	$243,853	$263,758	8	13,661	$30,482	$32,970
	GA/FL-East	253,010	69%	$640,610	$692,901	34	7,441	$18,841	$20,379
	Other	2,834	1%	$5,706	$6,172	16	177	$357	$386
	Total	366,974		$894,157	$967,145	61	6,016	$14,658	$15,855

2007	NC	1,383	0%	$3,904	$4,106	6	231	$651	$684
	SC	24,295	9%	$50,957	$53,590	4	6,074	$12,739	$13,398
	GA/FL-East	258,406	91%	$706,808	$743,331	46	5,618	$15,365	$16,159
	Other	1,347	0%	$3,141	$3,303	16	84	$196	$206
	Total	285,431		$764,811	$804,331	67	4,260	$11,415	$12,005
2008	NC	5,665	2%	$6,883	$6,971	7	809	$983	$996
	SC	17,427	6%	$38,326	$38,817	4	4,357	$9,582	$9,704
	GA/FL-East	276,322	92%	$722,068	$731,301	40	6,908	$18,052	$18,283
	Other	827	0%	$1,836	$1,860	11	75	$167	$169
	Total	300,241		$769,115	$778,949	57	5,267	$13,493	$13,666
2009	NC	1,972	1%	$6,030	$6,129	5	394	$1,206	$1,226
	SC	22,796	7%	$50,293	$51,118	4	5,699	$12,573	$12,780
	GA/FL-East	279,723	89%	$689,712	$701,025	39	7,172	$17,685	$17,975
	Other	8,820	3%	$24,136	$24,532	7	1,260	$3,448	$3,505
	Total	313,311		$770,172	$782,805	49	6,394	$15,718	$15,976
2010	NC	5,688	2%	$15,446	$15,446	4	1,422	$3,862	$3,862
	SC	28,331	8%	$79,101	$79,101	6	4,722	$13,183	$13,183
	GA/FL-East	318,118	86%	$961,283	$961,283	41	7,759	$23,446	$23,446
	Other	17,420	5%	$42,159	$42,159	6	2,903	$7,026	$7,026
	Total	369,556		$1,097,989	$1,097,989	51	7,246	$21,529	$21,529

Source: NMFS Logbooks, October 19, 2011.

Economic Activity

The commercial economic impacts associated with the harvesting of golden tilefish by U.S. commercial fishing vessels and the activities of the seafood and retail industries that depend on fish and seafood products can be estimated. These impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses). Using 2010 values, the harvesting sector accounted for 27 jobs, and $1,097,000 in income. When harvester data are combined with all aspects of the seafood industry (retail, restaurants, etc.) related to golden tilefish harvest, the values increase to 210 jobs, $6,161,000 in income, and $14,457,000 in output (Table 3-9).

Table 3-9. Impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses).

Species	Average Revenue (millions)1	Total Jobs	Harvester Jobs	Output (Sales) Impacts (millions)1	Income Impacts (millions)1
Golden Tilefish	$1.097	210	27	$14.457	$6.161

12010 dollars
Source: NMFS SERO

Economic Description of the Recreational Fishery
Additional information on the recreational sector of the snapper grouper fishery contained in previous or concurrent amendments is incorporated herein by reference [see Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Amendment 17A (SAFMC 2010a), Amendment 17B (SAFMC 2010b), Regulatory Amendment 9 (SAFMC 2011b), Comprehensive ACL Amendment for the South Atlantic Region (under review), Amendment 24 (under review)]. The following description of the recreational sector focuses on golden tilefish as this is the main species considered in this amendment.

The recreational sector is comprised of the private sector and for-hire sector. The private sector includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire sector is composed of the charterboat and headboat (also called partyboat) sectors. Charterboats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person.

Harvest
Recreational golden tilefish harvest in the South Atlantic was variable during the period 2005-2010. For this period, only Florida and North Carolina reported some harvest of the species, although there were years when no harvests were reported by these two states. On average, the private/rental (and shore – included in this mode but golden tilefish catches from private/rental

vessels and not shore) mode of fishing accounted for the largest harvests at 22,211 pounds (whole weight) or 4,842 fish (Table 3-10). Average charter harvests were 41,681 pounds (whole weight) or 11,444 fish. Headboats did not report any harvests of the species for the period.

Recreational harvests of golden tilefish also fluctuated from year to year for the period 2005-2010. On average, North Carolina accounted for most of the golden tilefish harvest in the South Atlantic at approximately 47,000 pounds whole weight, or 14,000 fish (Table 3-11). Florida accounted for harvests of approximately 17,000 pounds whole weight, or 3,000 fish. Georgia and South Carolina reported no harvest of the species during the period.

Table 3-10. Average harvest (whole weight) of golden tilefish in the South Atlantic, by mode, 2005-2010.

Harvest Type	Charterboat	Headboat	Shore and Private/Rental Boat	Total
Pounds (WW)	41,681	0	22,211	63,892
No. of Fish	11,444	0	4,842	16,286

Table 3-11. Average harvest (whole weight) of golden tilefish in the South Atlantic, by state, 2005-2010.

Harvest Type	Florida	Georgia	South Carolina	North Carolina
Pounds (WW)	17,106	0	0	46,786
No. of Fish	2,675	0	0	13,611

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab and MRFSS database, NOAA Fisheries, NMFS, SERO.

On average, overall harvest of golden tilefish peaked in July-August and troughed in January-February (Table 3-12). May and June were the peak months for charterboat harvests of golden tilefish harvest while July and August were the peak months for golden tilefish harvest by the shore/private mode. The lowest harvest occurred in January/February and November/December for charterboats and May/June for the shore/private mode.

There are observable differences between Florida and North Carolina on the specific months with recorded highest and lowest harvest of golden tilefish (Table 3-13). North Carolina had the highest harvest in July/August and lowest in January/February and November/December. Florida had its highest harvest in November/December and lowest in May/June.

Table 3-12. Average monthly distribution of golden tilefish harvest in the South Atlantic, by mode across all states, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Pounds (Whole Weight)											
Charter	0	0	467	467	10,072	10,072	9,428	9,428	873	873	0	0
Headboat	0	0	0	0	0	0	0	0	0	0	0	0
Shore/Priv.	585	585	1,672	1,672	399	399	4,012	4,012	1,547	1,547	2,891	2,891
Total	585	585	2,140	2,140	10,471	10,471	13,440	13,440	2,420	2,420	2,891	2,891
	Number of Fish											
Charter	0	0	93	93	2,940	2,940	2,425	2,425	265	265	0	0
Headboat	0	0	0	0	0	0	0	0	0	0	0	0
Shore/Priv.	143	143	130	130	79	79	1,309	1,309	172	172	588	588
Total	143	143	223	223	3,018	3,018	3,734	3,734	437	437	588	588

Table 3-13. Average monthly distribution of golden tilefish harvest in the South Atlantic, by state across all modes, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Pounds (Whole Weight)											
NC	0	0	467	467	9,947	9,947	12,106	12,106	873	873	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	585	585	1,672	1,672	524	524	1,335	1,335	1,547	1,547	2,891	2,891
TOTAL	585	585	2,140	2,140	10,471	10,471	13,440	13,440	2,420	2,420	2,891	2,891
	Number of Fish											
NC	0	0	93	93	2,903	2,903	3,544	3,544	265	265	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	143	143	130	130	115	115	189	189	172	172	588	588
TOTAL	143	143	223	223	3,018	3,018	3,734	3,734	437	437	588	588

Effort

Recreational effort derived from the MRFSS database can be characterized in terms of the number of trips as follows:

Target effort - The number of individual angler trips, regardless of trip duration, where the intercepted angler indicated that the species was targeted as either the first or the second primary target for the trip. The species did not have to be caught.
Catch effort - The number of individual angler trips, regardless of trip duration and target intent, where the individual species was caught. The fish caught did not have to be kept.
All recreational trips - The total estimated number of recreational trips taken, regardless of target intent or catch success.

Estimates of annual golden tilefish recreational effort in terms of target and catch trips are provided in Tables 3-14 through 3-17. Noticeable in these tables is the low levels of target and catch trips for golden tilefish. In addition, target trips are significantly lower than catch trips. While some angler trips recorded harvest of golden tilefish, much fewer angler trips recorded golden tilefish as a target species.

The private/rental mode recorded higher target and catch trips than the charter mode (Table 3-14), although both types of trips are relatively low which is consistent with the relatively low harvest of golden tilefish. Moreover, Florida recorded higher target and catch trips than North Carolina (Table 3-15). This effort distribution does not quite match with the harvest distribution described earlier. The shore mode did not report any target or catch trips.

Table 3-14. Average recreational effort (trips) for golden tilefish in the South Atlantic, by mode across all states, 2005-2010.

Type of Trips	Charterboat	Private/Rental Boat	Shore	Total
Target Trips	105	1,635	0	1,740
Catch Trips	1,975	2,719	0	4,694

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Table 3-15. Recreational effort (trips) for golden tilefish in the South Atlantic, by state across all modes, 2005-2010.

Type of Trips	Florida	Georgia	South Carolina	North Carolina
Target Trips	1,595	0	0	145
Catch Trips	2,432	0	0	2,262

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

On average, target trips and catch trips for golden tilefish peaked in November/December (Table 3-16). There were no target trips in July/August. Catch trips had their lowest level in February. Very low levels of charter target trips were recorded, with non-zero entries only in May/June and September/October. Although private target trips were higher than charter target trips, they were still relatively low and in fact were zero in May/June and July/August. A good portion of private target trips occurred in November/December. There were no charter catch trips in January/February and November/December, with most of the trips occurring in the summer months. Private catch trips were distributed throughout the year with relatively high levels in November/December and low levels in May/June.

The very low level of target trips in North Carolina took place only in May/June and September/October (Table 3-17). Target trips in Florida were substantially higher in

November/December than in other months; there were no target trips in May through August. Catch trips in North Carolina were substantially higher in July/August than in other months; there were no catch trips in January/February and November/December. Catch trips in Florida were spread throughout the year, with peaks in November/December and troughs in July/August.

Table 3-16. Average monthly distribution of recreational effort (trips) for golden tilefish in the South Atlantic, by mode across all states, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Target Trips												
Charter	0	0	0	0	35	34	0	0	18	19	0	0
Private	113	102	95	92	0	0	0	0	58	60	549	567
Shore	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	113	102	95	92	35	34	0	0	76	79	549	567
Catch Trips												
Charter	0	0	19	19	425	411	496	496	54	56	0	0
Private	158	142	134	130	80	77	275	275	131	135	581	600
Shore	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	158	142	154	149	505	488	771	771	184	190	581	600

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Table 3-17. Average monthly distribution of recreational effort (trips) for golden tilefish in the South Atlantic, by state across all modes, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Target Trips												
NC	0	0	0	0	35	34	0	0	37	39	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	113	102	95	92	0	0	0	0	39	40	549	567
TOTAL	113	102	95	92	35	34	0	0	76	79	549	567
Catch Trips												
NC	0	0	19	19	364	353	699	699	54	56	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	158	142	134	130	140	136	72	72	131	135	581	600
TOTAL	158	142	154	149	505	488	771	771	184	190	581	600

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Similar analysis of recreational effort is not possible for the headboat sector because the headboat data are not collected at the angler level. Estimates of effort in the headboat sector are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. Table 3-18 displays the annual angler days and Table 3-19 displays their average monthly distribution. Confidentiality issues required combining Georgia estimates with those of Northeast Florida.

Headboat angler days varied from year to year but generally declined since 2007 (Table 3-18). Southeast Florida registered the highest number of angler trips, followed by Georgia/Northeast Florida, South Carolina, and North Carolina. Clearly Florida dominated all other states in terms of headboat angler days.

On average, overall angler days peaked in July and troughed in December (Table 3-19). North Carolina and South Carolina had similar peaks and troughs as the overall average. Angler days in Georgia/Northeast Florida peaked in June and troughed in November while those in Southeast Florida peaked in April and troughed in September.

Table 3-18. South Atlantic headboat angler days, by state, 2005-2010.

	NC	SC	GA/NEFL	SEFL	TOTAL
2005	40,916	52,036	74,663	82,870	250,485
2006	25,736	56,074	48,908	126,614	257,332
2007	29,002	60,729	53,762	103,388	246,881
2008	16,982	47,287	52,521	71,598	188,388
2009	19,468	40,919	66,447	69,973	196,807
2010	21,071	44,951	53,676	69,986	189,684
Average	25,529	50,333	58,330	87,405	221,596

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab.

Table 3-19. Average monthly distribution of headboat angler days in the South Atlantic, by state, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NC	220	194	813	1,647	2,740	4,640	5,118	4,440	2,309	2,273	1,062	75
SC	153	272	1,828	3,791	5,201	9,772	12,245	8,949	3,603	3,031	1,337	153
GA/NEFL	2,668	3,423	5,672	6,380	6,056	8,402	8,229	5,688	3,175	3,173	2,637	2,826
SEFL	7,432	8,517	9,647	9,764	7,962	8,635	9,609	7,006	4,112	4,135	4,829	5,758
TOTAL	10,473	12,405	17,960	21,582	21,958	31,449	35,202	26,082	13,199	12,612	9,864	8,811

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab.

Permits

For-hire vessels are required to have a for-hire snapper grouper permit to fish for or possess snapper grouper species in the South Atlantic EEZ. The number of vessels with for-hire snapper grouper permits for the period 2005-2010 is provided in Table 3-20. This sector operates as an open access fishery and not all permitted vessels are necessarily active in the fishery. Some

vessel owners obtain open access permits as insurance for uncertainties in the fisheries in which they currently operate.

The number of for-hire permits issued for the South Atlantic snapper grouper fishery increased from 1,904 permits in 2005 to 2,104 permits in 2008, but subsequently decreased to 2,091 in 2009 and 1,815 in 2010. The majority of snapper grouper for-hire permitted vessels were home-ported in Florida; a relatively high proportion of these permitted vessels were also home-ported in North Carolina and South Carolina. Many vessels with South Atlantic for-hire snapper-grouper permits were homeported in states outside of SAFMC's area of jurisdiction, particularly in the Gulf states of Alabama through Texas. Although the number of vessels with South Atlantic for-hire snapper grouper permits homeported in states outside of SAFMC's area of jurisdiction increased from 2005 to 2009, they still accounted for approximately the same proportion (9-10%) of the total number of permits. For-hire snapper-grouper permits in these other areas fell in 2010.

Table 3-20. Number of South Atlantic for-hire snapper-grouper vessel permits, 2005-2010.

HomePort State	2005	2006	2007	2008	2009	2010	Avg.
North Carolina	294	317	353	399	391	333	348
South Carolina	136	142	152	160	167	147	151
Georgia	37	36	37	35	36	28	35
Florida	1,267	1,304	1,312	1,310	1,280	1,110	1,264
Gulf States (AL-TX)	102	84	79	84	87	84	87
Other States	68	84	93	116	130	113	101
Total	1,904	1,967	2,026	2,104	2,091	1,815	1,985

For hire permits do not distinguish charterboats from headboats. Based on a 1997 survey, Holland et al. (1999) estimated that a total of 1,080 charter vessels and 96 headboats supplied for-hire services in all South Atlantic fisheries during 1997. By 2010, the estimated number of headboats supplying for-hire services in all South Atlantic fisheries had fallen to 85, indicating a decrease in fleet size of approximately 11% between 1997 and 2010 (K. Brennan, Beaufort Laboratory, SEFSC, personal communication, Feb. 2011).

There are no specific permitting requirements for recreational anglers to harvest snapper grouper. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions.

Economic Value and Expenditures

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus. The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept.

These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips.

While anglers receive economic value as measured by the consumer surplus associated with fishing, for-hire businesses receive value from the services they provide. Producer surplus is the measure of the economic value these operations receive. Producer surplus is the difference between the revenue a business receives for a good or service, such as a charter or headboat trip, and the cost the business incurs to provide that good or service. Estimates of the producer surplus associated with for-hire trips are not available. However, proxy values in the form of net operating revenues are available (David Carter, NMFS SEFSC, personal communication, August 2010). These estimates were culled from several studies – Liese et al. (2009), Dumas et al. (2009), Holland et al. (1999), and Sutton et al. (1999). Estimates of net operating revenue per angler trip (2009 dollars) on representative charter trips (average charter trip regardless of area fished) are $146 for Louisiana through east Florida, $135 for east Florida, $156 for northeast Florida, and $128 for North Carolina. For charter trips into the EEZ only, net operating revenues are $141 in east Florida and $148 in northeast Florida. For full-day and overnight trips only, net operating revenues are estimated to be $155-$160 in North Carolina. Comparable estimates are not available for Georgia, South Carolina, or Texas.

Net operating revenues per angler trip are lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico (all states and all of Florida), and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenues are estimated to be $74-$77 in North Carolina. Comparable estimates are not available for Georgia and South Carolina.

The foregoing value estimates should not be confused with angler expenditures or the economic activity (impacts) associated with these expenditures. While expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), they do not represent the net value (benefits minus cost), nor the change in value associated with a change in the fishing experience.

Estimates of the economic activity (impacts) associated with recreational fishing for any species could be derived using average coefficients for recreational angling across all fisheries (species), as derived by an economic add-on to the MRFSS, and described and utilized in NMFS (2009). Business activity is characterized in the form of FTE jobs, income impacts (wages, salaries, and self-employed income), output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Job and output (sales) impacts are equivalent metrics across both the commercial and recreational sectors. Income and value-added impacts are not equivalent, though similarity in the magnitude of multipliers may result in roughly equivalent values. Neither income nor value-added impacts should be added to output (sales) impacts because this would result in double counting. Job and output (sales) impacts, however, may be added across sectors.

The current model to derive business activity is based on the number of recreational trips for a species. Because these trips for golden tilefish are relatively sparse (see Tables 3-14 through 3-19), estimates of economic activity generated by the recreational sector for the golden tilefish portion of the snapper grouper fishery reflect such sparse data. Estimates of the average golden tilefish recreational effort (2005-2010) and associated economic impacts (2008 dollars) are provided in Table 3-21. Target trips were used as the measure of recreational effort. As previously discussed, more trips may catch a species than target the species. Where such occurs, estimates of the economic activity associated with the average number of catch trips can be calculated based on the ratio of catch trips to target trips because the average output impact and jobs per trip cannot be differentiated by trip intent.

Table 3-21. Summary of golden tilefish target trips (2005-2010 average) and associated economic activity (2008 dollars). Output and value added impacts are not additive.

	North Carolina	South Carolina	Georgia	East Florida
	Shore Mode			
Target Trips	0	0	0	0
Output Impact	$0	$0	$0	$0
Value Added Impact	$0	$0	$0	$0
Jobs	0	0	0	0
	Private/Rental Mode			
Target Trips	40	0	0	1595
Output Impact	$2,183	$0	$0	$60,315
Value Added Impact	$1,231	$0	$0	$36,042
Jobs	0	0	0	1
	Charter Mode			
Target Trips	105	0	0	0
Output Impact	$40,875	$0	$0	$0
Value Added Impact	$22,939	$0	$0	$0
Jobs	1	0	0	0
	All Modes			
Target Trips	145	0	0	1595
Output Impact	$43,058	$0	$0	$60,315
Value Added Impact	$24,170	$0	$0	$36,042
Jobs	1	0	0	1

Source: Effort data from the MRFSS, economic activity results calculated by NMFS SERO using the model developed for NMFS (2009).

It should be noted that output impacts and value added impacts are not additive and the impacts for individual species should not be added because of possible duplication (some trips may target multiple species). Also, the estimates of economic activity should not be added across states to generate a regional total because state-level impacts reflect the economic activity expected to occur within the state before the revenues or expenditures "leak" outside the state, possibly to another state within the region. Under a regional model, economic activity that "leaks" from, for example, Florida into Georgia would still occur within the region and continue to be tabulated. As a result, regional totals would be expected to be greater than the sum of the individual state totals. Regional estimates of the economic activity associated with golden tilefish recreational fishing are unavailable at this time.

Because the headboat sector in the Southeast is not covered by the MRFSS, the current model used in deriving estimates could not provide this sector's estimates of economic activity. In the particular case of golden tilefish, estimating economic activity of the headboat sector is also unnecessary because this sector did not report any landings of the species during the period considered.

Financial Operations of the Charter and Headboat Sectors

Holland et al. (1999) estimated that the charterboat fee in the South Atlantic ranged from $292 to $2,000. The actual cost depended on state, trip length, and the variety of services offered by the charter operation. Depending on the state, the average fee for a half-day trip ranged from $296 to $360, for a full day trip the range was $575 to $710, and for an overnight trip the range was $1,000 to $2,000. Most (>90%) Florida charter operators offered half-day and full-day trips and about 15% of the fleet offered overnight trips. In comparison, only about 3% of operations in the other South Atlantic states offered overnight trips.

For headboats, the average fee in Florida was $29 for a half-day trip and $45 for a full day trip. For North and South Carolina, the average base fee was $34 per person for a half-day trip and $61 per person for a full day trip. Most of these headboat trips operated in Federal waters in the South Atlantic (Holland et al. 1999).

Capital investment in charter vessels averaged $109,301 in Florida, $79,868 for North Carolina, $38,150 for South Carolina and $51,554 for Georgia (Holland et al. 1999). Charterboat owners incur expenses for inputs such as fuel, ice, and tackle in order to offer the services required by their passengers. Most expenses incurred in 1997 by charter vessel owners were on crew wages and salaries and fuel. The average annual charterboat business expenditures incurred was $68,816 for Florida vessels, $46,888 for North Carolina vessels, $23,235 for South Carolina vessels, and $41,688 for vessels in Georgia in 1997. The average capital investment for headboats in the South Atlantic was approximately $220,000 in 1997. Total annual business expenditures averaged $135,737 for headboats in Florida and $105,045 for headboats in other states in the South Atlantic.

The 1999 study on the for-hire sector in the Southeastern U.S. presented two sets of average gross revenue estimates for the charter and headboat sectors in the South Atlantic (Holland et al.,

1999). The first set of estimates were those reported by survey respondents and were as follows: $51,000 for charterboats on the Atlantic coast of Florida; $60,135 for charterboats in North Carolina; $26,304 for charterboats in South Carolina; $56,551 for charterboats in Georgia; $140,714 for headboats in Florida; and $123,000 for headboats in the other South Atlantic states (Holland et al., 1999). The authors generated a second set of estimates using the reported average trip fee, average number of trips per year, and average number of passengers per trip (for the headboat sector) for each vessel category for Florida vessels. Using this method, the resultant average gross revenue figures were $69,268 for charterboats and $299,551 for headboats. Since the calculated estimates were considerably higher than the reported estimates (22% higher for charterboats and 113% higher for headboats), the authors surmised that this was due to sensitivity associated with reporting gross receipts, and subsequent under reporting. Alternatively, the respondents could have overestimated individual components of the calculated estimates. Although the authors only applied this methodology to Florida vessels, assuming the same degree of under reporting in the other states results in the following estimates in average gross revenues: $73,365 for charterboats in North Carolina, $32,091 for charterboats in South Carolina; $68,992 for charterboats in Georgia; and $261,990 for headboats in the other South Atlantic states.

It should be noted that the study's authors were concerned that while the reported gross revenue figures may be underestimates of true vessel income, the calculated values could overestimate gross income per vessel from for-hire activity (Holland et al., 1999). Some of these vessels are also used in commercial fishing activities and that income is not reflected in these estimates.

A more recent study of the North Carolina for-hire fishery provides some updated information on the financial status of the for-hire fishery in the state (Dumas et al., 2009). Depending on vessel length, regional location, and season, charter fees per passenger per trip ranged from $168.14 to $251.59 for a full-day trip and from $93.63 to $123.95 for a half-day trip; headboat fees ranged from $72.50 to $81.78 for a full-day trip and from $38.08 to $45 for a half-day trip. Charterboats generated a total of $55.7 million in passenger fees, $3.2 million in other vessel income (e.g., food and beverages), and $4.8 million in tips. The corresponding figures for headboats were $9.8 million in passenger fees, $0.2 million in other vessel income, and $0.9 million in tips. Non-labor expenditures (e.g., boat insurance, dockage fees, bait, ice, fuel) amounted to $43.6 million for charterboats and $5.3 million for headboats. Summing across vessel lengths and regions, charter vessels had an aggregate value (depreciated) of $120.4 million and headboats had an aggregate value (depreciated) of $10.2 million.