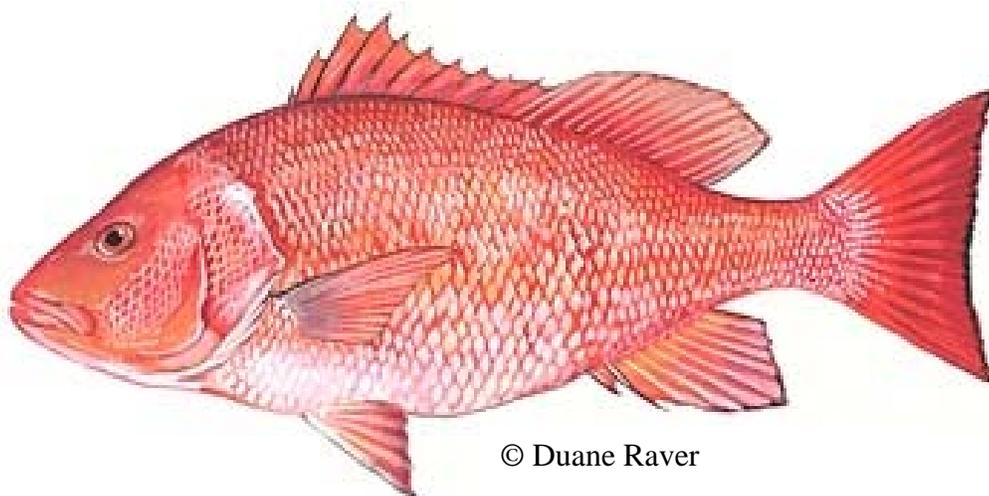


Summary Information for Red Snapper



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February 2009

Summary

Red snapper is overfished and experiencing overfishing. A statistical catch-at-age model (SCA) and a surplus-projection model (ASPIC) were considered in this assessment. Data used assessment consist of records of commercial catch for the handline (hook-and-line) and dive fisheries, logbook data from the recreational headboat fishery, and MRFSS survey data of the rest of the recreational sector. The bulk of landings of red snapper come from the recreational fishery, which have exceeded the landings of the commercial fishery by 2-3 fold over the assessment period. Total landings were variable, with a downward trend through the 1990s.

The fishing mortality (F) is compared to what the fishing mortality would be if the fishery were operating at the proxy level for maximum fishing ($F_{40\%}$). The ratio of $F/F_{40\%}$ suggests a generally increasing trend from the 1950s through the mid-1980s, and since 1985 has fluctuated about a mean near 14. This indicates that overfishing has been occurring since 1960 at about 9 times the sustainable level, with the 2006 estimate of $F/F_{40\%}$ at 7.658.

Estimated abundance-at-age shows truncation of the oldest ages from the 1950s into the 1980s; the age structure continues to be in a truncated condition. Fish of age 10 and above are practically non-existent in the population. Estimated biomass-at-age follows a similar pattern of truncation as seen in the abundance data. Total biomass and spawning biomass show nearly identical trends with a sharp decline during the 1950s and 1960s, continued decline during the 1970s, and stable but low levels since 1980. Numbers of age-1 fish have declined during the same period, however notably strong year classes occurred in 1983 and 1984, and again in 1998 and 1999.

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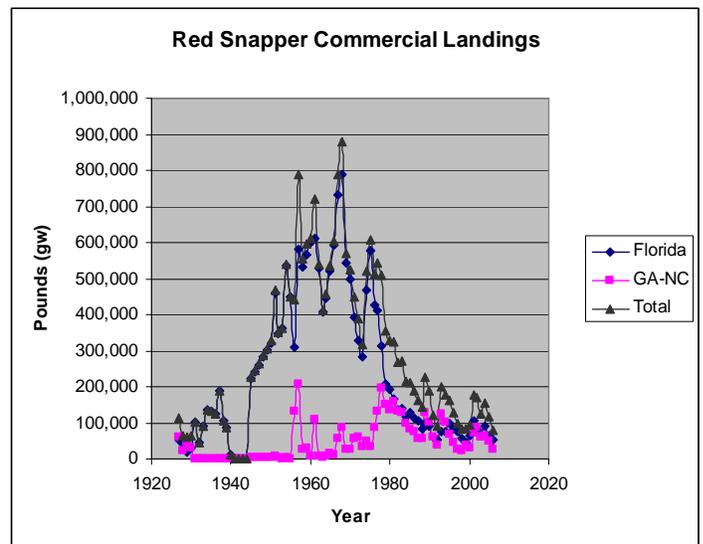
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1 Red Snapper Landings

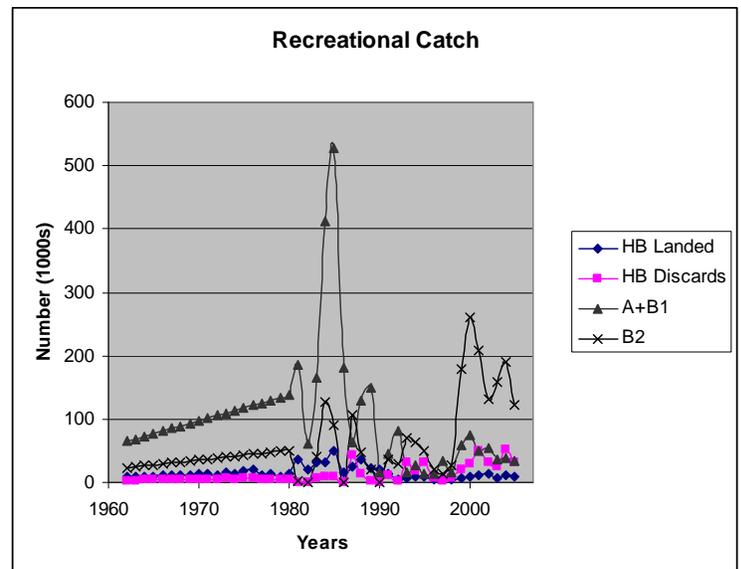
1.1 Red Snapper Commercial Landings (lbs gutted weight) From Assessment

Table 1. Table 3.2 from SEDAR 15 2008 assessment.

Year	Florida	GA-NC	Total
1927	53,153	58,584	111,737
1928	42,342	21,672	64,014
1929	17,117	43,619	60,736
1930	30,631	31,657	62,287
1931	100,901	1,852	102,753
1932	44,144	0	44,144
1933	90,541	0	90,541
1934	136,937	0	136,937
1935	131,532	0	131,532
1936	126,126	0	126,126
1937	189,189	0	189,189
1938	105,405	926	106,331
1939	86,486	1,852	88,338
1940	12,613	0	12,613
1941	0	0	0
1942	0	0	0
1943	0	0	0
1944	0	0	0
1945	221,622	3,704	225,325
1946	241,802	3,863	245,665
1947	261,982	4,022	266,004
1948	282,162	4,181	286,344
1949	302,342	4,341	306,683
1950	322,523	4,500	327,023
1951	459,459	6,944	466,404
1952	345,946	4,630	350,576
1953	362,162	1,802	363,964
1954	536,937	2,703	539,640
1955	448,649	0	448,649
1956	308,108	131,541	439,649
1957	579,279	209,326	788,605
1958	530,631	25,648	556,279
1959	566,667	30,459	597,126
1960	600,901	9,285	610,186
1961	610,811	109,866	720,676
1962	529,584	9,155	538,739
1963	406,379	3,839	410,218
1964	446,717	8,203	454,920
1965	519,844	14,670	534,515
1966	591,835	10,090	601,925
1967	733,301	55,863	789,164
1968	789,871	88,235	878,106
1969	544,517	27,023	571,540
1970	498,012	25,034	523,046



Year	Florida	GA-NC	Total
1971	391,932	56,029	447,962
1972	326,597	60,947	387,544
1973	284,717	33,488	318,205
1974	469,280	50,080	519,360
1975	576,252	32,654	608,906
1976	426,995	85,044	512,038
1977	409,869	131,921	541,790
1978	312,475	197,387	509,862
1979	206,477	149,680	356,157
1980	192,773	137,314	330,087
1981	166,062	158,669	324,731
1982	134,104	133,455	267,559
1983	141,099	130,138	271,237
1984	118,516	98,282	216,799
1985	127,659	83,071	210,730
1986	112,243	75,513	187,755
1987	105,465	56,591	162,056
1988	84,629	57,837	142,465
1989	98,692	129,212	227,904
1990	89,469	100,755	190,224
1991	61,923	60,329	122,252
1992	53,534	37,168	90,702
1993	74,326	124,096	198,422
1994	73,633	102,777	176,410
1995	96,745	66,246	162,991
1996	83,144	44,220	127,364
1997	73,618	25,884	99,501
1998	57,436	23,699	81,135
1999	44,352	38,750	83,102
2000	63,706	30,374	94,080
2001	104,467	73,128	177,595
2002	83,596	86,353	169,949
2003	66,078	59,689	125,768
2004	90,741	65,194	155,935
2005	65,890	50,475	116,366
2006	51,147	26,653	77,800



1.2 Red Snapper Recreational Landings (lbs gutted weight) From Assessment

Table 2. Red snapper recreational landings from SEDAR 17 assessment.

Year	Number of fish in 1000's										
	Landings			PSE	Discards			PSE	Landings + Discards		
	Headboat	MRFSS	total	MRFSS	Headboat	MRFSS	total	MRFSS	Headboat	MRFSS	total
1962*	8.502	64.8	73.305	25.2	3.1	23.63	26.734	30	11.602	88.437	100.039
1963*	9.033	68.85	77.886	25.2	3.29	25.11	28.405	30	12.327	93.964	106.291
1964*	9.564	72.9	82.468	25.2	3.49	26.59	30.076	30	13.052	99.491	112.544
1965*	10.096	76.95	87.049	25.2	3.68	28.06	31.747	30	13.777	105.019	118.796
1966*	10.627	81	91.631	25.2	3.88	29.54	33.418	30	14.503	110.546	125.049
1967*	11.158	85.05	96.212	25.2	4.07	31.02	35.089	30	15.228	116.073	131.301

Year	Number of fish in 1000's										
	Landings			PSE	Discards			PSE	Landings + Discards		
	Headboat	MRFSS	total	MRFSS	Headboat	MRFSS	total	MRFSS	Headboat	MRFSS	total
1968*	11.69	89.1	100.794	25.2	4.26	32.5	36.759	30	15.953	121.601	137.554
1969*	12.221	93.15	105.376	25.2	4.46	33.97	38.43	30	16.678	127.128	143.806
1970*	12.752	97.2	109.957	25.2	4.65	35.45	40.101	30	17.403	132.655	150.058
1971*	13.284	101.26	114.539	25.2	4.84	36.93	41.772	30	18.128	138.183	156.311
1972*	11.98	105.31	117.285	25.2	4.37	38.4	42.774	30	16.349	143.71	160.059
1973*	15.776	109.36	125.131	25.2	5.75	39.88	45.635	30	21.529	149.237	170.767
1974*	13.689	113.41	127.095	25.2	4.99	41.36	46.351	30	18.681	154.765	173.446
1975*	17.505	117.46	134.961	25.2	6.38	42.84	49.22	30	23.889	160.292	184.181
1976*	19.387	121.51	140.893	25.2	7.07	44.31	51.384	30	26.457	165.819	192.277
1977*	12.379	125.56	137.935	25.2	4.51	45.79	50.305	30	16.894	171.346	188.24
1978*	12.954	129.61	142.56	25.2	4.72	47.27	51.992	30	17.678	176.874	194.552
1979*	9.565	133.66	143.222	25.2	3.49	48.74	52.233	30	13.053	182.401	195.454
1980*	14.511	137.71	152.218	25.2	5.29	50.22	55.514	30	19.803	187.928	207.732
1981	35.719	186.52	222.234	25.1	0.38	2	2.383	100	36.102	188.515	224.617
1982	19.553	60.37	79.926	30.6	0	0	0	0	19.553	60.373	79.926
1983	30.698	165.96	196.66	19.8	7.41	40.04	47.451	38	38.105	206.006	244.111
1984	31.146	412.03	443.174	17.9	9.62	127.31	136.931	29.5	40.769	539.336	580.105
1985	50.336	527.14	577.475	19	8.62	90.29	98.912	43.9	58.958	617.429	676.387
1986	16.625	180.5	197.128	32.2	0	0	0	0	16.625	180.503	197.128
1987	24.996	63.25	88.247	19.7	42.18	106.73	148.906	57.8	67.174	169.979	237.153
1988	36.527	128.99	165.518	28.3	13.7	48.37	62.071	47.3	50.225	177.364	227.589
1989	23.453	149.92	173.368	19.9	3.13	20.04	23.173	41.9	26.588	169.953	196.541
1990	20.919	14.93	35.846	30.6	0	0	0	0	20.919	14.927	35.846
1991	13.857	46.28	60.133	33.1	10.78	35.99	46.771	51.5	24.635	82.269	106.904
1992	5.301	81.28	86.578	18.5	1.92	29.45	31.371	29.4	7.222	110.727	117.949
1993	7.347	16.32	23.67	21.8	31.74	70.51	102.242	28.4	39.082	86.83	125.912
1994	8.225	27.35	35.578	25.9	19.22	63.91	83.129	28.9	27.443	91.264	118.707
1995	8.826	14.01	22.837	29.7	32.05	50.87	82.918	20.2	40.872	64.883	105.755
1996	5.543	14.36	19.899	41.2	7.69	19.93	27.618	38	13.236	34.281	47.517
1997	5.77	34.33	40.097	48.5	2.31	13.74	16.052	26.9	8.08	48.069	56.149
1998	4.741	16.9	21.644	24	7.7	27.46	35.158	32.5	12.442	44.36	56.802
1999	6.836	58.18	65.017	20.9	21.11	179.67	200.775	15.9	27.946	237.846	265.792
2000	8.437	73.77	82.211	20.3	29.67	259.42	289.089	14.8	38.105	333.195	371.3
2001	12.028	50.81	62.842	16.6	49.44	208.89	258.329	13.8	61.472	259.699	321.171
2002	12.931	53.29	66.218	15.8	31.87	131.32	163.19	18.2	44.799	184.609	229.408
2003	5.706	35.66	41.367	16.5	25.47	159.18	184.646	16.2	31.175	194.838	226.013
2004	10.842	38.89	49.728	14.9	52.83	189.48	242.306	14.3	63.671	228.363	292.034
2005	8.907	33.71	42.615	18.2	32.52	123.06	155.576	13.4	41.424	156.767	198.191
2006	5.945	27.02	32.962	18.8	30.32	137.8	168.126	18.2	36.268	164.82	201.088

1.3 Red Snapper Landings (ALS), MRFSS, Headboat

Table 3. Red snapper commercial landings from ALS (includes all of Monroe County); MRFSS Web site; Headboat survey. Data do not include dead discards and MRFSS data are A+B1; weight not converted from numbers. Landings converted to gutted weight using factor of 1.11. Final 2008 data are not available for ALS and Headboat.

Year	ALS	HB	MRFSS
1986	202,468	48,991	102,264
1987	176,866	73,728	120,427
1988	159,443	117,178	202,698
1989	241,755	63,779	242,157
1990	200,742	59,176	103,875
1991	132,881	64,891	118,480
1992	91,926	26,050	556,498
1993	204,283	38,484	127,557
1994	182,043	38,753	180,644
1995	166,342	51,778	59,463
1996	129,789	41,652	95,682
1997	102,111	46,130	80,095
1998	81,463	24,187	103,570
1999	85,786	39,241	152,641
2000	95,214	44,506	450,378
2001	178,579	61,607	318,580
2002	171,686	63,780	352,170
2003	146,579	37,255	233,616
2004	154,419	72,380	264,790
2005	118,924	52,878	236,294
2006	81,000	37,325	216,393
2007	91,475	34,638	266,008
2008			685,408

1.4 Red Snapper Recreational Landings in Number

Table 4. Red Snapper Landings – Pounds Gutted Weight. Source: MRFSS Web site; Headboat survey. Data do not include dead discards and MRFSS data are A+B1; weight not converted from numbers. Final 2008 data are not available for ALS and Headboat.

Year	HB	MRFSS A+B1	PSE	Total
1986	16,625	180,503	32.2	197,128
1987	24,996	63,251	19.7	88,247
1988	36,527	169,866	23.4	206,393
1989	23,453	168,967	18.8	192,420
1990	20,919	14,927	30.6	35,846
1991	13,857	46,276	33.1	60,133
1992	5,301	81,277	18.5	86,578
1993	7,347	16,832	21.4	24,179
1994	8,225	28,002	25.4	36,227
1995	8,826	14,011	29.7	22,837

Year	HB	MRFSS A+B1	PSE	Total
1996	5,543	14,356	41.2	19,899
1997	5,770	34,327	48.5	40,097
1998	4,741	16,903	24	21,644
1999	6,836	58,181	20.9	65,017
2000	8,437	73,774	20.3	82,211
2001	12,028	52,080	16.4	64,108
2002	12,931	53,287	15.8	66,218
2003	5,706	33,109	16.5	38,815
2004	10,842	39,477	14.1	50,319
2005	8,907	35,939	17.9	44,846
2006	5,945	26,075	19	32,020
2007	7,136	41,407	19.9	48,543
2008		120,165	15.1	

Table 5. Red Snapper Landings – MRFSS Discards (B2). Source: MRFSS Web site.

Year	MRFSS B2s	PSE
1986	0	0
1987	106,728	57.8
1988	100,493	54.2
1989	26,738	40.1
1990	2,498	100
1991	44,619	43.8
1992	34,712	26.4
1993	70,507	28.4
1994	67,266	27.7
1995	54,796	19.4
1996	19,925	38
1997	15,011	26
1998	28,767	31.2
1999	182,436	15.7
2000	269,489	14.5
2001	210,793	13.7
2002	131,322	18.2
2003	160,229	16.1
2004	203,273	13.6
2005	125,739	13.3
2006	134,692	18.5
2007	455,405	12.8
2008	400,449	11.1

1.5 Red snapper Landings by State

Table 6. Commercial landings (pounds) of red snapper by state, 2001-2007. Source ALS. Monroe County not divided into Atlantic and Gulf.

State	2001-2006	Avg ww	Avg GW	Percent
GA & FL	745,393	106,485	95,932	70.54%
NC	87,903	12,558	11,313	8.32%
SC	223,423	31,918	28,755	21.14%

Table 7. Headboat landings (pounds) of red snapper by state, 2001-2007.

State	2001-2007	Avg ww	Avg GW	Percent
South FL	14,192	2,027	1,826	3.56%
GA & NFL	254,164	36,309	32,711	63.67%
SC	89,438	12,777	11,511	22.41%
NC	41,393	5,913	5,327	10.37%

Table 8. MRFSS landings (pounds) of red snapper by state, 2001-2007.

State	2001-2007	Avg ww	Avg GW	Percent
FL	1,833,457	261,922	235,966	87.88%
Georgia	112,640	16,091	14,497	5.40%
SC	69,668	9,953	8,966	3.34%
NC	70,453	10,065	9,067	3.38%

Table 9. MRFSS landings (number A+B1) of red snapper by state, 2001-2007.

State	2001-2007	Avg ww	Avg GW	Percent
FL	242,389	34,627	31,195	86.14%
Georgia	12,540	1,791	1,614	4.46%
SC	12,746	1,821	1,640	4.53%
NC	13,700	1,957	1,763	4.87%

Table 10. MRFSS number of red snapper released alive (B2) among states, 2001-2007.

State	2001-2006	Avg ww	Avg GW	Percent
FL	1,338,909	191,273	172,318	94.19%
Georgia	65,961	9,423	8,489	4.64%
SC	13,867	1,981	1,785	0.98%
NC	2,716	388	350	0.19%

Table 11. Percentage of red snapper MRFSS B2s by state. Average 2001-2007.

MRFSS	A+B1	B2	A+B1+B2	% B2
FL	34,627	191,273	225,900	84.67%
GA	1,791	9,423	11,214	84.03%
SC	1,821	1,981	3,802	52.11%
NC	1,957	388	2,345	16.54%
Total	40,196	203,065	243,261	83.48%

1.6 Red Snapper Landings by Month and State

1.6.1 Commercial 2001-2007

Table 12. Average red snapper commercial landings 2001-2007 (lbs gutted weight) by state and month. Includes Monroe County South Atlantic landings.

Month	Total	FL & GA	SC	NC
1	11,255	8,088	2,402	765
2	11,297	8,824	1,873	599
3	11,881	8,799	2,155	927
4	12,901	9,169	2,524	1,208
5	14,048	9,666	2,833	1,550
6	15,864	11,773	2,726	1,365
7	10,804	7,083	2,583	1,139
8	8,700	5,768	1,957	975
9	6,605	4,756	1,305	543
10	10,112	6,619	2,663	830
11	12,321	7,603	3,940	778
12	10,211	7,784	1,794	633
Total	136,000	95,932	28,755	11,313

Table 13. Percentage of red snapper (commercial) landed by month in FL, GA, SC, and NC during 2001-2007 (lbs gutted weight) by state and month.

Month	Total	FL+GA	SC	NC
1	8.28%	9.94%	8.36%	6.76%
2	8.31%	10.84%	6.51%	5.30%
3	8.74%	10.81%	7.49%	8.20%
4	9.49%	11.27%	8.78%	10.68%
5	10.33%	11.88%	9.85%	13.70%
6	11.66%	14.47%	9.48%	12.07%
7	7.94%	8.70%	8.98%	10.07%
8	6.40%	7.09%	6.81%	8.62%
9	4.86%	5.84%	4.54%	4.80%
10	7.44%	8.13%	9.26%	7.34%
11	9.06%	9.34%	13.70%	6.88%
12	7.51%	9.56%	6.24%	5.60%

1.6.2 Commercial – By Year

Table 14. Average red snapper commercial landings 2001-2007 (lbs gutted weight) by state and month. Includes Monroe County.

Month	2001			2002			2003		
	FL & GA	SC	NC	FL & GA	SC	NC	FL & GA	SC	NC
1	11,820	1,219	574	10,005	2,407	2,136	4,913	649	750
2	16,422	2,914	679	8,076	2,168	1,168	9,288	1,157	802
3	9,098	2,227	1,002	9,758	3,175	1,751	9,184	1,971	1,058
4	13,411	2,846	1,942	10,686	3,243	2,511	7,576	3,216	1,289
5	14,117	2,859	2,723	7,791	4,143	2,332	9,325	3,606	1,682
6	8,701	2,344	2,157	15,216	5,032	2,660	23,216	4,373	1,478
7	7,024	2,053	1,614	7,640	3,937	2,257	10,137	1,802	968
8	8,206	1,459	1,924	6,493	3,287	1,415	3,828	1,410	732
9	7,857	1,237	1,177	4,403	2,016	1,188	7,877	1,530	335
10	9,083	3,217	1,275	11,327	3,166	1,051	6,809	3,277	980
11	11,673	4,811	1,285	9,616	7,418	1,550	7,098	3,306	1,019
12	12,999	2,932	1,560	7,548	1,988	1,032	7,041	1,943	512
	130,411	30,119	17,911	108,557	41,981	21,050	106,291	28,240	11,605
	73.08%	16.88%	10.04%	63.27%	24.47%	12.27%	72.73%	19.32%	7.94%
Month	2004			2005			2006		
	FL & GA	SC	NC	FL & GA	SC	NC	FL & GA	SC	NC
1	10,665	6,240	661	8,118	3,827	828	5,534	1,422	131
2	6,423	2,605	857	7,510	3,114	356	8,835	768	129
3	15,178	3,343	1,732	8,468	2,489	252	6,866	1,014	380
4	12,956	3,991	1,047	5,946	2,759	445	8,634	1,169	560
5	13,840	3,229	1,673	10,006	2,944	1,047	7,056	1,855	866
6	8,778	2,241	687	8,158	2,723	792	3,724	1,444	897
7	8,508	3,584	1,206	7,921	3,118	867	3,020	2,661	640
8	8,118	2,263	705	6,104	2,695	409	1,595	1,056	543
9	1,086	822	205	3,979	1,181	471	2,413	743	278
10	6,420	3,712	497	4,539	2,952	277	2,798	1,367	695
11	8,106	5,157	442	5,380	3,944	644	2,577	1,117	232
12	4,995	1,921	286	2,500	1,203	142	4,967	1,186	178
	105,075	39,107	9,999	78,629	32,950	6,531	58,018	15,803	5,531
	68.15%	25.36%	6.49%	66.57%	27.90%	5.53%	73.12%	19.91%	6.97%

Month	2007		
	FL+GA	SC	NC
1	5,561	1,054	273
2	5,214	386	205
3	3,042	865	316
4	4,976	441	665
5	5,523	1,192	526
6	14,620	923	885
7	5,331	923	420
8	6,032	1,528	1,095
9	5,677	1,609	150
10	5,359	950	1,034
11	8,772	1,826	273
12	14,436	1,385	723

1.6.3 Headboat 2001-2007

Table 14. Average red snapper headboat landings 2001-2007 (lbs gutted weight) by state and month.

Month	Total	South FL	GA - NFL	SC	NC
1	1,595	87	1,439	39	31
2	2,444	582	1,769	33	61
3	4,044	431	3,027	462	125
4	5,456	48	3,826	1,337	244
5	7,211	200	4,246	2,351	413
6	5,522	77	3,431	1,523	491
7	5,150	75	3,270	1,389	417
8	5,173	44	2,310	1,810	1,009
9	2,789	34	1,480	550	724
10	4,621	66	3,159	724	672
11	4,202	148	2,761	1,125	168
12	3,245	81	1,993	167	1,003
	51,453	1,873	32,711	11,511	5,358

Table 15. Average gag headboat landings 2001-2007 (percentage) by state and month.

Month	Total	South FL	GA - NFL	SC	NC
1	3.10%	4.64%	4.40%	0.34%	0.57%
2	4.75%	31.06%	5.41%	0.28%	1.14%
3	7.86%	22.99%	9.25%	4.01%	2.33%
4	10.60%	2.57%	11.70%	11.62%	4.56%
5	14.02%	10.69%	12.98%	20.43%	7.72%
6	10.73%	4.12%	10.49%	13.23%	9.16%
7	10.01%	3.99%	10.00%	12.06%	7.77%
8	10.05%	2.35%	7.06%	15.72%	18.84%
9	5.42%	1.83%	4.53%	4.78%	13.52%
10	8.98%	3.52%	9.66%	6.29%	12.53%
11	8.17%	7.88%	8.44%	9.78%	3.14%
12	6.31%	4.35%	6.09%	1.45%	18.72%

1.6.4 Headboat – By Year

Table 16. Average red snapper headboat landings 2001-2007 (lbs gutted weight) by state and month.

Month	2001				2002				2003			
	South FL	GA – NFL	SC	NC	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC
1	8	222	3	4	14	143	43	3	2	80	0	3
2	22	392	38	41	5	146	0	21	13	139	0	7
3	13	515	100	30	81	433	123	61	5	333	0	26
4	0	715	341	101	0	579	190	116	0	449	291	41
5	56	703	559	81	0	881	480	278	0	579	841	34
6	15	537	229	131	1	819	639	301	8	433	238	34
7	3	606	371	94	3	733	411	286	9	215	177	38
8	5	491	764	361	4	306	212	757	5	139	112	40
9	0	306	149	402	0	244	155	225	3	200	93	186
10	0	160	161	95	14	404	258	54	0	466	64	95
11	148	458	235	96	3	295	736	30	1	312	8	49
12	10	360	131	6	8	121	16	0	0	446	0	0
Total	280	5,466	3,080	1,442	133	5,104	3,262	2,131	45	3,790	1,822	552
Percent	2.73%	53.23%	30.00%	14.04%	1.25%	48.02%	30.69%	20.05%	0.72%	61.04%	29.34%	8.90%
Month	2004				2005				2006			
	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC
1	1	241	0	17	42	322	0	7	4	395	0	2
2	0	211	0	0	550	540	0	0	64	446	0	0
3	12	384	266	15	334	754	21	5	35	627	9	3
4	4	807	424	21	14	792	111	0	12	624	54	7
5	0	705	488	29	11	1,116	130	33	22	735	79	17
6	4	775	374	18	0	465	147	64	5	446	86	7
7	0	1,112	334	15	7	511	116	39	28	324	144	4
8	0	943	80	15	7	340	789	0	20	171	63	0
9	4	44	43	13	2	319	95	5	7	378	42	13
10	34	1,494	189	524	0	405	79	10	15	564	21	6

11	1	777	192	16	0	333	73	5	2	515	32	0
12	70	177	28	1,165	0	221	0	0	3	189	2	0
Total	129	7,670	2,418	1,846	967	6,117	1,561	167	219	5,413	532	58
Percent	1.07%	63.58%	20.04%	15.31%	10.97%	69.41%	17.72%	1.90%	3.52%	87.01%	8.54%	0.93%
2007												
Month	South FL	GA - NFL	SC	NC								
1	30	277	0	0								
2	25	190	0	2								
3	23	486	19	6								
4	27	499	149	0								
5	144	235	166	10								
6	57	528	65	18								
7	37	313	67	12								
8	11	305	92	5								
9	24	236	66	1								
10	14	192	74	1								
11	17	531	38	0								
12	4	811	18	0								
Total	412	4,603	754	54								
Percent	7.08%	79.04%	12.95%	0.93%								

1.6.5 MRFSS 2001-2007

Table 17. Average red snapper MRFSS landings 2001-2007 (lbs gutted weight) by state and month.

Wave	Total	FL	GA	SC	NC
1	34,144	34,144	0	0	0
2	43,452	39,863	1,068	1,870	652
3	60,999	50,537	5,115	2,081	3,266
4	31,244	25,297	1,881	3,008	1,058
5	31,640	24,380	3,766	721	2,773
6	42,286	38,363	1,230	2,274	419
	243,766	212,582	13,060	9,954	8,169

Table 18. Average red snapper MRFSS landings 2001-2007 (percent lbs gutted weight) by state and month.

Wave	Total	FL	GA	SC	NC
1	14.01%	16.06%	0.00%	0.00%	0.00%
2	17.83%	18.75%	8.18%	18.79%	7.98%
3	25.02%	23.77%	39.17%	20.90%	39.99%
4	12.82%	11.90%	14.40%	30.22%	12.96%
5	12.98%	11.47%	28.84%	7.25%	33.94%
6	17.35%	18.05%	9.42%	22.85%	5.14%

Table 19. Average red snapper MRFSS landings 2001-2007 (A+B1 Number) by state and month.

Wave	Total	FL	GA	SC	NC
1	7,287	7,287	0	0	0
2	7,401	6,846	96	404	54
3	8,618	6,620	652	301	1,046
4	4,805	4,140	122	206	337
5	4,549	3,138	494	160	757
6	9,061	8,291	179	520	72
	41,721	36,323	1,542	1,590	2,266

Table 20. Average red snapper MRFSS landings 2001-2007 (A+B1 Number, percent) by state and month.

Wave	Total	FL	GA	SC	NC
1	17.47%	20.06%	0.00%	0.00%	0.00%
2	17.74%	18.85%	6.23%	25.41%	2.40%
3	20.66%	18.22%	42.28%	18.93%	46.14%
4	11.52%	11.40%	7.89%	12.94%	14.87%
5	10.90%	8.64%	32.01%	10.03%	33.41%
6	21.72%	22.83%	11.58%	32.69%	3.18%

Table 21. Average red snapper MRFSS landings 2001-2007 (B2 Number) by state and month.

Wave	Total	FL	GA	SC	NC
1	41,538	41,538	0	0	0
2	27,877	27,168	455	255	0
3	17,807	16,429	639	730	9
4	17,543	15,877	1,225	391	50
5	14,975	13,752	785	324	114
6	48,380	47,693	487	199	0
	168,120	162,458	3,591	1,898	173

Table 22. Average red snapper MRFSS landings 2001-2007 (B2 Number, percent) by state and month.

Wave	Total	FL	GA	SC	NC
1	24.71%	25.57%	0.00%	0.00%	0.00%
2	16.58%	16.72%	12.67%	13.42%	0.00%
3	10.59%	10.11%	17.78%	38.45%	5.22%
4	10.43%	9.77%	34.11%	20.59%	28.97%
5	8.91%	8.47%	21.87%	17.06%	65.81%
6	28.78%	29.36%	13.57%	10.49%	0.00%

1.6.6 MRFSS – By Year

Table 23. Average red snapper MRFSS landings 2001-2007 (lbs gutted weight) by state and month.

Wave	2001				2002				2003			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	62,677	0	0	0	90,770	0	0	0	13,095	0	0	0
2	30,992	377	0	0	78,840	0	0	0	61,961	656	10,580	0
3	67,061	935	0	8,541	65,389	638	0	4,908	37,164	163	14,150	1,293
4	18,669	0	0	1,901	54,684	0	0	2,940	22,806	1,479	6,493	2,206
5	5,484	107	0	133	26,606	1,192	3,942	12,876	20,846	600	371	6,048
6	113,362	0	12,020	0	9,019	295	71	0	34,847	1,357	0	0
Total	298,245	1,420	12,020	10,575	325,308	2,125	4,014	20,723	190,719	4,255	31,594	9,547
Percent	92.55%	0.44%	3.73%	3.28%	92.37%	0.60%	1.14%	5.88%	80.77%	1.80%	13.38%	4.04%
Wave	2004				2005				2006			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	10,087	0	0	0	19,248	0	0	0	48,708	0	0	0
2	32,334	1,309	1,347	0	53,950	4,930	1,042	3,545	46,298	0	1,559	0
3	44,104	7,877	467	514	38,013	3,317	1,019	4,467	8,594	23,149	531	4,858
4	35,452	1,297	570	0	24,753	5,078	4,814	1,177	12,895	0	0	0
5	28,171	11,414	1,291	0	22,070	15,949	0	0	46,958	0	0	2,488
6	77,050	7,514	1,649	3,259	30,984	0	648	0	20,155	0	198	0
Total	227,198	29,411	5,323	3,774	189,017	29,274	7,523	9,189	183,608	23,149	2,288	7,346
Percent	85.51%	11.07%	2.00%	1.42%	80.43%	12.46%	3.20%	3.91%	84.85%	10.70%	1.06%	3.39%
Wave	2007											
	FL	GA	SC	NC								
1	20,714	0	0	0								
2	5,359	1,025	0	1,517								
3	132,348	3,668	0	800								
4	27,294	6,763	11,494	0								
5	39,295	0	0	0								
6	18,465	389	3,086	0								
Total	243,474	11,846	14,580	2,317								
Percent	89.44%	4.35%	5.36%	0.85%								

Table 24. Average red snapper MRFSS landings 2001-2007 (A+B1 Number) by state and month.

	2001				2002				2003			
Wave	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	11,501	0	0	0	12,916	0	0	0	2,811	0	0	0
2	5,348	66	0	0	11,804	0	0	0	7,039	96	1,426	0
3	9,248	123	0	2,098	11,872	86	0	795	4,007	21	1,867	256
4	5,584	0	0	379	6,562	0	0	429	2,767	90	892	862
5	1,109	17	0	21	3,795	190	923	2,054	2,647	91	0	2,971
6	14,978	0	1,608	0	1,759	72	31	0	5,102	162	0	0
Total	47,768	206	1,608	2,498	48,708	348	954	3,278	24,373	460	4,185	4,089
Percent	91.72%	0.40%	3.09%	4.80%	91.41%	0.65%	1.79%	6.15%	73.62%	1.39%	12.64%	12.35%
	2004				2005				2006			
Wave	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	1,827	0	0	0	4,368	0	0	0	6,088	0	0	0
2	5,994	110	179	0	6,890	335	103	381	5,501	0	1,121	0
3	5,672	1,037	64	71	5,413	408	88	468	878	2,767	88	1,533
4	4,102	262	75	0	3,308	500	474	309	1,074	0	0	0
5	4,531	1,064	47	0	5,488	1,815	147	0	3,289	262	0	233
6	12,668	1,016	255	504	5,332	0	113	0	3,218	0	24	0
Total	34,794	3,489	620	575	30,799	3,058	925	1,158	20,048	3,029	1,233	1,766
Percent	88.14%	8.84%	1.57%	1.46%	85.70%	8.51%	2.57%	3.22%	76.88%	11.62%	4.73%	6.77%
	2007											
Wave	FL	GA	SC	NC								
1	11,501	0	0	0								
2	5,348	66	0	0								
3	9,248	123	0	2,098								
4	5,584	0	0	379								
5	1,109	17	0	21								
6	14,978	0	1,608	0								
Total	47,768	206	1,608	2,498								
Percent	91.72%	0.40%	3.09%	4.80%								

Table 25. Average red snapper MRFSS landings 2001-2006 (B2 Number) by state and month.

	2001				2002				2003			
Wave	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	79,799	0	0	0	54,344	0	0	0	34,643	0	0	0
2	18,502	242	0	0	14,662	0	0	0	26,882	0	1,783	0
3	18,549	0	0	0	8,366	0	0	63	26,022	192	3,361	0
4	17,086	0	0	175	21,123	0	158	0	16,746	365	0	0
5	10,020	356	969	138	15,949	152	0	0	7,050	31	0	0
6	63,932	621	402	0	16,398	76	31	0	42,593	560	85	0
Total	207,888	1,219	1,371	313	130,842	228	189	63	153,936	1,148	5,229	0
Percent	98.62%	0.58%	0.65%	0.15%	99.63%	0.17%	0.14%	0.05%	96.02%	0.72%	3.26%	0.00%
	2004				2005				2006			
Wave	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	18,967	0	0	0	9,958	0	0	0	13,255	0	0	0
2	39,647	290	0	0	42,839	206	0	0	29,140	2,204	0	0
3	22,070	1,367	0	0	10,921	2,911	1,660	0	10,528	0	88	0
4	21,475	1,563	0	0	4,953	102	2,333	0	12,673	6,543	245	0
5	26,063	2,229	0	0	18,668	616	329	0	8,496	1,758	0	519
6	68,193	1,323	474	0	29,719	50	0	0	49,084	161	0	0
Total	196,415	6,772	474	0	117,058	3,885	4,322	0	123,176	10,666	333	519
Percent	96.44%	3.33%	0.23%	0.00%	93.45%	3.10%	3.45%	0.00%	91.45%	7.92%	0.25%	0.39%
	2007											
Wave	FL	GA	SC	NC								
1	79,799	0	0	0								
2	18,502	242	0	0								
3	18,549	0	0	0								
4	17,086	0	0	175								
5	10,020	356	969	138								
6	63,932	621	402	0								
Total	207,888	1,219	1,371	313								
Percent	98.62%	0.58%	0.65%	0.15%								

2 ALLOCATIONS

The formula for determining commercial and recreational allocations for any particular time period is the total landings for a sector (commercial or recreational) divided by the total landings.

2.1 Red Snapper Commercial Allocation

Table 26. Red Snapper % Commercial. Source ALS.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1986	57.2%	52.3%	44.7%	44.6%	46.4%	45.8%	38.8%	40.6%	41.1%	42.3%	42.7%	42.8%	42.6%	42.0%	39.3%	38.7%	37.9%	37.7%	37.3%	36.9%	36.4%	35.8%
1987		47.7%	39.5%	41.3%	44.2%	43.9%	36.5%	38.7%	39.4%	40.9%	41.4%	41.6%	41.5%	40.9%	38.2%	37.6%	36.8%	36.7%	36.4%	36.0%	35.5%	34.9%
1988			33.3%	39.1%	43.3%	43.0%	34.7%	37.5%	38.5%	40.2%	40.8%	41.0%	40.9%	40.3%	37.5%	36.9%	36.2%	36.1%	35.8%	35.4%	34.9%	34.4%
1989				44.1%	48.5%	46.9%	35.1%	38.4%	39.4%	41.3%	41.9%	42.1%	41.9%	41.2%	37.9%	37.2%	36.4%	36.3%	36.0%	35.6%	35.0%	34.4%
1990					55.2%	49.1%	31.4%	36.5%	38.2%	40.7%	41.5%	41.7%	41.5%	40.7%	37.0%	36.4%	35.6%	35.5%	35.2%	34.8%	34.3%	33.7%
1991						42.0%	22.7%	31.5%	34.7%	38.1%	39.3%	39.8%	39.7%	38.9%	35.2%	34.8%	34.1%	34.2%	33.9%	33.6%	33.1%	32.6%
1992							13.6%	28.4%	33.1%	37.4%	38.9%	39.5%	39.4%	38.6%	34.6%	34.2%	33.5%	33.7%	33.5%	33.1%	32.7%	32.1%
1993								55.2%	50.1%	52.7%	51.8%	50.8%	49.4%	46.8%	39.9%	38.5%	37.1%	36.9%	36.3%	35.7%	35.0%	34.2%
1994									45.3%	51.3%	50.5%	49.4%	47.8%	45.0%	37.4%	36.3%	35.1%	35.1%	34.7%	34.2%	33.5%	32.8%
1995										59.9%	54.4%	51.5%	48.8%	44.9%	35.7%	34.8%	33.7%	33.9%	33.6%	33.2%	32.5%	31.8%
1996											48.6%	46.8%	44.5%	40.6%	31.4%	31.6%	31.1%	31.6%	31.6%	31.3%	30.8%	30.2%
1997												44.7%	42.0%	37.7%	27.9%	29.1%	29.2%	30.0%	30.2%	30.1%	29.6%	29.1%
1998													38.9%	34.4%	24.4%	27.0%	27.6%	28.8%	29.2%	29.2%	28.7%	28.2%
1999														30.9%	20.9%	25.2%	26.4%	27.9%	28.5%	28.6%	28.2%	27.7%
2000															16.1%	23.8%	25.7%	27.5%	28.2%	28.3%	27.9%	27.5%
2001																32.0%	30.6%	31.8%	31.7%	31.3%	30.4%	29.5%
2002																	29.2%	31.7%	31.6%	31.1%	30.0%	29.0%
2003																		35.1%	33.1%	31.9%	30.3%	29.0%
2004																			31.4%	30.4%	28.7%	27.4%
2005																				29.1%	26.9%	25.7%
2006																					24.2%	23.7%
2007																						23.3%

2.2 Red Snapper Recreational Allocation

Table 27. Red Snapper % Recreational. Source MRFSS Web site, NMFS Headboat survey.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1986	42.8%	47.7%	55.3%	55.4%	53.6%	54.2%	61.2%	59.4%	58.9%	57.7%	57.3%	57.2%	57.4%	58.0%	60.7%	61.3%	62.1%	62.3%	62.7%	63.1%	63.6%	64.2%
1987		52.3%	60.5%	58.7%	55.8%	56.1%	63.5%	61.3%	60.6%	59.1%	58.6%	58.4%	58.5%	59.1%	61.8%	62.4%	63.2%	63.3%	63.6%	64.0%	64.5%	65.1%
1988			66.7%	60.9%	56.7%	57.0%	65.3%	62.5%	61.5%	59.8%	59.2%	59.0%	59.1%	59.7%	62.5%	63.1%	63.8%	63.9%	64.2%	64.6%	65.1%	65.6%
1989				55.9%	51.5%	53.1%	64.9%	61.6%	60.6%	58.7%	58.1%	57.9%	58.1%	58.8%	62.1%	62.8%	63.6%	63.7%	64.0%	64.4%	65.0%	65.6%
1990					44.8%	50.9%	68.6%	63.5%	61.8%	59.3%	58.5%	58.3%	58.5%	59.3%	63.0%	63.6%	64.4%	64.5%	64.8%	65.2%	65.7%	66.3%
1991						58.0%	77.3%	68.5%	65.3%	61.9%	60.7%	60.2%	60.3%	61.1%	64.8%	65.2%	65.9%	65.8%	66.1%	66.4%	66.9%	67.4%
1992							86.4%	71.6%	66.9%	62.6%	61.1%	60.5%	60.6%	61.4%	65.4%	65.8%	66.5%	66.3%	66.5%	66.9%	67.3%	67.9%
1993								44.8%	49.9%	47.3%	48.2%	49.2%	50.6%	53.2%	60.1%	61.5%	62.9%	63.1%	63.7%	64.3%	65.0%	65.8%
1994									54.7%	48.7%	49.5%	50.6%	52.2%	55.0%	62.6%	63.7%	64.9%	64.9%	65.3%	65.8%	66.5%	67.2%
1995										40.1%	45.6%	48.5%	51.2%	55.1%	64.3%	65.2%	66.3%	66.1%	66.4%	66.8%	67.5%	68.2%
1996											51.4%	53.2%	55.5%	59.4%	68.6%	68.4%	68.9%	68.4%	68.4%	68.7%	69.2%	69.8%
1997												55.3%	58.0%	62.3%	72.1%	70.9%	70.8%	70.0%	69.8%	69.9%	70.4%	70.9%
1998													61.1%	65.6%	75.6%	73.0%	72.4%	71.2%	70.8%	70.8%	71.3%	71.8%
1999														69.1%	79.1%	74.8%	73.6%	72.1%	71.5%	71.4%	71.8%	72.3%
2000															83.9%	76.2%	74.3%	72.5%	71.8%	71.7%	72.1%	72.5%
2001																68.0%	69.4%	68.2%	68.3%	68.7%	69.6%	70.5%
2002																	70.8%	68.3%	68.4%	68.9%	70.0%	71.0%
2003																		64.9%	66.9%	68.1%	69.7%	71.0%
2004																			68.6%	69.6%	71.3%	72.6%
2005																				70.9%	73.1%	74.3%
2006																					75.8%	76.3%
2007																						76.7%

2.3 Red Snapper MRFSS Allocation

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
1986	28.9%	30.7%	35.3%	38.1%	36.5%	36.6%	46.6%	45.3%	45.2%	43.7%	43.2%	42.8%	43.1%	43.7%	47.1%	48.0%	49.0%	49.4%	49.7%	50.1%	50.6%	51.4%	
1987		32.5%	38.0%	40.4%	38.0%	37.9%	48.8%	47.1%	46.9%	45.0%	44.4%	43.9%	44.2%	44.8%	48.3%	49.1%	50.1%	50.4%	50.7%	51.0%	51.6%	52.3%	
1988			42.3%	43.3%	39.5%	39.1%	51.4%	49.1%	48.6%	46.4%	45.6%	45.0%	45.2%	45.8%	49.4%	50.2%	51.1%	51.4%	51.6%	52.0%	52.5%	53.2%	
1989				44.2%	38.0%	37.8%	53.7%	50.5%	49.7%	47.0%	46.1%	45.4%	45.6%	46.3%	50.2%	50.9%	51.9%	52.2%	52.3%	52.6%	53.2%	53.9%	
1990					28.6%	32.7%	57.5%	52.6%	51.1%	47.7%	46.5%	45.6%	45.9%	46.6%	51.0%	51.8%	52.7%	52.9%	53.0%	53.3%	53.9%	54.7%	
1991						37.5%	68.1%	59.0%	55.8%	51.1%	49.3%	48.1%	48.2%	48.8%	53.3%	53.8%	54.5%	54.7%	54.6%	54.8%	55.3%	56.0%	
1992							82.5%	65.5%	59.8%	53.6%	51.2%	49.6%	49.6%	50.1%	54.8%	55.1%	55.8%	55.8%	55.6%	55.8%	56.3%	57.0%	
1993								34.4%	39.9%	35.0%	35.2%	35.2%	36.9%	39.4%	47.7%	49.3%	51.0%	51.5%	51.7%	52.2%	53.0%	54.0%	
1994									45.0%	35.4%	35.5%	35.4%	37.5%	40.5%	49.9%	51.3%	52.8%	53.1%	53.2%	53.6%	54.3%	55.3%	
1995										21.4%	28.5%	30.4%	34.5%	39.0%	50.9%	52.3%	53.8%	54.1%	54.1%	54.4%	55.2%	56.1%	
1996											35.8%	35.5%	39.6%	44.0%	56.1%	56.4%	57.1%	57.0%	56.5%	56.7%	57.3%	58.2%	
1997												35.1%	42.0%	47.0%	60.3%	59.3%	59.4%	58.9%	58.2%	58.2%	58.7%	59.5%	
1998													49.5%	52.6%	65.6%	62.7%	61.9%	61.0%	59.9%	59.7%	60.1%	60.8%	
1999														55.0%	69.5%	64.6%	63.2%	62.0%	60.6%	60.3%	60.7%	61.4%	
2000															76.3%	66.9%	64.6%	62.9%	61.2%	60.8%	61.2%	61.9%	
2001																57.0%	58.5%	57.8%	56.9%	57.1%	58.0%	59.2%	
2002																	59.9%	58.3%	56.8%	57.1%	58.2%	59.6%	
2003																		56.0%	54.8%	55.8%	57.6%	59.5%	
2004																				53.9%	55.7%	58.1%	60.5%
2005																					57.9%	60.9%	63.3%
2006																						64.6%	66.4%
2007																							67.8%

2.4 Red Snapper Headboat Allocation

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1986	20.8%	20.3%	22.0%	18.7%	18.3%	18.6%	15.4%	14.9%	14.3%	14.6%	14.7%	14.9%	14.8%	14.8%	14.0%	13.8%	13.5%	13.2%	13.3%	13.3%	13.2%	13.0%
1987		19.9%	22.5%	18.2%	17.8%	18.2%	14.7%	14.2%	13.7%	14.0%	14.1%	14.5%	14.3%	14.3%	13.6%	13.3%	13.1%	12.9%	13.0%	13.0%	12.9%	12.7%
1988			24.4%	17.6%	17.3%	17.9%	13.9%	13.4%	12.9%	13.4%	13.6%	14.0%	13.8%	13.9%	13.1%	12.9%	12.7%	12.5%	12.6%	12.6%	12.6%	12.4%
1989				11.6%	13.5%	15.3%	11.2%	11.1%	10.9%	11.6%	11.9%	12.5%	12.4%	12.6%	11.9%	11.8%	11.7%	11.5%	11.8%	11.8%	11.8%	11.6%
1990					16.3%	18.2%	11.1%	10.9%	10.7%	11.6%	12.0%	12.7%	12.6%	12.7%	11.9%	11.8%	11.7%	11.5%	11.8%	11.8%	11.8%	11.6%
1991						20.5%	9.2%	9.5%	9.5%	10.8%	11.3%	12.1%	12.1%	12.3%	11.5%	11.4%	11.4%	11.2%	11.5%	11.6%	11.6%	11.4%
1992							3.9%	6.2%	7.1%	9.0%	9.9%	10.9%	11.0%	11.3%	10.6%	10.7%	10.7%	10.6%	10.9%	11.1%	11.1%	11.0%
1993								10.4%	10.0%	12.3%	13.0%	14.0%	13.7%	13.8%	12.4%	12.1%	11.9%	11.6%	12.0%	12.0%	12.0%	11.8%
1994									9.7%	13.3%	14.0%	15.2%	14.6%	14.6%	12.7%	12.4%	12.1%	11.8%	12.1%	12.2%	12.1%	11.9%
1995										18.7%	17.2%	18.1%	16.7%	16.1%	13.4%	12.8%	12.4%	12.0%	12.4%	12.4%	12.3%	12.0%
1996											15.6%	17.7%	15.9%	15.4%	12.4%	12.1%	11.8%	11.4%	11.9%	12.0%	11.9%	11.7%
1997												20.2%	16.1%	15.3%	11.8%	11.6%	11.4%	11.0%	11.6%	11.7%	11.7%	11.4%
1998													11.6%	13.0%	10.0%	10.4%	10.5%	10.2%	10.9%	11.2%	11.2%	11.0%
1999														14.1%	9.7%	10.2%	10.4%	10.1%	10.9%	11.2%	11.2%	10.9%
2000															7.5%	9.2%	9.8%	9.6%	10.6%	10.9%	10.9%	10.7%
2001																11.0%	10.9%	10.4%	11.4%	11.7%	11.6%	11.3%
2002																	10.9%	10.1%	11.6%	11.9%	11.8%	11.3%
2003																		8.9%	12.1%	12.3%	12.1%	11.5%
2004																			14.7%	13.9%	13.2%	12.1%
2005																				13.0%	12.1%	11.0%
2006																					11.2%	9.9%
2007																						8.8%

3 EFFECTIVENESS OF PROHIBITION OF FISHING FOR OR RETENTION OF RED SNAPPER CLOSURE

Eight steps were taken to determine the effectiveness of a closure, which are outlined below. If there was no reduction in effort and all current landings were discarded, only an 18% in total removals (landings and dead discards) would be expected. Total removals are determined by applying 40% and 90% release mortality rates to the recreational and commercial sectors, respectively.

Although a large number of red snapper are probably taken when targeting co-occurring species, there is probably some degree of targeting. If one assumes that during a closure red snapper are only taken when targeting major co-occurring species, some trips will not be taken during a seasonal closure for gag/vermillion snapper, and fishermen have some ability to avoid red snapper by avoiding locations then the reduction provided by closing red snapper year-round in the South Atlantic could be considerably greater.

Eight steps were taken to determine the reduction in total removals that could occur by closing red snapper year-round in the South Atlantic.

STEP 1 - Determine landings in numbers for red snapper during 2004-2006 using information from SEDAR 15 (2008).

STEP 2 – Determine average landings in pounds from logbook and average sampled landings from Headboat and MRFSS in numbers for 2004-2006.

Table 28. Landings (lbs) of red snapper during 2004-2006 from logbook and 2004-2006 commercial landings (number) from SEDAR 15 (2008) divided into month using logbook proportions. 90% release mortality rate applied to discards.

Month	Pounds from logbook			number from assessment divided into months		
	Tot WW	Tot GW	Avg GW	Dead dicards	landed	total removals
1	46,304	41,715	13,905	1,342	1,074	2,416
2	43,225	38,942	12,981	1,253	1,003	2,255
3	49,517	44,610	14,870	1,435	1,149	2,584
4	51,741	46,614	15,538	1,500	1,200	2,700
5	63,691	57,379	19,126	1,846	1,477	3,323
6	43,337	39,043	13,014	1,256	1,005	2,261
7	40,598	36,575	12,192	1,177	942	2,118
8	30,885	27,824	9,275	895	716	1,611
9	19,420	17,495	5,832	563	450	1,013
10	38,372	34,569	11,523	1,112	890	2,002
11	41,365	37,266	12,422	1,199	959	2,158
12	28,404	25,589	8,530	823	659	1,482
		sum	149,207	14,400	11,525	25,924

Table 29. Landings (lbs) of red snapper during 2004-2006 from headboat and 2004-2006 headboat landings (number) from SEDAR 15 (2008) divided into month using headboat proportions. 40% release mortality rate applied to dead discards.

Month	Lbs from Headboat			Number from assessment divided into month		
	tot ww	tot gw	avg gw	Dead discards	landed	total removals
1	6,864	6,184	2,061	587	326	912
2	12,060	10,865	3,622	1,031	572	1,603
3	16,410	14,784	4,928	1,402	779	2,181
4	19,107	17,214	5,738	1,633	907	2,540
5	22,416	20,195	6,732	1,916	1,064	2,980
6	15,919	14,341	4,780	1,360	755	2,116
7	17,542	15,804	5,268	1,499	833	2,332
8	16,174	14,571	4,857	1,382	768	2,150
9	6,420	5,784	1,928	549	305	853
10	22,243	20,039	6,680	1,901	1,056	2,956
11	12,958	11,674	3,891	1,107	615	1,722
12	12,354	11,130	3,710	1,056	586	1,642
			54,194	15,423	8,565	23,987

Table 30. Landings (lbs) of red snapper during 2004-2006 from headboat and 2004-2006 headboat landings (number) from SEDAR 15 (2008) divided into month using headboat proportions.

Month	MRFSS landings lbs			Numbers from assessment divided into month		
	tot ww	tot gw	avg gw	Dead discards	landed	total removals
1	43,314	39,022	13,007	3,266	1,806	5,072
2	43,314	39,022	13,007	3,266	1,806	5,072
3	81,204	73,157	24,386	6,122	3,386	9,508
4	81,204	73,157	24,386	6,122	3,386	9,508
5	75,985	68,455	22,818	5,729	3,168	8,897
6	75,985	68,455	22,818	5,729	3,168	8,897
7	47,751	43,019	14,340	3,600	1,991	5,591
8	47,751	43,019	14,340	3,600	1,991	5,591
9	71,436	64,356	21,452	5,386	2,979	8,365
10	71,436	64,356	21,452	5,386	2,979	8,365
11	78,511	70,730	23,577	5,919	3,274	9,193
12	78,511	70,730	23,577	5,919	3,274	9,193
			239,159	60,045	33,207	93,252

STEP 3 - Identify most common species taken with red snapper.

- Logbook data from 2004-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 lb of red snapper.
- Headboat and MRFSS data from 2004-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 red snapper.

Table 31. Species most commonly taken on trips where at least 1 lb of red snapper was caught based on data from 2004-2006.

Species	% by trip	% by wt	cum wt %
SNAPPER,VERMILION	64.91%	29.48%	29.48%
GROUPE,GAG	60.43%	13.21%	42.69%
SCAMP	63.59%	8.62%	51.31%
AMBERJACK,GREATER	38.01%	6.56%	57.87%
TRIGGERFISH,GRAY	53.92%	5.80%	63.67%
SNAPPER,RED	100.00%	5.09%	68.75%
GROUPE,RED	56.06%	4.86%	73.61%
JACK,ALMACO	32.83%	3.40%	77.02%
GROUPE,BLACK	11.35%	2.53%	79.55%
GROUPE,SNOWY	16.84%	1.70%	81.25%
KING MACKEREL	29.24%	1.50%	82.75%
SEA			
BASSE,ATLANTIC,BLACK,UNC	39.42%	1.49%	84.24%

Table 32. Species taken on headboat trips when at least 1 red snapper was caught. Based on data from 2004-2006.

Species	% trip	% number	Cum % number
Vermilion Snapper	70.71%	43.69%	43.69%
Black Sea Bass	82.41%	19.80%	63.48%
Tomtate	23.56%	4.83%	68.31%
Gray triggerfish	67.98%	3.98%	72.29%
Banded rudderfish	15.66%	3.16%	75.45%
Red Snapper	100.00%	2.98%	78.43%
Red pogy	21.33%	2.71%	81.14%
White grunt	11.66%	2.57%	83.71%
Greater amberjack	50.12%	2.21%	85.92%
Gray snapper	40.21%	1.74%	87.65%
Scamp	30.20%	1.69%	89.34%
Bank sea bass	13.31%	0.90%	90.25%
Scup	2.07%	0.71%	90.95%
Whitebone pogy	23.68%	0.70%	91.65%
Lane snapper	30.14%	0.69%	92.34%
Gag	54.03%	0.65%	92.99%

Table 33. Species taken on MRFSS trips when at least 1 red snapper was caught. Based on data from 2004-2006.

Species	% trip	% number	Cum % number
Vermilion snapper	27.20%	33.99%	33.99%
black sea bass	45.61%	26.11%	60.11%
red snapper	100.00%	5.21%	65.32%
gray triggerfish	20.96%	4.80%	70.12%

Species	% trip	% number	Cum % number
Tomtate	20.96%	2.89%	73.00%
White grunt	6.52%	2.12%	75.12%
Atlantic sharpnose shark	19.97%	1.71%	76.83%
Gag	17.42%	1.70%	78.53%
Round scad	2.27%	1.65%	80.18%
king mackerel	7.93%	1.38%	81.55%
red porgy	9.07%	1.37%	82.92%
Scamp	9.77%	1.22%	84.15%
greater amberjack	8.92%	1.19%	85.34%

STEP 4 – Identify trips that target co-occurring species.

STEP 5 - Determine incidental catch.

- For the commercial sector, incidental catch during a seasonal closure was determined by identifying trips that targeted (caught at least 100 lbs) of co-occurring species; and calculating the catch of red snapper on those trips. Trips targeting red snapper were removed from analyses assuming that targeting would not occur in the future. A trip would be considered to be targeting red snapper if greater than 300 lb whole weight of the landings on a trip included the species. [Note: 300 lbs ww (270 lbs gw) was chosen as the cut-off because when the trip limit analysis was done, there seemed to be a good break for landings greater than 300 lbs ww (270 lbs gw). If one examines the table for the trip limit analysis, one can see that the number of trips drops sharply for those that caught > 300 lbs ww (270 lbs gw). On average, 103 trips caught 300 lbs or greater; whereas, only 43 trips caught red snapper at levels greater than 300 lbs. A similar break is seen in the % reduction in harvest when the trip limit is > 300 lbs ww (270 lbs gw).] In addition, trips that employed diving gear, were not considered in analyses since fishermen can recognize a species before it is captured.
- For the recreational sector, incidental catch during a seasonal closure was determined by identifying trips that caught co-occurring species; and calculating the catch of red snapper on those trips.

STEP 6 – Determine total removals for reduced trips and behavior after quota. This step assumes that fishermen could have the ability to avoid red snapper by fishing differently.

STEP 7 – Compare estimate of total removals in Step 6 to landings for database in Step 2.

STEP 8 – Apply reduction in total removals to landings and discards in Step 1.

If one assumes the proposed actions in Snapper Grouper Amendment 16 would not be imposed, red snapper are only caught when fishermen target co-occurring species, and there is no ability to reduce red snapper catch by fishing differently or avoiding hot spots, then a 58% reduction in harvest could be expected (Table 34). If there is some ability to avoid red snapper, then the harvest reduction would be closer to 66%.

Table 34. Reduction in harvest of red snapper (RS) assuming: (1) no shallow water grouper SWG) closure; (2) a four month SWG closure; and (3) and SWG and VS closure.

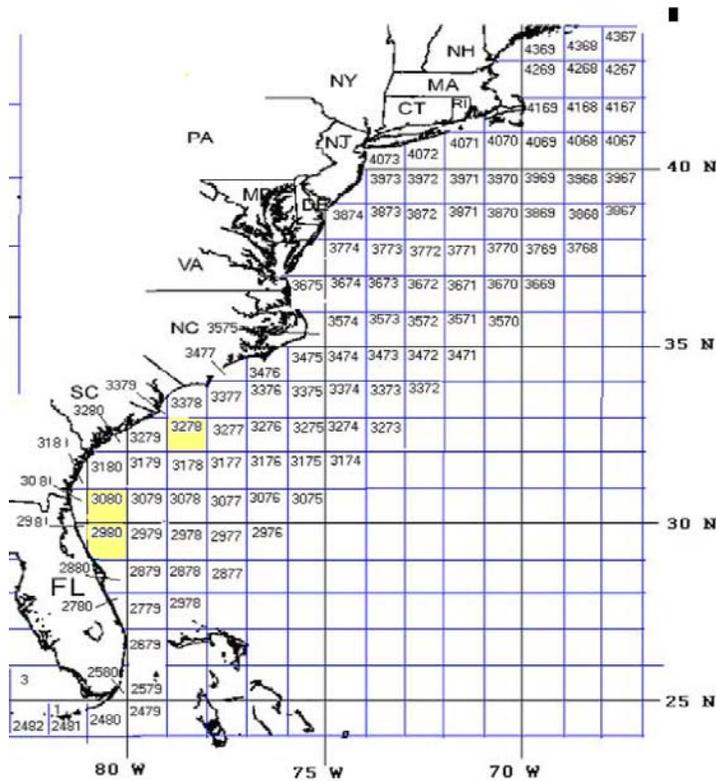
Action	No trip reduction or ability to avoid RS	20% reduction in trips during closure of SWG and or VS	20% trip reduction and 20% ability to avoid RS*
Scenario 1: Jan-Dec RS closure with no Jan-Apr SWG closure or rec VS closure	57.71%	No SWG or VS closure	66.16%
Scenario 2: Jan-Dec RS closure with Jan-Apr closure for SWG species	58.66%	65.00%	72.00%
Scenario 3: Jan-Dec RS closure with Jan-Apr closure for SWG species & Nov-March closure for vermilion snapper	58.93%	68.01%	74.40%

* No reduction in trips are assumed for the first scenario.

4. Locations where red snapper are caught

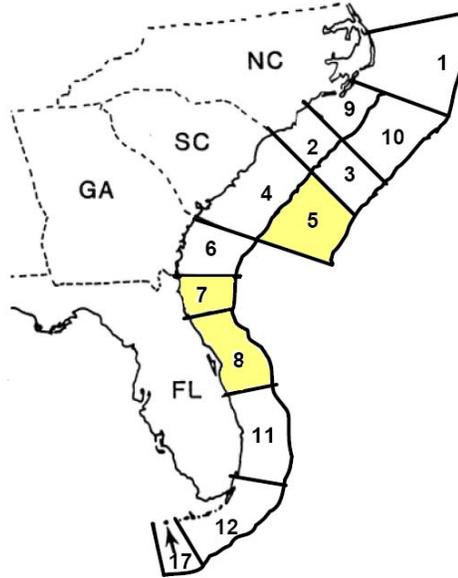
Commercial

Figure 1. Commercial landings (pounds whole weight) of red snapper by statistical grid 2001-2006. Shaded area represents locations where 53% of the red snapper were caught.



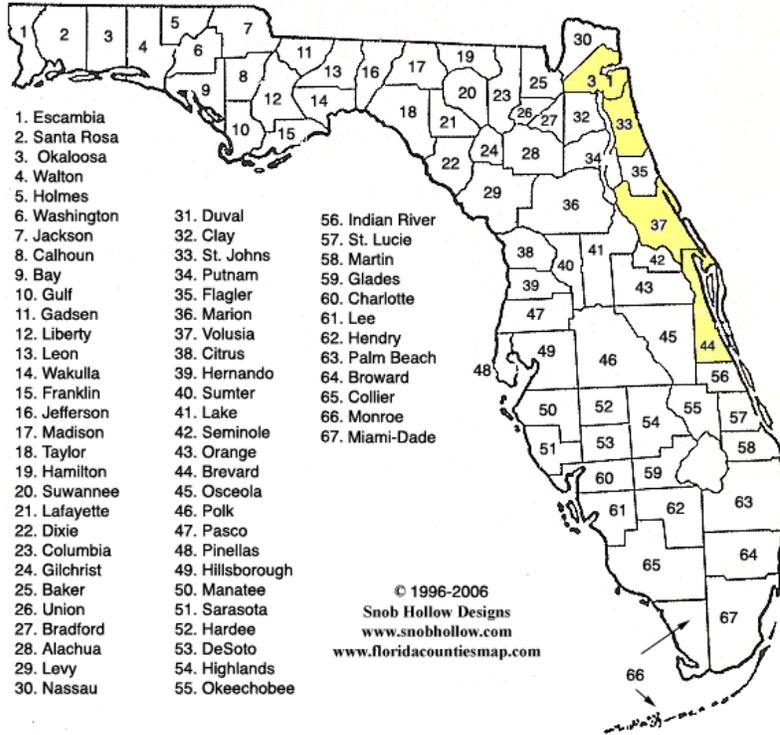
Headboat

Figure 2. Headboat landings (pounds whole weight) of red snapper by area code 2001-2006. Shaded area represents locations where 74% of the red snapper were caught.



MRFSS

Figure 3. Locations where red snapper were caught during 2001-2005. Represents sample and not adjusted for effort. Shaded area represents locations where 69% of the red snapper were taken.



5. Bag and size limit analysis

Table 35. Reduction in harvest associated with reducing the bag limit for red snapper to 1 fish per person per day. Includes non-compliance with bag limit, and 40% release mortality. Based on data from 2001-2006.

Sector	Bag limit 1
Private	2.80
Charter	3.87
Priv/Char combined	3.21
Headboat	3.92
All rec	3.35

Table 36. Reduction in harvest associated with increasing the size limit for red snapper. Includes non-compliance with size limit, and 40% release mortality. Based on data from 2001-2006.

Sector	Estimated Harvest Reductions			
	21 inch	22 inch	23 inch	24 inch
Headboat	9.4	23.4	37.5	43.7
MRFSS	5.3	17.8	26.7	32.8
Commercial				

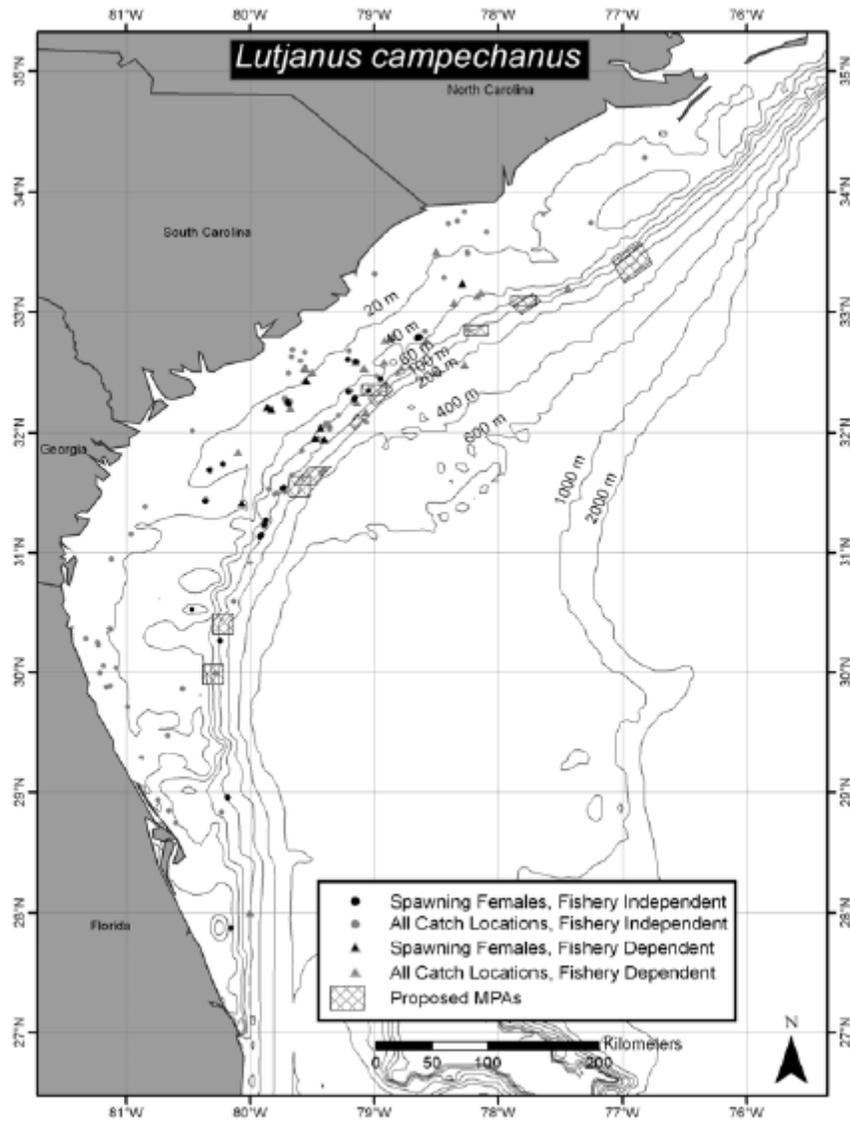
6. Commercial Trip Limit Analysis

Table 37. Trip limit analysis for red snapper data from 2001-2006.

Avg 2001-2006					
Trip Limit (lbs gutted weight)	Avg no. trips	Avg pounds over limit	Expected catch	% trips over limit	% reduction in catch from limit
0	1,751.2	148,689	0	100.0%	100.0%
23	1,028.7	113,738	34,952	58.7%	76.5%
45	689.5	92,679	56,010	39.4%	62.3%
68	505.7	77,849	70,840	28.9%	52.4%
90	386.7	66,826	81,863	22.1%	44.9%
135	256.7	51,019	97,671	14.7%	34.3%
225	136.8	32,205	116,484	7.8%	21.7%
270	102.7	26,241	122,448	5.9%	17.6%
450	41.3	12,926	135,763	2.4%	8.7%
541	26.7	9,568	139,122	1.5%	6.4%
631	17.7	7,329	141,360	1.0%	4.9%
721	12.7	5,805	142,885	0.7%	3.9%
811	9.8	4,675	144,014	0.6%	3.1%
901	7.7	3,793	144,896	0.4%	2.6%
991	5.8	3,145	145,544	0.3%	2.1%
1,081	4.3	2,650	146,039	0.2%	1.8%
1,171	3.3	2,278	146,411	0.2%	1.5%
1,261	2.8	1,965	146,724	0.2%	1.3%

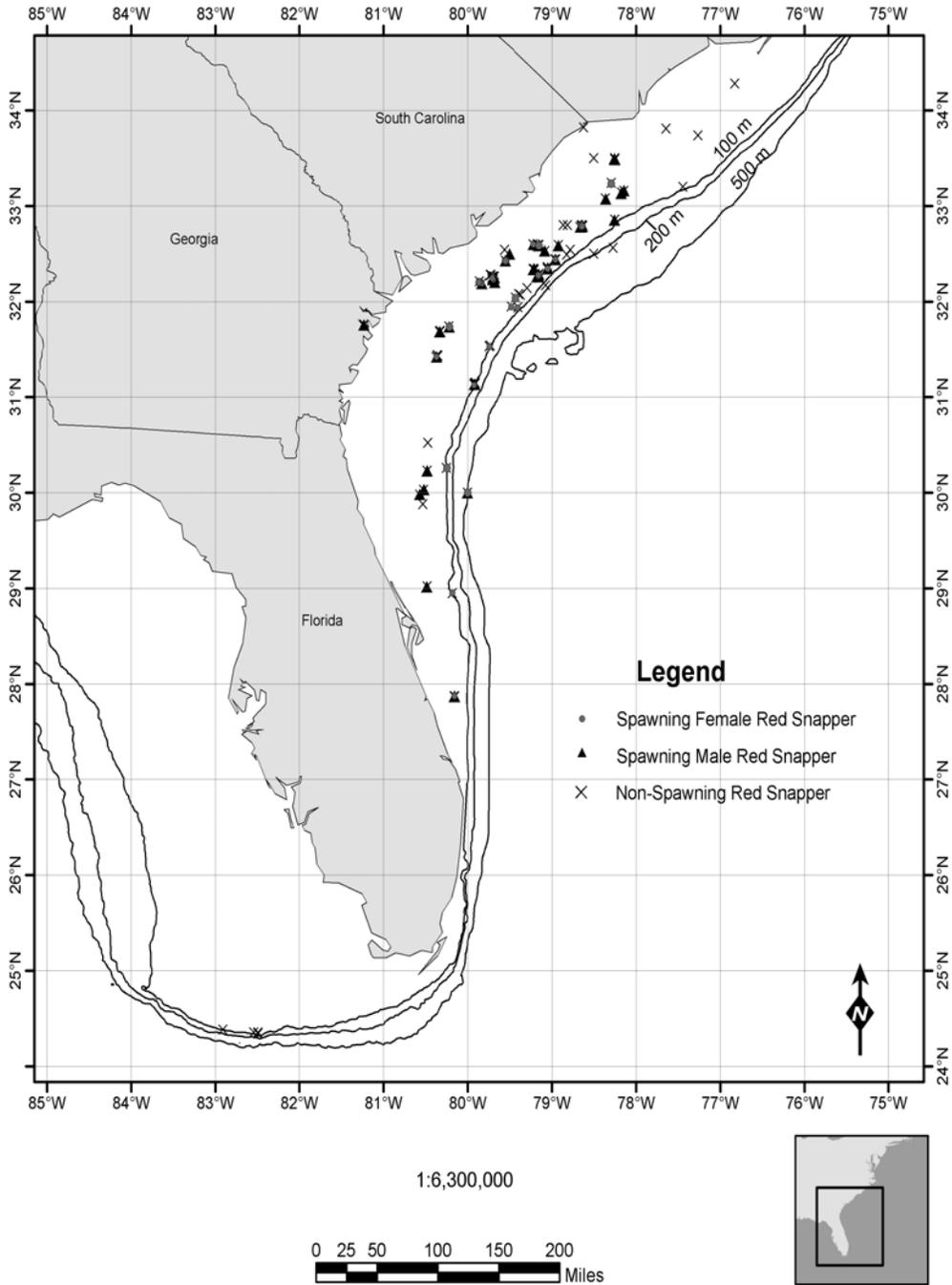
Avg 2001-2006					
Trip Limit (lbs gutted weight)	Avg no. trips	Avg pounds over limit	Expected catch	% trips over limit	% reduction in catch from limit
1,351	2.2	1,732	146,957	0.1%	1.2%
1,441	1.8	1,533	147,156	0.1%	1.0%
1,532	1.8	1,350	147,339	0.1%	0.9%
1,622	1.5	1,193	147,496	0.1%	0.8%
1,712	1.2	1,048	147,641	0.1%	0.7%
1,802	1.2	932	147,758	0.1%	0.6%
2,027	0.8	695	147,994	0.0%	0.5%
2,252	0.5	513	148,177	0.0%	0.3%
2,477	0.3	394	148,296	0.0%	0.3%
2,703	0.3	310	148,379	0.0%	0.2%
2,928	0.2	258	148,431	0.0%	0.2%
3,153	0.2	217	148,472	0.0%	0.1%
3,378	0.2	175	148,514	0.0%	0.1%
3,604	0.2	133	148,556	0.0%	0.1%
3,829	0.2	92	148,597	0.0%	0.1%
4,054	0.2	50	148,639	0.0%	0.0%
4,279	0.2	8	148,681	0.0%	0.0%
4,505	0.0	0	148,689	0.0%	0.0%

7. Spawning locations for red snapper



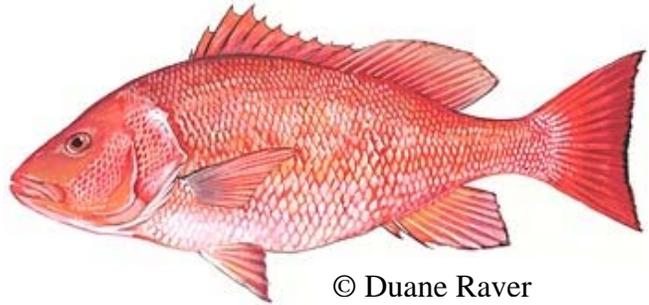
From Sedberry et al. (2006)

8. LOCATIONS WHERE RED SNAPPER WERE COLLECTED



9. SPECIES DESCRIPTIONS OF RED SNAPPER

The red snapper is found from North Carolina to the Florida Keys, and throughout the Gulf of Mexico to the Yucatan (Robins and Ray 1986). It can be found at depths from 10 to 190 m (33-623 ft). Adults usually occur over rocky bottoms. Juveniles inhabit shallow waters and are common over sandy or muddy bottom habitat (Allen 1985).



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The maximum size reported for this species is 100 cm (39.7 in) TL (Allen 1985, Robins and Ray 1986) and 22.8 kg (50 lbs) (Allen 1985). Maximum reported age in the Gulf of Mexico is reported as 53 years by Goodyear (1995) and 57 years by Allman et al. (2002). For samples collected from North Carolina to eastern Florida, maximum reported age is 45 years (White and Palmer 2004). McNerny (2007) reports a maximum age of 54 years red snapper in the South Atlantic. Natural mortality (M) is estimated to be 0.078 using the Hoenig (1983) method with a maximum age of 53 years (SEDAR 15 2008). Manooch et al. (1998) estimated M at 0.25 but the maximum age in their study was 25 years (Manooch and Potts 1997).

Red snapper are gonochorists. In the U.S. South Atlantic Bight and in the Gulf of Mexico, Grimes (1987) reported that size at first maturity is 23.7 cm (9.3 in) FL. For red snapper collected along the Southeastern United States, White and Palmer (2004) found that the smallest mature male was 20.0 cm (7.9 in) TL, and the largest immature male was 37.8 cm (15 in) TL. 50% of males are mature at 22.3 cm (8.8 in) TL, while 50% of females are mature at 37.8 cm (15 in) TL. Males are present in 86% of age 1, 91% of age 2, 100% of age 3, 98% of age 4, and 100% of older age fish. Mature females are present in 0% of age 1, 53% of age 2, 92% of age 3, 96% of age 4, and 100% of older age individuals. Grimes (1987) found that the spawning season of this species varies with location, but in most cases occurs nearly year round. White and Palmer (2004) reported that the spawning season for female red snapper off the southeastern United States extends from May to October, peaking in July through September. Red snapper eat fishes, shrimps, crabs, worms, cephalopods, and some planktonic items (Szedlemayr and Lee 2004).

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