

Trends in Catch Data and Estimated Static SPR Values
for Fifteen Species of Reef Fish Landed Along the
Southeastern United States

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METHODS

Council staff requested that the NOAA, NMFS, Beaufort Laboratory's Fish Biology Team provide graphical and tabular data reflecting trends in catches of fifteen species: black sea bass, white grunt, gray triggerfish, red porgy, vermilion snapper, red snapper, gag, scamp, red grouper, greater amberjack, black grouper, speckled hind, snowy grouper, yellowedge grouper, and tilefish. Weight of landings (kg), mean fish size, and headboat fishery catch per unit effort are presented for each species compiled for the entire southeastern United States fishing area: North Carolina through the east coast of Florida, including the Florida Keys and Dry Tortugas. Three data bases, each with a landings and fish size (bioprofiles) component, were utilized: Headboat, Commercial, and Marine Recreational Fisheries Statistical Survey (MRFSS).

Following are descriptions of the data and various limitations:

Headboat - Landings were available for the entire region for 1981-1999; restricted to NC and SC for 1972-1975; NC through North Florida for 1976-1977, and partial coverage of South Florida for 1978-1980. Headboat data are part of the "For Hire" recreational data.

Mean weights were obtained from bioprofiles data for 1972-1999 with the same geographic restrictions as the landings.

CPUE was calculated in terms of number of fish caught as well as kilograms of fish caught, all per angler day. CPUE trends were plotted in terms of one data point per year per species. For a given species, CPUE calculation were done only for those areas in which the species was a common and frequent occurrer. This was done to avoid negatively biasing the CPUE calculation (i.e., inclusion of areas of infrequent or rare occurrence would involve including both low landings data and high effort data, resulting in low and inaccurate CPUE values).

Commercial - Landings were available from 1986-1999. 1986 was the first year that most fish were identified to species. Before 1992 greater amberjack were included in an unclassified category only, which contained four *Seriola* species, the majority of which were probably greater amberjack. Since 1992, greater amberjack landings were identified to species in Florida, but still unclassified in NC, SC, and GA. Landings of gray triggerfish and white grunt were lumped into unclassified categories and could not be broken out easily.

Mean weights were generated from intercept (TIP) lengths, which were then applied to weight-length relationships for each species, 1983-1999.

MRFSS - Landings data were available for 1981-1999, and were recorded as charter boat (“For Hire”) landings and other recreational platforms (e.g., private boat, pier, shore, etc.). However, 1981-1985 data provide crude estimates of charter boat landings because they were combined with party boats (headboats) landings for those years. To adjust, we used the intercept data to obtain the proportion of charter boat and party boat samples for each species. We then applied those proportions to the landings data of each species, and discarded the party boat segment because it was already included in the official headboat data. Monroe County, FL landings are not included because county codes are not included in the landings data, and could not be easily broken out.

Mean weights for each species were obtained from the intercept data. For the samples with no weight recorded, the weight-length relationship for each species was used to convert the lengths to weights.

Estimates of SPR - Static spawning potential ratio (SPR) values were estimated for those species that have not had recent VPA analysis done on them: gray triggerfish, tilefish, red grouper, black grouper, snowy grouper, yellowedge grouper, and speckled hind. SPR’s for the other species are reported from the full assessments. The models are stochastic in that we used different estimates of natural mortality (M), varying proportion of females and males for the protogynous species, and in one case, different maturity schedules. The most up-to-date studies on age and growth and reproduction for each species were used in the analysis. The percent reduction in fishing mortality (F) and increase in fish minimum length needed to obtain 30% and 40% SPR are included by species. The species are listed in order of confidence that we place in the data used to derive the estimates.

General Comments:

Some of the data points look very questionable. These typically appear as peaks in the landings or mean weights. In some instances sample sizes are very small, such as for the mean weights of commercially caught gray triggerfish in 1983, greater amberjack in 1983, and black grouper in 1983 and 1984. In other instances unusually large landings were reported, such as for white grunt in 1998 commercial catch, and red snapper charter boat landings in 1992. Both we believe to be related to species identification. For white grunt, 1998 was the first year that the species was identified and separated from miscellaneous grunts, thus the unusually large number. And, the large catch of red snapper recorded for charter boat anglers in 1992 probably reflects vermillion snapper misidentified as red snapper.

Management Regulations Impacting Trends:

Since the Snapper Grouper Fishery Management Plan was implemented in 1983, nine

amendments have been made to it through 1999. Many of the regulations impact trends in landings and mean size of the various species in this report. Listed below are gear restrictions that impact all of the species listed in the report. Specific regulations such as size limits, bag limits, seasonal closures, and quotas are listed at the bottom of each species table. In addition, an Emergency Rule closing the red porgy fishery was put in place in September 1999.

1989 - Trawl gear used in directed snapper grouper fishery was prohibited from Cape Hatteras, NC through Cape Canaveral, FL.

1992 - Fish traps were prohibited except black sea bass pots when used north of Cape Canaveral, FL.

Entanglement nets (including trammel and gill) were prohibited.

Longline gear inside 50 fathoms was prohibited when used in the snapper grouper fishery. Powersticks and bangsticks were prohibited in special management zones off the South Carolina coast.

Black sea bass data (landings, mean weights, and CPUE-Wt are in kilograms).

Year	Commercial			Headboat			Charter boat			Other recreational				
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE #	CPUE Wt	Landings	Mean Wt	N	Landings	Mean Wt	N
						NC - NEFL								
72				150904	0.27	1								
73				486815	0.44	592	13.44	5.77						
74				338986	0.37	519	9.96	3.67						
75				287705	0.39	479	5.51	2.45						
76				287646	0.31	1622	8.78	2.45						
77				249028	0.36	1168	3.42	1.77						
78				271717	0.31	822	8.68	2.46						
79				293863	0.26	1197	11.26	2.64						
80				322621	0.27	1510	8.62	2.13	25424	0.15	49	128601	0.19	171
81				333613	0.29	1849	8.01	2.06	733	0.37	3	507045	0.29	433
82				328363	0.28	2895	7.73	1.89	132560	0.24	33	197614	0.21	165
83	0.32	333		314446	0.32	3073	5.91	1.62	48675	0.35	93	828732	0.34	222
84	0.42	2352		270223	0.27	2984	5.53	1.36	53085	0.43	47	417996	0.28	453
85	0.44	1792		255335	0.26	3368	5.16	1.19	25455	0.16	152	189919	0.28	275
86	623906	0.41	2398	293254	0.27	3254	4.98	1.25	49840	0.37	134	418843	0.24	519
87	363779	0.44	2068	288132	0.31	2159	4.40	1.24	425111	0.42	196	242583	0.28	344
88	684746	0.39	2545	216831	0.32	3840	3.47	1.00	205022	0.45	90	318751	0.27	444
89	576724	0.39	1090	172171	0.24	6209	3.26	0.85	71489	0.52	172	181540	0.25	301
90	662497	0.37	2227	129836	0.22	5381	2.58	0.66	293116	0.52	56	357748	0.35	334
91	487755	0.41	3011	97920	0.22	5195	1.97	0.50	101038	0.43	296	228647	0.34	412
92	476537	0.39	2958	64875	0.28	3959	1.16	0.35	106048	0.47	138	125861	0.31	255
93	425012	0.65	2326	60074	0.26	4225	1.24	0.36	60776	0.48	199	212779	0.32	198
94	435346	0.44	2697	57889	0.24	3331	1.16	0.35	156969	0.56	177	109424	0.28	211
95	310589	0.50	1038	66471	0.28	3133	1.54	0.48	123224	0.46	226	168628	0.33	169
96	324009	0.42	1177	67015	0.30	3565	1.37	0.44	783558	0.41	129	159599	0.33	238
97	798971	0.41	2313	64639	0.30	4067	1.29	0.42	51696	0.45	301	126349	0.29	128
98	394190	0.45	2147	87348	0.35	4003	1.57	0.61	38856	0.48	326	118852	0.40	219

1983 - 8" TL minimum size limit, all fisheries

1989 - Gear restrictions as listed in text

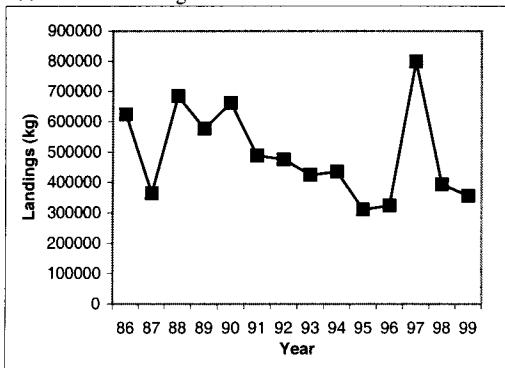
1992 - Gear restrictions as listed in text

1999 - 10" TL minimum size limit, all fisheries

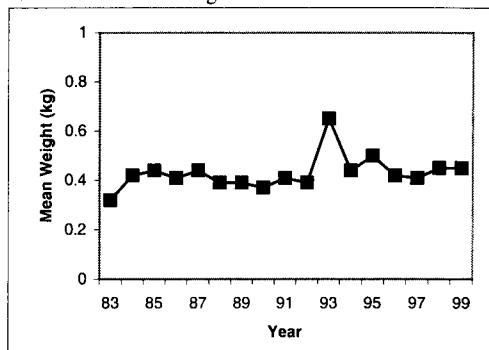
- Recreational bag limit 20 BSB/person/day

Black sea bass

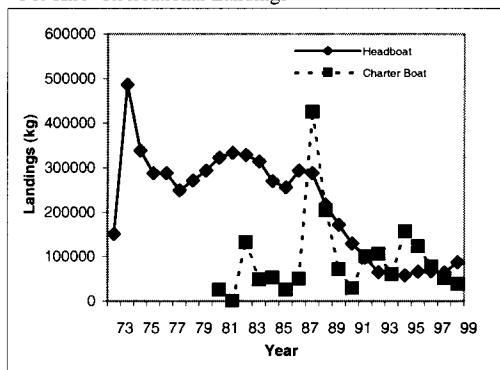
Commercial Landings



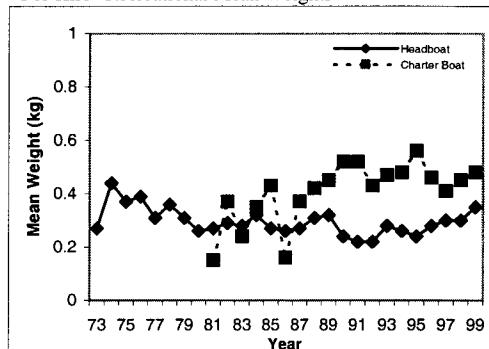
Commercial Mean Weights



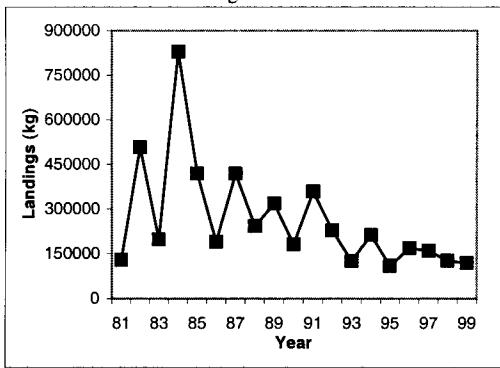
"For Hire" Recreational Landings



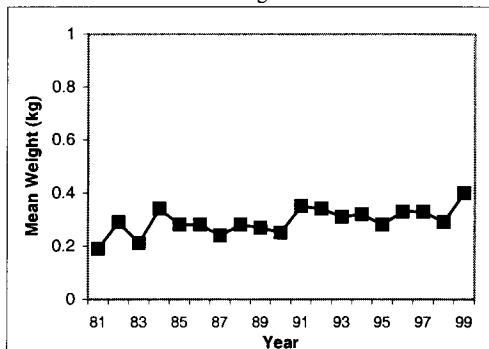
"For Hire" Recreational Mean Weights



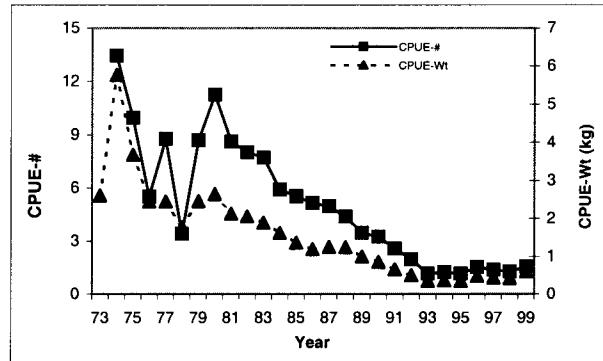
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - North Florida



White grunt (Landings, mean weights, and CPUE-Wt are in kg. Commercial landings do not include grunts unclassified.)

Year	Commercial		Headboat				Charter boat				Other Recreational				
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE-#	CPUE-Wt	CPUE-#	CPUE-Wt	N	Landings	Mean Wt	N	
				NC & SC			SEFL & Keys								
1972				103517	0.83	2109	2.78	2.11							
1973				64235	0.91	1515	1.36	1.11							
1974				77269	0.93	930	1.47	0.92							
1975				69665	0.84	1053	1.87	0.75							
1976				64852	0.86	1264	1.87	0.71							
1977				52217	0.84	704	0.73	0.56							
1978				36156	0.62	754	0.44	0.39							
1979				38528	0.58	465	0.57	0.46							
1980				39913	0.73	744	0.47	0.45							
1981				98023	0.66	783	0.93	0.80							
1982				123125	0.53	2306	1.04	0.87	0.48	0.17	1.53	1	213881	0.24	
1983	0.94	75	93426	0.44	3043	0.79	0.78	0.43	0.12	12319	1.18	2	270046	0.24	
1984	0.85	604	64631	0.48	3151	0.51	0.40	0.45	0.14	63395	0.93	14	216549	0.29	
1985	0.85	610	80687	0.43	3397	0.70	0.50	0.58	0.17	6764			296489	0.28	
1986	0.88	310	89248	0.47	2761	0.70	0.49	0.64	0.20	63164			85407	0.28	
1987	0.81	656	113641	0.47	3259	0.92	0.48	0.95	0.27	33904	0.99	4	232106	0.51	
1988	0.86	408	123221	0.45	2611	0.80	0.45	1.25	0.36	32707	0.94	96	181801	1.16	
1989	0.84	359	111116	0.49	2202	1.02	0.51	0.92	0.28	20996	0.77	40	32960	0.87	
1990	0.61	667	122979	0.41	2234	1.28	0.63	0.99	0.27	113438	0.81	57	333243	0.87	
1991	16	666	425	140284	0.85	2261	1.13	1.00	0.59	0.16	19174	0.88	68	614548	0.53
1992	66	0.72	612	95762	0.46	1995	1.11	0.54	0.81	0.22	44329	0.75	75	33128	0.48
1993	32	0.77	1132	97876	0.45	2608	1.09	0.54	0.89	0.24	27842	0.73	94	259097	0.43
1994	163	0.72	541	105286	0.45	2512	1.22	0.64	0.80	0.22	78408	0.71	63	207984	0.34
1995	427	0.81	477	100239	0.47	3398	1.11	0.59	0.88	0.27	19331	0.61	50	122187	0.37
1996	40	0.79	641	88566	0.39	2633	0.73	0.44	1.11	0.32	24413	0.81	47	123752	0.32
1997	42	0.72	1278	85599	0.41	2896	0.83	0.49	1.14	0.31	24030	0.85	41	60272	0.33
1998	4713	0.57	1513	79050	0.41	3206	0.72	0.42	1.28	0.35	10619	0.92	35	61293	0.32
1999	4896	0.71	1844	71377	0.42	2914	0.77	0.47	0.76	0.20	16360	0.77	59	43711	0.31
														200	

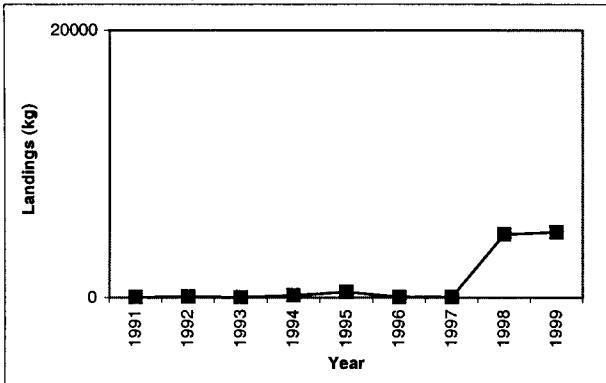
1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text

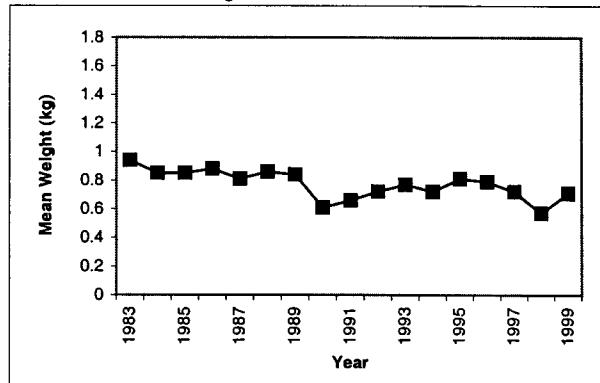
1999- Recreational aggregate bag limit of 20 fish/person/day

White grunt

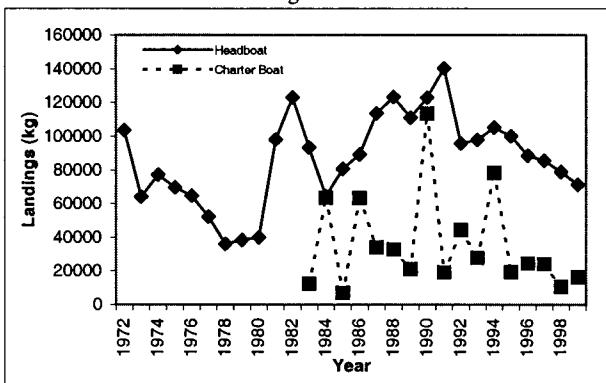
Commercial Landings



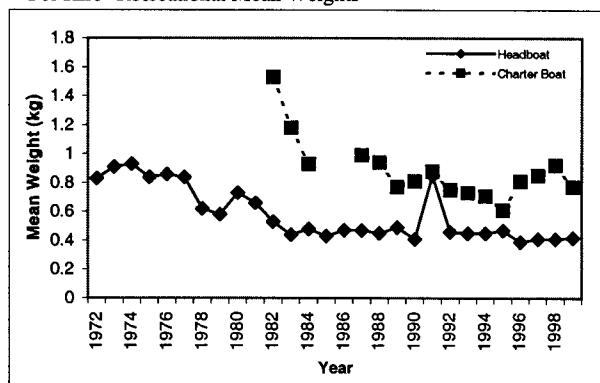
Commercial Mean Weights



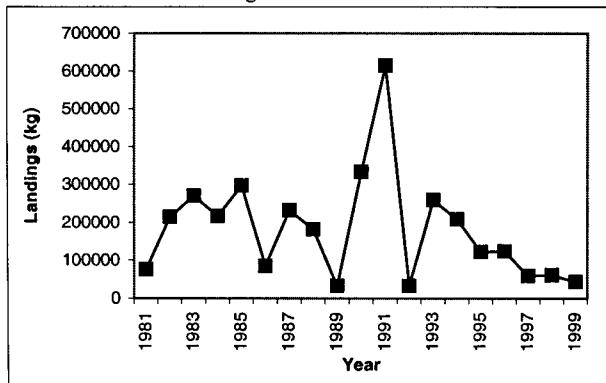
"For Hire" Recreational Landings



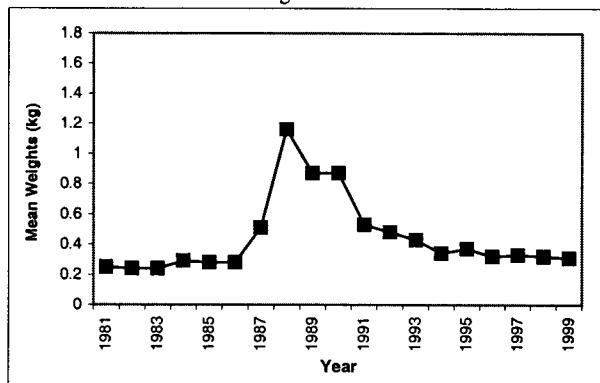
"For Hire" Recreational Mean Weights



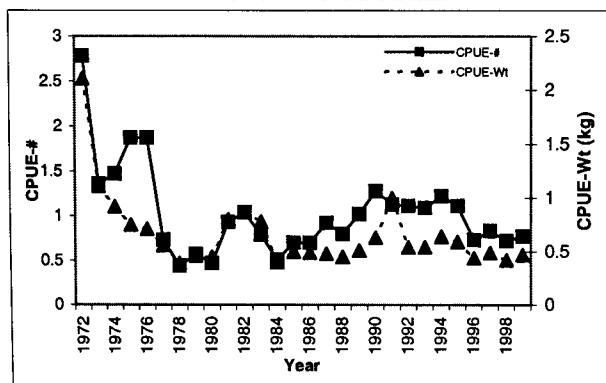
Other Recreational Landings



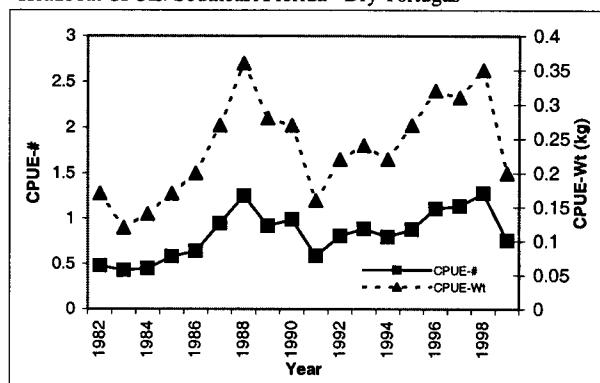
Other Recreational Mean Weights



Headboat CPUE: North Carolina - South Carolina



Headboat CPUE: Southeast Florida - Dry Tortugas



Gray triggerfish data (landings, mean weights, and CPUE-Wt) are included because of unclassified category.)

1989 - Gear restrictions as listed in text

1892 - Gear restrictions as listed in text

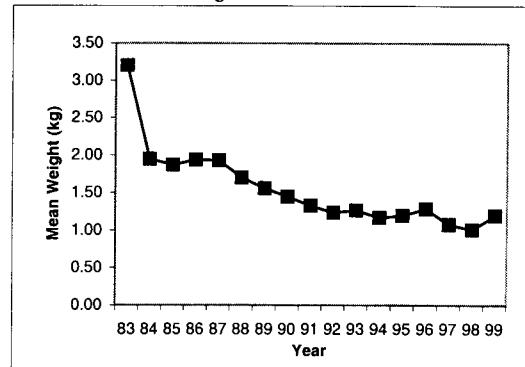
1995 - 12" TL minimum size limit in EEZ off the Atlantic coast of Florida, all fisheries
1992 - Gear restrictions as listed in text

Gray triggerfish

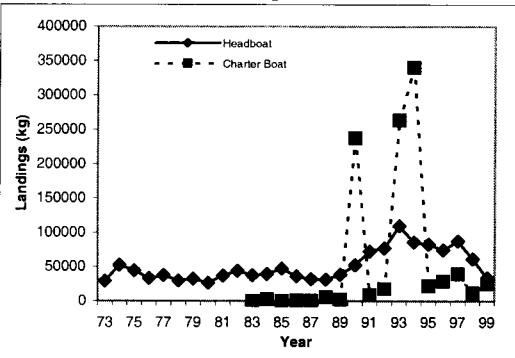
Commercial Landings

No data available

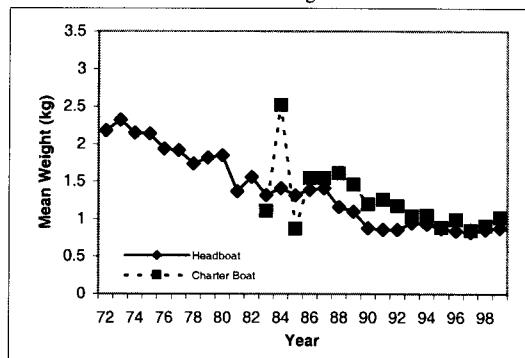
Commercial Mean Weights



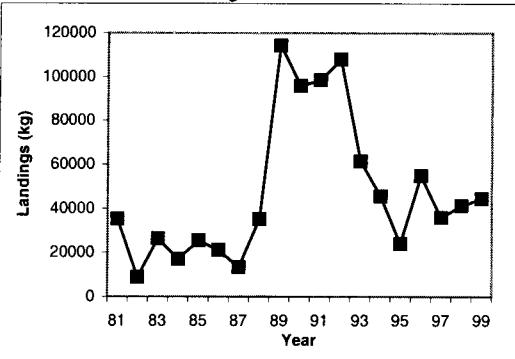
"For Hire" Recreational Landings



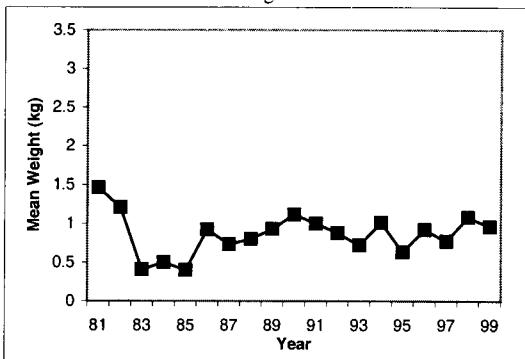
"For Hire" Recreational Mean Weights



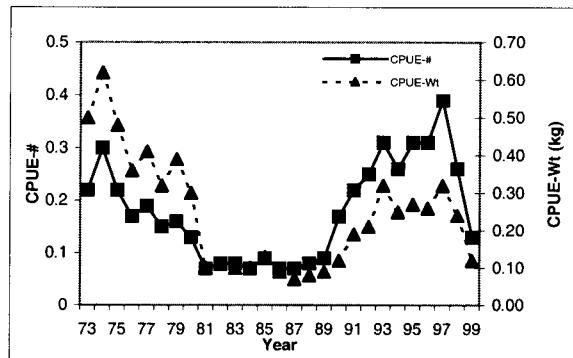
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Southeast Florida



Red porgy data (landings, mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter boat			Other Recreational				
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE#	CPUE-Wt	Landings	Mean Wt	N	Landings	Mean Wt	N
						NC - NEFL								
72				235351	1.06	2115	4.4	4.8						
73				334125	1.13	2508	5.1	5.8						
74				233116	1.07	1798	2.8	2.8						
75				202542	1.05	1148	2.4	2.2						
76				186310	1.09	1240	2.2	1.9						
77				240348	1.01	1100	2.4	2.5						
78				239757	1.02	843	1.9	2.2						
79				162176	1.05	458	1.5	1.7						
80				161668	0.95	727	1.7	1.7						
81				147625	0.85	575	2.0	1.8	0			5789	0.58	8
82				195923	0.72	1246	2.8	2.0	0			3	2503	0.55
83	1.05	337		118592	0.78	1206	1.7	1.3	19158	0.85	19		2487	0.33
84	0.92	3347		98446	0.78	1284	1.3	1.0	43250	0.65	24		4835	0.85
85	0.93	3447		118106	0.66	967	1.7	1.2	35	0.50	1		93437	0.64
86	307283	0.89	3770	100737	1.39	1228	1.4	0.9	1284	0.58	8		7538	0.60
87	260159	0.78	3306	100006	0.58	1203	1.3	0.8	9574	0.69	23		23407	0.57
88	284672	0.74	1721	97764	0.59	811	1.3	0.8	32207	0.53	27		148055	0.60
89	302010	0.72	2035	74865	0.50	1511	1.4	0.7	45587	0.61	51		16277	0.40
90	347227	0.65	2463	56819	0.48	1312	1.0	0.5	7078	0.79	47		14016	0.32
91	256559	0.62	2457	63874	0.48	649	1.1	0.5	50482	0.68	17		14741	0.43
92	134958	0.69	1384	49830	0.49	828	0.8	0.5	32513	0.65	77		20206	0.50
93	133897	0.74	1979	45824	0.54	1011	0.7	0.4	15797	0.65	43		10564	0.92
94	158678	0.74	1745	39721	0.52	780	0.7	0.4	4115	0.58	50		10503	0.51
95	155473	0.68	2260	42198	0.57	851	0.7	0.4	33755	0.60	54		2427	0.58
96	166084	0.65	2679	37294	0.57	868	0.7	0.4	53391	0.70	21		32952	0.98
97	163169	0.66	3208	34155	0.60	635	0.5	0.3	4984	0.67	14		2845	0.76
98	134576	0.61	3559	31417	0.58	793	0.4	0.2	3621	0.60	15		1689	0.76
99	44674	0.73	2961	22070	0.69	264	0.2	0.1	11248	0.85	58		5294	1.02
														7

1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text

12" TL minimum size limit, all fisheries

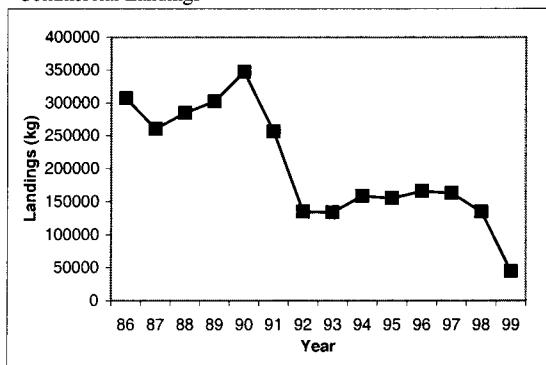
1999 - 14" TL minimum size limit, all fisheries

- March and April commercial sale prohibited

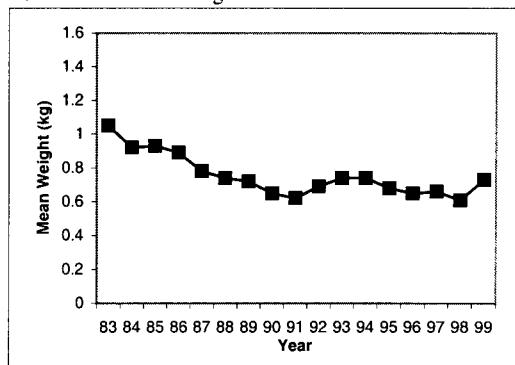
- September, emergency rule, fishery closed to recreational and commercial harvest

Red porgy

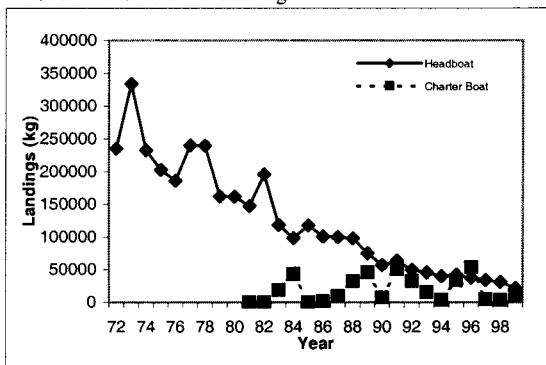
Commercial Landings



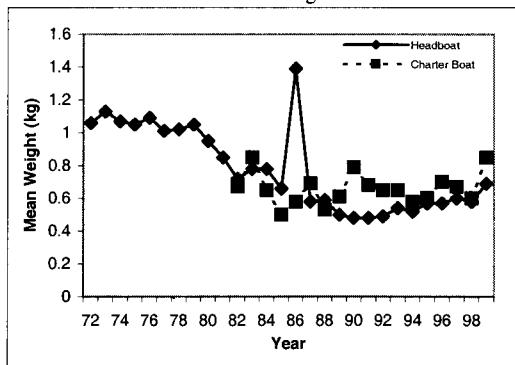
Commercial Mean Weights



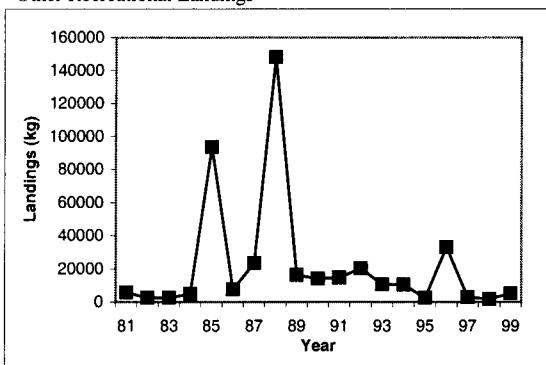
"For Hire" Recreational Landings



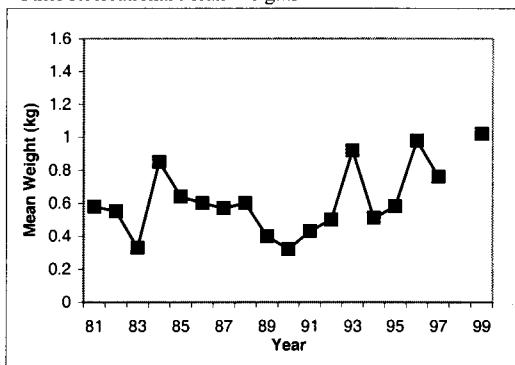
"For Hire" Recreational Mean Weights



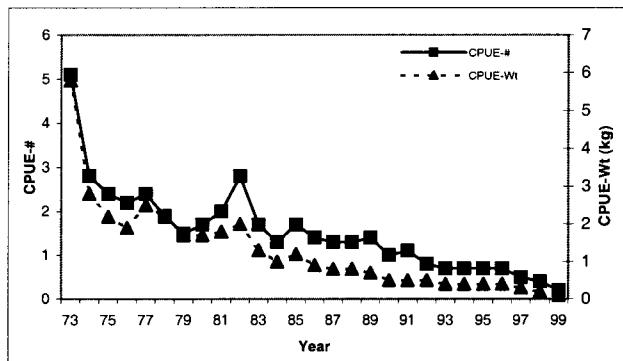
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Northeast Florida



Vermilion snapper data (landings, mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter boat			Other Recreational					
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE #	CPUE-Wt	NC - NEFL	Landings	Mean Wt	N	Landings	Mean Wt	N
72				48576	0.51	569	1.7	1.0							
73				67762	0.78	278	1.1	1.2							
74				47679	0.56	672	1.1	0.6							
75				74872	0.62	702	1.4	0.8							
76				115354	0.61	667	0.8	0.5							
77				69538	0.45	514	0.3	0.3							
78				131201	0.44	917	0.4	0.4							
79				97192	0.46	699	0.2	0.3							
80				90025	0.49	677	0.5	0.5							
81				104320	0.38	676	1.6	0.6	0					0	
82				154150	0.43	1397	2.0	0.9	0				8639	0.23	6
83				133985	0.35	2280	1.8	0.7	96935	0.41	24	80523	0.48	13	
84	0.94	391		111114	0.36	2316	1.5	0.5	5483	0.31	29	3466	0.10	1	
85	0.85	4921		168814	0.32	2994	2.3	0.7	4759	0.39	15	62931	0.40	6	
86	0.82	5996		158448	0.31	3564	2.1	0.6	0			5109	0.18	20	
87	0.63	8621		204999	0.29	3383	2.4	0.7	27891	0.41	15	26823	0.65	23	
88	0.56	8022		189892	0.29	2495	2.6	0.7	35048	0.55	83	26059	0.36	38	
89	0.62	5625		157189	0.24	4776	2.3	0.5	28586	0.26	33	19478	0.39	19	
90	0.59	6007		175439	0.23	5333	2.6	0.7	15828	0.63	38	38870	0.41	17	
91	0.61	10525		275691	0.53	4041	2.8	1.4	30213	0.49	24	34679	0.25	23	
92	0.63	6039		113216	0.29	2835	1.5	0.5	49421	0.83	117	6943	0.42	10	
93	0.70	8230		116665	0.32	3330	1.6	0.6	30585	0.39	60	11050	0.46	15	
94	0.72	7545		127754	0.31	5738	2.0	0.7	21354	0.56	75	7489	0.41	4	
95	0.65	9866		123314	0.33	4811	2.0	0.7	15506	0.37	75	4455	0.48	6	
96	0.59	5252		125332	0.35	3563	2.2	0.8	70871	0.53	16	594			
97	0.66	5223		136039	0.38	4048	2.3	0.9	18961	0.37	40	13978	0.43	28	
98	0.58	6675		124962	0.35	4072	2.2	0.8	44848	0.59	69	11923	0.92	1	
99	0.66	11825		152287	0.39	4233	2.6	1.0	37593	0.59	171	29600	0.40	41	

1983 - 4" mesh on trawl gear to achieve 12" minimum size on VS

1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text

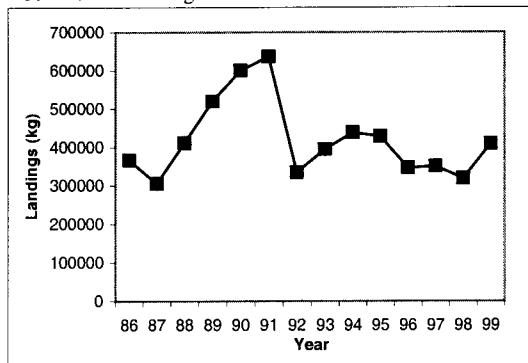
10" TL minimum size limit, all fisheries

Recreational bag limit of 10 VS /person/day

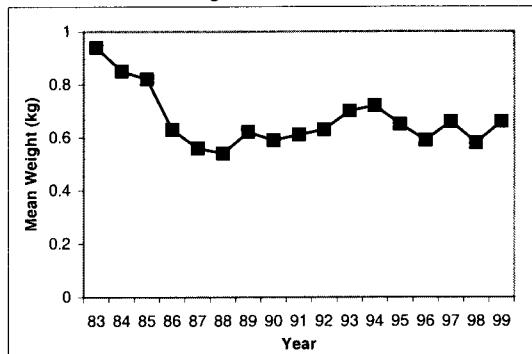
1999 - 11" recreational minimum size limit, 12" commercial minimum size limit

Vermilion snapper

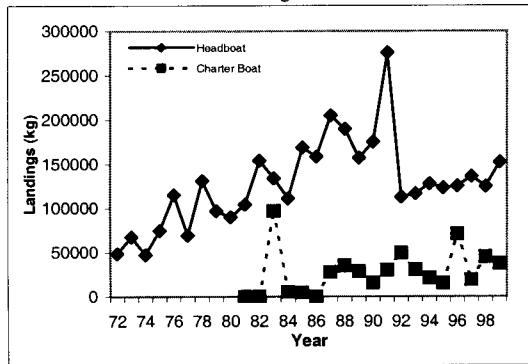
Commercial Landings



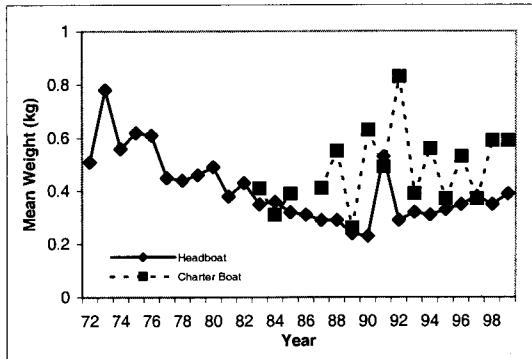
Commercial Mean Weights



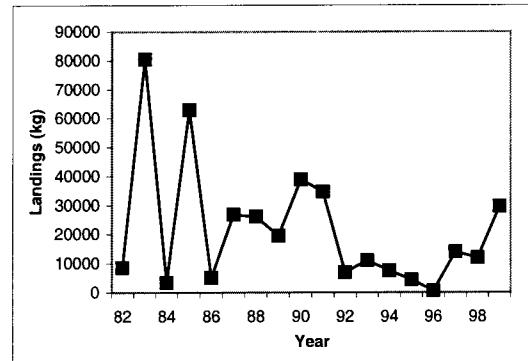
"For Hire" Recreational Landings



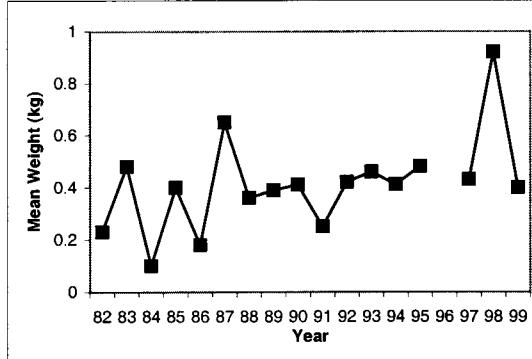
"For Hire" Recreational Mean Weights



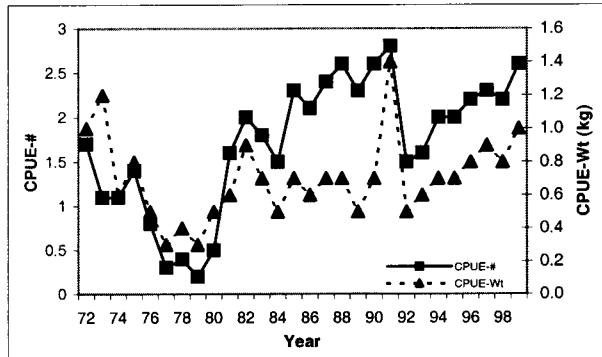
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Northeast Florida



Red snapper data (landings, mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter boat			Other Recreational			
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE #	CPUE-Wt	Landings	Mean Wt	N	Landings	Mean Wt
							NC - NEFL						
72				18517	8.00	50	0.04	0.38					
73				26626	8.48	41	0.07	0.46					
74				13770	4.43	95	0.03	0.16					
75				15833	3.45	166	0.05	0.17					
76				102011	2.32	499	0.06	0.26					
77				85973	1.86	718	0.03	0.09					
78				75590	1.71	741	0.03	0.10					
79				81574	2.51	245	0.01	0.08					
80				32177	1.87	259	0.04	0.08					
81				52086	1.50	675	0.24	0.35					
82				44410	2.02	431	0.12	0.27	1018				
83	5.54	35		33527	1.23	947	0.17	0.19	1233	2.59	8	68563	1.50
84	1.79	1073		36885	1.29	1261	0.16	0.19	32106	0.70	44	40038	1.10
85	2.32	871		59840	1.17	1156	0.25	0.30	3830	1.91	5	111714	1.3
86	101696	2.42	1124	24636	1.68	419	0.08	0.11	25451	0.18	206	460543	1.28
87	88984	2.58	1270	37076	1.39	303	0.11	0.16	28116	1.23	25	83672	36
88	80358	2.13	777	58928	1.66	196	0.12	0.20	42346	2.05	24	40615	0.50
89	117132	2.37	1201	32074	1.32	362	0.11	0.15	28186	1.62	21	67085	0.7
90	91254	2.28	847	29759	1.45	311	0.10	0.14	1419	0.61	14	93738	0.56
91	62198	2.45	971	32633	1.87	89	0.07	0.17	19954	2.03	14	44558	1.62
92	43130	4.15	543	13100	2.71	62	0.03	0.06	135325	2.10	10	145256	9
93	85352	3.40	1400	19352	2.60	194	0.04	0.10	21467	4.68	15	7604	4.83
94	85806	3.03	1191	19488	2.95	108	0.04	0.09	37991	3.43	35	38857	3
95	75364	3.82	1315	26039	3.09	131	0.05	0.15	24504	1.82	24	37414	2.22
96	58913	3.91	812	20972	3.36	78	0.04	0.15	11205	1.72	9	24544	2.06
97	51141	4.38	436	23226	3.79	67	0.03	0.15	29910	1.28	20	9616	5
98	40151	8.55	521	12178	2.57	136	0.03	0.08	27603	2.34	26	34441	2.24
99	42810	3.31	1140	19758	2.82	156	0.04	0.13	40936	1.28	114	25	25

1983 - 12" TL minimum size limit, all fisheries

1989 - Gear restrictions as listed in text

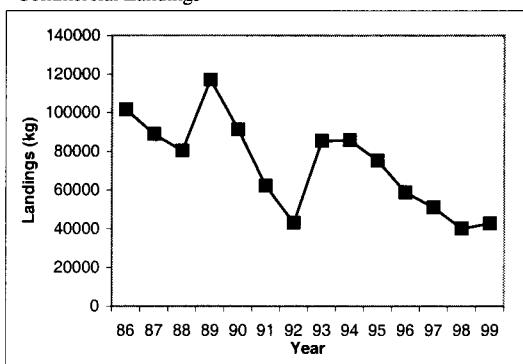
1992 - Gear restrictions as listed in text

20" TL minimum size limit, all fisheries

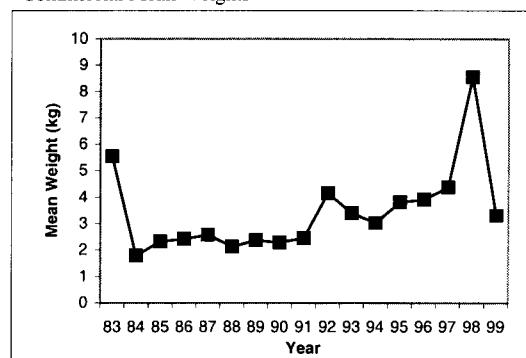
Recreational bag limit of 10 snapper/person/day, no more than 2 RS (Excluding VS)

Red snapper

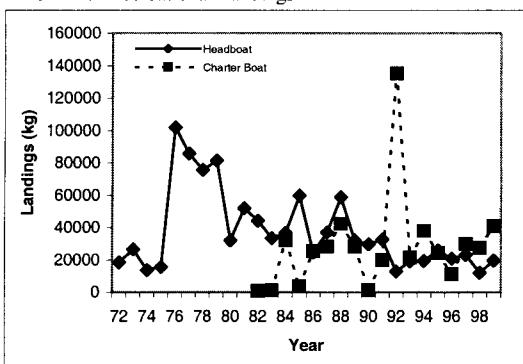
Commercial Landings



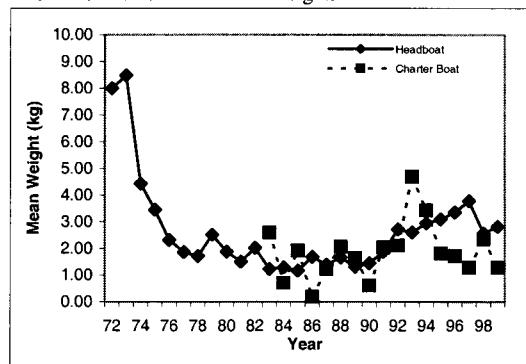
Commercial Mean Weights



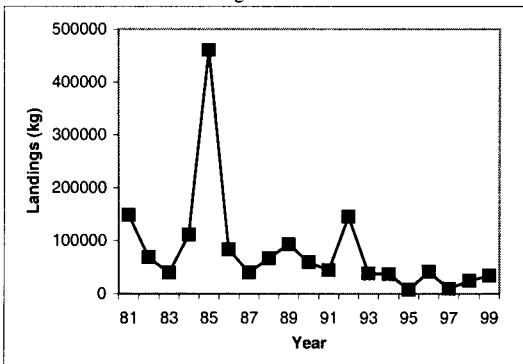
"For Hire" Recreational Landings



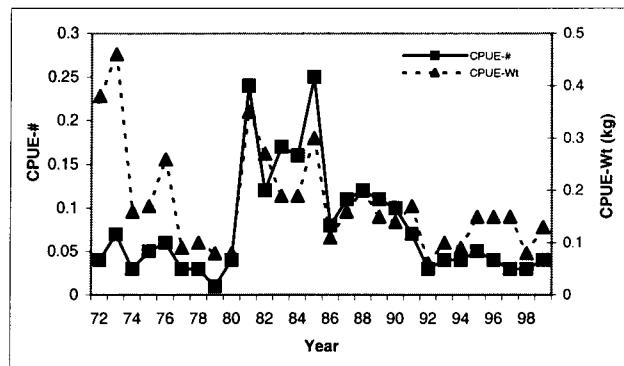
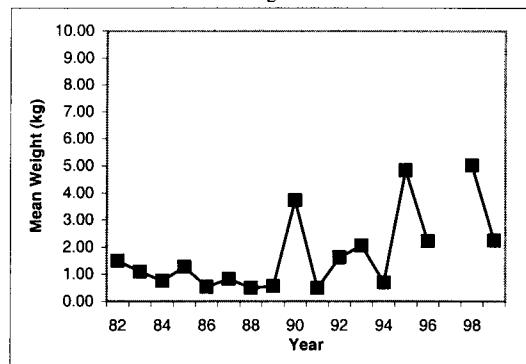
"For Hire" Recreational Mean Weights



Other Recreational Landings



Other Recreational Mean Weights



Gag data (landings, mean weights, and CPUE-Wt are in kg)

Year	Commercial			Headboat				Charter boat				Other Recreational				
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE-#	CPUE-Wt	Landings	Mean Wt	N	Landings	Mean Wt	N		
							NC - NEFL									
72				54136	5.35	76	0.15	1.11								
73				85817	7.47	124	0.18	1.48								
74				65830	7.54	88	0.09	0.78								
75				33471	6.96	135	0.05	0.36								
76				26124	7.85	149	0.04	0.29								
77				26813	6.15	183	0.05	0.29								
78				18906	5.89	173	0.03	0.20								
79				30562	5.83	147	0.06	0.37								
80				19543	4.63	175	0.04	0.22								
81				67130	4.42	225	0.07	0.31	0			38724	0.83	9		
82				58007	4.76	296	0.06	0.31	1063	1.10	1	10149	0.52	5		
83				59971	3.68	481	0.08	0.31	358219	2.20	2	46920	3.00	7		
84				93522	4.93	713	0.09	0.43	30118	3.58	17	105841	3.12	12		
85				3443	3.78	71585	4.53	512	0.07	0.33	3739	3.00	5	58482	0.89	21
86				2412	60839	3.35	382	0.08	0.26	16611	4.75	2	3835	0.77	15	
87				3463	84937	3.22	372	0.09	0.30	82972	2.63	24	170898	2.91	32	
88				1932	91269	3.38	288	0.10	0.38	135881	3.33	33	76638	1.73	17	
89				1794	78711	3.15	472	0.10	0.36	61410	3.46	30	133790	3.15	20	
90				1329	62911	2.95	366	0.09	0.30	36969	2.88	65	130351	0.63	15	
91				1780	51674	2.94	184	0.07	0.26	30385	3.92	21	72870	2.15	30	
92				2354	56466	3.06	276	0.07	0.28	71019	4.13	75	146148	4.18	28	
93				2430	55053	3.98	282	0.06	0.26	76530	4.07	44	147849	4.33	33	
94				1741	43048	3.89	363	0.05	0.23	90232	4.47	65	141489	3.59	26	
95				379	50439	5.29	2571	0.06	0.27	63730	3.98	52	82070	3.67	22	
96				2097	30092	4.36	220	0.05	0.20	44465	7.32	29	96272	8.98	12	
97				1966	27934	5.24	259	0.04	0.17	16452	6.97	19	107178	4.48	8	
98				2267	32149	4.06	341	0.05	0.20	33219	9.15	21	61574	4.53	13	
99				2739	26465	4.60	259	0.03	0.16	94133	5.02	54	181091	4.20	36	

1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text

20" TL minimum size limit, all fisheries

Recreational bag limit of 5 grouper/person/day

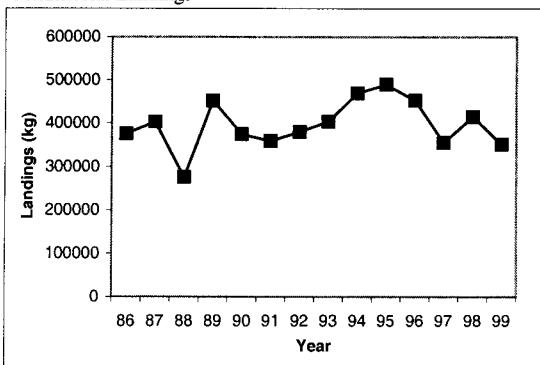
1999 - 24" TL minimum size limit

- Included in the 5 grouper bag limit, no more than 2 fish may be gag or black grouper individually or combined

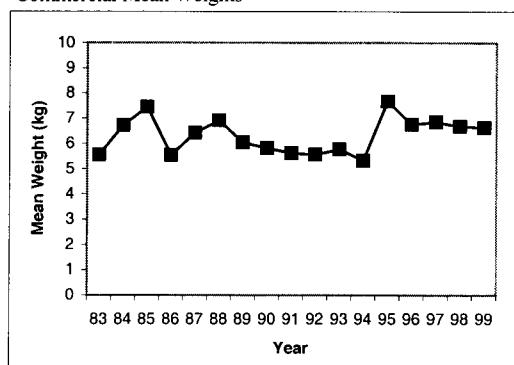
- March and April commercial sale prohibited

Gag

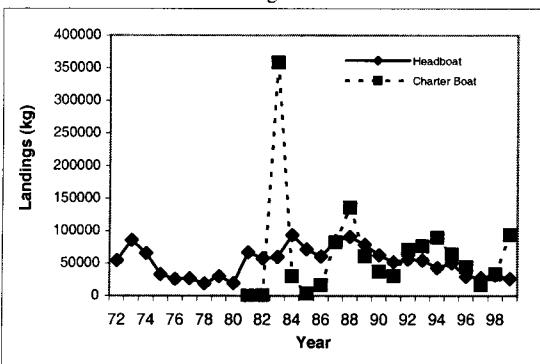
Commercial Landings



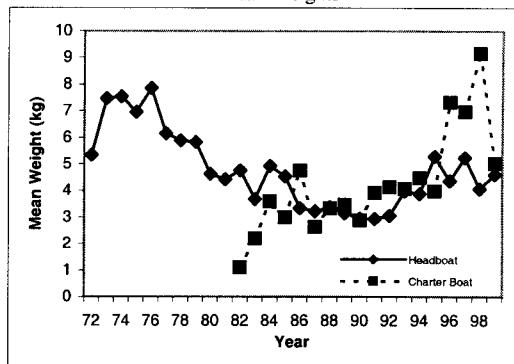
Commercial Mean Weights



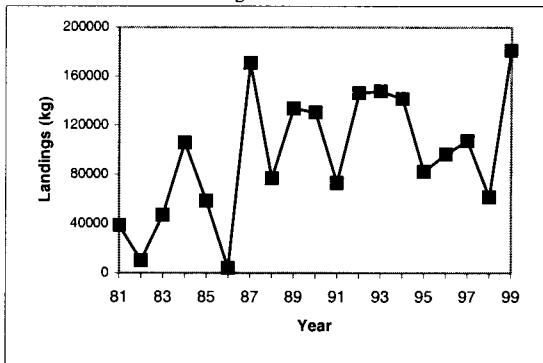
"For Hire" Recreational Landings



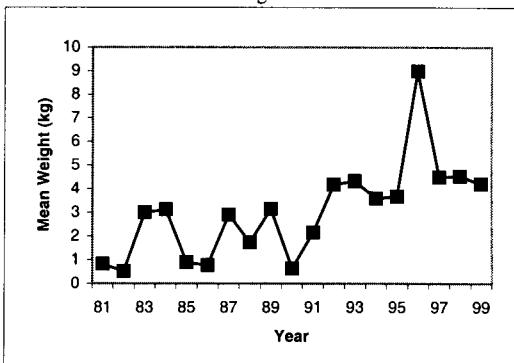
"For Hire" Recreational Mean Weights



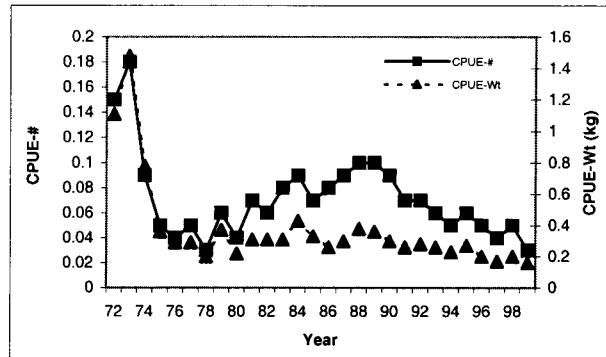
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Northeast Florida



Scamp data (landings, mean weights, and CPUE-Wt are in kg.)

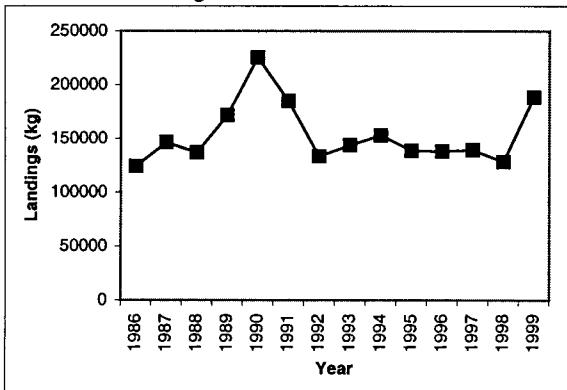
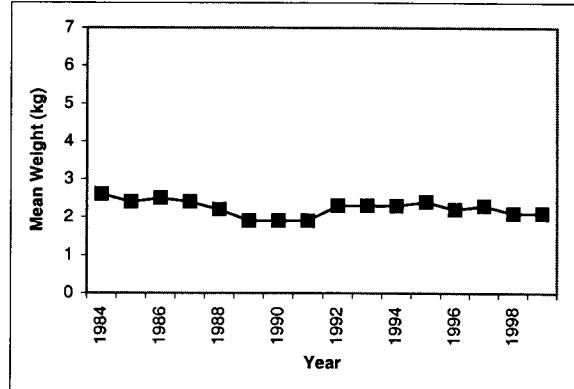
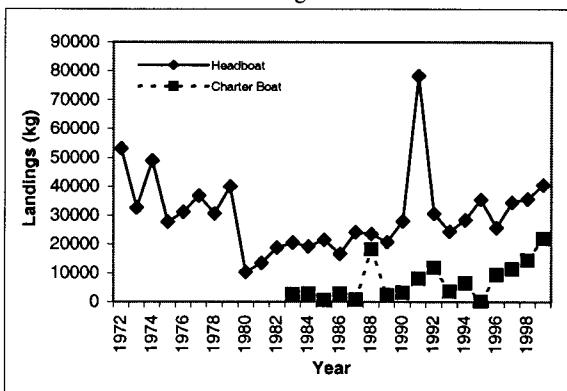
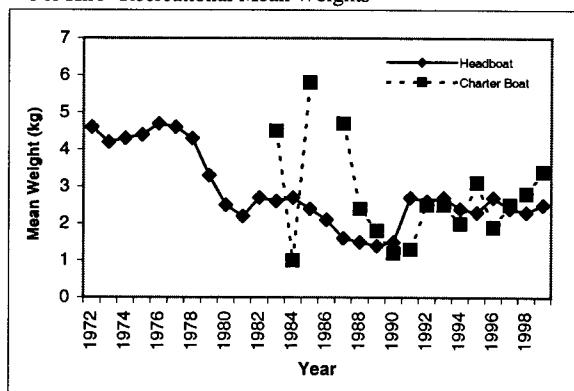
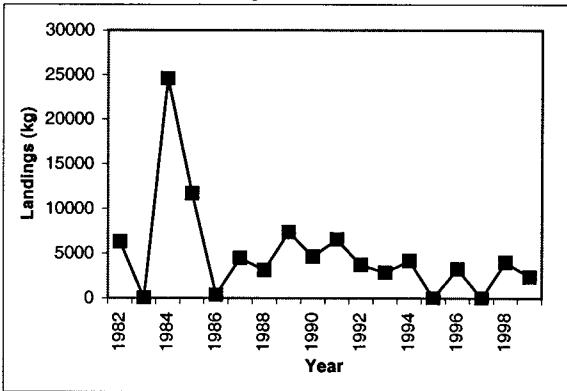
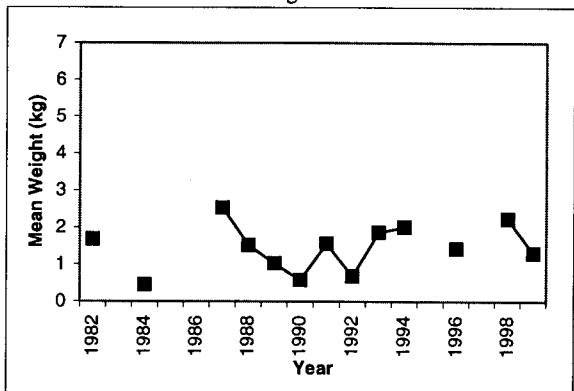
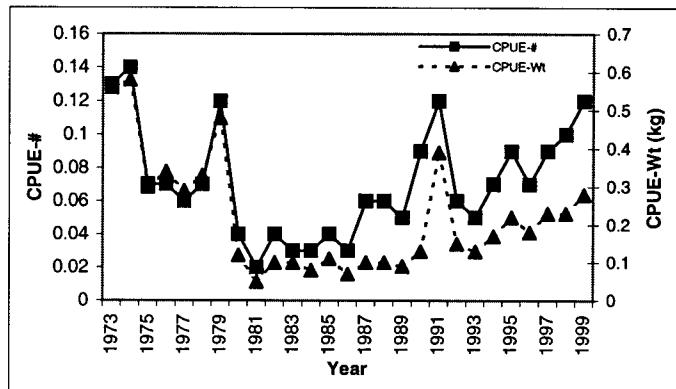
Year	Commercial		Headboat		Charter boat		Other Recreational							
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE #	CPUE-Wt	Landings	Mean Wt	N	Landings	Mean Wt	N
														NC - NEFL
1972	53140	4.6	375	0.23	1.09									
1973	32671	4.2	363	0.13	0.56									
1974	48966	4.3	373	0.14	0.58									
1975	27807	4.4	483	0.07	0.30									
1976	31130	4.7	863	0.07	0.34									
1977	36832	4.6	426	0.06	0.29									
1978	30622	4.3	302	0.07	0.33									
1979	40022	3.3	170	0.12	0.48									
1980	10231	2.5	158	0.04	0.12									
1981	13485	2.2	109	0.02	0.05									
1982	18838	2.7	253	0.04	0.10									
1983	20566	2.6	434	0.03	0.10									
1984	1275	19240	2.7	454	0.03	0.08								
1985	2.4	1722	21515	2.4	433	0.04	0.11	619	5.8	1	11721			
1986	124117	2.5	2269	16733	2.1	411	0.03	0.07	2843	4.5	11	0	356	
1987	146433	2.4	4049	24189	1.6	521	0.06	0.10	803	4.7	6	4483	2.53	45
1988	136826	2.2	2887	23590	1.5	446	0.06	0.10	18263	2.4	40	3140	1.52	3
1989	171501	1.9	3462	20836	1.4	340	0.05	0.09	2335	1.8	23	7364	1.03	11
1990	225181	1.9	3424	27920	1.5	317	0.09	0.13	3155	1.2	45	4637	0.58	13
1991	184704	1.9	4142	78234	2.7	388	0.12	0.39	8039	1.3	15	6552	1.56	8
1992	133307	2.3	1798	30622	2.6	228	0.06	0.15	11780	2.5	40	3737	0.68	3
1993	143831	2.3	2409	24421	2.7	322	0.05	0.13	3686	2.5	30	2859	1.86	3
1994	152945	2.3	1957	28457	2.4	332	0.07	0.17	6545	2.0	40	4174	2.01	1
1995	138753	2.4	2990	35522	2.3	364	0.09	0.22	126	3.1	2	0		
1996	138231	2.2	2786	25746	2.7	265	0.07	0.18	9350	1.9	8	3254	1.43	1
1997	139241	2.3	2324	34450	2.4	416	0.09	0.23	11365	2.5	3	0		
1998	128296	2.1	3256	35673	2.3	382	0.10	0.23	14486	2.8	11	4005	2.23	2
1999	188431	2.1	5625	40581	2.5	338	0.12	0.28	21980	3.4	28	2409	1.31	1

1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text

20" TL minimum size limit, all fisheries

Recreational bag limit of 5 grouper/person/day

Scamp**Commercial Landings****Commercial Mean Weights****"For Hire" Recreational Landings****"For Hire" Recreational Mean Weights****Other Recreational Landings****Other Recreational Mean Weights****Headboat CPUE: North Carolina - Northeast Florida**

Red grouper data (landings, mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter boat			Other Recreational							
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE-#	CPUE-Wt	Landings	Mean Wt	N	Landings	Mean Wt	N			
							SEFL										
1972				10.4	12												
1973				9.98	10												
1974				8.39	15												
1975				7.13	27												
1976				3.51	64												
1977				4.91	111												
1978				4.01	96												
1979				2.51	157												
1980				2.45	175												
1981	16880	2.60	223	0.03	0.07							46148	1.33	12			
1982	14279	2.24	274	0.02	0.05							114878	4.76	5			
1983	560	79	17648	2.00	389	0.05	0.08	4061	4.45			319477	1.08	6			
1984	5.91	216	18361	1.95	598	0.04	0.08	316	8.21			671848	0.92	12			
1985	6.48	208	19627	2.25	583	0.04	0.09	4258	2.83			59453	0.54	1			
1986	93568	5.43	119	13314	2.08	387	0.03	5974	1.37			1	728030	0.66	13		
1987	71463	2.98	465	15702	2.17	283	0.03	31673	0.07				88861	1.17	14		
1988	103663	4.89	446	10615	1.90	211	0.01	0.03	122332	1.22			54308	2.74	6		
1989	71706	3.29	525	8126	2.35	242	0.01	0.03	1264	1.59			15	17263	1.58	3	
1990	58239	3.72	987	21733	2.72	184	0.02	0.07	173953	2.18				4	10719		
1991	61026	4.08	713	7777	2.85	64	0.01	0.02	388	2.57				3	17104	1.23	3
1992	52709	4.32	322	13294	3.34	79	0.02	0.06	2330	3.74				8	121856	2.30	7
1993	68880	4.51	687	14095	2.93	107	0.02	0.07	60205	3.29				11	102681	2.86	15
1994	85651	4.21	500	16099	2.91	133	0.02	0.06	5006	3.09				17	94380	2.63	4
1995	74101	4.15	497	16011	3.13	189	0.03	0.08	27249	3.17				7	109384	1.76	6
1996	101660	4.59	347	16853	3.05	207	0.03	0.08	21796	2.84				8	140101	2.85	13
1997	166781	4.16	596	25235	3.54	399	0.03	0.11	23676	4.39				9	27636	2.80	7
1998	217943	3.45	1193	33748	2.93	445	0.06	0.18	8612	2.81				8	64816	3.46	10
1999	274214	3.73	1795	26074	3.33	309	0.02	0.06	15391	3.13				43	30932	3.13	21

1983 - 12" TL minimum size limit, all fisheries

1989 - Gear restrictions as listed in text

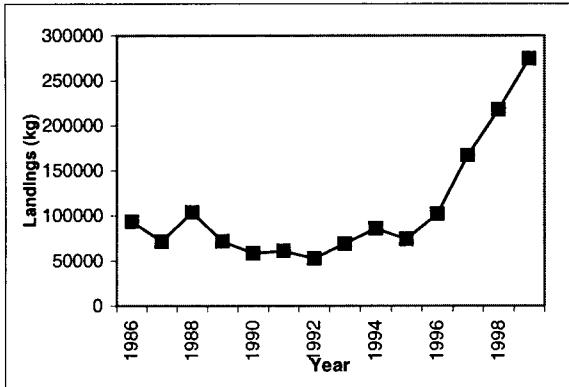
1992 - Gear restrictions as listed in text

20" TL minimum size limit, all fisheries

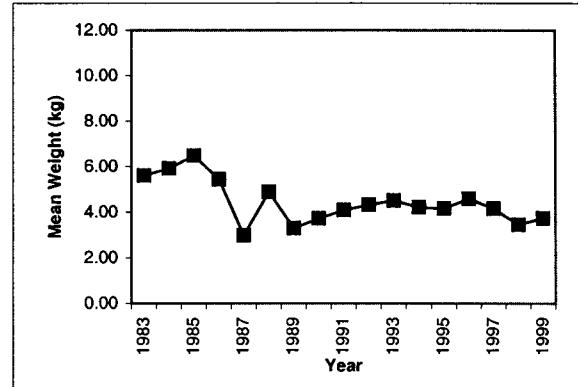
Recreational bag limit of 5 grouper/person/day

Red grouper

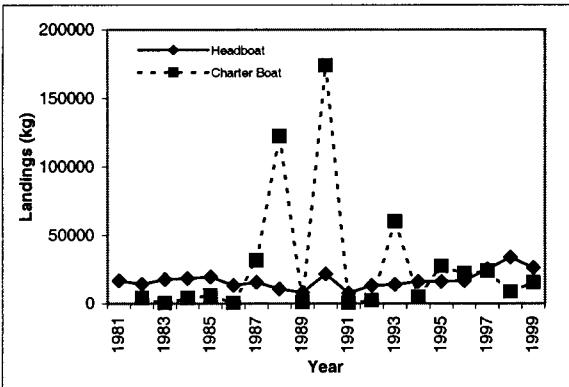
Commercial Landings



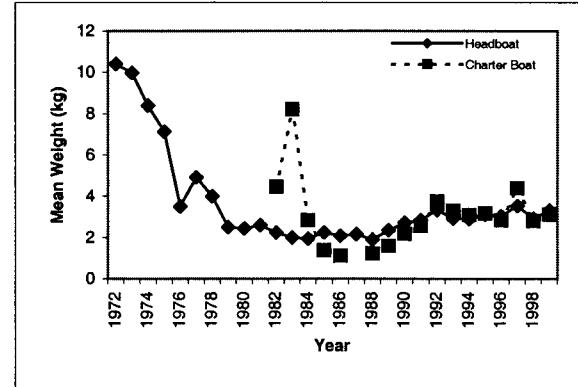
Commercial Mean Weights



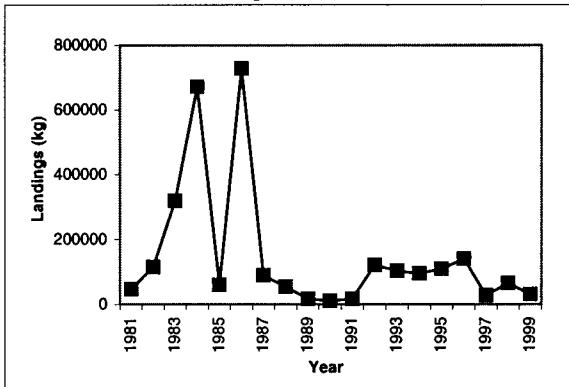
"For Hire" Recreational Landings



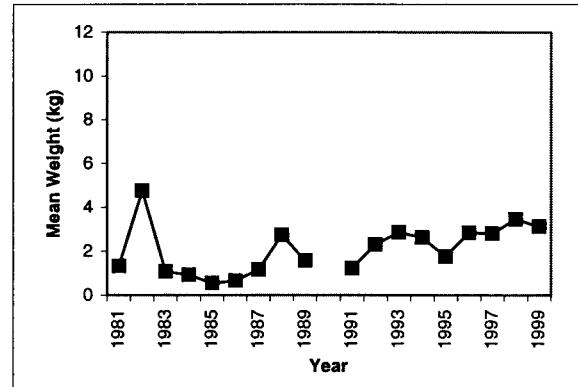
"For Hire" Recreational Mean Weights



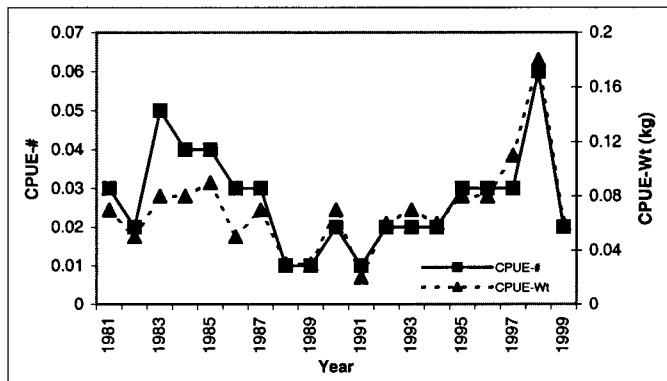
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Southeast Florida



Greater amberjack data (landings, mean weights, and CPUE-Wt are in kg.)

Commercial				Headboat				Charter boat				Other Recreational			
Year	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE-#	CPUE-Wt	Landings	Mean Wt	N	Landings	Mean Wt	N	
							NC - SEFL								
72				0.77	1							459631	7.10	2	
73				7.96	16							231962	10.91	13	
74				7.13	22							43979	8.70	1	
75				9.58	19							154952	14.66	7	
76				9.67	50							396966	7.77	12	
77				5.21	39							445690	12.97	21	
78				10.42	92							423073	15.27	18	
79				4.97	115							282419	6.66	13	
80				6.81	52							153309	4.63	17	
81				71631	4.46	108	0.05	0.20	148667	15.63	6				
82				118594	5.32	48	0.07	0.31	3914	14.55	2				
83	35.49	1		54213	3.34	161	0.05	0.15	35327	7.91	7				
84	3.90	1		113345	6.45	151	0.05	0.29	181257	11.55	34				
85	5.81	24		51398	3.95	165	0.03	0.14	179373	10.62	16				
86	232878	8.26	22	53728	4.38	168	0.03	0.13	355806	10.97	34	899836	13.31	19	
87	629073	6.35	50	94986	5.01	186	0.04	0.21	307662	12.78	48	224838	12.49	14	
88	577291	6.47	61	76431	7.85	86	0.03	0.18	397668	10.54	30				
89	506944	9.21	29	44158	4.93	191	0.03	0.11	314312	13.20	62				
90	835765	7.28	53	47798	6.26	119	0.02	0.11	206767	8.64	27				
91	1060147	9.51	137	65088	7.13	74	0.02	0.17	413312	10.12	35				
92	1007593	12.31	244	71255	6.32	130	0.02	0.19	229485	10.43	38	315746	7.44	14	
93	863930	12.07	812	71200	8.33	121	0.02	0.21	260519	11.60	59	130720	10.89	26	
94	888360	10.69	412	54693	7.43	124	0.02	0.16	353272	10.24	93	159359	6.29	8	
95	844016	12.91	319	35784	7.65	113	0.02	0.12	311588	11.36	48	83893	10.18	13	
96	691348	10.65	181	42036	8.13	76	0.02	0.14	273664	12.65	67	226450	11.58	34	
97	631670	12.32	506	22823	8.91	72	0.01	0.08	193910	11.87	34	30698	11.59	8	
98	547889	10.83	663	24357	6.63	93	0.01	0.10	134191	10.76	66	59682	12.63	5	
99	496482	13.00	742	31554	6.60	127	0.02	0.11	531231	10.09	313	100068	11.16	12	

1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text

28" FL recreational minimum size limit

36" FL commercial minimum size limit (28" FL minimum for cored fish)

Recreational bag limit of 3 GAJ/person/day

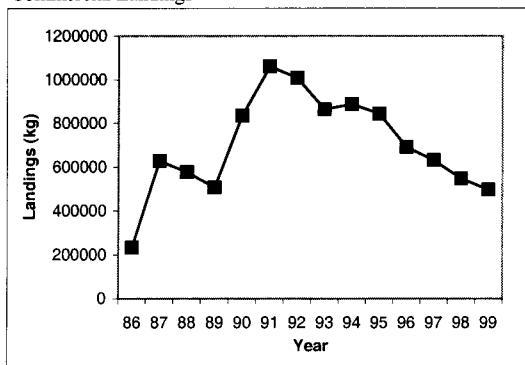
Commercial harvest and/or landing of GAJ in excess of bag limit is prohibited in April off Cape Canaveral, FL
1998 - Commercial quota of 1,169,931 lb gutted weight, season starts May 1

1999 - Recreational bag limit of 1 GAJ/person/day

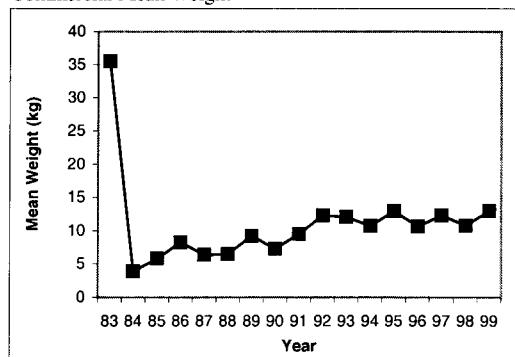
During April closure, commercial and recreational bag limit 1/person/day and sale prohibited

Greater amberjack

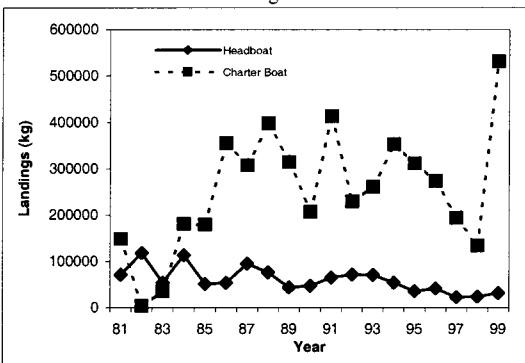
Commercial Landings



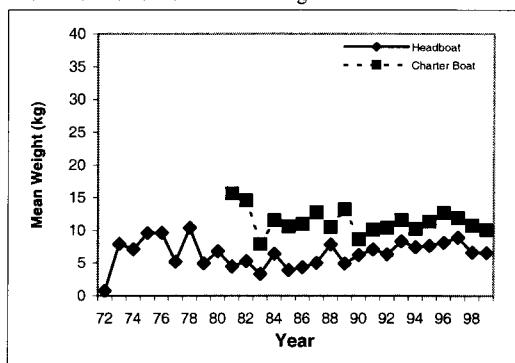
Commercial Mean Weight



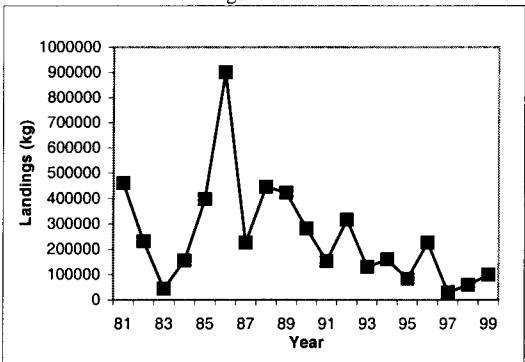
"For Hire" Recreational Landings



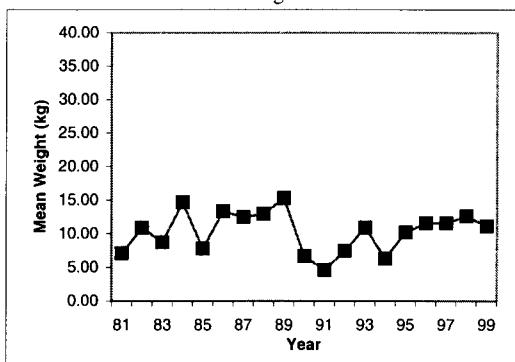
"For Hire" Recreational Mean Weights



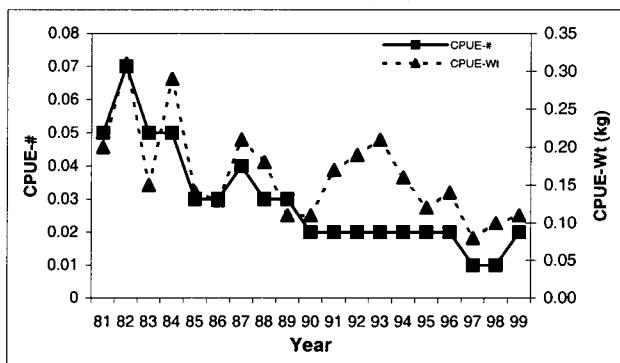
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Southeast Florida



Black grouper data (landings , mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter Boat			Other Recreational				
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE#	CPUE-Wt	SEFL	Landings	Mean Wt	N		
1972				11.07	4									
1973														
1974														
1975														
1976														
1977				21.34	2									
1978				5.55	6									
1979				8.65	24									
1980				6.43	43									
1981	6981	4.09	67				3920			150254	4.35	10		
1982	12295	5.01	42	0.008	0.054		18842			27056	.42	3		
1983	25736	5.65	34	0.002	0.132		79944	1.59		156028	6.55	4		
1984	17.01	1	5120	3.80	48	0.007	0.025	15427	2.02	6	65755	1.05	3	
1985	21.17	4	5202	5.71	59	0.007	0.028	15318			.79607	6.38	3	
1986	198525	0.89	3	6774	4.98	54	0.006	0.033	711021			326505	4.26	8
1987	229738	3.87	135	12018	6.37	28	0.008	0.055	803			141577	5.38	6
1988	159148	4.96	274	9353	4.69	17	0.012	0.048	305090			980737		
1989	161015	3.68	191	2659	3.91	20	0.003	0.012	940	5.40	2	115285	18.00	1
1990	95654	4.06	312	1547	4.70	18	0.002	0.007	0			36833		
1991	58158	4.36	77	2025	5.13	10	0.002	0.010	0			133037		
1992	59875	6.16	89	3959	4.64	11	0.005	0.022	31203			84910	2.23	1
1993	70175	4.57	127	5760	5.77	17	0.007	0.035	0	0				
1994	63951	7.32	43	4966	5.41	20	0.007	0.028	0			30072	10.49	1
1995	379	6.97	8	3362	3.25	14	0.007	0.022	0			42026	2.84	8
1996	71455	9.62	17	4785	5.41	15	0.006	0.031	2746	8.65	2	61023	5.78	17
1997	74768	7.12	81	3213	6.33	25	0.005	0.026	8546	17.30	2	25635	4.88	6
1998	80034	6.70	108	3685	5.97	24	0.006	0.035	6073	14.97	1	385556	7.90	8
1999	63623	6.24	112	4193	6.41	11	0.004	0.028	26468	4.84	61	3599	4.49	11

1989 - Gear restrictions as listed in text

1992 - Gear restrictions as listed in text
20" TL minimum size limit, all fisheries

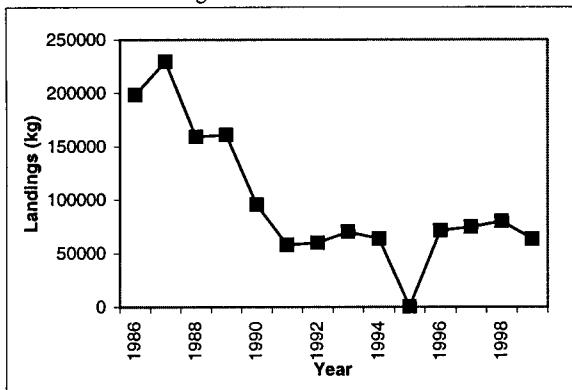
Recreational bag limit of 5 grouper/person/day

1999 - 24" TL minimum size limit

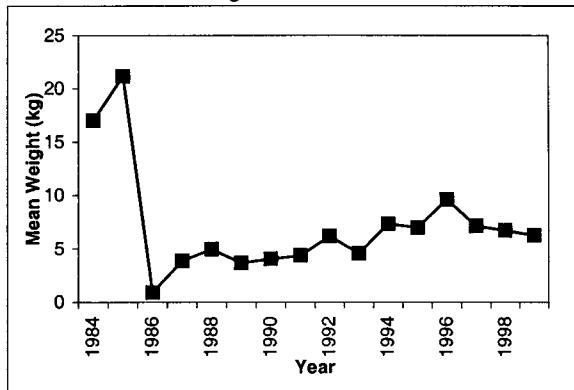
- Included in the 5 fish grouper bag limit, no more than 2 fish may be gag or black grouper individually or combined
- March and April commercial sale prohibited

Black grouper

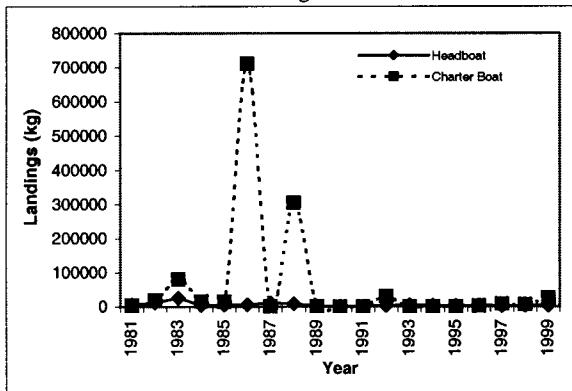
Commercial Landings



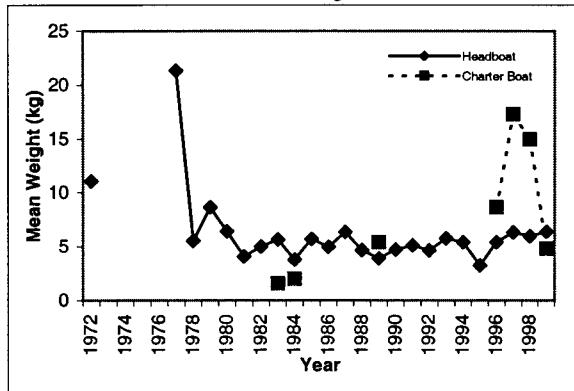
Commercial Mean Weights



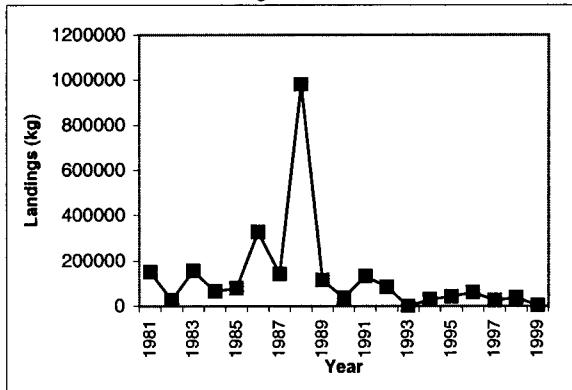
"For Hire" Recreational Landings



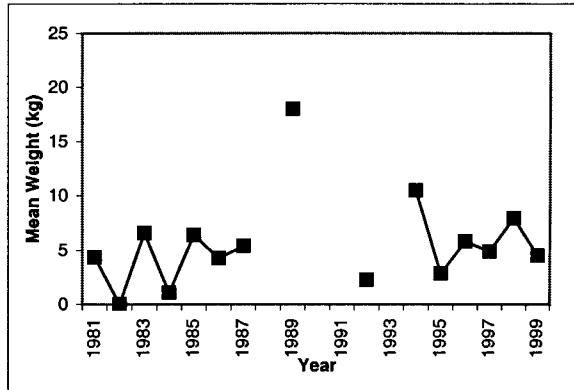
"For Hire" Recreational Mean Weights



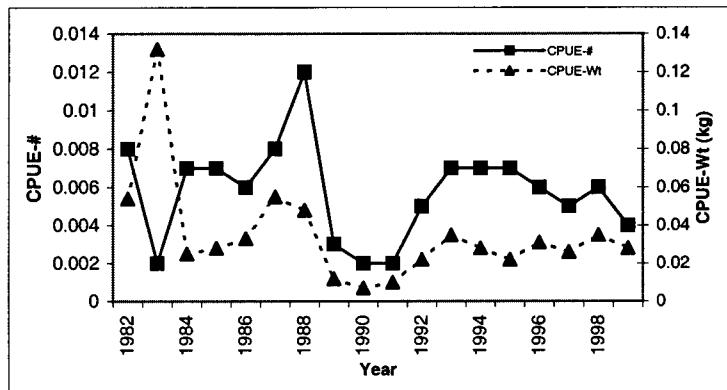
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: Southeast Florida



Speckled hind data (landings, mean weights, and CPUE-Wt are in kg.)

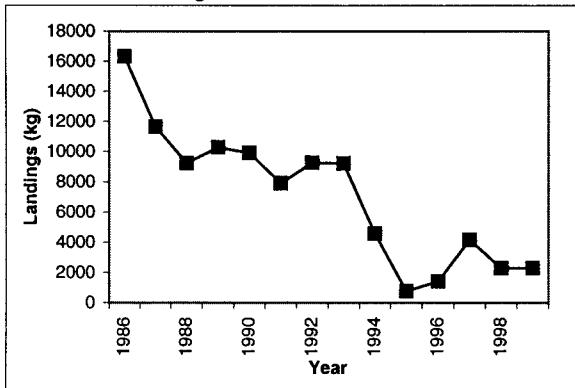
1992 - Gear restrictions as listed in text

Recreational bag limit of 5 grouper/person/day

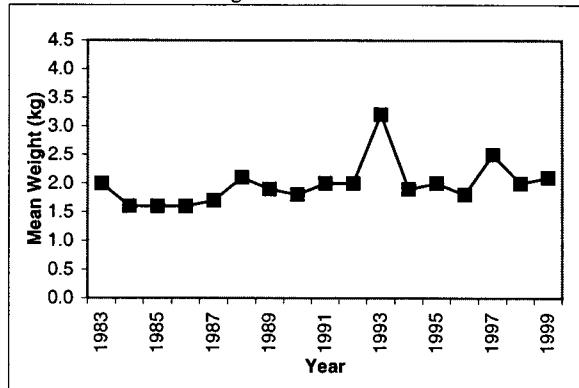
1994 - One SH/vessel/trip commercial or recreational

Speckled hind

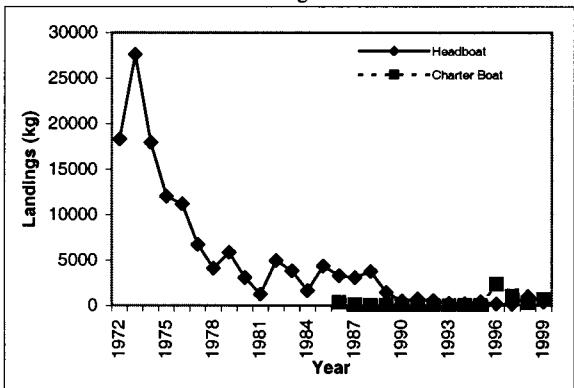
Commercial Landings



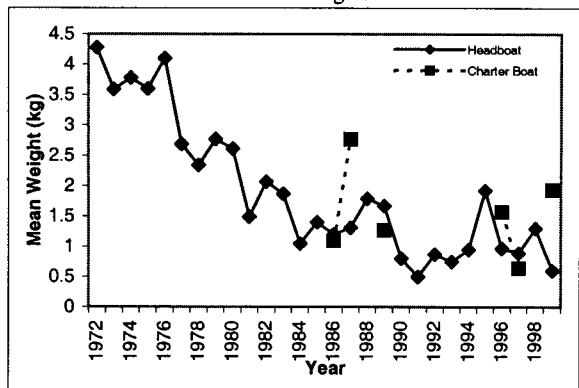
Commercial Mean Weights



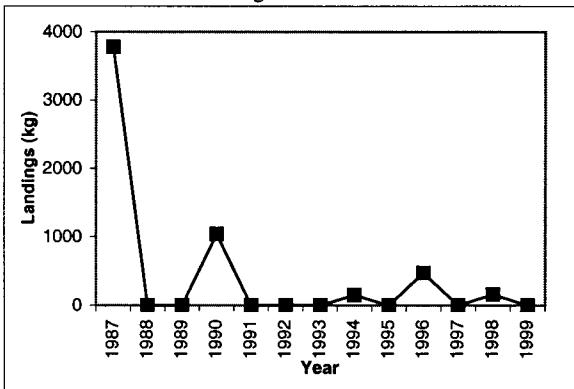
"For Hire" Recreational Landings



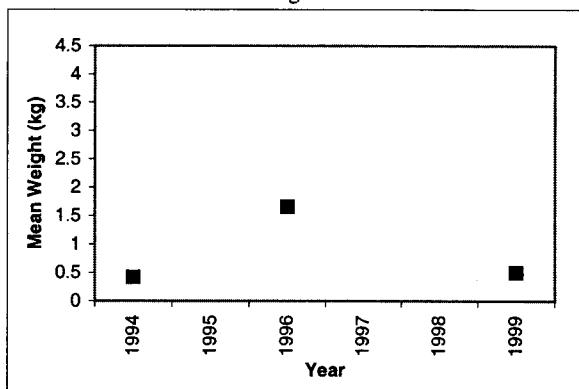
"For Hire" Recreational Mean Weights



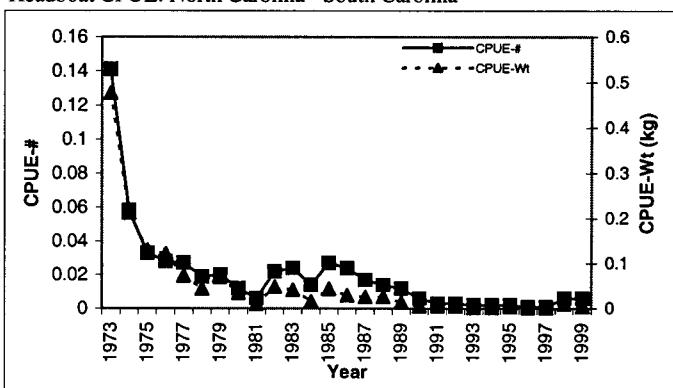
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - South Carolina



Snowy grouper data (landings, mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter boat			Other Recreational					
	Landings	Mean Wt	N	Landings	Mean Wt	N	CPUE#	CPUE-Wt	NC - SEFL	Landings	Mean Wt	N	Landings	Mean Wt	N
72					4.47	38	0.021	0.104							
73					4.14	27									
74					4.09	116									
75					3.81	104	0.011	0.066							
76					3.20	115	0.027	0.122							
77					2.46	62	0.012	0.038							
78					1.24	25	0.008	0.049							
79					3.24	25	0.014	0.054							
80					3.28	29	0.030	0.102							
81					7647	1.79	32	0.008	0.020	0					
82					7520	3.05	11	0.006	0.019	0				0	
83					29147	2.37	33	0.024	0.080	2690				18711	6.50
84					95	1100	1.79	6	0.001	0.003	0			824	0.50
85					3.97	3058	1962	1.49	38	0.003	0.005	0		0	
86					2.42	1735	1919	1.39	46	0.003	0.005	0		0	
87					86	2.84	2863	1907	1.39	46	0.003	0		0	
88					87	2.78	1807	2002	1.47	20	0.003	0.005	497	1.00	1
89					88	1.77	1209	1487	1.27	23	0.002	0.004	45	0.40	2
90					89	2.26	1605	1827	2.21	51	0.003	0.004	0	0	
91					90	2.48	2394	1291	0.99	6	0.002	0.003	0		
92					91	2.99	2715	991	1.46	3	0.001	0.003	129	1.33	3
93					92	3.47	4628	397	0.18	2	0.001	0.001	0	0	
94					93	3.01	7110	493	0.50	7	0.001	0.001	652	5.30	2
95					94	2.32	2689	331	0.69	16	0.001	0.001	0	0	
96					95	1.59	5558	330	0.81	11	0.001	0.001	289	0.55	1
97					96	2.19	2050	1552	1.09	18	0.002	0.005	0	0	
98					97	2.35	2352	1002	2.11	130	0.001	0.004	670	4.79	2
99					98	2.10	2131	589	1.21	10	0.001	0.002	2637	0	
					99	2.85	3437	233	0.44	1	0.001	0.001	6474	2.18	32

1992 - Gear restrictions as listed in text

Recreational bag limit of 5 grouper/person/day

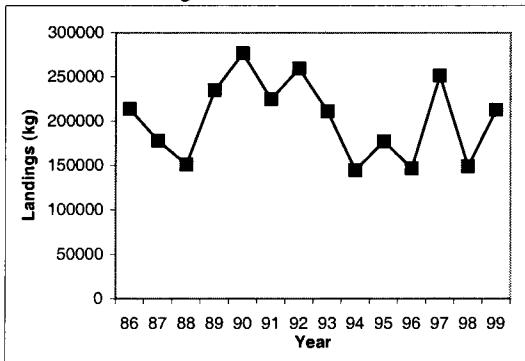
1994 - Commercial quota of 344,508 lb gutted weight

Commercial trip limit of 2,500 lb while season is open

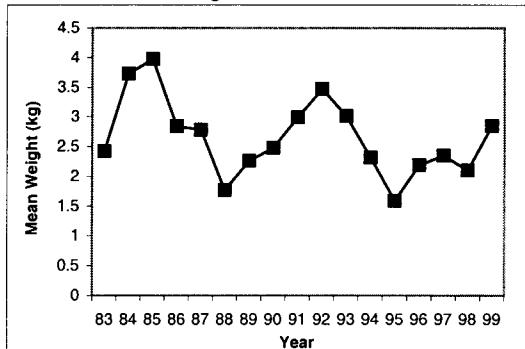
Commercial trip limit of 300 lb in closed season

Snowy grouper

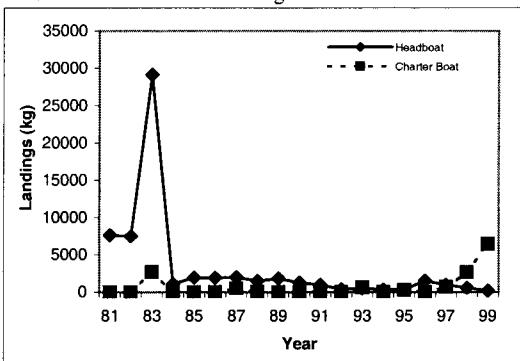
Commercial Landings



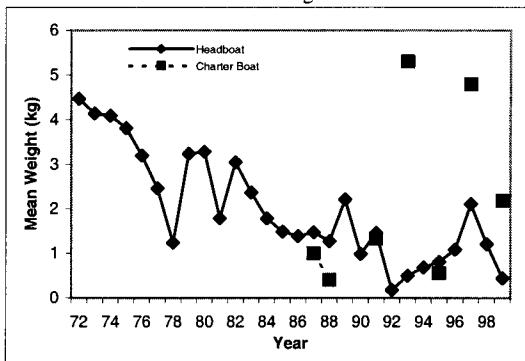
Commercial Mean Weights



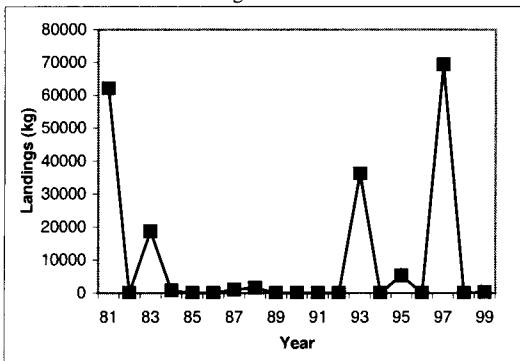
"For Hire" Recreational Landings



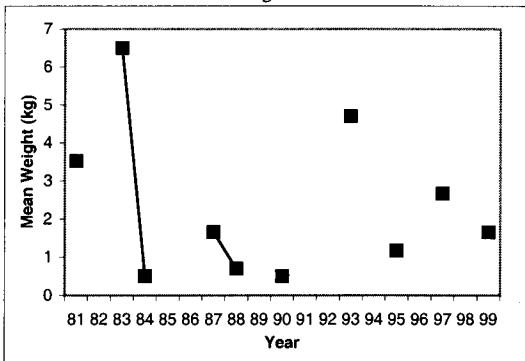
"For Hire" Recreational Mean Weights



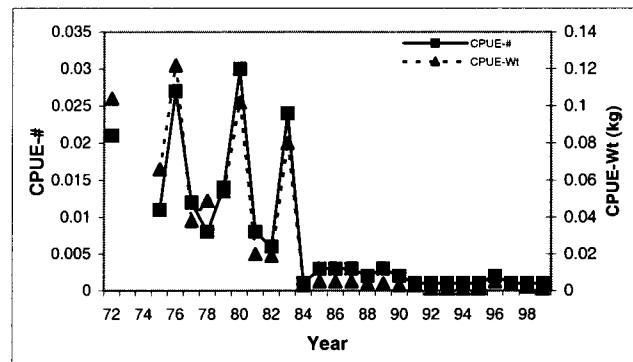
Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE: North Carolina - Southeast Florida



Yellowedge grouper data (landings, mean weights, and CPUE-Wt are in kg.)

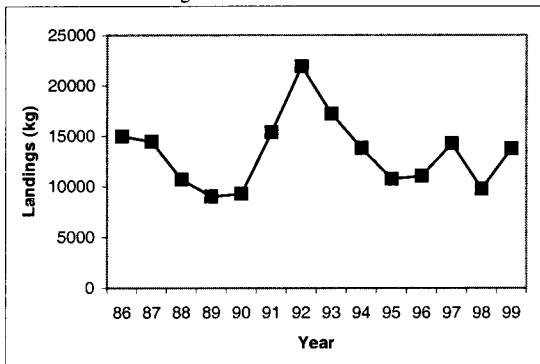
Year	Commercial			Headboat			Charter boat			Other Recreational		
	Landings	Mean Wt	N	Landings	Mean Wt	N	Landings	Mean Wt	N	Landings	Mean Wt	N
72				7.89	7							
73				4.99	2					0	0	
74				7.08	5					0	0	
75				4.14	17					0	0	
76				1.95	18					0	0	
77				2.71	3					0	0	
78				7.95	3					0	0	
79				8.63	5					0	0	
80				3.08	2					0	0	
81				957	0.75	3				0	0	
82				599	1.75	1				0	0	
83				1381	3.11	5				0	0	
84				47	282	1.02				0	0	
85				3.51	102	12				0	0	
86	14982	5.34	387	43			0			0	0	
87	14461	5.10	102	436	4.50	1	0			0	0	
88	10707	3.79	97	16	1.20	1	0			0	0	
89	9028	3.86	43	43	3.34	2	0			0	0	
90	9287	3.34	107	37			0			0	0	
91	15379	4.03	192	42			0			0	0	
92	21920	4.09	787	19			0			0	0	
93	17190	4.59	756	52			0			0	0	
94	13806	3.45	135	118			0			0	0	
95	10775	3.49	94	113	1.29	1	0			0	0	
96	11045	2.90	98	233			0			0	0	
97	14247	3.70	248	11	2.45	15	41	0.53	1	0	0	
98	9777	2.65	60	115			0			0	0	
99	13789	2.85	189	0	3.9	1	0	5.73	1	0	0	

1992 - Gear restrictions as listed in text

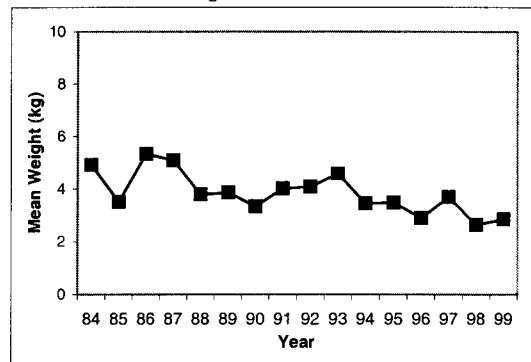
Recreational bag limit of 5 grouper/person/day

Yellowedge grouper

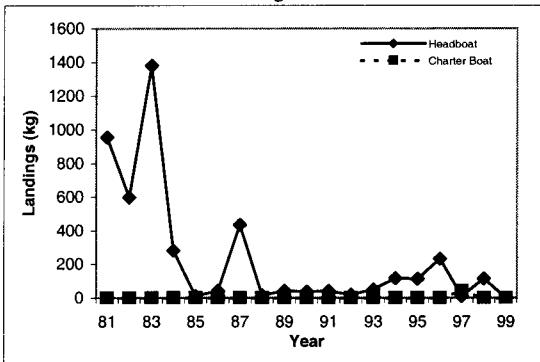
Commercial Landings



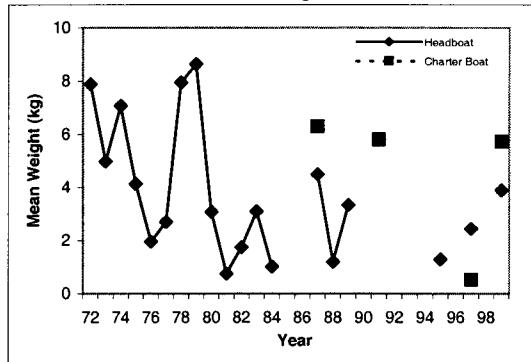
Commercial Mean Weights



"For Hire" Recreational Landings



"For Hire" Recreational Mean Weights



Other Recreational Landings

No data available

Other recreational Mean Weights

No data available

Headboat CPUE

No data available

Tilefish data (landings, mean weights, and CPUE-Wt are in kg.)

Year	Commercial			Headboat			Charter boat			Other Recreational		
	Landings	Mean Wt	N	Landings	Mean Wt	N	Landings	Mean Wt	N	Landings	Mean Wt	N
72												
73										0	0	
74										0	0	
75										0	0	
76										0	0	
77										330	0.20	1
78										20384	1.00	1
79												
80												
81	187	1.99	1		0							
82	8			0	0							
83	0			0	0							
84	11.49	291	0		0							
85	8.86	109	0		0							
86	593073	6.19	4053	0			114	2.50	1	0		
87	166697	7.35	542	36			2142	1.30	2	0		
88	296643	5.07	1060	0			0			1799	2.00	1
89	446986	4.67	834	6	0.77	17	0			0		
90	458372	5.95	755	3	0.23	14	62	1.30	1	0		
91	451465	4.72	6344	0			81	1.25	2	0		
92	359937	4.98	11667	12	0.22	1	0			0		
93	427224	4.29	29265	0			0			0		
94	326257	3.97	9536	5			6998	2.83	3	0		
95	269377	4.64	9604	0			0			0		
96	170572	2.78	2317	0			0			0		
97	125740	2.80	2787	439	2.37	111	917	1.96	1	6326	2.40	13
98	178910	2.41	1805	0			1023			0		
99	230631	2.68	3829	4	1.45	2	2004	1.86	2	0		

1992 - Gear restrictions as listed in text

Recreational bag limit of 5 grouper/person/day

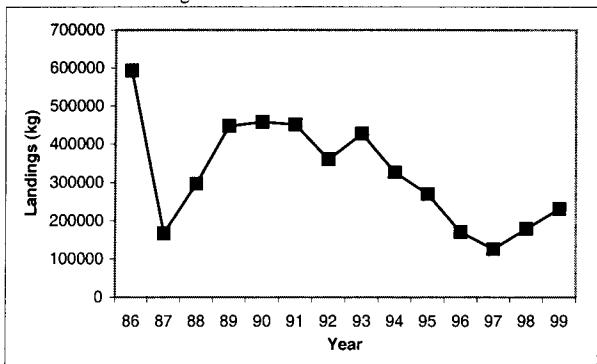
1994 - Commercial quota of 1,001,633 lb gutted weight

Commercial trip limit of 5,000 lb while season is open

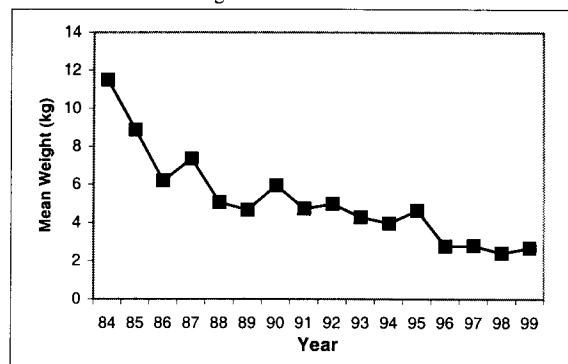
Commercial trip limit of 300 lb in closed season

Tilefish

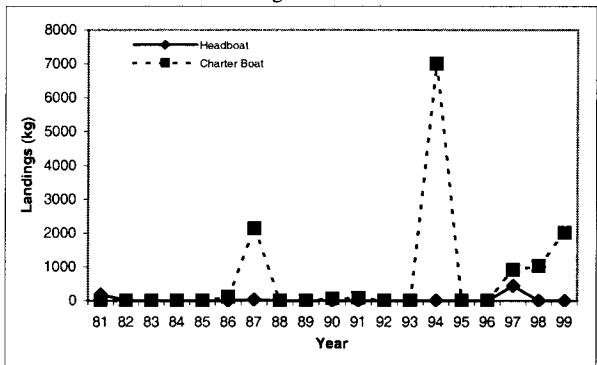
Commercial Landings



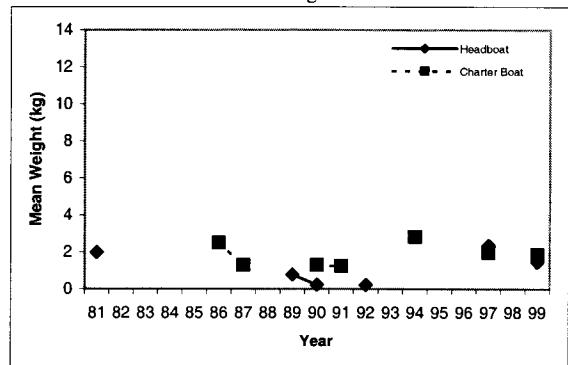
Commercial Mean Weights



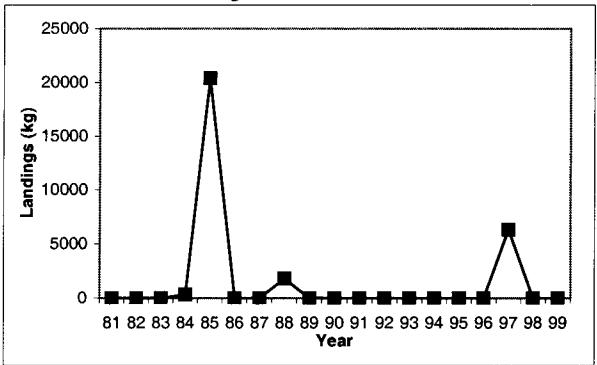
"For Hire" Recreational Landings



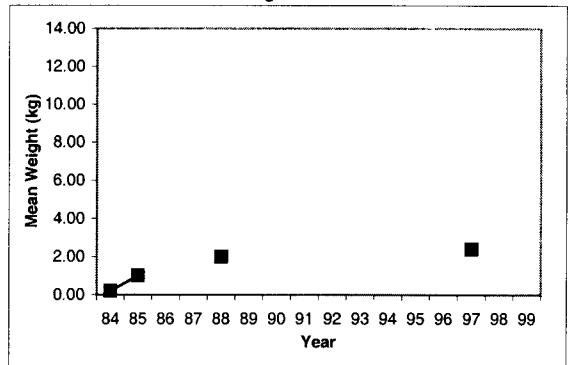
"For Hire" Recreational Mean Weights



Other Recreational Landings



Other Recreational Mean Weights



Headboat CPUE

No data available

Table 16. Population status for 15 species of reef fish from the southeastern United States. Blocked = Most appropriate range of M; Bold = most appropriate M. SPRs are based on total mature biomass. SPR values in () indicate values for male and female biomass specifically for protogynous species. If SPRs were above 30% and/or 40%, then no analysis of reduction in F or minimum size was required.

Species	M	Full F	Most Recent Static SPR	Analysis Type	F to obtain 30% SPR	F to obtain 40% SPR	Minimum size for 30% SPR	Minimum size for 40% SPR
Vermilion	0.20	0.61	12%	VPA	0.24 (-60%)	0.18 (-70%)	14"	16"
Snapper	0.25	0.55	16%		0.25 (-55%)	0.21 (-68%)	13"	14"
0.30	0.51	21%		0.35 (-31%)	0.25 (-51%)	13"	14"	
	0.35	0.46	27%		0.41 (-11%)	0.28 (-39%)	11"	13"
Red	0.15	0.69	11%	VPA	0.23 (-67%)	0.14 (-80%)	26"	28"
Snapper	0.20	0.63	11%		0.24 (-63%)	0.20 (-68%)	23"	26"
0.25	0.57	24%		0.40 (-30%)	0.26 (-55%)	20"	23"	
	0.30	0.50	32%		0.34 (-33%)		21"	
Scamp	0.10	0.24	22%	VPA	0.17 (-30%)	0.11 (-55%)	22"	25"
0.15	0.18	35%			0.14 (-20%)		21"	
	0.20	0.13	52%					
	0.25	0.07	69%					
Black Sea Bass	0.20	1.03	15%	VPA				
0.30	0.96	26%			Data were not available for reduction in F and minimum size analysis			
	0.40	0.89	39%					

Species	M	Full F	Most Recent Static SPR	Analysis Type	F to obtain 30% SPR	F to obtain 40% SPR	F to obtain 40% (-60%)	Minimum size for 30% SPR	Minimum size for 40% SPR
Gag	0.10	0.26	18%	VPA	0.15 (-40%)	0.10 (-60%)	0.14 (-30%)	32"	36"
	0.15	0.20	30%				30"		
	0.20	0.14	46%						
	0.25	0.09	64%						
White	0.20	0.29	39%	VPA					
Grunt	0.25	0.26	48%						
NC&SC	0.30	0.23	58%						
	0.35	0.20	66%						
White	0.20	0.43	44%	VPA					
Grunt	0.25	0.36	53%						
SEFL	0.30	0.33	61%						
	0.35	0.29	68%						
Greater Amberjack	0.20	0.48	>40%	VPA					
	0.30	0.65	>40%						
	0.35	1.10	>40%						

Species	M	Full F	Most Recent Static SPR	Analysis Type	F to obtain 30% SPR	F to obtain 40% SPR	Minimum size for 30% SPR	Minimum size for 40% SPR
Red Porgy	0.20	0.70	15% (7-30)	VPA				
	0.28	0.64	24% (13-42)		0.51 (-20%)	0.26 (-59%)		
	0.35	0.59	34% (20-52)					
Gray Triggerfish	0.20	0.89	46%	Catch Curve				
	0.25	0.84	55%					
	0.30	0.80	62%					
	0.35	0.76	69%					
Red Grouper	0.15	0.61	11% (6-15)	Catch Curve	0.21 (-65%)	0.15 (-75%)	26"	28"
	0.20	0.56	16% (10-20)		0.28 (-50%)	0.17 (-76%)	24"	26"
	0.25	0.50	22% (15-27)		0.35 (-30%)	0.23 (-55%)	22"	24"
	0.30	0.45	29% (21-35)		0.43 (- 5%)	0.27 (-40%)	17"	22"
Black Grouper	0.10	0.65	5% (0.25-11)	Catch Curve	0.13 (-80%)	?	39"	42"
	0.15	0.60	10% (0.58-15)		0.18 (-70%)	0.12 (-80%)	33"	36"
	0.20	0.54	15% (1-20)		0.25 (-53%)	0.17 (-68%)	28"	32"
	0.25	0.49	21% (3-26)		0.29 (-40%)	0.20 (-60%)	24"	28"

Species	M	Full F	Most Recent Static SPR	Analysis Type	F to obtain 30% SPR	F to obtain 40% SPR	Minimum size for 30% SPR	Minimum size for 40% SPR
Snowy	0.10	0.40	5% (1-11)	Catch Curve	0.11 (-72%)	0.07 (-82%)	32"	35"
Grouper	0.15	0.33	10% (2-17)		0.13 (-60%)	0.10 (-70%)	28"	31"
	0.20	0.26	19% (6-26)		0.17 (-35%)	0.12 (-53%)	24"	26"
	0.25	0.19	32% (13-38)			0.14 (-24%)		22"
Speckled	0.10	0.52	3% (1-10)	Catch Curve	0.13 (-75%)	?	27"	29"
Hind	0.15	0.48	5% (2-13)		0.14 (-70%)	0.10 (-80%)	24"	26"
	0.20	0.43	9% (3-18)		0.17 (-60%)	0.13 (-70%)	22"	24"
	0.25	0.39	13% (6-22)		0.20 (-50%)	0.14 (-65%)	19"	22"
Yellowedge	0.10	0.25	32% (18-41)	Catch Curve		0.17 (-33%)		26"
Grouper	0.15	0.20	48% (30-58)					
	0.20	0.15	64% (44-72)					
	0.25	0.11	78% (60-83)					
			100% mature Age-4 (Age-8)					
Tilefish	0.10	0.29	27% (20%)	Catch Curve	0.23 (-20%) [0.17 (-40%)]	0.15 (-50%) [0.12 (-60%)]	20" [22"]	23" [24"]
	0.15	0.22	43% (34%)			[0.18 (-20%)]		[20"]
	0.20	0.16	61% (51%)					
	0.25	0.11	76% (67%)					

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Data Sources Used to Derive SPR Values (by species)

Vermilion Snapper:

Manooch, C.S., III, J.C. Potts, D.S. Vaughan, and M.L. Burton 1998. Population assessment of the vermilion snapper, *Rhomboplites aurorubens*, from the southeastern United States. NOAA Technical Memorandum NMFS-SEFSC-411, 59p.

Red Snapper:

Manooch, C.S., III, J.C. Potts, D.S. Vaughan, and M.L. Burton 1998. Population assessment of the red snapper from the southeastern United States. Fisheries Research 38:19-32.

Scamp:

Manooch, C.S., III, J.C. Potts, M.L. Burton, and P.J. Harris. 1998. Population assessment of the scamp, *Mycteroperca phenax*, from the southeastern United States. NOAA Technical Memeorandum NMFS-SEFSC-410, 57p.

Black Sea Bass:

Vaughan, D.S., M.R. Collins, B. Zhao, and H.S. Meister. 1996. Population characteristics of the black sea bass *Centropristes striata* from the U.S. southern Atlantic coast. Report to the South Atlantic Fishery Management Council, October 29, 1996.

Gag:

Potts, J. C., and C. S. Manooch, III. 1998. Population assessment of the gag, *Mycteroperca microlepis*, from the southeastern United States. Report to the South Atlantic Fishery Management Council, November 1998, 73p.

White Grunt:

Potts, J. C. 2000. Population assessment of two stocks of white grunt, *Haemulon plumieri*, from the southeastern coast of the United States. NOAA Technical Memorandum NMFS-SEFSC-442, 67p.

Greater Amberjack:

Legault, C. M., and S. C. Turner. 1999. Stock assessment analyses on Atlantic greater amberjack. Report to the South Atlantic Fishery Management Council, July 1999, 32p.

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Vaughan, D. S. 1999. Population characteristics of the red porgy, *Pagrus pagrus*, from the U.S. southern Atlantic coast. Report to the South Atlantic Fishery Management Council, January 1999, 61p. 12 figures.

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Hood, P.B., and A.K. Johnson. 1997. A study of the age structure, growth, maturity schedules and fecundity of gray triggerfish (*Balistes capriscus*), red porgy (*Pagrus pagrus*), and vermilion snapper (*Rhomboplites aurorubens*) from the eastern Gulf of Mexico. MARFIN Final Report FO499-95-F, September 24, 1997.

Snowy Grouper:

Wyanski, D.M., D.B. White, and C.A. Barans. 2000. Growth, population age structure, maturity, and spawning of snowy grouper, *Epinephelus niveatus*, off the Carolinas, USA. Fishery Bulletin 98(1):199-218.

Red Grouper:

Stiles, T.C., and M.L. Burton. 1994. Age, growth, and mortality of red grouper, *Epinephelus morio*, from the southeastern U.S. Proceedings of the 43rd Gulf and Caribbean Fisheries Institute, 123-137.

Moe, M.A. 1969. Biology of the red grouper, *Epinephelus morio*, from the eastern Gulf of Mexico. Fla. Dept. Natur. Resour. Mar. Res. Lab. Prof. Pap. Ser. 10. 95p.

Vaughan, D.S., and M.L. Burton. 1994. Estimation of von Bertalanffy growth parameters in the presence of size-selective mortality: a simulated example with red grouper. Transaction of the American Fisheries Society, 123:1-8.

Black Grouper:

Crabtree, R. E., and L. H. Bullock. 1998. Age, growth, and reproduction of black grouper, *Mycteroperca bonaci*, in Florida waters. Fishery Bulletin 96(4):735-753.

Speckled Hind:

Matheson, R.H., and G.R. Huntsman. 1984. Growth, mortality, and yield-per-recruit models for speckled hind and snowy grouper from the United States South Atlantic Bight. *Transactions of the American Fisheries Society*, 113:607-616.

National Marine Fisheries Service, Beaufort Laboratory Staff. 1991. South Atlantic Snapper Grouper Assessment. Report to the South Atlantic Fishery Management Council.

Yellowedge Grouper:

Brule T., T. Colas-Marrufo, A. Tuz-Sulub, and C. Deniel. 2000. Evidence for protogynous hermaphroditism in the serranid fish *Epinephelus flavolimbatus* (Perciformes: Serranidae) from the Campeche Bank in the southern Gulf of Mexico. 66(2):513-521.

Bullock, L.H., and M.F. Godcharles. 1985. Life history aspects of the yellowedge grouper, *Epinephelus flavolimbatus* (Pisces: Serranidae), from the eastern Gulf of Mexico. Fla. Dep. Nat. Resour. Unpubl. Manuscript 27p.

Bullock, L. H., M. F. Godcharles, and R. E. Crabtree. 1996. Reproduction of yellowedge grouper, *Epinephelus flavolimbatus*, from the eastern Gulf of Mexico. *Bulletin of Marine Science* 59(1):216-224.

Keener, P. Undated. Age, growth, and reproductive biology of the yellowedge grouper, *Epinephelus flavolimbatus* (Pisces: Serranidae), off the southeastern coast of the United States. Unpublished SCDNR Report.

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Padgett, S. M., P. J. Harris, and P. T. Powers. 1998. Analytical report on the age, growth, and reproductive biology of the tilefish, *Lopholatilus chamaeleonticeps*, along the southeastern coast of the United States, 1980-1986 and 1996-1998. South Carolina Department of Natural Resources MARMAP Report (Contract #50WCNF606013), 40p.

Harris, M. J., and G. D. Grossman. 1985. Growth, mortality, and age composition of a lightly exploited tilefish substock off Georgia. *Transactions of the American Fisheries Society* 114:837-846.

Erickson, D. L., and G. D. Grossman. 1986. Reproductive demography of tilefish from the South Atlantic Bight with a test for the presence of protogynous hermaphroditism. *Transactions of the American Fisheries Society* 115:279-285.

Grimes, C. B., C. F. Idelberger, K. W. Able, and S. C. Turner. 1988. The reproductive biology of tilefish, *Lopholatilus chamaeleonticeps* Goode and Bean, from the United States Mid-Atlantic Bight, and the effects of fishing on the breeding system. *Fishery Bulletin* 86(4):745-761.