

REVIEW OF THE
INTERSTATE FISHERY MANAGEMENT PLAN FOR

SPANISH MACKEREL
(Scomberomorus maculatus)

2006 FISHING YEAR



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Table of Contents

I.	Status of the Plan	3
II.	Status of the Stocks.....	4
III.	Status of the Fishery.....	4
IV.	Status of Assessment Advice	5
V.	Status of Research and Monitoring.....	5
VI.	Status of Management Measures	6
VII.	Implementation of FMP Compliance Requirements for 2006.....	6
VIII.	Recommendations of the Plan Review Team	7
IX.	References.....	8
X.	Figures.....	9
XI.	Tables.....	10

I. Status of the Plan

The Fishery Management Plan (FMP) for the Coastal Migratory Pelagic Resources (1983 and subsequent amendments) and the Interstate Fishery Management Plan for Spanish Mackerel (1990) manage Atlantic group Spanish mackerel in federal and state Atlantic waters from New York through the east coast of Florida. All states in that range, excluding Pennsylvania, have a declared interest in the Commission's FMP for Spanish mackerel. The South Atlantic State/Federal Fisheries Management Board serves as the Commission's Spanish Mackerel Management Board and reports to the Commission's Interstate Fishery Management Plan (ISFMP) Policy Board. The Commission FMP for Spanish mackerel is a flexible document intended to track the federal FMP; thus, the South Atlantic Fishery Management Council (Council) has the lead on Atlantic group Spanish mackerel management.

The goals of the Commission's Spanish Mackerel FMP are to complement federal management in state waters, to conserve the Atlantic group Spanish mackerel resource throughout its range, and to achieve compatible management among the states that harvest Spanish mackerel. The FMP's objectives are to: (1) allow recovery of overfished populations and stabilize the stock at a level to produce maximum sustainable yield (MSY); (2) achieve compatible management throughout the range of the stock; (3) provide a flexible management system responsive to changes in the fishery and/or information; (4) promote cooperative interstate research and comprehensive monitoring activities and establish mandatory, timely reporting for quota monitoring; (5) minimize disruption of traditional fisheries and markets; and (6) minimize waste in the fishery.

Atlantic group Spanish mackerel are managed on the basis of the annual recommendations of the joint (Gulf of Mexico and South Atlantic) Mackerel Stock Assessment Panel (MSAP), an appointed technical group which reviews the stock assessments and makes annual determinations of Acceptable Biological Catch (ABC). The Council determines needed annual adjustments to regulatory measures for Atlantic group Spanish mackerel, including Total Allowable Catch (TAC), bag limits, size limits, and trip limits. The SAFMC deliberations are assisted by a Mackerel Committee that includes representatives from the Mid-Atlantic Council and a fishermen Advisory Panel with South Atlantic and Mid-Atlantic representation.

The 2006-2007 fishing year ran from March 1, 2006 to February 28, 2007, a change from the April 1-March 31 fishing year used before the implementation of Amendment 15 to the federal FMP in 2005. This change was intended to provide social and economic stability in the fisheries. The TAC for the 2006-2007 fishing year was 7.04 million pounds, allocated on a 55:45 basis between the commercial fishery (3.87 million lbs) and the recreational fishery (3.17 million lbs).

Trip limits for the commercial fishery in federal waters continued to be a year-round 3,500 pound daily possession/landing limit from New York through Georgia. A January 2000 Framework modified the trip limits for the Southern Zone (south of the Georgia/Florida border) based on the amount of commercial quota which is available on December 1 of each year. From December 1 until 75% of the adjusted allocation is taken, no trip limits are in place on Monday through Friday, but are limited to 1,500 pounds on Saturday and Sunday. Once 75% of the adjusted allocation is taken, vessels are limited to 1,500 pounds per day for all days. When 100% of the adjusted allocation is taken, vessels are limited to 500 pounds per day until the end of the season (March 31). The adjusted allocation compensates for the estimated catch of 500 pounds

per vessel per day to the end of the season. The timing of the fishing year is such that it is unlikely the commercial quota will affect any of the mid-Atlantic states.

A Plan Review Team (PRT) comprised of Council, Commission, and State representatives annually reviews the status of implementation of the interstate FMP and reports to the Commission's South Atlantic State/Federal Fisheries Management Board. The consensus of the Spanish Mackerel PRT is that the goal of the Commission's FMP and its management objectives continue to be valid. The South Atlantic and most Mid-Atlantic states have completely implemented the current requirements of the interstate Spanish mackerel plan. See Table 1 for state Spanish mackerel regulations in 2006.

II. Status of the Stocks

The Mackerel Stock Assessment Panel conducted a full stock assessment for Atlantic group Spanish mackerel in 2003, which included data through the 2001/2002 fishing year; projected landings through 2002/2003 were also included (MSAP 2003). Estimated fishing mortality for Atlantic group Spanish mackerel has been below F_{MSY} and F_{OY} since 1995. Estimated stock abundance has increased since 1995 and is now at a high for the analysis period (Figure 1). Stock biomass has increased from about 19 million to 24 million fish. Probabilities that the Spanish mackerel is overfished are less than 1% and that overfishing has occurred in the most recent fishing year of the assessment are 3%; therefore, the MSAP concluded that Atlantic group Spanish mackerel were not overfished and overfishing did not occur in 2002/2003. Although all measures of stock status are well within desirable ranges, the median estimate of MSY dropped from 6.4 million pounds in the last full assessment in 1998 to 5.2 million pounds in the 2003 assessment. Much of the decline is believed to be due to the lower estimates of recruitment between the 2003 and the 1998 assessments. The MSAP recommended an Acceptable Biological Catch (ABC) as the median estimate of catch at F 40% SPR, which is 6.7 million pounds (20th – 80th percentile range = 5.2-8.4 million pounds).

III. Status of the Fishery

Spanish mackerel remain an important recreational and commercial fishery in South Atlantic waters, and are taken as far north as Massachusetts, although recreational landings north of Maryland are limited and/or sporadic (see Tables 2 and 5). Trip limits implemented in state and federal waters continue to prevent premature closure of the commercial fishery before the end of the fishing year. Total landings of Spanish mackerel in 2006 are estimated at 5.04 million pounds. The commercial fishery harvested approximately 72% of this total by pounds of fish, and the recreational fishery about 28%. These values are very close to the average contribution of each sector from 1981-2005 (71% and 29%).

From 1960 to 2006, commercial landings of Atlantic coast Spanish mackerel have ranged between 1.9 and 11.1 million pounds, although since the peaks in 1977 and 1980, landings have averaged 3.6 million pounds (1981-2006) (Figure 1). Coastwide commercial landings have been below 4 million pounds since 1995; this coincided with the entanglement net ban in Florida. Gill nets were the dominant commercial gear in Florida before this ban, since which the use of cast nets has increased. Coastwide, cast nets were used to take about 41% of the commercial harvest in 2006, as compared to the 38% taken with gillnets (Table 3). The 2006 landings were approximately 3.63 million pounds (Table 2), of which 3.14 million pounds were landed in

Florida (about 87% of the harvest). North Carolina harvested nearly 13% of the total 2006 landings, and the states of Rhode Island through Virginia landed the remaining 0.5% of the total (see Table 2).

Recreational anglers harvested an estimated 817,497 Spanish mackerel (1.41 million pounds) in 2006, about 28% less than was harvested in 2005 (Tables 4 and 5). The number of recreationally harvested fish appears to show a cyclical trend, with low harvests in the early to mid 80s and mid to late 90s, interspersed with higher harvests (Figure 2). Florida and North Carolina continue to account for the majority of recreational landings in both number and weight (>70% by number since 1981); in 2006, Florida harvested 54% of the total number of fish, and North Carolina 38%. The number of recreational releases of Spanish mackerel has generally increased over time; however, the number of releases in 2006 (333,611 fish) declined to numbers similar to the late 1990s (Table 6, Figure 2).

IV. Status of Assessment Advice

The Mackerel Stock Assessment Panel conducted a quantitative stock assessment in May 2003. The status of the Atlantic Spanish mackerel stock was evaluated using an age-based sequential virtual population analysis (VPA). The South Atlantic Fishery Management Council, inclusive of members of the South Atlantic Board, internally reviewed and endorsed the assessment. The SAFMC review process is accomplished by the Scientific and Statistical Committee and the Mackerel Advisory Panel.

A benchmark stock assessment of Atlantic coast Spanish mackerel will be completed in Fall 2008 through the SouthEast Data, Assessment, and Review (SEDAR) process.

V. Status of Research and Monitoring

The National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) continues to monitor length and weight at age and size frequencies, fishing mortality, and migration; collect age data and catch per unit effort by area, season, fishery, and gear; monitor shrimp trawl bycatch; investigate methods to predict year class strength; calculate estimates of recruitment, and develop conservation gear to reduce bycatch. The NMFS is also collecting discard data through a bycatch logbook in the mackerel and snapper-grouper fisheries. The Gulf and South Atlantic Fisheries Development Foundation and several states (North Carolina, South Carolina, Georgia, and Florida) have evaluated finfish bycatch in the southeastern shrimp trawl fishery, including bycatch of Spanish mackerel. The South Atlantic component of the Southeast Area Monitoring and Assessment Program (SEAMAP) collects Spanish mackerel data in its shallow trawl survey from Cape Hatteras to Cape Canaveral. Additionally, the Northeast Area Monitoring and Assessment Program (NEAMAP) is scheduled to begin spring and fall surveys between Martha's Vineyard and Cape Hatteras starting in the fall of 2007, following completion of the pilot survey in the fall of 2006.

Abundance trends continue to be monitored primarily through fishery-dependent sources. The states and the SEFSC monitor catch data through the cooperative commercial statistics collection program and the recreational fisheries survey. The commercial catch is monitored most intensively in the winter and early spring by the state of Florida and the NMFS as the commercial quota is approached.

VI. Status of Management Measures

Amendment 18, a regulatory amendment to modify the trip limits to reflect the recent change in the fishing year, will be reviewed by the Council in September of 2007 and, if approved, will be sent to the Secretary of Commerce for formal review. Previous versions of this amendment also contained options to reduce the TACs for both Atlantic coast Spanish mackerel and king mackerel based on the 2003 report from the MSAP addressing Spanish mackerel and a 2004 stock assessment for king mackerel. In June 2007, the Council voted to remove the action to reduce the TACs for both species. This was based on the public comment received and on the recommendation of the Council's Scientific and Statistical Committee to delay action until after the 2008 king mackerel benchmark stock assessment is available. The original regulatory amendment of June 2006 (which was turned into a plan amendment in September 2006) proposed to reduce the TAC for Atlantic coast Spanish mackerel to 6.7 million pounds. A change in the TAC was considered for two reasons: the MSAP had recommended an ABC of 6.7 million pounds in 2003; and, since 2000, estimated landings have been 1 to 3 million pounds below the TAC of 7.04 million pounds, with a decrease in the difference over time. Therefore, if the fishery developed greater capacity and the TAC was realized at a level of 7.04 million pounds for several years, fishing mortality rates would increase and could eventually exceed F 30% SPR.

The Council also delayed further development of Amendment 19 to the Fishery Management Plan for the Coastal Migratory Pelagic Resources until the 2008 king mackerel assessment is complete. The primary action under consideration would divide the FMP into separate Atlantic and Gulf Coastal Migratory Pelagic Fishery Management Plans. In creating the two plans, the Councils (Gulf and Atlantic) would need to determine the management structure for Spanish mackerel, including boundary lines, how fish are counted, permit requirements, etc. Separate management plans are expected to greatly reduce the level of inconveniences and cost to the public and to speed up the management process by eliminating delays in the review and implementation stages resulting from having both Councils review and approve actions.

VII. Implementation of FMP Compliance Requirements for 2006

Since adoption of the interstate Spanish Mackerel FMP in 1990, southern and mid-Atlantic states have responded to the plan's recommendations through implementation of bag limits, size limits, commercial trip limits, and/or provisions for seasonal closures (Table 1) to complement the Council's measures for federal waters. In February 1994, the South Atlantic State/Federal Fishery Management Board determined the following measures of the Commission's Spanish Mackerel FMP to be mandatory for compliance with the interstate plan: quota closures, 10 fish bag limit, 12-inch fork length minimum size, 3.5-inch minimum stretch mesh size for the directed gill net fishery, and commercial trip limits or landing restrictions (3,500 lb/trip from Georgia through New York; incremental trip limits in Florida). The date for compliance was March 20, 1995. The bag limit was increased to 15 fish through a regulatory adjustment on August 2, 2000.

The Plan Review Team judges that all nine states with a declared interest have achieved full regulatory compliance with the interstate plan. The recovery of the Spanish mackerel fishery throughout its historical range continues to benefit from management measures in state (Florida, in particular) and federal waters.

VIII. Recommendations of the Plan Review Team

Management and Regulatory Recommendations

1. In order to prevent disruption of traditional fisheries and avoid user conflicts, it is recommended that states with commercial Spanish mackerel fisheries north of Florida maintain the trip limits as specified in the federal FMP.
2. States should be considered *de minimis* with regard to trip and landing limits (federal FMP measure 8.6.8) if their landings are less than five percent (5%) of the target commercial quota. If a state's landings are five percent or greater of the target commercial quota, the state should implement the required trip or landing limits in the next fishing year. Any state with *de minimis* status should provide monitoring reports for their commercial fishery on a timely enough basis to prevent quota overages.
3. In light of the mandatory nature of state regulatory requirements implied as a result of federal action, it is preferable that the Commission has a mechanism to independently affirm those measures. This can be accomplished through:
 - an amendment to the ASMFC plan to incorporate a framework mechanism for tracking the federal FMPs adjustments to TACs, bag limits, size limits, trip limits, and other regulatory measures; or
 - a joint federal/interstate FMP for Spanish mackerel; or
 - a state law that automatically tracks federal regulations.

Given limited resources, the latter is probably the most efficient mechanism to accomplish complementary state/federal management of Spanish mackerel, with the South Atlantic Fishery Management Council remaining as the lead agency. Until an amendment or joint plan is feasible, southern and mid-Atlantic states should remain actively involved in the joint councils' regulatory processes for Atlantic group Spanish mackerel.

Research and Monitoring Recommendations

High Priority

- Length, sex, age, and CPUE data are needed for improved stock assessment accuracy. Simulations on CPUE trends should be explored and impacts on VPA and assessment results determined. Data collection is needed for all states, particularly those north of North Carolina.
- Evaluation of weight and especially length at age of Spanish mackerel.
- Development of fishery-independent methods to monitor stock size of Atlantic Spanish mackerel (consider aerial surveys used in south Florida waters).
- More timely reporting of mid-Atlantic catches for quota monitoring.
- Provide better estimates of recruitment, natural mortality rates, fishing mortality rates, and standing stock. Specific information should include an estimate of total amount caught and distribution of catch by area, season, and type of gear.
- Develop methodology for predicting year class strength and determination of the relationship between larval abundance and subsequent year class strength.
- Commission and member states should support and provide the identified data & input needed to improve the SAFMC's SEDAR process.

- The full implementation of ecosystem-based management and the implementation of monitoring /research efforts needed to support ecosystem-based management needs should be conducted.

Medium Priority

- Yield per recruit analyses should be conducted relative to alternative selective fishing patterns.
- Determine the bycatch of Spanish mackerel in the directed shrimp fishery in Atlantic Coastal waters (partially met: Branstetter, 1997; Ottley et al., 1998; Gaddis et al., 2001;Page et al., 2004).
- Evaluate potential bias of the lack of appropriate stratification of the data used to generate age-length keys for Atlantic and Gulf Spanish mackerel.
- Evaluate CPUE indices related to standardization methods and management history, with emphasis on greater temporal and spatial resolution in estimates of CPUE.
- Consideration of MRFSS add-ons or other mechanisms for collection of socioeconomic data for recreational and commercial fisheries.
- Determine normal Spanish mackerel migration routes and changes therein, as well as the climatic or other factors responsible for changes in the environmental and habitat conditions which may affect the habitat and availability of stocks.
- Determine the relationship, if any, between migration of prey species (i.e., engraulids, clupeids, carangids), and migration patterns of the Spanish mackerel stock.

Low Priority

- Final identification of Spanish mackerel stocks through multiple research techniques.
- Complete research on the application of assessment and management models relative to dynamic species such as Spanish mackerel.
- Delineation of spawning areas and areas of larval abundance through temporal and spatial sampling.

IX. References

- Branstetter, S. 1997. Final implementation of high-priority objectives of a bycatch reduction research program for the Gulf of Mexico and South Atlantic shrimp fishery. NMFS 93-SER-059.
- Gaddis, G., D. Haymans, J.L. Music, Jr., and J. Page. 2001. Interstate fisheries management planning and implementation. Final Report. Award No. NA86FG0116. USDOC/NOAA/NMFS. Atlantic Coastal Fisheries Management Act (P.L. 103-206).
- Mackerel Stock Assessment Panel (MSAP). 2003. 2003 Report of the Mackerel Stock Assessment Panel. Award No. NA17FC2203 and NA17FC1053. Gulf of Mexico Fishery Management Council, Tampa, Florida & South Atlantic Fishery Management Council, Charleston, South Carolina. 31 pp.
- Ottley, A., C.N. Belcher, B. Good, J.L. Music, Jr., and C. Evans. 1998. Interstate fisheries management planning and implementation. Final Report. Award No. NA57FG0170. USDOC/NOAA/NMFS. Atlantic Coastal Fisheries Management Act (P.L. 103-206).

X. Figures

Figure 1. Estimated Atlantic Spanish mackerel stock abundance from the 2003 base model (MSAP 2003)

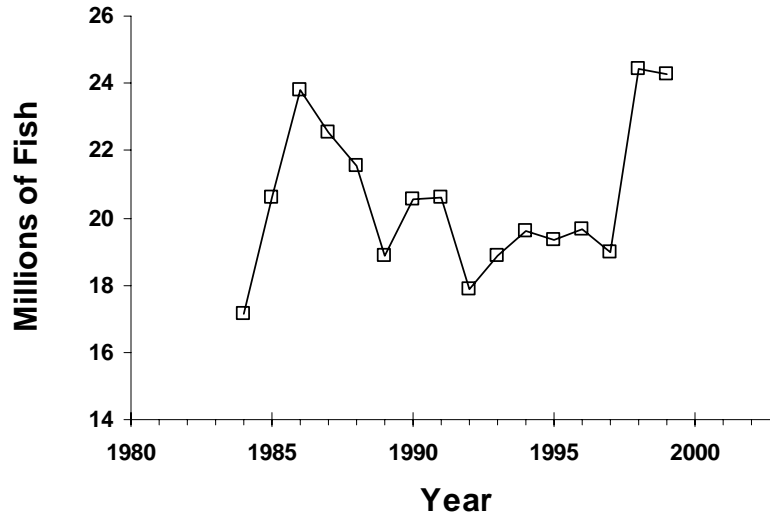


Figure 2. Commercial and recreational harvest (pounds) of Spanish mackerel, 1960-2006 (Recreational data available from 1981-present only; see Tables 2 and 5 for values and sources)

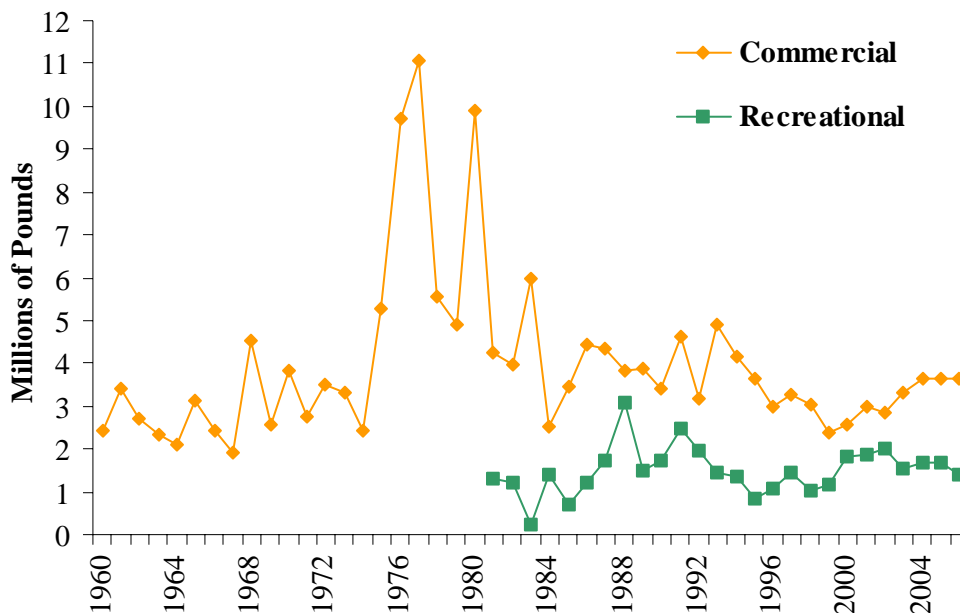
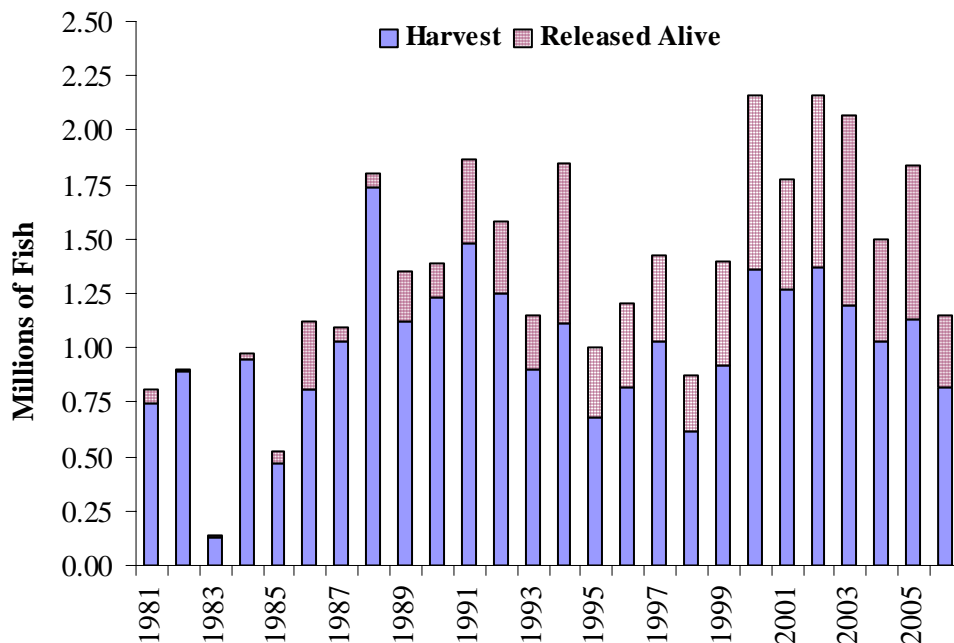


Figure 3. Recreational harvest and releases (numbers of fish) of Spanish mackerel, 1981-2006
(See Tables 4 and 6 for values and sources)



XI. Tables

Table 1. Summary of state regulations for Spanish mackerel in 2006

Notes: commercial license required to sell Spanish mackerel in all states; other general gear restrictions apply to the harvest of Spanish mackerel.

State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb. trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure when quota reached.
VA	14" TL, 15 fish	14" TL; size limit exemption for pound net fishery. 3,500 lb. trip limit. Closure when quota reached.
NC	12" FL, 15 fish	12" FL. 3,500 lb. trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL, 15 fish
GA	12" FL, 15 fish	12" FL. State waters: 15 fish limit, closure from December 1 - March 15. 3,500 trip limit in federal waters. Closure when quota reached.
FL	12" FL, 15 fish	12" FL. Trip limits: April 1 – Nov. 30 - 3,500 lb.; Dec. 1 until 75% of adjusted quota reached - 3,500 lb. Mon-Fri. & 1,500 lb. Sat-Sun; >75% adjusted quota until quota filled -1,500 lb.; > 100% of adjusted quota - 500 lb.

Table 2. Commercial landings (pounds) of Spanish mackerel by state, 1981-2006
(All landings by calendar year; Source: NMFS Fisheries Statistics Division, queried 8/29/07)

Year	MA	RI	NY	NJ	MD	VA	NC	SC	GA	FL	Total
1981			500	500		3,500	51,639		518	4,174,432	4,231,089
1982			1,000	200		12,700	189,217	1,081	745	3,758,603	3,963,546
1983	2,600	2,600	600	100		3,500	41,336	706		5,947,102	5,998,544
1984			300	100		10,000	127,467	1,321		2,397,373	2,536,561
1985			100			15,300	173,186	847		3,244,980	3,434,413
1986	600		3,200	1,500		168,400	232,197	6,375	1,335	4,003,738	4,417,345
1987	16,000	4,900	16,600	24,000	4,800	251,200	504,063	961	255	3,497,135	4,319,914
1988		3,400	19,200	16,900	4,300	291,600	438,222	1,029	726	3,071,687	3,847,064
1989	12,400	8,900	17,700	24,100	10,400	354,400	589,383	1,605		2,853,177	3,872,065
1990	6,585	5,530	24,329	28,336	43,411	491,651	838,914	384	491	1,979,081	3,418,712
1991	19,698	9,530	149,321	77,151	62,688	447,127	858,808	444	197	2,986,871	4,611,835
1992	608	2,277	31,873	51,751	37,930	271,313	738,362	1,952	71	2,022,961	3,159,098
1993	5	2,843	42,063	23,036	9,445	335,688	589,868	480	95	3,902,240	4,905,763
1994	3,273	893	124,733	19,915	3,363	376,818	531,355	362		3,099,780	4,160,492
1995		12,419	9,136	2,153	3,089	168,732	402,305			3,064,926	3,662,760
1996		2,523	17,980	40,821		283,750	401,546			2,244,667	2,991,287
1997	15	86	31,107	12,122	3,033	164,639	766,901			2,269,289	3,247,192
1998	71	109	37,238	13,242	13,204	121,109	372,440			2,498,461	3,055,874
1999	2,407	276	47,831	17,144	21,604	251,626	459,120			1,566,706	2,366,714
2000		188	35,825	11,757	26,607	168,679	659,431			1,675,473	2,577,960
2001		20,052	13,851	9,401	18,899	178,610	653,491			2,115,782	3,010,086
2002		65	18,741	11,196	20,725	102,417	698,463			1,995,212	2,846,819
2003	514	366	18,339	5,432	5,239	103,401	456,794			2,740,632	3,330,717
2004	198	5,971	16,921	3,060	4,881	66,979	456,243			3,066,356	3,620,609
2005		294	5,197	2,074	7,750	43,579	444,987			3,134,031	3,637,912
2006		1,486	5,720	1,456	290	8,841	470,560			3,141,749	3,630,102

Table 3. Coastwide commercial landings of Spanish mackerel by gear
(Source: NMFS Fisheries Statistics Division, queried 8/29/07)

Gear	Pounds	% of total
Gillnets	1,383,581	38.1%
Cast Nets	1,474,906	40.6%
Line Gears	658,804	18.2%
Other	112,384	3.1%
Total	3,629,675	

Table 4. Recreational harvest (numbers) of Spanish mackerel by state, 1981-2006
(NMFS Fisheries Statistics Division, queried 8/29/07)

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981	4,277								231,744	25,058	1,786	485,395	748,260
1982									694,420	21,092	408	173,649	889,569
1983									6,156	3,279	2,109	117,532	129,076
1984									618,313	79,855	3,718	248,048	949,934
1985									344,965	36,606	4,809	84,226	470,606
1986					1,479		457	6,942	431,021	147,358	25,257	195,385	807,899
1987				1,417			8,036	1,520	815,920	65,846	20,925	118,184	1,031,848
1988								101,691	1,312,070	82,136	4,403	233,582	1,733,882
1989		320		1,010	22,067			73,236	679,360	121,115	7,444	213,665	1,118,217
1990		403		1,726	2,495	319	1,355	63,821	821,334	81,375	31,567	225,263	1,229,658
1991	7,071	78	4,173	7,608	25,071	2,054	41,250	68,102	676,717	132,198	2,391	517,290	1,484,003
1992				1,325	10,549	210	4,847	71,265	701,974	62,546	25,736	370,809	1,249,261
1993	188			2,681	3,457		43,050	73,832	451,523	92,621	12,979	219,458	899,789
1994					7,910		43,710	145,872	535,949	113,991	15,235	252,668	1,115,335
1995							26,216	86,899	285,882	34,355	16,726	226,334	676,412
1996					1,172			69,399	355,036	134,282	16,948	245,085	821,922
1997								68,517	585,765	101,067	28,396	246,885	1,030,630
1998					4,046	186	3,633	33,140	239,052	65,584	28,002	244,235	617,878
1999		438			1,335	226	1,220	75,972	476,019	27,477	9,007	327,621	919,315
2000	1,528			4,453	923		15,219	71,249	671,353	28,283	20,545	547,315	1,360,868
2001	2,561			802			8,025	29,590	400,706	43,501	11,013	774,065	1,270,263
2002								17,433	401,982	24,235	1,927	926,600	1,372,177
2003	3,373						6,975	17,063	349,170	24,879	11,235	784,385	1,197,080
2004	1,338				1,531		8,800	21,012	308,996	144,394	7,906	532,956	1,026,933
2005							20,792	20,525	331,601	70,273	12,140	676,973	1,132,304
2006					458		3,188	21,303	307,284	43,430	2,510	439,324	817,497

Table 5. Recreational harvest (pounds) of Spanish mackerel by state, 1981-2006
(NMFS Fisheries Statistics Division, queried 8/29/07)

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981									423,801	53,292	4,306	808,808	1,290,207
1982									928,201	29,546	483	251,115	1,209,345
1983									14,725	8,274	4,198	199,331	226,528
1984									848,537	116,083	5,540	427,501	1,397,661
1985									507,545	34,445	3,547	152,113	697,650
1986					2,500		1,008	9,709	639,105	256,157	47,941	251,673	1,208,093
1987				2,890			14,345	2,011	1,296,732	117,053	40,681	230,725	1,704,437
1988								160,407	2,136,806	140,896	5,141	656,047	3,099,297
1989		847		3,560	35,415			81,107	877,911	197,982	6,162	303,485	1,506,469
1990				2,332	3,320	470	1,790	86,932	1,084,167	153,932	45,748	346,585	1,725,276
1991	26,327	251	16,958	19,612	36,096	3,062	57,249	72,708	1,056,524	291,717	3,717	887,777	2,471,998
1992				3,880	16,526	302	9,634	76,411	947,065	145,451	79,818	669,160	1,948,247
1993	580			7,590	5,280		68,757	93,272	664,815	135,287	22,209	439,555	1,437,345
1994					8,613		44,969	160,610	588,035	152,836	66,949	350,679	1,372,691
1995							34,705	110,433	329,466	40,995	12,072	302,632	830,303
1996								80,505	385,922	184,655	31,856	413,687	1,096,625
1997								22,233	862,497	143,297	37,877	400,148	1,466,052
1998					9,189	379	5,725	57,467	305,630	106,209	112,562	408,872	1,006,033
1999		1,303			2,207	240	1,715	79,601	469,258	44,917	10,031	578,123	1,187,395
2000	5,053			10,798	1,118		20,642	83,296	671,616	30,543	47,137	946,395	1,816,598
2001	10,351			1,168			14,526	42,046	499,829	46,945	23,056	1,232,506	1,870,427
2002								12,163	475,742	47,057	4,795	1,475,232	2,014,989
2003							9,762	22,031	446,052	29,107	34,855	1,021,204	1,563,011
2004					3,078		14,434	29,244	558,968	147,609	11,799	915,099	1,680,231
2005							38,946	28,192	359,927	138,517	16,296	1,088,720	1,670,598
2006							6,550	46,832	458,539	83,647	4,661	807,327	1,407,556

Table 6. Recreational releases (numbers) of Spanish mackerel by state, 1981-2006
(NMFS Fisheries Statistics Division, queried 8/29/07)

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981									5,616			56,374	61,990
1982												6,613	6,613
1983											515	4,929	5,444
1984									2,931	1,300		21,797	26,028
1985									27,753	3,862		23,316	54,931
1986								74	280,252	7,879	605	20,469	309,279
1987								13,947	28,136	5,506	2,916	7,197	57,702
1988									17,413	27,019	2,456	18,334	65,222
1989								10,286	64,749	73,983	391	83,682	233,091
1990				257				21,094	76,940	26,929		35,520	160,740
1991	859				2,674	1,092	1,747	28,777	133,601	19,331	57	190,602	378,740
1992	586							18,072	180,235	15,515	3,859	113,062	331,329
1993	584				1,160		2,684	70,081	81,927	15,966		74,052	246,454
1994				1,059	50,743			91,832	241,082	207,055		136,041	727,812
1995				7,297	1,269		1,562	24,467	145,845	14,159	2,594	129,469	326,662
1996								28,951	103,067	83,543	139	167,411	383,111
1997						338		22,658	140,704	62,356		168,815	394,871
1998							1,075	49,429	80,700	32,087	7,351	87,804	258,446
1999				1,415	2,670			36,276	205,870	46,400	495	185,106	478,232
2000	667					608	1,656	82,227	300,384	47,273	16,479	353,042	802,336
2001	2,271			1,657	4,907	825	7,265	30,158	160,591	9,711	3,188	285,738	506,311
2002							4,449	9,923	196,967	9,206	8,641	554,743	783,929
2003							6,994	20,539	164,787	223,116	6,501	445,965	867,902
2004	2,853						753	13,738	121,531	114,157	3,527	213,577	470,136
2005							4,937		174,140	153,584	8,983	367,862	709,506
2006							1,620	9,247	90,033	33,644	7,057	192,010	333,611