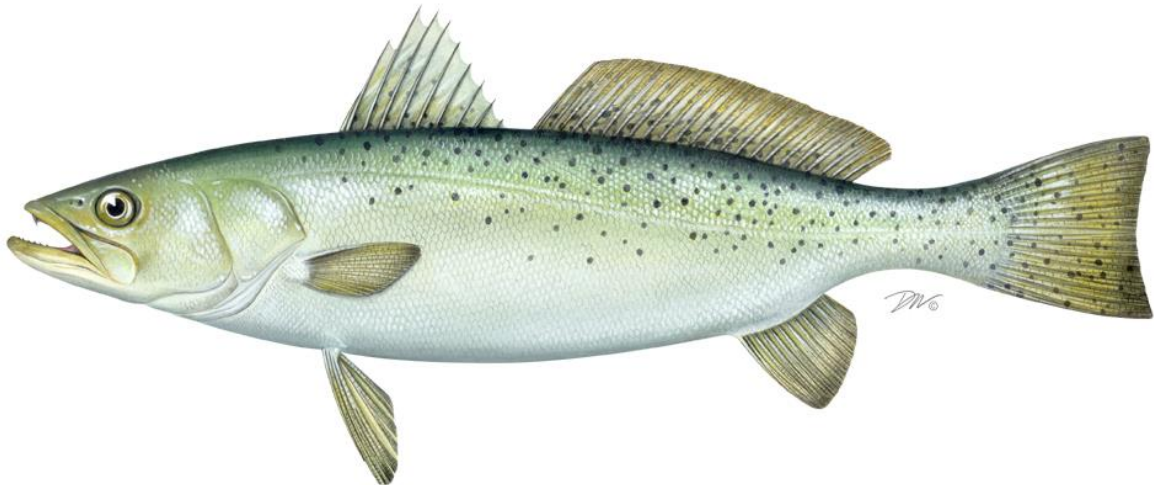


2014 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

SPOTTED SEATROUT
(Cynoscion nebulosus)

2013 FISHING YEAR



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I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	Original FMP – October 1984
<u>Amendments:</u>	Amendment 1 – November 1991 Omnibus Amendment to Spanish Mackerel, Spot, and Spotted Seatrout (Amendment 2)- August 2011
<u>Management Area:</u>	The Atlantic coast distribution of the resource from Maryland through the east coast of Florida
<u>Active Boards/Committees:</u>	South Atlantic State/Federal Fisheries Management Board; Spotted Seatrout Plan Review Team, Omnibus Amendment Plan Development Team

The Atlantic States Marine Fisheries Commission (ASMFC) adopted the Fishery Management Plan (FMP) for spotted seatrout in 1984. The states of Florida through Maryland have a declared interest in the Commission's FMP for spotted seatrout. The ISFMP Policy Board approved Amendment 1 to this FMP in November 1991. In August of 2011, the South Atlantic State/Federal Management Board approved the Omnibus Amendment to Spanish Mackerel, Spot, and Spotted Seatrout FMPs. The Omnibus Amendment (Amendment 2) brought the Spotted Seatrout FMP under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (1993) and the ASMFC Interstate Fishery Management Plan Charter (1995).

The goal of the management plan is "to perpetuate the spotted seatrout resource in fishable abundance throughout its range and generate the greatest possible economic and social benefits from its harvest and utilization over time." Plan objectives include: 1) attain over time optimum yield; 2) maintain a spawning potential ratio of at least 20% to minimize the possibility of recruitment failure; 3) promote conservation of the stocks in order to reduce the inter-annual variation in availability and increase yield per recruit; 4) promote the collection of economic, social, and biological data required to effectively monitor and assess management efforts relative to the overall goal; 5) promote research that improves understanding of the biology and fisheries of spotted seatrout; 6) promote harmonious use of the resource among various components of the fishery through coordination of management efforts among the various political entities having jurisdiction over the spotted seatrout resource; and 7) promote determination and adoption of standards of environmental quality and provide habitat protection necessary for the maximum natural protection of spotted seatrout. Amendment 2 to the Spotted Seatrout FMP added the following objectives in support of the compliance under the Act: 1) Manage the spotted seatrout fishery restricting catch to mature individuals; 2) manage the spotted seatrout stock to maintain sufficiently-high spawning stock biomass; 3) develop research priorities that will further refine the spotted seatrout management program to maximize the biological, social, and economic benefits derived from the spotted seatrout population.

Recommended management measures include a minimum size limit of 12 inches total length (TL) with comparable mesh size regulations in directed fisheries, and data collection for stock assessment and monitoring the status of the fisheries. All states with a declared interest in spotted seatrout have implemented at least the recommended minimum size limit. In addition, each state

has either initiated spotted seatrout data collection programs or modified other programs to collect improved catch and effort data. Table 1 provides the states' recreational and commercial regulations for spotted seatrout through 2014.

II. Status of the Stock

A coastwide stock assessment of spotted seatrout has not been conducted given the largely non-migratory nature of the species and the lack of data on migration where it does occur. Instead, state-specific age-structured analyses of local stocks have been performed by several states. These stock assessments provide estimates of spawning potential ratio (SPR), which is a measure of the effect of fishing pressure on the relative abundance of the mature female segment of the population. The FMP recommends a goal of 20% SPR; North Carolina, South Carolina, and Georgia have adopted this goal, and Florida has established a 35% SPR goal.

Florida's stock assessments are for separate northern and southern populations. Average transitional SPR estimates for Florida's spotted seatrout during 2007-2009 were 67% in the northeast region of the state's Atlantic coast and 45% in the southeast region (Murphy et al. 2011). This assessment provided the basis for some relaxation in the management of spotted seatrout in Florida (Table 1).

The South Carolina Department of Natural Resources packaged three state-specific assessments into a report in 2001; however, these assessments were not peer reviewed. This initial assessment of South Carolina spotted seatrout covered 1986-1992 and indicated that female SPR was just above the 20% goal in the terminal year (Zhao and Wenner 2001). This assessment led to an increase in the minimum size limit and decrease in the creel limit for spotted seatrout in South Carolina. A more recent assessment of the population of South Carolina spotted seatrout was conducted for the period 1981-2004, but not peer reviewed (de Silva, Draft 2005). Two modeling approaches were used, and both models indicated that the current spawning stock biomass is below what would be required to maintain 20% SPR.

Assessments in North Carolina and Georgia spotted seatrout covered 1981-1997 and 1986-1995, respectively, and both indicated that female SPR was below the 20% goal in the terminal year (Zhao and Burns 2001, Zhao *et al.* 2001). A more recent assessment of spotted seatrout in Georgia has been performed; however, it remains unpublished. This 2002 Georgia assessment is unpublished because the results were highly questionable due to data deficiencies and changing methodologies.

North Carolina recently completed a peer reviewed stock assessment of spotted seatrout covering 1991-2008, which included all spotted seatrout caught in North Carolina and Virginia (Jensen 2009). The assessment indicated that SPR has been below 20% SPR in recent years. Jensen (2009) recommended the implementation of management measures to account for recent increases of recreational fishing and discard mortality and maintain a sufficiently large spotted seatrout population to act as a buffer against the effects of future cold stun events. Based on the assessment, North Carolina developed a draft state FMP for spotted seatrout, with the final version approved in April 2012.

III. Status of the Fishery

Both commercial and recreational fishermen regularly catch spotted seatrout from Maryland through the east coast of Florida (except in South Carolina where spotted seatrout has been declared a gamefish and can only be taken by recreational means). Landings from states north of Maryland are minimal and/or inconsistent from year to year. All catch estimates in this section include those in the management area only (MD-FL). Total recreational landings have surpassed total commercial landings every year since recreational landings have been recorded in 1981 (Figure 1). In 2009, recreational landings were more than five times the commercial landings. A coastwide (VA, NC, SC) winter mortality event in 2000/2001 likely contributed to the sudden decline in commercial and recreational landings in 2001 and 2002. Both fisheries' landings have increased since then.

Commercial Fishery

The National Marine Fisheries Service (NMFS) compiles commercial spotted seatrout landings. The data are cooperatively collected by the NMFS and state fishery agencies from state mandated trip-tickets, landing weigh-out reports from seafood dealers, federal logbooks, shipboard and portside interviews, and biological sampling of catches. See Table 2.

Atlantic coast commercial landings of spotted seatrout (1960-2013) have ranged from 165,000 pounds to 1.38 million pounds (Figure 1). Commercial landings historically came primarily from Florida and North Carolina, with Virginia, South Carolina, and Georgia accounting for a small portion of the total. From 1960 to 1976, annual commercial landings of spotted seatrout averaged 1.07 million pounds, but have declined since then due to increased regulation and possible declines in abundance. Significant changes to regulations include the 1987 designation of spotted seatrout as a gamefish in South Carolina, and the 1995 prohibition on the use of entangling nets in Florida's coastal waters. From 2004 to 2013, commercial landings have averaged approximately 328,254 pounds. North of Florida, variability in annual harvest is typical and seems to parallel the climatic conditions of the preceding winter and spring. In 2013 the commercial landings are estimated to be 456,284 pounds, representing a 12% increase from the previous year's harvest and a 50% increase from the previous ten-year average. North Carolina accounted for approximately 80% of the total coastwide catch, with Virginia and Florida responsible for approximately 7% and 14.5% of the 2013 commercial landings, respectively.

Recreational Fishery

Recreational catch statistics are collected by the NMFS recreational fisheries survey. Effort data are collected through telephone interviews. Catch data are collected through access-point angler intercept surveys. Catch per trip estimates are produced for each type of fish encountered, either observed or reported, and these estimates are combined with the effort estimates by sampling stratum to produce the catch and harvest estimates. See Tables 3, 4, and 5.

Over the last 33 years, the recreational catch of spotted seatrout (kept and released) has shown a strong upward trend, increasing from 1.1 million fish in 1981 to a peak of 8.8 million fish in 2012, and back down to 5.7 million fish in 2013 (Figure 2). The recreational harvest of spotted seatrout, however, has remained relatively stable around the time series average of 1.3 million fish. The recreational harvest increased from approximately 952,458 fish in 2010 to 1.8 million fish in 2012, with a decrease to 1.1 million fish in 2013. Due in part to recreational size and creel

limits and closed seasons, as well as the encouragement of catch and release practices, the percentage of caught fish being released has increased to 75-87 percent of the catch since 2000. In 2013, the release percentage (80.3%) was similar to the previous 10-year average (79.3%). In 2013, North Carolina anglers took the largest proportion of harvested fish with 33%, followed closely by Florida anglers at 30%. Recreational catches are generally made with rod and reel, but some are taken by recreational nets and by gigging, where these methods are permitted. Most recreational fishing is conducted from private boats and the majority of the catch is taken from nearshore waters.

IV. Status of Assessment Advice

A coastwide stock assessment of spotted seatrout has not been conducted and the Plan Review Team (PRT) does not recommend that one be completed due to the life history of the fish and the available data. Several states have performed age-structured analyses on local stocks of spotted seatrout. Recent Florida and North Carolina stock assessments for spotted seatrout provide divergent trends on the status of the species. The 2005 stock assessment in South Carolina indicated an increasing population trend but a status level that is still below target spawning stock biomass levels (de Silva 2005). The PRT supports the continuation of state-specific assessments, yet recognizes the difficulty most states face to attain sufficient data of a quality that can be used in the assessment process and personnel who can perform the necessary modeling exercises.

The lack of biological and fisheries data for stock assessment and effective management of the resource was recognized in the 1984 FMP and continues to be a hindrance. Some states are increasing their collection of biological and fisheries data, which should provide insight on stock status over time.

V. Status of Research and Monitoring

In addition to the commercial and recreational fishery-dependent data collected and/or compiled through the National Marine Fisheries Service, Fisheries Statistics Division, some states have implemented fishery-independent or additional fishery-dependent monitoring programs.

The Florida Fish and Wildlife Conservation Commission (FWC) implemented a juvenile finfish monitoring program in the northern Indian River Lagoon in the spring of 1990 and in the estuarine reaches of the St. Johns, St. Marys, and Nassau Rivers in northeast Florida in the spring of 2001 (FWC-FWRI 2013). Florida also initiated a stratified random sampling program in 1997 on the Atlantic coast that utilizes a 183-m haul seine to catch exploitable-sized fishes. This has been conducted in the northern Indian River and southern Indian River since initiation and in northeast Florida since 2001. Trends in the YOY abundance have seen a decline since a strong recruitment evident in 2011. Recent relative abundance of adults (>199 mm SL) have also declined in both the central and north regions since 2011 and 2012, respectively. Samples have not yet been processed for the 2013 sampling program.

Florida's fishery-dependent sampling includes commercial trip-ticket information and biostatistical sampling of the commercial and recreational catch. A voluntary angler logbook program was implemented in 2002 to collect information on the lengths of spotted seatrout

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released alive by anglers. Recently (2011) this program changed to ‘postcard’ program enlisting anglers encountered at sites visited during the MRIP angler intercept survey.

Georgia collects fishery-dependent data through a Marine Sportfish Carcass Recovery Program. Data collected through this survey are used to examine trends in the size and age composition of the recreationally harvested population, valuable information for future stock assessments. For 2013, a total of 4,392 fish carcasses were donated through the program. Approximately 69% (3,023) of the carcasses were seatrout, with an average centerline (CL) length of 363.4 mm CL (minimum: 227 mm CL; maximum: 597 mm CL), were reported from 15 recovery locations.

Georgia also collects fishery-independent data through the Marine Sportfish Population Health Study, was implemented in 2003 to provide age and sex specific estimates of relative abundance in two Georgia estuaries, Wassaw Sound and the Altamaha Sound region. This trammel net survey is conducted monthly, September through November, and utilizes a hybrid random-stratified and fixed station design in which each station is sampled once in a given month. For 2013, the average centerline length in Wassaw was 342.8 mm CL and 345.0 mm CL in Altamaha.

South Carolina has an extensive directed research program on this species. Current project objectives include determining the size and age composition of the recreational catch by sampling independent angler and fishing tournament catches as well as a carcass program, and producing fisheries independent relative abundance estimates from trammel net surveys along the South Carolina coast. The latter is a stratified random sampling design and has been conducted monthly since November 1990. South Carolina also has an electrofishing survey of upper estuarine waters. It uses a stratified random design and has been operating monthly since 2001. In 2013, a total of 85 Spotted Seatrout were captured by 302 random electrofishing sets, with a mean overall CPUE of 0.28 Spotted Seatrout per set and PSEs of between 33% and 66% per stratum. CPUE has generally declined in the electrofishing survey since 2009. In contrast to electrofishing, the trammel net survey, catches some YOY as well as older seatrout (S. Arnott, Personal Communication, 2011). During 2013, a total of 3,535 Spotted Seatrout were captured in 911 random trammel net sets, with an overall mean CPUE of 3.88 Spotted Seatrout per trammel set and percent standard errors (PSEs) of between 12.1% and 32.2 per stratum. Additionally, South Carolina also has ongoing seatrout parasite studies (Moravec et al. 2006). Catch rates, size composition, and sub-samples of the catch on a bi-monthly basis are used for generating age-length keys for cohort specific indices of abundance. Roumillat and Brouwer (2004) have described the reproductive dynamics of female spotted seatrout in South Carolina.

North Carolina has collected age, growth, and maturity data for spotted seatrout caught in fishery-dependent and fishery-independent sampling programs since 1991. A fishery-independent monitoring program was initiated in May 2001, supported by USFWS Sports Fish Restoration funds. The program utilizes a stratified random, multi-mesh size gill net survey along North Carolina’s Outer Banks, the bays of western Pamlico Sound, the Neuse, the Pamlico, Pungo, New and Cape Fear Rivers, and the Atlantic Ocean. Project objectives include calculating annual indices of abundance for important recreational fish (spotted seatrout included); supplementing samples for age, growth, and reproductive studies; evaluating catch rates and species distribution for identifying and resolving bycatch problems; and characterizing

habitat utilization. Additional areas of the Neuse and Pamlico-Pungo Rivers contribute to the Pamlico Sound Area Independent Gill Net Survey, with common objectives and sampling design. Hydrophone work was conducted in North Carolina to characterize critical spawning habitats for spotted seatrout in Pamlico Sound. For the 2013 surveying program, the overall spotted seatrout CPUE was 0.68 (n=200) for Pamlico Sound (second highest in the time series); 0.63 (n=196) for surveys in the Pamlico-Pungo, and Neuse rivers (the fourth highest in the time series); and 0.32 (n=37) for surveys in the Cape Fear and New Rivers. Hook-and-line and estuarine gill net discard mortality studies were conducted in North Carolina in 1998-2001, supported by Atlantic Coastal Fisheries Cooperative Management Act funds.

A spotted seatrout tagging study was initiated in September 2008 and is scheduled to conclude in August 2012. Funding for one year was to collect preliminary data necessary to design and conduct an effective long-term tagging study on spotted seatrout in North Carolina, 2008-2009 (funded by NC Sea Grant Fishery Resource Grant). This was followed by an advanced tagging study by NC State University researchers who are using a combined conventional tag and telemetry approach to study the movement and mortality of spotted seatrout in North Carolina, 2009-2012 (funded by NC Marine Resources Fund, which consists of proceeds from the sale of the Coastal Recreational Fishing License).

VI. Status of Management Measures and Issues

Changes to State Regulations

North Carolina:

Reduction in recreational bag limit from six fish to four fish and removed restriction limiting two fish to greater than 24 inches total length.

Florida

Effective September 1, 2013, the recreational seasons were dropped, the commercial season was lengthened, and the commercial possession limit was modified to accommodate twice the possession limit on a vessel occupied by two or more license fishers.

Omnibus Amendment (Interstate)

In August 2011, the Management Board approved the development of an amendment to the Spot FMP to address three issues: compliance measures, consistency with federal management in the exclusive economic zone, and alignment with Commission standards. The updated FMP's objectives are to: (1.) Increase the level of research and monitoring on spot bycatch in other fisheries, in order to complete a coastwide stock assessment (2.) Manage the Spot fishery stock to maintain the spawning stock biomass above the target biomass levels. (3.) Develop research priorities that will further refine the spot management program to maximize the biological, social, and economic benefits derived from the spot population. Through the Omnibus Amendment does not require specific fishery management measures in either the recreational or commercial fisheries for states within the management unit range.

De minimis Guidelines

A state qualifies for *de minimis* status if its past 3-years' average of the combined commercial and recreational catch is less than 1% of the past 3-years' average of the coastwide combined commercial and recreational catch. Those states that qualify for *de minimis* are not required to implement any monitoring requirements, none of which are included in the plan.

De Minimis Requests

The states of New Jersey and Delaware requests continuation of *de minimis* status. The PRT notes these states meet the requirements of *de minimis*.

VII. Implementation of FMP Compliance Requirements for 2013

12'' TL minimum size with comparable mesh size requirements (both commercial and recreational)

VIII. Recommendations of Plan Review Team

Management and Regulatory Recommendations

- Increase observer coverage in states that have a commercial fishery for spotted seatrout.

Prioritized Research Recommendations

High Priority

- Conduct state-specific stock assessments to determine the status of stocks relative to the plan objective of maintaining a spawning potential of at least 20%.
- Collect data on the size or age of spotted seatrout released alive by anglers and the size and age of commercial discards.
- Continue work to examine the stock structure of spotted seatrout on a regional basis, with particular emphasis on advanced tagging techniques.
- Expand the NMFS recreational fishery survey to assure adequate data collection for catch and effort data, increased intercepts, and state add-ons of social and economic data needs.
- Conduct telemetry tagging surveys to provide precise estimates of mortality attributed to winter kills.
- Provide state-specific batch fecundity estimates for use in stock assessments.
- Develop state-specific juvenile abundance indices.
- Increase observer coverage in states that have a commercial fishery for spotted seatrout.

Medium Priority

- Identify essential habitat requirements.
- Evaluate effects of environmental factors on spawning frequency and stock density.
- Initiate collection of social and economic aspects of the spotted seatrout fishery.

IX. References

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X. Figures

Figure 1. Commercial landings (1960-2013) and recreational landings (1981-2013), in pounds, from Maryland to Florida (See Tables 2 and 4 for values and sources)

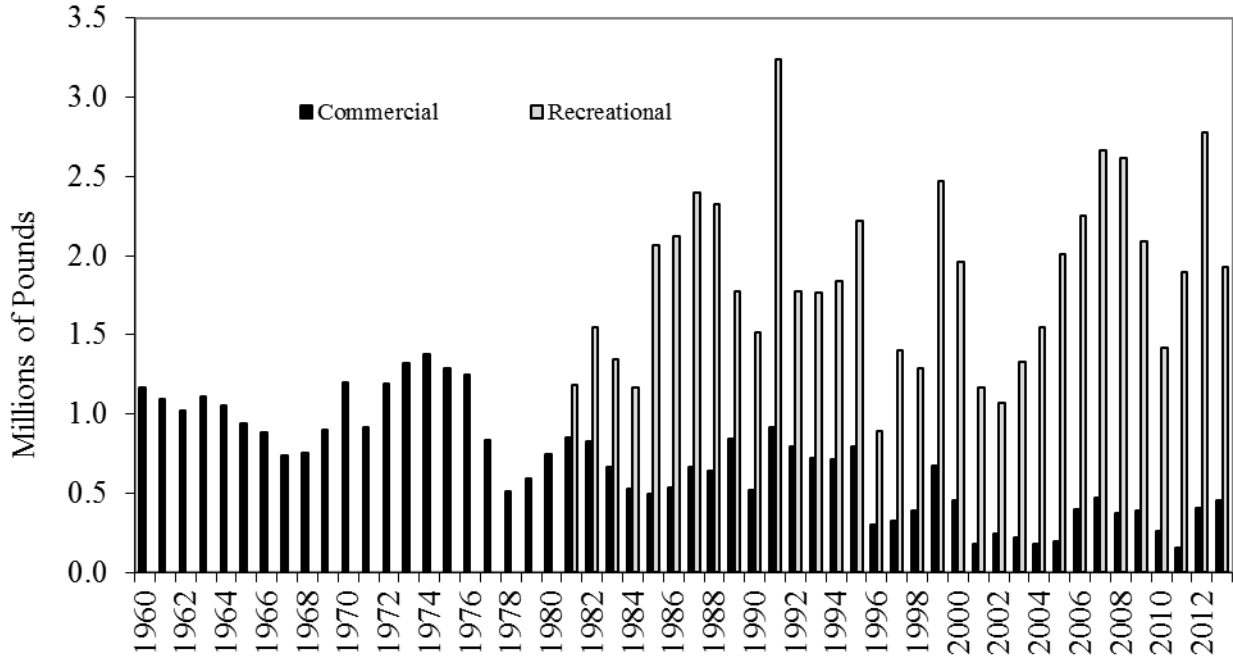
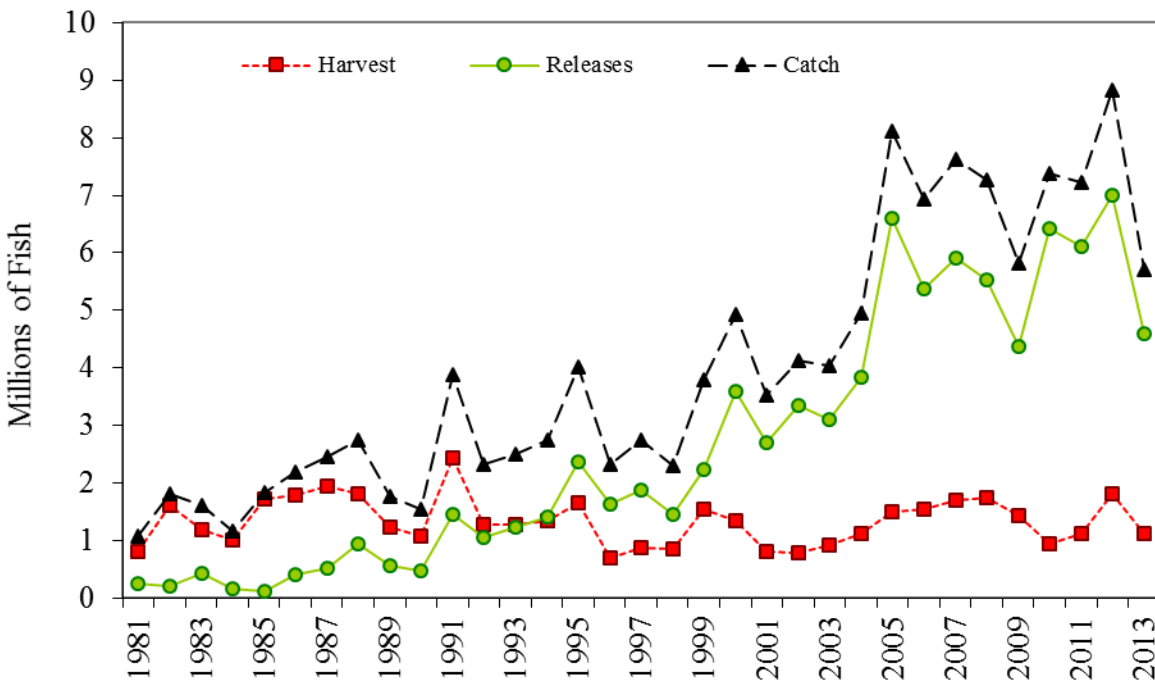


Figure 2. Recreational catch (numbers), 1981-2013, from Maryland to Florida (See Tables 3 and 5 for values and sources)



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XI. Tables

Table 1. Summary of state regulations for spotted seatrout in 2013

State	Recreational	Commercial
New Jersey	13" TL; 1 fish	Gill net: 13"; open 1/1-5/20 & 9/3-10/19 & 10/27-12/31; 100 lb possession limit; 100 lb bycatch limit; mesh ≥ 3.25 " stretched except 2.75 - 3.25" stretched allowed within 2nm for permitted fishermen doing monthly reporting. Trawl: 13"; open 1/1-7/31 & 10/13-12/31; mesh ≥ 3.75 " diamond or 3.375 square; 100 lb possession limit' 100 lb bycatch limit. Pound net: 13"; open 1/1/-6/6 & 7/1-12/31; 150 lb bycatch limit. Hook & line: open 1/1-12/31, 13", 1 fish.
Delaware	12" TL	12" TL
Maryland	14" TL; 10 fish	12" TL. Minimum mesh size restrictions for trawl (3-3/8" sq. or 3-3/4" diag.) and gill nets (3").
PRFC	14" TL; 10 fish	14" TL
Virginia	14" TL; 10 fish. 1 fish from Dec 1-March 31 for 24" TL or greater	14" TL except pound nets and haul seines allowed 5% by weight less than 14". Hook & line - 10 fish limit between April 1- November 30. Quota: 51,104 lbs (Sept. 1-Aug. 31).
North Carolina	14" TL; 4 fish	14" TL; hook & line - 75 fish limit.
South Carolina	14" TL; 10 fish. May be taken by rod & reel year-round or gigging March-November.	Gamefish status since 1987: native caught fish may not be sold.
Georgia	13" TL; 15 fish	13" TL; 15 fish. Commercial fishing license to sell. BRD requirement for trawl; gear mesh regulations.
Florida	Slot limit: 15-20" TL with 1 fish >20" allowed; north region: 6 fish limit; south region: 4 fish limit	15-24" TL; June 1-Nov 30 season (north), May 1-Sept 30 season (south); 75 fish per day or vessel (up to 150 per day if two or more licensed commercial fishers aboard); hook & line or cast net only. Restricted Species endorsement, landed whole

Note: A commercial fishing license is required to possess spotted seatrout for sale in all states with a fishery.

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Table 2. Commercial landings (pounds) of spotted seatrout by state, 1981-2013
(Source: State Compliance Reports, 2014)

Year	MD	VA	NC	SC	GA	FL	Total
1981		4,000	113,304		629	736,026	853,959
1982		3,400	83,847	1,944	4,994	732,278	826,463
1983		4,400	165,360	4,479	5,795	481,535	661,569
1984		3,000	152,934	2,374	4,348	367,541	530,197
1985		8,302	109,048	1,770	7,149	369,756	496,025
1986		18,500	191,514	12,214	8,691	307,261	538,180
1987		13,300	315,380	11,941	10,739	317,044	668,404
1988		15,500	296,538	486	9,110	315,947	637,581
1989		18,500	451,909	33	10,565	361,973	842,980
1990		21,435	250,634	1,095	5,942	236,453	515,579
1991	98	21,200	660,662		7,380	225,812	915,323
1992	0	10,395	526,271		11,310	247,189	795,330
1993	868	38,033	449,886		8,550	223,931	721,355
1994	690	44,636	412,458		5,112	247,666	710,704
1995	668	28,722	574,410		8,482	184,269	796,665
1996	12,742	3,897	226,668		7,501	48,254	299,062
1997	15,199	11,639	232,583		7,621	57,316	324,358
1998	16,933	21,235	307,777		2,845	41,556	390,346
1999	29,419	35,055	546,775		3,244	61,802	676,295
2000	18,419	15,463	376,657		1,997	45,392	457,928
2001	25,161	19,039	105,797			30,234	180,231
2002	10,313	8,792	175,643		969	44,640	240,357
2003	816	5,299	181,529			27,075	215,579
2004	401	10,705	130,961	0	815	29,605	181,116
2005	2,339	7,341	129,601	0	0	36,762	196,058
2006	295	30,218	312,620	0	0	36,687	400,542
2007	14	34,166	374,722	0	0	46,838	469,854
2008	269	44,275	304,430	0	0	20,887	369,861
2009	176	23,880	320,247	0	0	46,297	390,657
2010	1,025	17,271	200,822	0	0	39,374	258,492
2011	585	14,728	75,239	0	0	63,592	154,144
2012	1890	76,963	265,017	0	0	61,664	405,534
2013	2428	28,223	367,412	0	0	58,221	456,284

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Table 3. Recreational harvest (numbers of fish) of spotted seatrout by state, 1981-2013
(Source: NMFS Fisheries Statistics Division, 01/21/14)

Year	MD	VA	NC	SC	GA	FL	Total
1981	0	0	30,036	20,934	189,080	576,847	816,897
1982	0	0	112,023	849,634	226,758	426,378	1,614,793
1983	0	0	91,956	121,939	325,656	645,120	1,184,671
1984	0	0	90,262	95,281	114,403	700,876	1,000,822
1985	0	0	263,878	347,851	251,765	866,162	1,729,656
1986	7,507	82,671	270,866	477,136	401,489	550,592	1,790,261
1987	29,295	17,415	320,977	392,328	439,782	744,330	1,944,127
1988	20,769	288,706	420,115	355,547	389,276	331,708	1,806,121
1989	151,985	66,033	181,150	174,010	448,767	198,618	1,220,563
1990	20,416	67,939	251,089	113,160	368,787	249,824	1,071,215
1991	17,995	69,032	316,895	438,503	1,204,116	385,817	2,433,452
1992	3,235	30,091	333,990	200,030	338,175	363,238	1,268,759
1993	7,038	103,131	206,523	222,145	463,703	274,118	1,276,658
1994	33,511	115,025	457,635	139,551	337,965	255,215	1,339,081
1995	19,198	90,838	325,927	223,750	607,096	381,884	1,648,693
1996	35,766	46,099	151,380	137,530	171,676	148,572	691,023
1997	19,950	92,725	256,719	111,576	167,286	228,096	879,793
1998	13,620	34,623	294,502	125,038	197,293	189,621	854,822
1999	2,112	138,492	410,320	101,260	655,407	241,096	1,548,687
2000	1,634	90,135	250,450	219,740	486,673	288,443	1,337,075
2001	0	13,447	182,123	63,452	309,487	250,987	819,496
2002	0	16,304	197,484	84,778	271,357	206,310	776,233
2003	2,091	102,483	106,416	123,027	425,994	169,587	929,598
2004	0	68,409	284,902	188,798	340,625	234,235	1,117,669
2005	1,954	22,062	586,561	271,810	242,281	379,547	1,504,963
2006	4,860	43,530	565,042	230,326	378,587	331,144	1,553,966
2007	0	159,244	531,614	160,602	576,633	277,858	1,705,951
2008	0	103,880	654,435	155,022	641,947	181,744	1,737,028
2009	7,933	22,635	608,789	124,079	506,552	171,667	1,441,655
2010	3,146	17,417	195,065	101,053	384,076	251,454	952,289
2011	3,058	247,736	215,922	66,207	289,950	286,500	1,109,373
2012	6,032	125,627	500,521	234,921	526,604	427,468	1,821,173
2013	0	55,151	369,265	126,351	237,551	335,547	1,125,409

2014 Spotted Seatrout FMP Review

Table 4. Recreational harvest (pounds of fish) of spotted seatrout by state, 1981-2013
(Source: NMFS Fisheries Statistics Division, 01/21/14)

Year	MD	VA	NC	SC	GA	FL	Total
1981			63,037	14,808	138,719	967,921	1,184,485
1982			120,045	588,999	177,846	660,296	1,547,186
1983			96,359	138,442	323,888	784,532	1,343,221
1984			39,862	116,118	141,307	866,077	1,163,364
1985			288,088	509,552	234,705	1,032,343	2,064,688
1986	4,960	64,393	328,440	587,570	440,774	695,168	2,121,305
1987	22,512	38,495	366,443	592,612	491,317	883,708	2,395,087
1988	36,630	460,377	390,835	448,472	536,960	453,064	2,326,338
1989	184,318	112,345	259,726	277,488	608,009	328,337	1,770,223
1990	39,059	121,135	282,873	174,844	423,814	475,045	1,516,770
1991	34,753	121,604	472,396	628,010	1,449,854	534,372	3,241,967
1992	7,802	56,685	508,760	227,211	430,947	543,492	1,774,897
1993	12,801	201,561	307,151	268,055	586,425	392,827	1,768,820
1994	26,763	175,185	679,996	183,344	412,393	357,442	1,835,365
1995	31,464	148,543	478,673	247,986	667,379	642,669	2,216,714
1996	0	77,270	197,260	171,728	196,487	249,898	892,643
1997	32,963	261,912	311,890	163,771	242,505	380,275	1,397,953
1998	37,189	61,888	444,441	151,718	262,897	329,793	1,288,244
1999	0	290,694	690,606	146,277	916,860	428,061	2,472,498
2000	2,972	195,544	385,191	267,296	565,904	545,201	1,962,108
2001	0	26,733	213,439	58,884	369,084	502,254	1,170,394
2002	0	28,882	274,101	111,954	302,558	353,692	1,071,187
2003	3,495	218,061	145,936	140,277	502,278	316,279	1,326,326
2004	0	138,841	379,779	168,232	383,501	473,294	1,544,639
2005	5,491	55,901	664,012	339,212	271,586	663,908	2,007,533
2006	10,272	107,770	821,982	291,373	445,026	572,273	2,249,198
2007	0	380,281	879,306	277,514	616,213	512,806	2,666,120
2008	0	239,743	1,005,548	242,942	773,069	353,317	2,614,619
2009	9,006	44,761	954,845	174,894	598,647	305,129	2,087,282
2010	7,254	30,176	407,534	140,321	424,960	404,576	1,414,941
2011	4,664	550,157	403,517	116,979	353,472	464,863	1,893,652
2012	10,257	226,556	817,551	388,105	518,663	819,009	2,780,141
2013	0	126,291	649,158	228,014	282,362	637,881	1,926,218

2014 Spotted Seatrout FMP Review

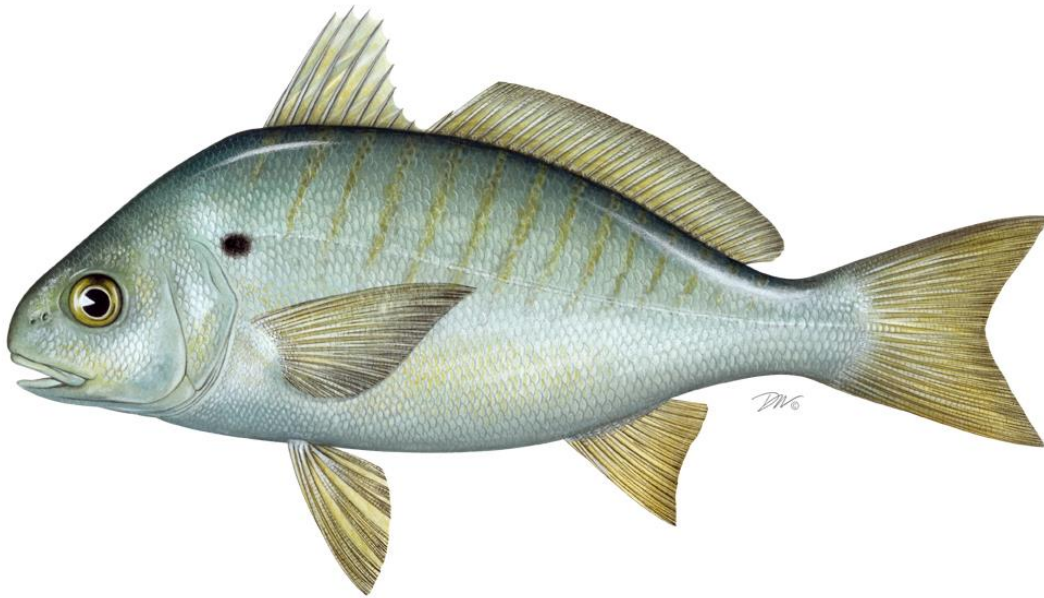
Table 5. Recreational releases (number of fish) of spotted seatrout by state, 1981-2013
(Source: NMFS Fisheries Statistics Division, 01/21/14)

Year	MD	VA	NC	SC	GA	FL	Total
1981			0	5,522	36,853	209,059	251,434
1982			0	8,007	17,645	171,093	196,745
1983			16,579	32,860	12,038	367,881	429,358
1984			30,173	44,436	16,174	76,346	167,129
1985			16,578	6,409	22,917	66,960	112,864
1986	13,639	28,606	19,792	115,315	189,798	35,646	402,796
1987	0	30,070	136,104	130,253	176,415	41,391	514,233
1988	26,999	148,934	74,818	78,568	182,628	431,665	943,612
1989	52,859	11,977	82,909	54,279	167,025	187,406	556,455
1990	4,874	23,435	84,235	35,223	114,624	203,439	465,830
1991	21,811	40,550	169,921	51,415	369,972	789,779	1,443,448
1992	701	19,855	139,616	97,813	192,261	597,254	1,047,500
1993	0	65,605	149,744	92,101	146,665	780,573	1,234,688
1994	32,466	243,463	207,262	220,941	125,421	574,629	1,404,182
1995	157,530	327,643	277,896	194,996	327,835	1,074,703	2,360,603
1996	51,594	165,169	153,051	107,691	63,585	1,081,893	1,622,983
1997	4,826	168,964	98,377	89,147	61,148	1,449,278	1,871,740
1998	49,460	74,569	73,024	151,935	100,059	1,005,443	1,454,490
1999	7,082	152,120	253,442	92,792	160,801	1,577,378	2,243,615
2000	4,805	264,550	90,070	368,332	547,765	2,310,491	3,586,013
2001		110,308	194,982	38,709	365,140	1,995,635	2,704,774
2002		136,265	385,162	147,962	357,953	2,326,420	3,353,762
2003	0	207,270	131,619	314,642	737,730	1,707,957	3,099,218
2004	10,493	257,996	260,877	277,553	610,325	2,413,742	3,830,986
2005	2,603	192,091	1,058,921	461,021	642,398	4,245,920	6,602,954
2006	24,953	82,935	594,955	543,560	808,986	3,315,836	5,371,225
2007	2,331	362,809	848,682	572,330	1,038,992	3,094,164	5,919,308
2008		366,566	880,560	734,227	720,738	2,830,240	5,532,331
2009	30,381	171,028	1,213,526	398,971	915,301	1,641,702	4,370,909
2010	107,017	550,118	1,684,872	407,228	742,215	2,937,411	6,428,861
2011	7,685	1,214,620	1,916,249	279,969	552,123	2,141,212	6,111,858
2012	55,183	428,540	1,646,512	817,017	1,029,479	3,025,556	7,002,287
2013	8,382	291,070	1,427,410	600,607	321,461	1,939,475	4,588,405

2014 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

SPOT
(Leiostomus xanthurus)

2013 FISHING YEAR



The Spot Plan Review Team

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I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	October 1987; Omnibus Amendment August 2011
<u>Management Area:</u>	The Atlantic coast distribution of the resource from Delaware through Florida
<u>Active Boards/Committees:</u>	South Atlantic State/Federal Fisheries Management Board; Spot Plan Review Team; South Atlantic Species Advisory Panel; Omnibus Amendment Plan Development Team

The Fishery Management Plan (FMP) for Spot was adopted in 1987 and includes the states from Delaware through Florida (ASMFC 1987). In reviewing the early plans created under the Interstate Fisheries Management Plan process, the ASMFC found the Spot FMP to be in need of evaluation and possible revision. A Wallop-Breaux grant from the U.S. Fish and Wildlife Service was provided to conduct a comprehensive data collection workshop for spot. The October 1993 workshop at the Virginia Institute of Marine Science was attended by university and state agency representatives from six states. Presentations on fishery-dependent and fishery-independent data, population dynamics, and bycatch reduction devices were made and discussed. All state reports and a set of recommendations were included in the workshop report (Kline and Speir 1993).

Subsequent to the workshop and independent of it, the South Atlantic State/Federal Fisheries Management Board (Management Board) reviewed the status of several plans in order to define the compliance issues to be enforced under the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). The Management Board found recommendations in the plan to be vague and perhaps no longer valid, and recommended that an amendment be prepared to the Spot FMP to define the management measures necessary to achieve the goals of the FMP. In their final schedule for compliance under the ACFCMA, the ISFMP Policy Board adopted the finding that the FMP does not contain any management measures that states are required to implement. In August 2009, the Management Board expanded the initiated amendment to the Spanish Mackerel FMP to include Spot and Spotted Seatrout, creating the Omnibus Amendment for Spot, Spotted Seatrout and Spanish Mackerel. The goal of the Omnibus Amendment was to update all three plans with requirements specified under the Atlantic Coastal Fisheries Cooperative Management Act (1993) and the Interstate Fishery Management Program Charter (1995). In August 2011, the Management Board approved the Omnibus Amendment for Spot, Spotted Seatrout, and Spanish Mackerel.

II. Status of the Stock

No coastwide assessment has been performed for spot; however, spot are a target or component of multiple state surveys using trawl, gillnet, or seine net to sample. In addition to these surveys, commercial and recreational data can provide indices of relative spot abundance.

Omnibus Amendment/Annual Trigger Exercises

As part of the requirements for under the 2011 Omnibus Amendment, for years in-between benchmark stock assessments, the Spot PRT was tasked with conducting annual monitoring analysis, the results to be presented to the South Atlantic State/Federal Fisheries Management Board. This annual analysis has been known as the trigger exercises, where the following data sources are compared to the 10th percentile of the data sets' time series. These data sources are;

- Coastwide recreational landings (numbers), 1981-present
- Coastwide commercial landings (pounds), 1950-present
- SEAMAP-South Atlantic Trawl Survey catch-per-unit-effort (NC-FL data), 1989-present
- NMFS Bottom Trawl Survey catch-per-unit effort (NY-NC data), 1972-present
- Maryland DNR Chesapeake Bay Seine Survey catch-per-unit-effort, 1967-present

In conducting this annual review, if two terminal values of the five data sources- at least one of which must be fishery independent - fall below the 10th percentile, the Management Board will be prompted to consider management action. In 2012, the triggers did not trip though it was noted by the Spot PRT that commercial and recreational landings have fallen below their 10th percentile twice over the last 3 years, and once among the fishery independent indices (MD Bay Seine Program in 2011).

In 2014, for the sixth consecutive year, the Spot Plan Review Team (PRT) will compile and analyze available fishery-dependent and fishery-independent data from the following data sources: commercial harvest, effort, and biological sampling data from Maryland, Virginia and North Carolina; recreational harvest and effort data from Maryland, Virginia, North Carolina, and South Carolina; and fishery-independent survey data from New Jersey, Delaware, Maryland, Virginia, North Carolina, and South Carolina, as well as the Southeast Area Monitoring and Assessment Program (SEAMAP) survey covering North Carolina through Florida and the NMFS Trawl Survey for New York to North Carolina. The PRT developed indices of relative spot abundance from catch-per-unit effort and fishery characterization data. The PRT will also evaluate alternative approaches to assessing the fishery.

III. Status of the Fishery

Total landings of spot in 2013 are estimated at 6.17 million pounds, an increase of 85% from 2012 and a 24% deviation from the previous ten-year average (Tables 1 and 3). The recreational fishery harvested less than the commercial fishery (57% to 43% respectively, by pounds), which follows the fluctuating pattern over the last 8 years. This contrasts with 2012, during which recreational harvests exceeded commercial harvests by about 3:2.

Commercial spot landings have ranged between 1.27 and 14.52 million pounds from 1950-2013(Figure 1), with the 2013 landings (3.52 million pounds) more than doubling the 2012 landings. The estimated ex-vessel value of the 2013 harvest was \$3.6 million (Table 1). Coastwide, the majority of commercially harvested spot are taken in gillnets (69.4% in 2013, Table 2). Virginia landed over 59% of the commercial harvest (by pounds) in 2013, followed by North Carolina with 22% of the harvest. Although small spot have been known to be a bycatch component of the haul seine, shad gillnet, and pound net fisheries in the Chesapeake Bay and in North Carolina, these mesh sizes, especially for the shad gillnet and channel net fisheries, tend to be too large to catch even large spot. Further, the shad fishery is executed in mostly freshwater, where the number of adult spot is generally low. The largest bycatch component for spot comes from the South Atlantic shrimp trawl fishery. The fate of these spot can be discards or sale, depending upon market conditions and volume.

The recreational harvest of spot along the Atlantic coast from 1981 to 2013 has varied between 3.6 and 20.1 million fish (or 1.7 and 6.9 million pounds; Tables 3 and 4). There was an increasing trend in the recreational harvest from the low in 1999 of 1.6 million fish to 15.9 million fish in 2007; however, harvest has been variable since 2007, with the 2013 catch recording 8.2 million fish, up 3.5 million fish from 2012 (Figure 2). Anglers in Virginia were responsible for 52.8% of the total number of fish harvested in 2013, followed by anglers in South Carolina (8.9%), North Carolina (17.8%), and Maryland (11.5%). Many anglers are known to catch spot to use as bait, as well as for other recreational purposes.

The estimated number of spot released annually by recreational anglers has varied between 2.0 and 10.5 million fish, with 2013 having the highest (8.2 million fish) number since 1991.

IV. Status of Assessment Advice

A formal stock assessment of spot has not been conducted. The 1987 FMP recognized the lack of biological and fisheries data necessary for stock assessment and effective management of the resource. Spot life history information and fisheries data have generally been localized and conducted at different levels of population abundance. Commercial and recreational catch and effort data have only recently begun to be analyzed to determine the relationship between landings and abundance. An additional and extremely problematic issue is the non-quantifiable incidental bycatch and discard mortality of small spot in non-directed fisheries.

The Spot Plan Review Team evaluated the adequacy of data for assessment purposes in 2012, and reported the following:

- Commercial landings data appear adequate for a spot assessment; however, discard data are limited. The level of commercial biological sampling is on par with other species having assessments performed.
- The adequacy of recreational harvest and harvest length data is comparable to other species which rely primarily on MRIP data. Limited discard length data are available and discard mortality rates are unknown; however, less recreational discarding of spot occurs than for many other species, potentially due to its use as a bait fish.
- The number, time series, and distribution of fishery-independent indices appear adequate for stock assessment purposes. Biological data appear ample from several surveys, although reproductive data are limited. Further, the amount and representativeness of samples from each survey has not been investigated in detail.
- Additional investigation into the quality and quantity of commercial, recreational, and indices data for a spot stock assessment would need to take place through a data workshop.

Given that there have been no significant increases in the monitoring of discard data, the Spot PRT's recommendations and observations from 2009, regarding the feasibility of Spot stock assessment, remain.

V. Status of Research and Monitoring

Catch and effort data are collected by the commercial and recreational statistics programs conducted by the states and the National Marine Fisheries Service (NMFS). Biological characterization data from fishery landings are also available from several states. Specifically, age data are now available from Maryland, Virginia, North Carolina, and South Carolina. North Carolina annually ages 400-500 spot across all fisheries. Virginia has aged more than 300 spot per year since 2001, except 2006 when 228 were aged. Maryland began an ageing program in 2008. South Carolina began collecting limited otolith samples in 2010 through the SC-State Finfish Survey. While the numbers collected have not been very many (<50 per year) the age range matches the range seen in the fishery independent surveys. Age validation study for spot in SC was completed in 2012 (J. Johnson, MS Thesis Project, College of Charleston)

Recruitment indices are available from surveys in Delaware, Maryland, Virginia, North Carolina, and South Carolina. Adult or aggregate (mix of juvenile and older spot) relative abundance indices are available from New Jersey, Delaware, North Carolina, South Carolina, and SEAMAP (covering North Carolina through Florida). These surveys, in addition to the Northeast Fisheries Science Center Bottom

Trawl Survey, the Northeast Area Monitoring and Assessment Program (NEAMAP), the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP), and the Chesapeake Bay Fishery-Independent Multispecies Survey (CHESFIMS) also collect a variety of biological data elements.

VI. Status of Management Measures and Issues

The FMP for Spot identified two management measures for implementation: 1) promote the development and use of bycatch reduction devices through demonstration and application in trawl fisheries, and 2) promote increases in yield per recruit through delaying entry to spot fisheries to age one and older.

Considerable progress has been made in developing bycatch reduction devices (BRDs) and evaluating their effectiveness. Proceedings from a 1993 spot and croaker workshop summarized much of the experimental work on bycatch reduction, and many states have conducted subsequent testing. For example, North Carolina Division of Marine Fisheries (NCDMF) conducted research on the four main gear types (shrimp trawl, flynet, long haul seine, and pound net) responsible for the bulk of the scrap fish landings in order to reduce the catch of small fish. State testing of shrimp trawl BRDs achieved finfish reductions of 50-70% with little loss of shrimp, although total bycatch numbers relative to shrimp fishery effort are still unknown. The Virginia Marine Resources Commission investigated the use of culling panels in pound nets and long haul seines to release small croaker, spot, and weakfish. The Potomac River Fisheries Commission (PRFC) also investigated the use of culling panels in pound nets, finding that the panels allowed the release of 28% of captured spot less than six inches in length.

Following favorable testing, devices have been made mandatory or recommended in several state fisheries. The use of BRDs is required in all penaeid shrimp trawl fisheries in the South Atlantic. The PRFC recommends the use of culling panels in pound nets and allows those nets with panels to keep one bushel of bycatch of flounder and weakfish. In North Carolina, escapement panels have been required in the bunt nets of long haul seines in an area south and west of Bluff Shoals in the Pamlico Sound since April 1999. However, evaluation of the beneficial effects of BRDs to spot stocks continues to need further study.

General gear restrictions, such as minimum mesh sizes or area trawling bans, have helped protect some age classes of spot. However, only Georgia has implemented a minimum size limit (8 inches total length, both recreational and commercial) aimed at protecting immature spot. Georgia is also the only state with a spot creel limit (25 fish, both recreational and commercial).

Omnibus Amendment (Interstate)

In August 2011, the Management Board approved the development of an amendment to the Spot FMP to address three issues: compliance measures, consistency with federal management in the exclusive economic zone, and alignment with Commission standards. The updated FMP's objectives are to: (1.) Increase the level of research and monitoring on spot bycatch in other fisheries, in order to complete a coastwide stock assessment (2.) Manage the Spot fishery stock to maintain the spawning stock biomass above the target biomass levels. (3.) Develop research priorities that will further refine the spot management program to maximize the biological, social, and economic benefits derived from the spot population. Through the Omnibus Amendment does not require specific fishery management measures in either the recreational or commercial fisheries for states within the management unit range.

De minimis Guidelines

A state qualifies for *de minimis* status if its past 3-years' average of the combined commercial and recreational catch is less than 1% of the past 3-years' average of the coastwide combined commercial and

recreational catch. Those states that qualify for *de minimis* are not required to implement any monitoring requirements, none of which are included in the plan.

De Minimis Requests

The states of South Carolina and Georgia request *de minimis* status. The PRT notes they meet the requirements of *de minimis*.

VII. Implementation of FMP Compliance Requirements for 2013

- All states within the management unit have submitted compliance reports for the 2013 fishing year. The PRT found no compliance issues.

VIII. Recommendations of the Plan Review Team

Management and Regulatory Recommendation

The Spot PRT recommends that the Board not initiate a stock assessment for spot, given the high uncertainties in the bycatch data which would have prevented the assessment from passing a peer review. The Spot PRT will continue to monitor the fishery through the trigger exercises and may present additional analysis for consideration in 2014.

Research and Monitoring Recommendations

High Priority

- State monitoring and reporting on the extent of unutilized bycatch and fishing mortality on fish less than age-1 in fisheries that take significant numbers of spot.
- Evaluate the effects of mandated bycatch reduction devices on spot catch in those states with significant commercial harvests.
- Develop fishery-dependent and fishery-independent size and sex specific relative abundance estimates.
- Cooperative coastwide spot juvenile indices should be developed to clarify stock status.
- Continue monitoring long-term changes in spot abundance, growth rates, and age structure.
- Continue monitoring of juvenile spot populations in major nursery areas.
- Improve spot catch and effort statistics from the commercial and recreational fisheries, along with size and age structure of the catch, in order to develop production models.
- Conduct age validation studies.
- Cooperatively develop criteria for aging spot otoliths and scales.
- Develop catch-at-age matrices for recreational and commercial fisheries.
- Determine the effect that anthropogenic perturbations may be having on growth, survival, and recruitment.

Medium Priority

- Develop stock assessment analyses appropriate to current data.
- Cooperatively develop a yield-per-recruit analysis.
- Develop stock identification methods and investigate the degree of mixing between state stocks during the annual fall migration.
- Determine migratory patterns through tagging studies.
- Determine the onshore vs. offshore components of the spot fishery.

IX. References

- Atlantic States Marine Fisheries Commission (ASMFC). 1987. Fishery Management Plan for Spot. Washington (DC): ASMFC. Fisheries Management Report #11. 90 p.
- Kline LL, Speir H (editors). 1993. Proceedings of a Workshop on Spot (*Leiostomus xanthurus*) and Atlantic Croaker (*Micropogonias undulatus*). Washington (DC): Atlantic States Marine Fisheries Commission. Special Report #25. 175 p.
- Spot Plan Review Team (PRT). 2012. Spot Data Availability and Stock Monitoring Report, 2009. Washington (DC): Atlantic States Marine Fisheries Commission. Report to the South Atlantic State-Federal Fisheries Management Board. 85 p.

X. Figures

Figure 1. Spot commercial and recreational landings (pounds), 1950-2013

(Recreational landings available from 1981-present; see Tables 1 and 3 for state-by-state values and data sources)

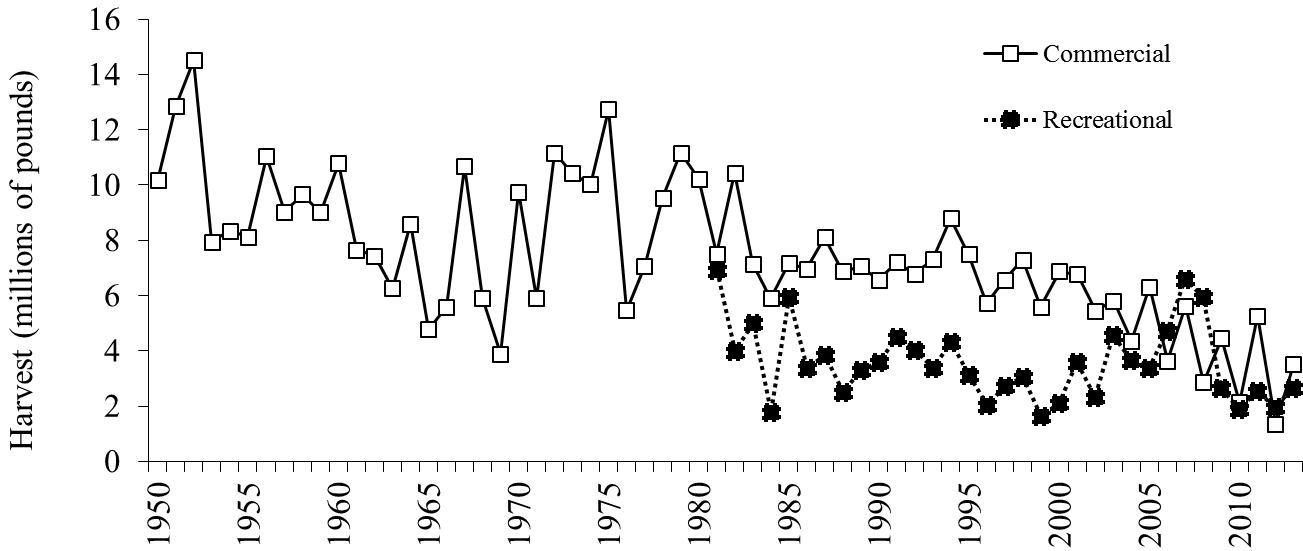
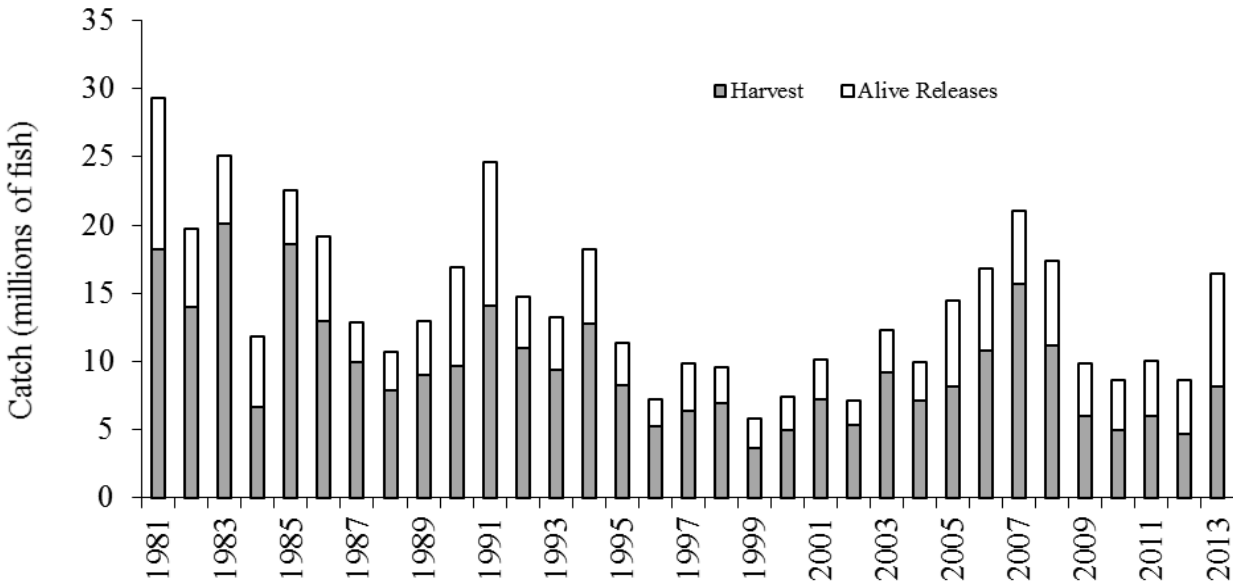


Figure 2. Spot recreational harvest and releases (numbers of fish), 1981-2013

(See Tables 4 and 5 for state-by-state values and data source)



2013 REVIEW OF THE ASMFC SPOT FMP

XI. Tables

Table 1. Commercial landings (pounds) by state, and estimated value (ex-vessel), 1981-2013

(Source: NMFS Fisheries Statistics Division & State Compliance Reports, 1/23/2014)

Year	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total	Value
1981		6,000	11,100	14,200	1,025,800	3,511,574	127,384	7,721	2,798,881	7,502,660	\$1,949,238
1982		1,800	2,500	6,200	1,017,100	4,918,763	62,562	292	4,431,239	10,440,456	\$2,629,992
1983		800		129,400	1,567,900	2,952,295	240,096		2,266,296	7,156,787	\$2,034,211
1984		100		43,200	735,200	3,481,920	130,265		1,508,552	5,899,237	\$1,709,041
1985		2,400	17,237	7,700	1,561,739	4,043,843	142,755		1,399,819	7,175,493	\$2,059,771
1986		6,600	86,455	104,400	1,839,500	3,354,191	655,378	124	918,875	6,965,523	\$2,008,712
1987		15,900	140,109	251,800	3,721,100	2,806,041	220,553	1,528	943,713	8,100,744	\$2,288,900
1988		1,600	37,722	58,000	1,985,500	3,080,258	376,221	644	1,344,276	6,884,221	\$2,103,710
1989		8,200	31,249	115,800	2,468,100	3,254,473	31,472	361	1,144,639	7,054,294	\$2,447,602
1990		9,039	23,864	127,882	1,630,735	3,455,460	39,957	43	1,275,729	6,562,709	\$2,280,712
1991		54,433	262,498	216,035	2,539,340	3,047,305	31,787		1,051,532	7,202,930	\$2,341,850
1992		102,213	112,967	331,837	2,497,622	2,826,138	171,959	261	740,048	6,783,045	\$1,903,514
1993	63	10,900	21,862	182,198	3,349,399	2,672,164	251,225	1,276	826,312	7,315,399	\$2,902,373
1994		31,408	100,435	166,246	4,269,402	2,937,355	288,241		1,002,887	8,795,974	\$3,326,892
1995	22	30,151	62,324		3,622,954	3,006,885	209,132	247	558,087	7,489,802	\$2,572,195
1996	318	1,149	80,930	256,711	2,982,083	2,290,040	60,574		56,423	5,728,228	\$2,237,567
1997	189	6,175	35,686	120,331	3,465,507	2,627,977	87,170		227,097	6,570,132	\$2,810,144
1998	579	27,582	140,363	225,937	4,277,256	2,397,025	63,912		161,205	7,293,859	\$2,838,921
1999		7,822	47,770	223,463	2,961,890	2,262,213	9,393		72,973	5,585,524	\$2,204,565
2000	939	13,852	32,288	176,946	3,764,679	2,829,818	8,519	0	57,946	6,884,987	\$3,562,693
2001	160	20,034	74,144	283,488	3,248,212	3,093,921	12,950	0	33,056	6,765,965	\$2,835,318
2002	5,737	1,326	13,099	138,640	3,062,211	2,184,076	23,151	0	20,586	5,448,826	\$2,297,333
2003	35	6,003	74,144	184,437	3,471,484	2,043,421	17,181	0	9,337	5,806,042	\$2,747,351
2004	98	1,652	56,029	43,729	1,931,454	2,317,215	1,876	0	12,792	4,364,845	\$3,350,472
2005	435	769	125,685	114,987	4,335,314	1,714,518	10,468	0	21,156	6,323,332	\$3,310,675
2006	2,959	3,646	62,824	35,082	2,137,586	1,364,797	5,691	0	22,502	3,635,087	\$2,843,714
2007	1,080	4,474	128,207	389,520	4,335,314	879,135	6,357	0	14,317	5,637,154	\$4,307,860
2008	0	1,942	32,649	123,718	2,137,586	737,293	1,492	0	9,181	2,863,714	\$1,821,412
2009	317	34,063	71,449	528,625	4,014,576	1,006,535	22,557	0	22,057	4,456,467	\$4,514,714
2010	447	6,048	60,416	561,217	1,104,667	572,345	3,957	0	13,446	2,143,898	\$1,823,273
2011	159	54,890	93,776	553,010	3,763,055	936,993	12,162	0	29,031	5,272,523	\$4,547,925
2012	90,141	9,935	18,103	100,347	615,726	489,708	541	0	36,744	1,361,245	\$1,142,878
2013	156,751	48,324	79,157	336,020	2,097,666	768,671	585	0	31,248	3,518,422	\$3,553,594

Table 2. Commercial landings (pounds) by gear, 2013

(Source: NMFS Fisheries Statistics Division, 1/23/2014)

Gear	Landings (lbs)	Percent of Total
Gill Nets	2,308,144	69.4%
Haul Seine	370,958	11.2%
Pound Net	101,548	3.1%
Trawl	71,059	2.1%
Other	474,137	14.3%
Total	3,325,846	100.0%

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Table 3. Recreational harvest (pounds) by state, 1981-2013

(Source: NMFS Fisheries Statistics Division, 1/23/2014)

Year	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981	20,348	6,175	8,047	554,986	4,625,985	1,193,537	144,600	50,734	311,406	6,915,818
1982		85,446	19,281	656,245	1,563,396	1,093,047	313,177	20,199	236,027	3,986,818
1983			4,017	354,788	2,520,125	1,630,882	293,161	28,023	167,294	4,998,290
1984		3,768	5,714	361,850	404,533	650,386	169,346	81,758	122,585	1,799,940
1985	3,415	4,255		193,266	1,955,039	3,120,532	441,808	13,071	213,042	5,944,428
1986	1,327	2,114	3,836	1,139,871	1,205,158	536,443	455,836	23,369	25,360	3,393,314
1987				1,545,691	1,336,387	690,653	226,701	14,601	32,835	3,846,868
1988		84,941	1,876	80,547	720,609	802,320	632,868	14,645	184,602	2,522,408
1989	132	606	10,368	633,150	1,400,728	929,188	288,591	7,798	23,254	3,293,815
1990		5,644	11,821	791,264	2,103,751	613,904	50,525	6,259	1,737	3,584,905
1991		19,528	48,100	634,894	2,729,698	727,463	245,661	1,786	107,256	4,514,386
1992		8,788	36,799	724,279	2,278,309	403,775	397,677	6,978	167,845	4,024,450
1993	315	2,264	844	636,032	951,766	812,810	461,447	109,317	396,632	3,371,427
1994	7,198	20,364	34,795	676,687	1,217,036	1,842,360	469,518	2,687	57,234	4,327,879
1995		1,186	22,919	485,682	1,067,637	1,247,995	242,973	7,701	42,851	3,118,944
1996		10,966	789	294,404	492,982	710,086	494,448	5,445	26,953	2,036,073
1997		8,609	50,781	401,275	1,263,447	722,868	254,794	2,072	13,962	2,717,808
1998			36,658	631,422	866,619	1,249,543	228,502	2,088	47,196	3,062,028
1999			10,886	272,292	244,499	646,662	391,402	2,275	84,511	1,652,527
2000	130,649	46,244	32,968	600,302	252,885	893,835	128,669	1,402	14,129	2,101,083
2001			20,110	629,861	523,202	1,773,671	346,878	1,720	284,706	3,580,148
2002			10,870	336,660	829,972	984,898	140,164	2,857	7,840	2,313,261
2003			14,386	1,690,502	875,729	1,714,158	227,821	5,710	26,504	4,554,810
2004			6,919	442,100	1,136,261	1,846,688	245,991	721	3,338	3,682,018
2005		14,546	68,075	658,077	1,375,629	1,103,830	158,407	917	12,751	3,392,232
2006		28,971	38,010	991,142	1,926,940	978,181	745,772	1,166	6,067	4,716,249
2007	952	0	74,531	1,282,803	3,237,069	1,378,993	605,024	2,346	12,899	6,594,617
2008	0	23,157	42,078	618,172	1,828,398	671,916	2,731,815	4,292	21,041	5,940,869
2009	0	1,882	48,465	802,395	829,245	354,375	589,027	2,493	22,169	2,650,051
2010		212,616	74,641	447,575	563,423	260,757	322,885	214	28,033	1,910,144
2011		755	52,120	314,032	1,101,847	411,243	596,679	171	62,657	2,539,504
2012		104,028	21,558	253,103	410,777	230,259	933,684	91	19,090	1,972,590
2013	6,099	118,685	107,330	280,842	1,336,913	460,928	301,307	1,614	42,267	2,655,985

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Table 4. Recreational harvest (numbers) by state, 1981-2013

(Source: NMFS Fisheries Statistics Division, 1/23/2014)

Year	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981	44,278	28,006	17,508	948,931	11,662,684	4,023,934	562,750	124,057	799,226	18,211,374
1982		387,582	82,094	2,864,603	4,526,847	4,124,465	1,230,253	84,153	735,398	14,035,395
1983			14,464	1,600,362	12,059,247	4,880,268	970,747	112,123	488,029	20,125,240
1984		8,501	15,553	904,793	1,489,795	2,758,366	724,925	363,841	396,402	6,662,176
1985	15,494	12,692		1,028,391	5,491,918	8,789,391	2,355,044	62,338	861,700	18,616,968
1986	3,824	9,587	12,178	3,789,796	4,229,191	2,646,049	2,007,386	137,782	96,803	12,932,596
1987				3,180,704	3,864,151	2,129,146	599,807	79,487	73,833	9,927,128
1988		348,593	2,360	277,964	2,028,768	2,558,322	1,951,157	57,786	663,681	7,888,631
1989	602	1,128	45,853	1,154,314	3,714,855	2,924,299	1,078,570	34,977	67,506	9,022,104
1990		25,927	44,362	2,120,655	5,354,294	1,986,601	142,271	17,730	7,252	9,699,092
1991		88,393	138,113	1,841,555	8,820,075	2,317,095	598,290	10,281	269,628	14,083,430
1992		20,443	90,053	1,671,897	6,317,539	1,271,416	1,190,757	25,788	357,678	10,945,571
1993	1,168	7,788	3,263	1,880,043	2,836,534	2,057,440	1,437,809	228,606	946,757	9,399,408
1994	19,275	144,589	92,352	1,761,701	3,395,503	5,929,269	1,329,997	9,587	137,067	12,819,340
1995		2,949	51,695	1,099,658	2,731,242	3,329,981	875,189	27,842	140,231	8,258,787
1996		23,954	955	591,300	1,109,237	2,007,071	1,423,352	14,131	64,337	5,234,337
1997		20,148	126,089	713,657	3,328,144	1,440,661	680,842	5,471	31,987	6,346,999
1998			96,389	1,327,259	2,023,756	2,865,190	489,068	6,788	120,389	6,928,839
1999			19,911	655,289	569,250	1,308,167	801,785	5,578	264,233	3,624,213
2000	498,470	281,481	65,952	1,389,505	527,259	1,924,108	246,290	2,950	40,908	4,976,923
2001	0	0	51,096	1,088,997	1,056,365	3,650,711	735,551	3,681	652,976	7,239,377
2002	0	0	22,013	690,515	1,601,837	2,586,313	393,597	6,987	25,907	5,327,169
2003	0	0	30,166	3,300,595	1,441,002	3,796,556	524,513	11,523	84,686	9,189,041
2004	0	0	17,494	867,589	1,717,416	3,825,768	729,851	1,563	6,790	7,166,471
2005	0	46,795	150,772	1,788,679	2,781,973	3,012,872	358,550	3,199	23,796	8,166,636
2006	0	68,168	110,607	2,895,783	3,584,930	2,978,506	1,170,611	1,761	7,990	10,818,356
2007	1,813	0	176,997	3,615,346	8,203,377	3,078,346	605,024	6,529	30,184	15,717,616
2008	0	132,472	133,996	1,892,116	4,398,472	1,843,343	2,731,815	8,903	58,732	11,199,849
2009	0	6,720	128,799	2,064,326	2,146,607	1,056,346	589,027	17,948	25,391	6,035,164
2010	0	650,260	214,180	1,164,091	1,669,843	834,561	322,885	851	94,671	4,951,342
2011	0	1,370	150,650	912,704	2,967,029	1,207,335	596,680	968	152,329	5,989,065
2012	39,912	627,664	65,555	766,145	1,350,153	784,272	1,001,664	348	65,598	4,701,311
2013	13,294	326,956	248,346	945,972	4,332,620	1,464,592	732,413	6,573	132,204	8,202,970

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Table 5. Recreational releases (numbers) by state, 1981-2013

(Source: NMFS Fisheries Statistics Division, 1/23/2014)

Year	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981		25,740	1,502	1,331,316	8,905,412	735,408	82,035	5,975	64,344	11,151,732
1982		974,847	5,061	1,677,415	1,618,065	806,851	366,650	44,091	205,387	5,698,367
1983		57,556		1,114,795	2,715,522	634,107	192,240	39,798	186,615	4,940,633
1984			13,260	1,150,599	2,607,693	952,816	346,003	17,897	130,493	5,218,761
1985	22,220	2,979		735,873	2,051,793	429,914	515,106	17,316	170,060	3,945,261
1986		79,712		2,720,343	2,250,794	816,204	331,290	20,863	10,351	6,229,557
1987			1,104	248,973	1,736,228	593,937	304,127	28,434	57,437	2,970,240
1988		110,698	4,501	716,258	762,504	995,806	110,498	16,951	110,003	2,827,219
1989		4,503	40,193	730,580	2,519,034	524,897	138,834	1,630	22,425	3,982,096
1990		14,504	10,120	1,811,434	4,441,195	921,849	13,709	4,079	30,937	7,247,827
1991		91,991	59,770	2,123,582	7,041,156	946,564	100,666	14,629	168,284	10,546,642
1992		1,324	12,553	493,597	2,091,001	841,163	279,044	16,791	64,738	3,800,211
1993			35,987	1,573,486	1,374,950	528,449	130,055	47,667	185,226	3,875,820
1994	8,140	160,380	53,078	1,037,498	2,142,198	1,363,884	320,921	22,434	335,647	5,444,180
1995		22,162	14,195	253,827	1,166,428	1,035,361	331,781	9,799	268,765	3,102,318
1996	7,178	39,448	1,128	208,897	577,847	924,204	212,920	5,329	65,083	2,042,034
1997		21,512	88,751	1,316,341	1,365,809	450,663	245,349	990	18,102	3,507,517
1998		12,542	75,985	633,914	900,352	650,157	307,480	12,286	58,264	2,650,980
1999			15,789	618,742	339,988	633,112	86,894	10,675	530,849	2,236,049
2000	157,991	16,633	30,522	1,080,310	502,923	481,995	115,682	17,376	54,388	2,457,820
2001		2,040	13,139	577,417	968,976	1,143,695	154,077	11,714	74,232	2,945,290
2002	2,127	3,331	27,220	501,111	481,765	671,669	103,914	20,038	44,584	1,855,759
2003		39,049	13,273	670,382	933,842	1,132,992	231,612	31,055	106,918	3,159,123
2004			39,998	383,292	882,136	1,257,887	210,215	12,536	9,427	2,795,491
2005		5,772	157,445	2,135,086	2,456,981	1,334,559	183,819	25,117	41,773	6,340,552
2006		65,244	92,864	1,355,280	1,371,751	2,588,647	496,870	3,774	21,755	5,996,185
2007	535	119,976	44,455	1,618,690	2,156,839	1,197,005	151,481	17,600	26,675	5,333,256
2008		1,166,532	98,304	1,737,665	1,487,665	1,322,408	188,746	25,908	128,942	6,156,170
2009		7,691	140,014	632,595	1,457,588	1,222,053	326,065	10,486	40,890	3,837,382
2010		191,745	72,216	1,155,003	1,155,882	871,054	166,679	562	57,924	3,671,065
2011		1,370	66,661	296,513	2,245,221	1,000,566	222,623	9,766	196,294	4,039,014
2012	37634	477938	60,334	919,896	1,145,960	759,081	142,093	3,968	373,916	3,920,820
2013	332	746,878	214,067	2,621,931	2,226,300	1,314,199	957,781	8,623	110,865	8,200,976

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Table 6. PRT-recommended management triggers, with highlighted years indicating values below the 10th percentile based on data through 2013.

Year	ACCSP Commercial Landings (pounds)	NMFS Commercial Landings (pounds)	Recreational Landings (numbers)	Combined NMFS Survey Index	Combined SEAMAP Survey Index	MD Chesapeake Bay Seine Survey Index
1950	10,165,400	10,165,400				
1951	12,855,900	12,855,900				
1952	14,520,700	14,520,700				
1953	7,936,600	7,936,600				
1954	8,343,000	8,343,000				
1955	8,126,400	8,126,400				
1956	11,037,500	11,037,500				
1957	9,031,700	9,031,700				
1958	9,662,000	9,662,000				
1959	9,008,700	9,008,700				
1960	10,787,600	10,787,600				
1961	7,646,400	7,646,400				
1962	7,438,200	7,438,100				
1963	6,256,300	6,256,200				
1964	8,603,400	8,603,300				
1965	4,786,800	4,786,800				
1966	5,583,600	5,583,600				
1967	10,677,700	10,677,600				0.018
1968	5,895,800	5,895,800				0.596
1969	3,893,900	3,893,900				1.226
1970	9,749,100	9,749,100				0.084
1971	5,899,500	5,899,500				0.864
1972	11,169,500	11,169,500		7.70		1.160
1973	10,419,900	10,419,800		72.10		3.264
1974	10,028,000	10,028,000		92.00		2.297
1975	12,737,400	12,737,000		59.40		4.416
1976	5,461,700	5,461,600		196.70		3.195
1977	7,056,300	7,055,800		591.90		6.891
1978	9,541,925	9,541,925		183.60		3.360
1979	11,165,310	11,165,310		326.80		2.708
1980	10,215,973	10,215,973		126.20		2.529
1981	7,502,660	7,502,660	18,227,092	233.30		1.647
1982	10,440,456	10,440,456	14,119,411	45.60		2.254
1983	7,156,792	7,156,792	20,158,832	246.80		1.074
1984	5,899,725	5,899,725	6,678,762	322.90		3.428
1985	7,175,566	7,175,566	18,636,497	51.70		1.498
1986	6,965,468	6,965,468	13,097,985	256.40		1.766
1987	8,100,756	8,100,735	9,994,920	180.20		1.174
1988	6,885,199	6,885,465	7,913,748	180.20		4.495
1989	7,052,068	7,053,374	9,022,104	453.80	325.07	0.697
1990	6,561,635	6,561,641	9,712,267	102.40	538.52	1.046
1991	7,176,813	7,176,632	14,137,171	47.60	599.44	0.809
1992	6,781,052	6,765,078	11,023,214	10.10	243.39	0.441
1993	7,315,598	7,315,577	9,413,956	7.90	129.69	1.425
1994	8,795,908	8,795,939	12,871,694	411.70	218.43	1.486

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Year	ACCSP Commercial Landings (pounds)	NMFS Commercial Landings (pounds)	Recreational Landings (numbers)	Combined NMFS Survey Index	Combined SEAMAP Survey Index	MD Chesapeake Bay Seine Survey Index
1995	7,820,831	7,489,478	8,311,446	65.10	364.65	0.096
1996	5,728,189	5,647,298	5,270,362	77.40	141.63	0.283
1997	6,572,097	6,570,132	6,351,489	29.70	203.49	1.343
1998	7,293,875	7,293,919	6,989,184	17.40	105.15	0.437
1999	5,589,301	5,589,288	3,653,547	67.80	79.77	0.607
2000	6,884,987	6,884,989	4,976,923	59.00	124.53	0.828
2001	6,885,017	6,884,989	4,976,923	55.40	124.53	0.828
2002	6,770,062	6,770,093	7,239,378	0.08	177.56	0.367
2003	5,449,615	5,449,507	5,327,170	39.17	76.34	0.357
2004	5,808,901	5,808,929	9,189,041	29.96	345.02	0.306
2005	6,774,708	6,730,217	7,166,471	115.74	226.22	0.805
2006	5,122,940	5,120,448	8,166,637	276.93	438.98	3.485
2007	3,193,544	3,187,897	10,818,356	173.70	276.99	0.342
2008	5,751,737	5,684,401	15,717,617	110.67	75.70	0.609
2009	2,882,773	2,883,286	11,199,849	197.12	183.92	0.867
2010	5,532,318	5,569,679	6,035,163	245.16	216.67	0.443
2011	2,228,614	2,275,959	4,951,340	491.31	317.30	2.890
2012	5,436,577	5,267,410	5,989,066	444.76	495.60	0.065
2013	1,352,077	1,315,141	4,701,311	782.82	247.00	0.827
Trigger (10th %ile)	4,887,642	5,149,840	5,035,611	13.83	89.92	0.297