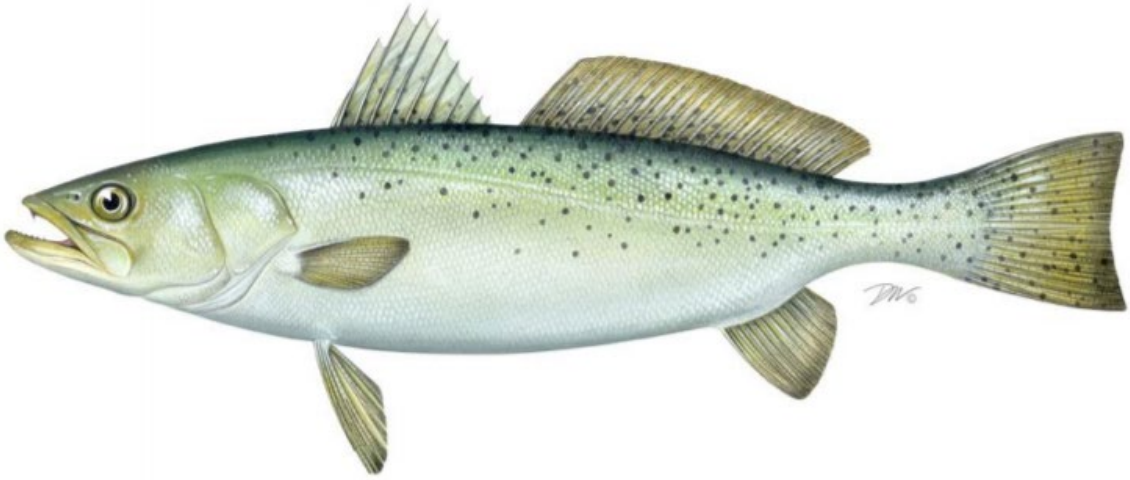
ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR SPOTTED SEATROUT
(Cynoscion nebulosus)

2017 FISHING YEAR



Prepared by the Plan Review Team

Approved by the South Atlantic Management Board
October 2018

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I. Status of the Fishery Management Plan

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

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

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 optimum yield over time.
2. Maintain a spawning potential ratio of at least 20% to minimize the possibility of recruitment failure.
3. Promote conservation of the stocks to reduce inter-annual variation in availability and to increase yield per recruit.
4. Promote 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.
7. Promote determination and adoption of standards of environmental quality and provide habitat protection necessary for the maximum natural protection of spotted seatrout.

The Omnibus Amendment added the following objectives to support compliance under the Act:

1. Manage the spotted seatrout fishery by 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 population.

Management measures include a minimum size limit of 12 inches in total length (TL), with comparable mesh size regulations in directed fisheries, and data collection for stock assessments and monitoring of the fishery. All states with a declared interest in spotted seatrout (NJ-FL) have implemented, at a minimum, 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 2017.

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 static spawning potential ratio (SPR), a measure of the effect of fishing pressure on the relative spawning power of the female stock. The FMP recommends a goal of 20% SPR. South Carolina and Georgia have adopted this goal while North Carolina and Florida have established a 30% and 35% SPR goal, respectively.

Spotted seatrout stock assessments have been conducted in individual states. Assessments in North Carolina, which included data from 1981-1997, and Georgia, which included data from 1986-1995, 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 was performed in Georgia in 2002; however, it remains unpublished due to questionable results attributed to data deficiencies and changing methodologies.

North Carolina completed a peer reviewed stock assessment, which included data from 1991-2008 and included all spotted seatrout caught in North Carolina and Virginia (Jensen 2009). The assessment indicated that SPR has been below 20% in recent years. Jensen (2009) recommended management measures be implemented to account for recent increases of recreational fishing and discard mortality and to maintain a sufficiently large spotted seatrout population to buffer against future cold stun events. Based on this assessment, North Carolina approved a state FMP for spotted seatrout in April 2012.

A peer-reviewed stock assessment of spotted seatrout in Virginia and North Carolina waters was completed in 2014, incorporating data from 1991-2013 (NCDMF 2014). Results suggest

that the age structure of this stock expanded during the last decade; however, there was a sharp decline in recruitment after 2010. Similarly, spawning stock biomass (SSB) declined after a peak in 2007. These declines may be attributed to cold stun events. In 2012, SSB exceeded the currently defined threshold, suggesting the stock is not overfished. Additionally, fishing mortality is below the threshold, suggesting the stock is not experiencing overfishing.

The South Carolina Department of Natural Resources packaged several state-specific assessments into a report in 2001, though these were not peer reviewed. The initial assessment covering 1986-1992 indicated that female SPR was just above the 20% goal in the terminal year (Zhao and Wenner 2001), leading to a minimum size limit increase and a creel limit reduction. A more recent assessment was conducted for the period 1981-2004 (de Silva, Draft 2005). Two modeling approaches were used, and both models indicated that the current SSB is below the requirement to maintain 20% SPR.

Florida conducted separate stock assessments for the northern and southern populations on their Atlantic coast. Average transitional SPR estimates during 2007-2009 were 0.67 in the northern region and 0.45 in the southern region (Murphy et al. 2011), leading to some relaxation in Florida's management of the resource (Table 1). A new statewide assessment was completed in 2018 (http://www.myfwc.com/media/4500170/sst-assessment-2016.pdf) (Addis et al. 2018). This assessment includes stock synthesis models constructed for each of Florida's four management regions (NW, SW, NE, and SE). The results indicate that the spotted seatrout stock in northeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring. They also indicate that the stock in southeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring.

III. Status of the Fishery

This report includes updated recreational estimates from the Marine Recreational Information Program's transition to the mail-based Fishing Effort Survey (FES) on July 1, 2018. Therefore, recreational estimates will likely be different from those shown in past FMP Reviews and state compliance reports (due annually on September 1) through 2018. Figure 1 shows coastwide recreational landings including estimates using both the previous Coastal Household Telephone Survey (CHTS) and FES calibration for comparison, but other figures, tables, and text will only show data based on the FES calibration. Data based on either survey can be referenced at: https://www.st.nmfs.noaa.gov/st1/recreational/queries/.

Spotted seatrout is regularly caught both commercially and recreationally from Maryland through the east coast of Florida. In South Carolina, 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 were first recorded in 1981 (Figure 2). A coastwide (VA, NC, and SC) winter mortality event in 2000/2001 likely contributed to the sudden decline in commercial and recreational landings in 2001 and 2002.

Commercial Fishery

Commercial harvest statistics were obtained from the Atlantic Coastal Cooperative Statistics Program (ACCSP) for years prior to 2017 and from state compliance reports for 2017. Atlantic coast commercial landings of spotted seatrout (1960-2017) have ranged from 156,000 pounds to 1.38 million pounds (Figure 2). Historically, commercial landings primarily came from North Carolina and Florida, 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, followed by a decline 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 2007 to 2016, commercial landings averaged approximately 340 thousand pounds. In 2017, commercial landings totaled 371,279 pounds, a 25% increase from 2016. North Carolina, Virginia, and Florida accounted for 81%, 15%, and 4% of the total commercial landings, respectively.

Recreational Fishery

Recreational harvest statistics were obtained from the Marine Recreational Information Program (MRIP) for years prior to 2017 and from state compliance reports for 2016. Over the last 33 years, recreational catch of spotted seatrout (kept and released) has shown an upward trend, increasing from 4.3 million fish in 1981 to over 26 million fish in 2010. In 2017, recreational catch totaled 22.7 million fish, nearly identical to the catch in 2016 (Figure 3). Recreational harvest has remained relatively stable throughout the time series with an average of 3.5 million fish. Recreational harvest in 2017 was 4.1 million fish (a 10% increase from 2016), with North Carolina (30%), Georgia (26%), and Florida (24%) responsible for the largest shares. 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 throughout the time series, with the most recent 10-year average (2008-2017) at 82%. In 2017, the release percentage declined slightly from the 2016 value (84%) to 82%. Rod and reel is the primary recreational gear, but some spotted seatrout 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 availability of data. Several states have performed age-structured analyses on local stocks, and recent stock assessments 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 2014 North Carolina and Virginia stock assessment showed declines in recruitment since 2010. The 2016 Florida stock assessment indicated that the spotted seatrout stock in northeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring (Addis et

al. 2018). It also indicated that the stock in southeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring. The PRT supports the continuation of state-specific assessments, yet recognizes the difficulty most states face to attain sufficient data of assessment quality and personnel who can perform the necessary modeling exercises.

The lack of biological and fisheries data for effective assessment and 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 will provide insight on stock status over time.

V. Status of Research and Monitoring

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

Maryland
MD DNR samples commercial pound nets weekly in the Potomac River and Chesapeake Bay from May through September (2017 n=3, 464 mm TL).

A few juvenile spotted seatrout are encountered in the coastal bays seine survey and the Chesapeake Bay blue crab trawl survey, indicating seatrout utilize these areas as nursery habitat (2017 seine n=6, trawl n=53).

Virginia
The VMRC Biological Sampling Program collects commercial and recreational fishery-dependent biological data. In 2017, the VMRC collected 1,389 commercial lengths and weights, determined the sex of 303 individuals, and aged 222 individuals. In 2017, the VMRC collected lengths of 105 and sex of 35 recreationally caught seatrout.

North Carolina
Commercial fish houses are sampled monthly for fishery-dependent length, weight, and age data. Very little variation is seen throughout sampling years. In 2017, gill nets were responsible for 93% of the catch and gigs for 5.5%.

A fishery-independent Estuarine Trawl Survey is conducted to measure annual juvenile recruitment for many species. The Catch per Unit Effort (CPUE) index for the current 10-year time series has not shown significant trends in CPUE over that time span, although CPUE has shown a declining trend since the most recent peak in 2012. The CPUE of age-0 spotted seatrout for 2017 was 0.79 fish per tow, below the most recent 10-year average but above the 2016 value.

A fishery-independent gill net survey is conducted to measure age composition and develop indices of age 1+ abundance for many species. Seatrout age 1+ abundance index varies very little annually, averaging 0.56±0.06 seatrout per set, but low CPUEs in 2011 and 2015

correspond to known cold stun mortality events. The CPUE of adult spotted seatrout for 2017 was 1.05 fish per set, above both the most recent 10-year mean and the 2016 value.

The NCDMF Age Lab ages otoliths collected from several fishery-dependent and independent sources. A total of 870 spotted seatrout were aged by otoliths in 2017 with a maximum age of 7 and a modal age of 1.

South Carolina
The State Finfish Survey collects fishery-dependent catch, effort, and length data from private boat anglers in January and February. In 2017, 22% of 198 interviewed parties primarily targeted spotted seatrout (2017 n=183, mean catch rate of 1 fish per targeted fishing hour).

A mandatory trip reporting system for the charter boat fishery has been in place since 1993. In 2017, 990 (6%) interviewed trips targeted seatrout (2017 mean catch rate of 1.52 fish per targeted fishing hour).

The Freezer Drop-Off and the Fishing Tournament programs gather biological information like size, sex, maturity, and age. In 2017, these programs gathered biological information from 81 spotted seatrout.

South Carolina conducts two fishery-independent data collection programs. The Trammel Net Survey covers 7 monthly and 2 quarterly strata. Spotted seatrout is consistently one of the top three most abundance species encountered. The 2017 statewide mean CPUE was similar to 2016 and above the long-term average. The Electrofishing survey covers 5 monthly strata, and catches relatively low numbers of mostly YOY seatrout. Statewide catch rate by the electrofishing survey have been low since 2010.

Georgia
A Marine Sportfish Carcass Recovery Program collects recreational fishery-dependent size and age data (2017 n=2,431 spotted seatrout, average length of 387 mm, 315-521 mm range).

The Marine Sportfish Population Health Study trammel net survey samples monthly from September to November since 2003 in the Wassaw and Altamaha Sounds to collect fishery-independent age- and sex-specific estimates of relative abundance (2017: Wassaw CPUE (geometric mean): 0.67; Altamaha CPUE: 1.40). Gillnet sampling also occurs through this study, often encountering seatrout (2017: Wassaw CPUE: 0.29; Altamaha CPUE: 0.45).

Florida
Fishery-dependent sampling includes commercial trip-ticket information and biostatistical sampling of commercial and recreational catch. A voluntary angler logbook program was implemented in 2002 to record lengths of spotted seatrout released alive by anglers. In 2011, this program changed to a ‘postcard’ program, enlisting anglers encountered during MRIP angler intercept interviews.

A juvenile finfish monitoring program is conducted in the northern Indian River Lagoon (since 1990) and in the estuarine St. Johns, St. Marys, and Nassau Rivers (since 2001). Florida also conducts a 183-m haul seine survey in the Indian River (since 1997) and northeast Florida (Jacksonville/St. John's River) (since 2001). Southeast (Indian River/Tequesta) coast YOY abundance in 2017 declined from 2016. Northeast coast YOY abundance in 2017 increased slightly from 2016. Adult abundance (>200 mm SL) decreased in the southeast but increased slightly in the northeast from 2016 values.

VI. Status of Management Measures and Issues

Changes to State Regulations
None.

De Minimis Requests
A state qualifies for *de minimis* status if its previous three-year average combined commercial and recreational catch is less than 1% of the previous three-year average coastwide combined commercial and recreational catch. Those states that qualify for *de minimis* are not required to implement any monitoring requirements, as none are included in the plan.

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

VII. Implementation of FMP Compliance Requirements for 2017

The PRT notes that all states have met the compliance requirements.

VIII. Recommendations of Plan Review Team

Management and Regulatory Recommendations

- Consider approval of *de minimis* requests by New Jersey and Delaware.
- Maintain observer coverage in states that have a commercial fishery for spotted seatrout.

Prioritized Research Recommendations

High Priority

- Conduct state-specific stock assessments to determine stock status 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 or age of commercial discards.
- Research release mortality and how this changes with factors such as season, habitat (e.g., depth, temperature, salinity), fish life history (e.g., size, age) and fishing methods (e.g., gear types).
- Monitor the size, age and reproductive condition of recreationally harvested fish (e.g. freezer drop off and tournament monitoring programs).
- Research into links between spawning activity, environmental conditions, trophic interactions and recruitment.

- Continue work to examine the stock structure of spotted seatrout on a regional basis (e.g., genetics, use of advanced tagging techniques).
- Research effects of winter severity on the population.
- Utilize telemetry technology to better understand life history characteristics.
- Conduct additional research on the significance of age-specific fecundity changes (i.e., environmental impacts on spawning output of population)
- Develop state-specific juvenile abundance indices.

Medium Priority

- Identify essential habitat requirements.
- Initiate collection of social and economic aspects of the spotted seatrout fishery.

IX. References

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X. Figures

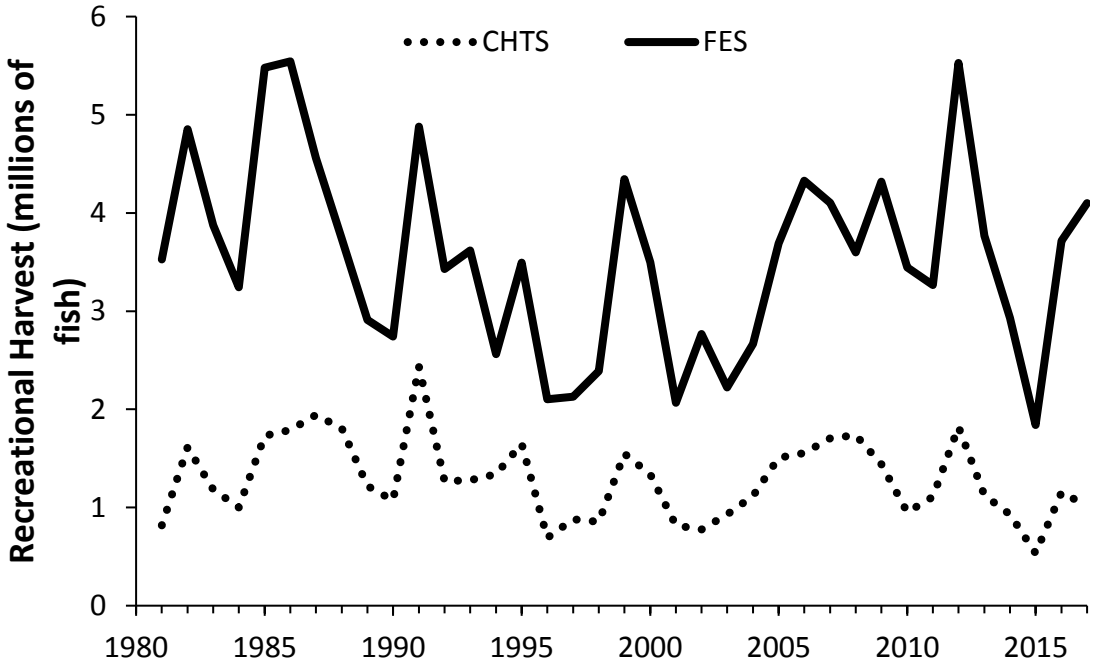

Figure 1. Recreational harvest estimated using the Coastal Household Telephone Survey (CHTS) and the mail-based Fishing Effort Survey (FES). (Source: personal communication with NOAA Fisheries, Fisheries Statistics Division. [10/06/2018])

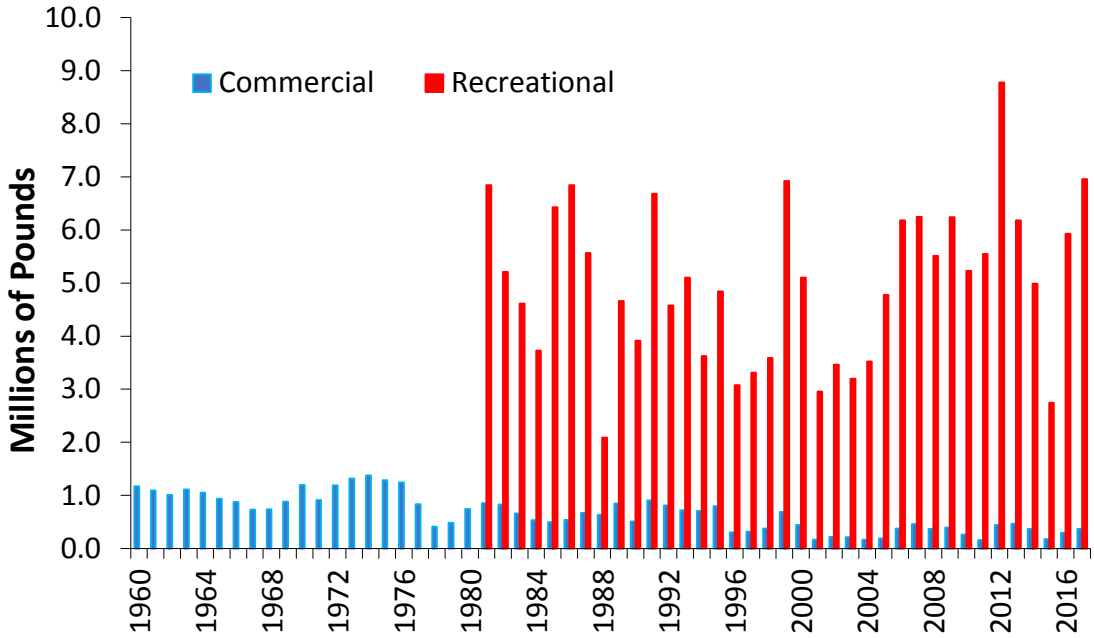

Figure 2. Commercial landings (1960-2017) and recreational landings (1981-2017), in pounds, from Maryland to Florida (See Tables 2 and 4 for values and sources). Recreational data not available prior to 1981.

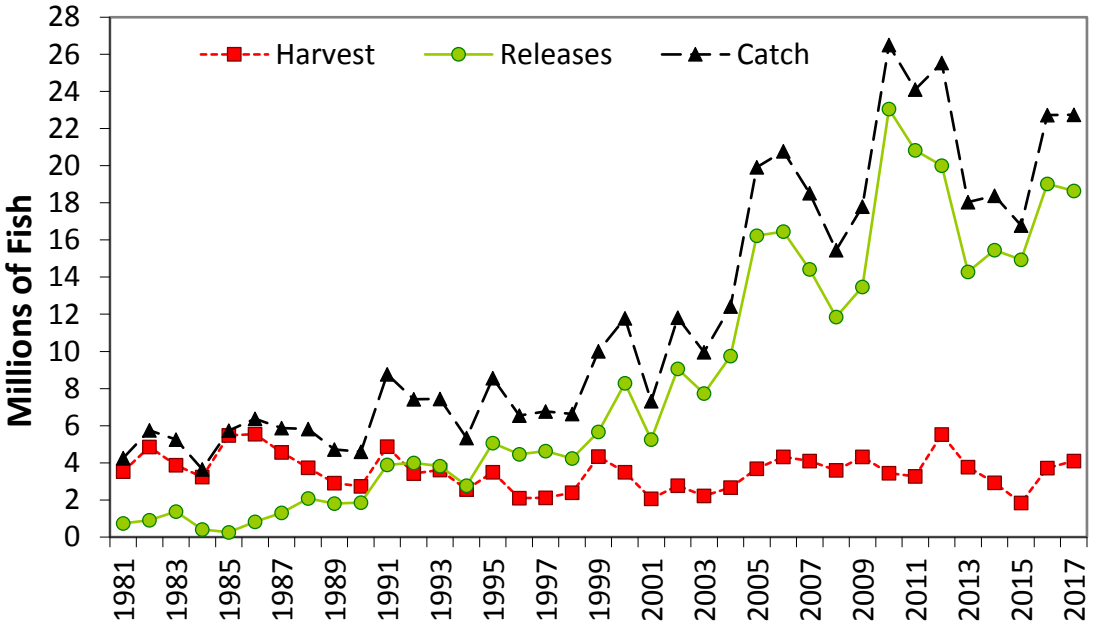

Figure 3. Recreational catch, harvest, and releases (numbers), 1981-2017, from Maryland to Florida (See Tables 3 and 5 for values and sources).

XI. Tables

Table 1. Summary of state regulations for spotted seatrout in 2017.

State	Recreational	Commercial
New Jersey	13" TL; 1 fish	Gill net, trawl, and pound net: 13"; 100 lb/vessel/day possession and bycatch limit; seasonal closures; monthly reporting. Trawl and gill net mesh size restrictions. Hook & line fishermen must follow rec limits.
Delaware	12" TL	12" TL
Maryland	14" TL; 4 fish	14" TL. 150 lb limit per day or trip (whichever is longer). Trawl and gill net mesh size restrictions.
PRFC	14" TL; 10 fish	14" TL
Virginia	14-24" TL; 1 fish >24" allowed; 5 fish; closed season March-July.	14" TL; pound nets/seines allowed 5% by weight less than 14". Hook & line fishermen must follow rec limits. Quota: 51,104 lbs (Sept-Aug). After 80% reached, 100 lb/vessel/day possession and bycatch limit.
North Carolina	14" TL; 4 fish	14" TL; 75 fish limit. Unlawful to possess or sell Friday 12:00am-Sunday 12:00am.
South Carolina	14" TL; 10 fish. Gig March-Nov.	Gamefish status since 1987; native caught fish may not be sold.
Georgia	14" TL; 15 fish	14" TL; 15 fish. BRD requirement for trawl; gear mesh regulations.
Florida	15-20" TL slot; 1 fish >20" allowed; northeast 6 fish; northwest 5 fish; south 4 fish; hook & line/cast net only.	15-24" TL; Season varies by region; 75 fish limit or 150 fish limit with two or more licensed fishermen on board; hook & line/cast net only.

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

Table 2. Commercial landings (pounds) of spotted seatrout by state, 2008-2017 (Source: ACCSP for years prior to 2016 and State Compliance Reports for 2016). Starred boxes represent confidential data.

Year	MD	VA	NC	SC	GA	FL	Total
2008	290	43,512	304,430		*	20,887	369,119
2009	*	26,350	320,247		*	46,297	392,894
2010	*	20,870	200,822		*	39,374	261,066
2011	640	17,315	75,239		*	63,592	156,787
2012	*	116,767	265,016			61,676	443,460
2013	*	42,086	367,610		*	58,288	467,984
2014	*	90,051	242,245		*	37,710	370,006
2015	*	7,942	128,752			39,226	175,920
2016	*	18,483	253,965	*		23,105	295,553
2017	23	55,224	299,875			16,157	371,279

Table 3. Recreational harvest (numbers of fish) of spotted seatrout using the FES effort calibration, by state, 2008-2017. (Source: MRIP for years prior to 2017 and State Compliance Reports for 2017)

Year	MD	VA	NC	SC	GA	FL	Total
2008		278,345	1,372,973	283,127	1,048,367	616,807	3,599,619
2009	20,285	67,687	1,857,890	370,370	1,363,056	639,102	4,318,390
2010	9,684	77,068	630,748	406,781	1,135,113	1,187,103	3,446,497
2011	11,042	644,074	723,502	193,487	762,304	931,353	3,265,762
2012	21,323	392,484	1,602,836	622,205	1,206,654	1,682,942	5,528,444
2013	0	153,706	1,107,957	440,751	937,046	1,122,151	3,761,611
2014	21,560	84,537	725,086	260,321	724,411	1,111,177	2,927,092
2015	11,619	23,062	249,260	311,106	740,932	504,137	1,840,116
2016	10,092	163,529	978,624	311,168	1,290,220	962,946	3,716,579
2017	24,255	172,288	1,217,834	647,679	1,060,493	977,797	4,100,346

Table 4. Recreational harvest (pounds of fish) of spotted seatrout using the FES effort calibration, by state, 2008-2017. (Source: MRIP for years prior to 2017 and State Compliance Reports for 2017)

Year	MD	VA	NC	SC	GA	FL	Total
2008		673,026	2,114,130	435,317	1,224,085	1,063,032	5,509,590
2009	23,031	132,635	2,878,160	508,657	1,576,285	1,121,118	6,239,886
2010	19,623	137,095	1,277,174	598,963	1,310,371	1,883,653	5,226,879
2011	11,181	1,450,980	1,353,388	327,349	894,796	1,509,893	5,547,587
2012	36,380	690,821	2,720,028	1,002,364	1,231,246	3,097,576	8,778,415
2013	0	379,399	1,881,881	717,402	1,125,802	2,075,929	6,180,413
2014	46,870	166,182	1,451,592	382,155	825,903	2,111,818	4,984,520
2015	23,546	48,477	430,579	462,498	794,861	984,940	2,744,901
2016	20,024	341,977	1,724,492	475,749	1,740,513	1,625,597	5,928,352
2017	48,624	342,463	2,157,198	992,938	1,403,646	2,011,777	6,956,646

Table 5. Recreational releases (number of fish) of spotted seatrout using the FES effort calibration, by state, 2008-2017. (Source: MRIP for years prior to 2017 and State Compliance Reports for 2017).

Year	MD	VA	NC	SC	GA	FL	Total
2008		910,967	2,226,578	1,220,429	1,149,386	6,351,756	11,860,702
2009	160,644	549,846	4,462,890	1,001,740	2,125,707	5,177,671	13,480,869
2010	300,919	2,530,405	7,657,503	1,167,472	1,676,201	9,717,723	23,050,609
2011	21,353	3,462,963	7,420,553	743,581	1,348,499	7,839,264	20,836,213
2012	259,437	1,257,157	4,916,356	1,761,694	2,196,920	9,610,576	20,006,019
2013	22,780	738,474	4,278,671	2,190,796	1,320,699	5,722,715	14,282,174
2014	74,250	1,059,287	3,949,284	1,407,310	1,687,540	7,279,660	15,460,257
2015	242,150	834,028	4,824,088	1,147,982	1,763,638	6,131,007	14,943,497
2016	133,223	3,708,969	6,475,193	1,791,072	2,113,253	4,783,644	19,028,477
2017	107,611	3,154,997	5,147,567	1,949,554	2,436,867	5,845,559	18,642,226