FISHERY MANAGEMENT PLAN UPDATE
SPOTTED SEATROUT
AUGUST 2023

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

Original FMP Adoption:	February 2012	
Amendments:	None	
Revisions:	None	
Supplements:	Supplement A to the FMP	February 2014
Information Updates:	None	
Schedule Changes:	None	
Comprehensive Review:	July 2019	

Spotted seatrout (*Cynoscion nebulosus*) is managed under the authority of two state and one interjurisdictional fishery management plans (FMP). The North Carolina Marine Fisheries Commission (MFC) currently manages spotted seatrout under the North Carolina Spotted Seatrout FMP (NCDMF 2012) and the North Carolina FMP for Interjurisdictional Fisheries (NCDMF 2022). Supplement A to the 2012 North Carolina Spotted Seatrout FMP (NCDMF 2014) maintains short–term measures in the spotted seatrout fishery (40% reduction at 14-inch total length minimum size) to address several sources of uncertainty in the 2009 stock assessment through acquisition and assessment of additional data. The supplement examined sources of uncertainty in the assessment, the rationale for not implementing on schedule the North Carolina Spotted Seatrout FMP February 2014 management measures and presented possible interim management measures. At its February 2014 business meeting, the MFC voted to maintain short-term management measures in the spotted seatrout fishery (Proclamation FF-38-2014: 14-inch minimum size, 75-fish commercial trip limit with weekend closures in joint waters except in Albemarle and Currituck sounds; Proclamation FF-39-2014: 14-inch minimum size, four-fish recreational bag limit). These measures will remain in effect until Amendment 1 is completed.

As required in the 2012 FMP, a stock assessment (NCDMF 2015a) was completed on schedule (2014-2015), peer reviewed, approved for management, and presented to the MFC at its May 2015 business meeting. A new benchmark stock assessment began in late 2020 and was completed and accepted for use in management October 2022. Results from the 2022 Spotted Seatrout Stock Assessment showed that the North Carolina and Virginia stock of Spotted Seatrout is not overfished, but overfishing is occurring. The North Carolina Division of Marine Fisheries (DMF) is drafting Amendment 1 to the state FMP for spotted seatrout to end overfishing and ensure sustainable harvest.

The Atlantic States Marine Fisheries Commission (ASMFC) manages spotted seatrout in all Atlantic States who have a declared interest in the species. In addition to the ASMFC spotted seatrout FMP, the ASMFC manages spotted seatrout under the Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout (ASMFC 2011). The goals for the Omnibus Amendment are to bring the FMPs for the three species under the authority of the ASMFC Interstate Fishery Management Program Charter and bringing compliance requirements to each state. Because the intent of the Omnibus amendment was to bring the ASMFC spotted seatrout FMP into compliance with the new ASMFC charter, management measures were not adjusted and the identified objectives and compliance requirements to the states of the Omnibus Amendment are the same as Amendment 1 to the ASMFC spotted seatrout FMP (ASMFC 1990) and are as follows:

- Manage the spotted seatrout fishery restricting catch to mature individuals (12-inch minimum size limit).
- Manage the spotted seatrout stock to maintain appropriate spawning stock biomass (20% SPR).
- 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.

To ensure compliance with interstate requirements, North Carolina also manages this species under the North Carolina Fishery Management Plan for Interjurisdictional Fisheries (NCDMF 2022). The goal of this FMP is to adopt fishery management plans, consistent with N.C. law, approved by the Mid-Atlantic Fishery Management Council, South Atlantic Fishery Management Council, or the ASMFC by reference and implement corresponding fishery regulations in North Carolina to provide compliance or compatibility with approved fishery management plans and amendments, now and in the future. The goal of these plans, established under the Magnuson-Stevens Fishery Conservation and Management Act (federal council plans) and the Atlantic Coastal Fisheries Cooperative Management Act (ASMFC plans) are like the goals of the Fisheries Reform Act of 1997 to "ensure long-term viability" of these fisheries.

Management Unit

The management unit for the North Carolina Spotted Seatrout FMP (NCDMF 2012) includes all spotted seatrout within the coastal and joint waters of North Carolina. The unit stock, or population unit, for North Carolina's assessment of spotted seatrout includes all spotted seatrout in North Carolina and Virginia. Virginia landings were included in the stock assessment of spotted seatrout because of the high rate of mixing observed between North Carolina and Virginia.

Goal and Objectives

The goal of the North Carolina Spotted Seatrout FMP (NCDMF 2012) is to determine the status of the stock and ensure long-term sustainability for the spotted seatrout stock in North Carolina. To achieve this goal, it is recommended that the following objectives be met:

- Develop an objective management program that provides conservation of the resource and sustainable harvest in the fishery.

- Ensure the spawning stock is of sufficient capacity to prevent recruitment-overfishing.
- Address socio-economic concerns of all user groups.
- Restore, improve, and protect important habitats that affect growth, survival, and reproduction of the North Carolina spotted seatrout stock.
- Evaluate, enhance, and initiate studies to increase understanding of spotted seatrout biology and population dynamics in North Carolina.
- Promote public awareness regarding the status and management of the North Carolina spotted seatrout stock.

DESCRIPTION OF THE STOCK

Biological Profile

Spotted seatrout range from Massachusetts to southern Florida and the Bahamas on the U.S. Atlantic Coast and continue through the Gulf of Mexico to the Yucatan Peninsula, Mexico (Murphy et al. 2006), however it is rare north of Virginia, United States. Genetic and tagging data support a single unit stock in Virginia and North Carolina (Ellis et al. 2019). In addition, based on genetic data, New River, North Carolina is an area of complex, seasonal mixing between two genetically distinct populations (Ellis et al. 2019): Georgia through Cape Fear River, North Carolina, and Bogue Sound, North Carolina and north (O'Donnell et al. 2014; Ellis et al. 2019). Spotted seatrout inhabit shallow coastal and estuarine waters throughout their range and are considered a euryhaline species (Deaton et al. 2010). In North Carolina, the state record was recorded at 12.5 pounds in 2022. The maximum reported age of spotted seatrout is 9 years in North Carolina for both male and female fish (NCDMF 2012). Most spotted seatrout in North Carolina are mature by age 1 and 7.9 inches for males and 9.9 inches for females. All males are mature at 12 inches and females at 15 inches. Spawning in North Carolina occurs from April to October with peak spawn around May (Burns 1996). Spawning occurs within the first few hours after sunset (Luczkovich et al. 1999) and a single fish is capable of spawning multiple times (batch spawners) throughout the season. In South Carolina and Florida, it has been observed that during peak spawning older spotted seatrout spawn more often than younger fish (Roumillat and Brouwer 2004, Lowerre-Barbieri et al. 2009). Estimates of the number of eggs a female can produce in a year from the Southeast and Gulf Coasts vary based on size, age, and range, from 3 million to 18 million per year (Nieland et al. 2002; Roumillat and Brouwer 2004; Murphy et al. 2011).

Stock Status

The 2022 North Carolina spotted seatrout stock assessment (NCDMF 2022) indicated the spotted seatrout stock in North Carolina and Virginia is not overfished but overfishing is occurring (Figures 1 and 2).

Stock Assessment

The 2022 benchmark stock assessment of spotted seatrout in North Carolina and Virginia was conducted using a seasonal size-structured assessment model applied to data characterizing

commercial and recreational landings and discards, fisheries-independent survey indices, and biological data collected from 1991 through 2019. A nonstationary process was assumed for natural mortality and growth in the model. The seasonal time step and nonstationary natural mortality assumption allows for capturing the cold-stun signals that have been observed for spotted seatrout. Both the observed data and the model predictions suggest a shift in population dynamics around the year 2004 when the survey index data became available. Lower fishing mortality and higher spawning stock biomass and recruitment with greater variation were predicted for the time period after 2004. This trend was also observed in the recreational landing and discards data, with higher values in the time period after 2004. The fishing year was defined as the biological year, March 1 through February 28 or 29, to incorporate cold stun mortalities within a single model year.

In 2019, estimated SSB was 4,980,243 pounds (2,259 metric tons), which is greater than the threshold ($SSB_{20\%}$=2,519,884 pounds or 1,143 metric tons; Figure 1), indicating the stock is not overfished. The terminal year estimate of fishing mortality (F_{2019}) was based on an inverse-variance weighted average of 2017-2019 F values. The 2019 estimate of fishing mortality was 0.75, which is higher than the threshold (F20%=0.60), indicating the stock is experiencing overfishing (Figure 2).

DESCRIPTION OF THE FISHERY

Current Regulations

The DMF currently allows the recreational harvest of spotted seatrout seven days per week with a minimum size limit of 14-inches total length (TL) and a daily bag limit of four fish. The commercial harvest is limited to a daily limit of 75 fish with a minimum size limit of 14-inches TL). It is unlawful for a commercial fishing operation to possess or sell spotted seatrout for commercial purposes taken from Joint Fishing Waters of the state from midnight on Friday to midnight on Sunday each week; the Albemarle and Currituck sounds are exempt from this weekend closure. In the event of a catastrophic cold stun, the DMF has the authority to close the fishery until the following spawning period. In 2018, the spotted seatrout commercial and recreational fishery was closed from January 5 through June 15 by proclamation due to a state-wide cold stun event. For both commercial and recreational sectors of the spotted seatrout fishery, landings are reported on the biological year which is from March through February of the following year (e.g., biological year 2022 is from March 2022 through February 2023). It is important to note that data from January and February of 2023 is preliminary.

Commercial Fishery

Annual landings have been variable throughout the time series (Table 1; Figure 3). Commercial landings in biological year 2022 (520,994 pounds) decreased by 20% compared to the previous year (654,152 pounds; Table 1; Figure 3). Commercial landings in biological years 2021 and 2020 were similar and the two highest years since biological year 1991. Commercial landings of spotted seatrout increased sharply in biological year 2019 and have remained high. This sharp increase in commercial landings is most likely due to several strong year classes of fish and mild winters from 2019-2022, resulting in high numbers of available fish. Additionally, regulations limiting fall commercial fishing for other species – specifically southern flounder – likely influenced

commercial spotted seatrout effort. During the early to mid-1990s, landings in the ocean and estuarine areas were more similar than in the remainder of the time series (1995-2022) in which estuarine landings have dominated. The primary gear of harvest are estuarine gill nets (anchored and run around).

Recreational Fishery

Recreational landings of spotted seatrout are estimated from the Marine Recreational Information Program (MRIP). Recreational estimates across all years have been updated and are now based on the MRIP's new Fishing Effort Survey-based calibrated estimates. For more information on MRIP see https://www.fisheries.noaa.gov/topic/recreational-fishing-data.

Recreational harvest of spotted seatrout estimated by MRIP (Type A + B1) in biological year 2022 was 3,358,921 pounds, or 1,802,527 fish, similar to 2021 (2,839,919 pounds, 1,498,384 fish). Though harvest in biological years 2020, 2021, and 2022 are lower than the timeseries high (2019, 4,221,440 pounds, 2,415,392 fish) landings in these biological years have remained much higher than the time series average prior to biological year 2019 (1991-2018, 1,397,934 pounds, 905,205 fish). Additionally, pounds of spotted seatrout harvested in 2022 were the second highest in the time series and pounds harvested from 2019-2022 represent four of the top five pounds harvested in the time series. Estimated recreational releases in biological year 2022 (11,148,452 fish) were well above the time series average of 3,524,607 fish and the previous biological year's releases of 6,859,777 fish (Table 1).

The North Carolina Saltwater Fishing Tournament recognizes anglers for landing and/or releasing fish of exceptional size or rarity by issuing citations that document the capture for the angler. Citations awarded through the North Carolina Saltwater Fishing Tournament for spotted seatrout have varied by year throughout the time series, averaging 371 citations (Table 2; Figure 4). The number of awarded citations in calendar year 2022 (1,094 citations) increased from the previous calendar year (655 citations) and was the highest number of citations in the time-series. Awarded citations for spotted seatrout have generally increased each year since 2015. The number of release citations (fish over 24 inches that are released) awarded in calendar year 2022 (485 release citations) was the highest since release citations began in 2008 and an increase of just over 200 citations from calendar year 2021 (283 release citations). The percentage of spotted seatrout release citations (44%) was the time-series high and represents the second year in a row of a time-series high (Table 2).

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

Commercial fish houses are sampled monthly to provide length, weight, and age data. This information is used to characterize the commercial fishery for stock assessments and to monitor trends in the size and age of fish being removed from the stock. The average sizes of fish landed by the commercial fishery are typically larger than the recreational fishery and is primarily driven by the larger maximum size observed in the commercial landings; however, modal length for the commercial fishery in 2022 was the same (16 inches fork length) as the recreational fishery (16 inches fork length) and was likely driven by similar maximum sizes in the commercial and

recreational fisheries (Table 3; Figure 5). Undersized fish represent a small portion of the harvest in both sectors; 1.3% of commercial harvest and 3.7% of the recreational harvest was below the 14-inch size limit in 2022 (Figure 5).

The number of fish sampled by division staff at commercial fish houses has varied over time due to annual variability in landings of the fishery. The mean length of spotted seatrout in 2022 (17.9 inches fork length) was similar to the time series (1991-2021) average (16.6 inches fork length) and the mean length in 2021 (17.5 inches fork length), however, minimum length (13.2 inches fork length) was well above the minimum length in 2021 (10.9 inches fork length; Table 3; Figure 6). For the past four years (2019-2022), minimum length has been consistently greater than the time series average (8.4 inches fork length). Maximum length in 2022 decreased to 28.3 inches fork length and was slightly below the time series average (29.7 inches fork length). Most spotted seatrout landings by the commercial fishery in 2022 came from the run around and anchored gill net fishery (92%) with pound nets (1.6%), and all other gears (5.6%; mainly beach seines, swipe nets, and haul seines) accounting for the rest.

Recreational catch is almost exclusively hook-and-line. The mean length from the recreational fishery in 2022 (17.4 inches fork length) was similar to the previous year (17.0 inches fork length) while the minimum length (12.6 inches fork length) and maximum length (28 inches fork length) were both increases from 2021 (11.1- and 26.5-inches fork length, respectively). All three 2022 length metrics – mean, minimum, and maximum – were greater than the time series (1991-2021) average of each (16.0, 10.4-, and 25.8-inches fork length, respectively; Table 3; Figure 7). Eighty-eight percent of the spotted seatrout sampled from the recreational fishery in 2022 were between 14 and 19 inches (Figure 5).

Fishery-Independent Monitoring

The DMF utilizes numerous fishery independent monitoring programs to provide indices of juvenile (Program 120) and adult (Program 915) relative abundance to include in stock assessments. Program 120, the North Carolina Estuarine Trawl Survey, is a fishery independent multispecies monitoring program that has been ongoing since 1971 in the months of May and June. One of the key objectives of this program is to provide a long-term database of annual juvenile recruitment for economically important species. This survey samples a fixed set of 104 core stations with additional stations as needed. The core stations are sampled from western Albemarle Sound south to the South Carolina border each year without deviation two times in the months of May and June. An additional set of 27 spotted seatrout juvenile stations in Pamlico Sound and its major tributaries were added in 2004 and are sampled during the months of June and July. Data from the spotted seatrout specific stations are used to generate an index of relative abundance of age zero spotted seatrout, calculated as the average number of fish per tow. The resulting relative abundance index for the time series is variable with no significant trend overall, and peaks in 2006, 2008, 2012, 2013, and 2018 suggesting relatively higher recruitment in those years (Figure 8). The Program 120 relative abundance index in 2022 was 0.69 spotted seatrout per tow, which was three times the 2020 value. However, the 2020 value was the lowest value since the time series began in 2004 (0.67 spotted seatrout per tow). The 2022 relative abundance index was a 65% decrease from the time series mean (2004-2021; 1.97 spotted seatrout per tow) and represents the third year in a row of lower than time series average relative juvenile abundance index values.

The DMF started a fishery independent gill net survey (Program 915) in 2001 to generate a long-term database of age composition and to develop indices of abundance for numerous commercial and recreationally important finfish species, including spotted seatrout. The survey utilizes a stratified random sampling scheme of multi-mesh gill nets designed to characterize the size and age distribution for key estuarine species in Pamlico Sound and help managers assess the spotted seatrout stocks without relying solely on commercial and recreational fishery dependent data. Three regions encompassing most of the estuarine waters in North Carolina are sampled monthly from February to December. Pamlico Sound stations include waters on the backside of the barrier islands and the bays of Hyde and Dare counties, the central river stations include the Pamlico, Pungo, and Neuse rivers, and the southern river stations include the Cape Fear and New rivers. In the 2022 Spotted Seatrout Stock Assessment, the northern stations (i.e., the Pamlico Sound and Central River stations) were combined then separated into spring (April-June) and fall (September-November) indices of abundance (NCDMF 2022). During 2020 no indices of abundance are available for spotted seatrout from the fishery-independent assessment (Program 915). Sampling in this program was suspended in February 2020 due to COVID-19 restrictions and protected species interactions but resumed July 2021. Relative abundance in the Fall Index has been relatively consistent since 2006 with some variation around the time series mean (0.83 spotted seatrout per set) with a large spike in relative abundance in 2019 to the time series high (2.10 spotted seatrout per set) followed by a steep drop to the time series low when sampling resumed in 2021 (0.15 spotted seatrout per set) before returning to just above the time series mean in 2022 (0.88 spotted seatrout per set; Figure 9). The Spring Index has been more variable throughout the time series. However, 2019 also represented a timeseries high in relative abundance (1.50 spotted seatrout per set; Figure 10). Sampling Program 915 did not resume until July of 2021, therefore there is no Spring Index in 2021. Relative abundance in 2022 (1.15 spotted seatrout per set) represents the second highest relative abundance value in the time series.

Spotted seatrout age samples are collected from numerous DMF fishery independent and dependent sources. To date, a total of 21,392 otoliths from spotted seatrout have been aged since 1991 (Table 4). With the exception of 2003, the minimum age of sampled spotted seatrout has been age zero for every year the DMF has recorded this information. Maximum ages have varied every year, ranging from age five to age nine. Modal ages, which give an indication of the age of the largest cohort in the fishery, averages age one. Spotted seatrout length-at-age was summarized based on all available age data (1991-2022; Figure 12). Average growth of spotted seatrout slows down around age-4, but fish as large as 24.7 inches have the potential to be young of the year (age-0), demonstrating the species' fast growth. In 2022, the number of fish aged (815 fish) decreased from the previous year (1,006 fish). Spotted seatrout sampled in 2022 had a modal age of 2 and maximum age of 6, which were, respectively, an increase from and the same as the previous year (1, 6).

Tagging

DMF established the Multi-Species Tagging Program in 2014 designed to collect data on habitat use, migration patterns, population structure, and morality rates of cobia, red drum, southern flounder, spotted seatrout, and striped bass. Specifically, spotted seatrout are tagged with single yellow tags (low reward), single red tags (high reward), or double yellow tags. Since 2014, Division staff and Division trained volunteer taggers have tagged 12,358 spotted seatrout and 795

recaptures of spotted seatrout have been reported (Table 7). In 2022, Division staff and volunteers tagged 800 spotted seatrout and 25 recaptures were reported (Table 7, Figure 12).

RESEARCH NEEDS

The following research needs were compiled from those listed as high research priorities in the 2022 North Carolina Spotted Seatrout Stock Assessment Report. Improved management of spotted seatrout is dependent upon research needs being met. Research needs are not listed in order of priority.

- Test and validate the newly developed size-structured model with known data sets and a simulation study that compares this size-structured model with an age-structured model
- Collect data to characterize annual length distributions of commercial discards and recreational releases to inform selectivity parameterization
- Develop a fishery-independent survey for Virginia waters
- Develop a winter-season survey to capture population dynamics in that period, including collection of length composition data
- Integrate tagging data into stock assessment model so both tagging data and other data sources can work together to give a better picture of the population
- Implement a year-round, fisheries-independent juvenile survey
- Improve estimates of recreational discard mortality

MANAGEMENT STRATEGY

Maintain a spawning potential ratio of 20% to increase the likelihood of sustainability through an expanded age structure and an increase in the spawning stock biomass. This strategy should provide a greater cushion for the population and likely lead to faster recovery of the population after cold stun events, which can lead to mass mortalities in the winter months potentially affecting the number of mature fish available to spawn the following spring. The Director maintains authority to intervene in the event of a catastrophic cold stun event and close the fishery in specific areas or statewide until June 15. This reduces fishing mortality on spotted seatrout until after the peak in their spawning season.

FISHERY MANAGEMENT PLAN SCHEDULE RECOMMENDATIONS

The review of the plan is underway. A benchmark stock assessment was completed October 2022, incorporating data through February 2020.

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TABLES

Table 1: Recreational harvest (number of fish landed and weight in pounds) and releases (number of fish) and commercial harvest (weight in pounds) of spotted seatrout from North Carolina for the biological years 1991–2022. The biological year is from March through February of the following year (e.g., biological year 2022 is from March 2022 through February 2023). *Data from the January and February portion of biological year 2023 is preliminary.

	Recreational			Commercial	
Year	Numbers Landed	Numbers Released	Weight Landed (lb)	Weight Landed (lb)	Total Weight (lb)
1991	973,624	576,139	1,334,162	738,338	2,072,500
1992	908,233	449,085	1,390,746	482,192	1,872,938
1993	569,327	462,573	857,720	487,612	1,345,332
1994	798,937	443,785	1,207,520	479,249	1,686,769
1995	863,057	708,851	1,221,065	540,890	1,761,955
1996	575,357	638,588	699,078	142,742	841,820
1997	779,611	245,747	1,025,110	229,168	1,254,278
1998	702,274	112,315	1,125,898	372,674	1,498,572
1999	1,080,411	718,987	1,878,913	675,136	2,554,049
2000	728,906	170,075	1,095,729	192,130	1,287,859
2001	499,556	515,433	659,893	89,880	749,773
2002	746,908	1,349,460	957,824	222,625	1,180,449
2003	388,715	546,960	515,678	144,086	659,764
2004	570,836	597,766	744,870	127,443	872,313
2005	1,574,164	3,149,889	1,772,342	123,938	1,896,280
2006	1,432,937	1,581,255	2,050,493	385,530	2,436,023
2007	1,242,654	2,232,904	2,002,059	325,267	2,327,326
2008	1,331,397	2,219,488	2,035,508	318,413	2,353,921
2009	1,850,581	4,461,889	2,855,284	362,781	3,218,065
2010	623,597	7,739,240	1,264,714	112,703	1,377,417
2011	758,250	7,580,380	1,466,310	83,875	1,550,185
2012	1,666,056	4,819,440	2,762,953	315,128	3,078,081
2013	1,055,564	4,521,077	1,958,333	364,123	2,322,456
2014	737,345	3,655,134	1,325,748	226,394	1,552,142
2015	202,703	5,426,396	339,433	115,553	454,986
2016	1,130,681	6,225,783	2,013,905	273,848	2,287,753
2017	1,054,500	4,725,746	1,852,474	259,473	2,111,947
2018	499,562	16,426,445	728,401	151,750	880,151
2019	2,415,392	7,050,239	4,221,440	443,638	4,665,078
2020	1,605,722	5,428,135	2,827,646	653,092	3,480,738
2021	1,495,384	6,859,777	2,839,919	654,152	3,494,071
2022	1,802,527	11,148,452	3,358,921	520,994	3,879,915
Mean	1,020,774	3,524,607	1,637,190	331,713	1,968,903

Table 2: Total number of awarded citations for spotted seatrout (>24 inches total length for release or > five pounds landed) from the North Carolina Saltwater Fishing Tournament for the time period of calendar years 1991–2022.

Year	Total Citations	Release Citations[+]	% Release
1991	185		0
1992	203		0
1993	12		0
1994	237		0
1995	483		0
1996	132		0
1997	125		0
1998	332		0
1999	695		0
2000	511		0
2001	518		0
2002	353		0
2003	328		0
2004	378		0
2005	290		0
2006	686		0
2007	1,000		0
2008	428	5	1
2009	434	14	3
2010	168	16	10
2011	37	3	8
2012	143	5	3
2013	162	21	13
2014	197	18	9
2015	176	16	9
2016	214	44	21
2017	464	81	17
2018	198	73	37
2019	468	172	37
2020	579	193	33
2021	655	283	43
2022	1,094	485	44

[+] Spotted seatrout release citations (fish released greater than 24 inches total length) began in 2008.

Table 3: Mean, minimum, and maximum lengths (fork length, inches) of spotted seatrout measured from the commercial and recreational fisheries, calendar years 1991–2022.

Year	Commercial				Recreational			
	Mean Length	Minimum Length	Maximum Length	Total Number Measured	Mean Length	Minimum Length	Maximum Length	Total Number Measured
1991	14.4	7.7	28.7	1,207	15.1	4.9	31.9	745
1992	16.0	8.4	27.9	1,791	15.6	5.1	24.2	543
1993	16.3	8.5	29.7	1,898	15.7	9.3	25.0	485
1994	15.6	7.0	29.1	1,224	16.0	10.6	24.0	1,076
1995	17.1	8.5	29.1	2,728	15.6	8.5	31.6	853
1996	16.0	7.0	27.6	748	14.6	8.9	24.3	307
1997	14.9	8.1	29.9	4,155	15.3	8.9	23.1	622
1998	14.5	8.0	29.9	4,698	16.4	11.0	36.5	551
1999	15.6	7.6	30.2	6,167	16.4	11.6	26.8	699
2000	17.5	6.0	30.7	2,901	15.6	11.3	25.2	330
2001	16.3	7.6	30.7	1,595	14.8	11.5	26.0	326
2002	16.1	8.0	28.9	3,897	14.9	11.8	24.8	283
2003	17.2	9.5	29.6	2,305	14.6	9.9	25.0	130
2004	16.6	9.0	27.9	2,676	15.3	8.9	22.5	294
2005	16.8	8.5	27.5	2,429	14.2	8.7	25.2	664
2006	16.3	8.9	29.3	6,493	15.5	10.1	25.9	706
2007	17.3	9.6	31.0	8,455	15.9	10.8	27.7	521
2008	17.0	7.3	30.3	5,877	15.6	11.5	26.5	790
2009	16.7	5.4	29.5	6,631	16.0	9.1	26.0	779
2010	17.5	11.4	30.9	4,060	17.5	12.4	24.8	336
2011	16.6	8.8	27.8	1,274	17.0	12.3	24.2	638
2012	16.5	7.4	31.1	4,822	16.5	13.0	24.1	939
2013	16.7	8.7	28.5	6,144	16.8	10.1	23.5	865
2014	17.3	5.5	28.3	3,321	17.6	13.1	26.0	381
2015	18.3	8.9	30.9	2,676	16.9	12.8	25.0	154
2016	17.3	9.4	31.7	3,025	16.8	13.0	25.2	647
2017	17.6	7.6	32.9	3,066	17.0	11.6	25.8	864
2018	17.2	10.5	28.0	1,180	15.7	9.3	23.3	274
2019	17.3	10.1	28.9	2,622	16.7	10.7	24.6	1,574
2020	17.5	10.9	33.4	2,851	17.0	12.1	26.8	1,119
2021	17.5	10.9	29.9	3,432	17.0	11.1	26.5	1,019
2022	17.9	13.2	28.3	3,314	17.4	12.6	28.0	632

Table 4: Modal age, minimum age, maximum age, and number aged for spotted seatrout collected through DMF sampling programs, calendar years 1991–2022.

Year	Modal Age	Minimum Age	Maximum Age	Total Number Aged
1991	1	0	7	679
1992	1	0	6	572
1993	1	0	6	645
1994	1	0	9	688
1995	1	0	5	623
1996	1	0	6	734
1997	1	0	6	710
1998	1	0	9	765
1999	1	0	6	869
2000	1	0	7	566
2001	1	0	5	425
2002	1	0	7	713
2003	1	1	7	405
2004	1	0	6	598
2005	1	0	5	727
2006	1	0	8	970
2007	2	0	8	702
2008	1	0	7	616
2009	2	0	6	660
2010	1	0	6	623
2011	1	0	6	421
2012	1	0	5	593
2013	2	0	5	635
2014	1	0	7	530
2015	2	0	5	448
2016	1	0	5	456
2017	1	0	7	881
2018	1	0	5	516
2019	1	0	8	1,167
2020	2	0	5	634
2021	1	0	6	1,006
2022	2	0	6	815

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Table 5: Summary of the MFC management strategies and their implementation status for the 2012 N.C. Spotted Seatrout FMP.

Management Strategy	Implementation Status
50% reduction in harvest needed, six fish bag limit, 14-inch minimum size limit, and weekend closure for commercial gears year-round (no possession on weekends).	Accomplished; Proclamation authority
A maximum of two fish over 24 inches for recreational fishermen	Proclamation authority
The small mesh gill net attendance requirement is extended to include weekends, December through February	Accomplished
Development of a mutual aid agreement between DMF Marine Patrol and WRC Wildlife Enforcement Officers for Inland fishing waters	Accomplished
Move forward with the mediation policy process to resolve conflict between spotted seatrout fishermen	Conflict resolution process established under Rule 15A NCAC 03I .0122.
Remain status quo with the assumption that the Director will intervene in the event of a catastrophic event and do what is necessary in terms of temporary closures by water body	Repealed Rule 15A NCAC 03M .0504 and used proclamation authority in 15A NCAC 03M .0512; Beginning in May 2017 re-established spotted seatrout Rule 15A NCAC 03M .0522 due to ASMFC considering retiring Interstate Spotted Seatrout FMP
More extensive research on cold stun events by DMF, Universities, etc.	Preliminary research accomplished (Ellis et al. 2017a, 2017b), additional work ongoing.

Table 6: Summary of the MFC management strategies and their implementation status for Supplement A to the 2012 N.C. Spotted Seatrout FMP adopted in 2014.

Management Strategy	Implementation Status
2014: 14-inch minimum size limit, four recreational bag limit, 75 fish commercial trip limit, no gill nets in joint waters on weekends, unlawful for a commercial operation to possess or sell spotted seatrout taken from joint waters on weekends.	Proclamation authority
2014: 14-inch minimum size limit, three fish recreational bag limit with a December 15- January 31 closure, 25 fish commercial trip limit (no closure)	Delay in management strategy
If a cold stun occurs close spotted seatrout harvest through June 15 and retain four fish recreational bag limit and 75 fish commercial trip limit	Proclamation authority
Revisit the Spotted Seatrout FMP in three years to determine if sustainable harvest measures are working	On schedule to begin July 2017*

* The MFC approved the 2017 FMP schedule in August 2017, which included a schedule change for spotted seatrout to begin in 2019, two years later than originally planned.

Table 7: Total tagged, total recaptured, average days at large, maximum days at large, average distance traveled (miles), and maximum distance traveled (miles) for spotted seatrout tagged in the DMF Multi-Species Tagging Program from calendar year 2014-2022.

Year Tagged	Total Tagged	Total Recaptured	Average Days at Large	Maximum Days at Large	Average Distance Traveled	Maximum Distance Traveled
2014	634	44	91	431	35	271
2015	1047	37	139	641	17	94
2016	1306	93	133	567	28	214
2017	2581	138	116	1099	29	208
2018	1464	67	200	904	60	202
2019	2619	257	169	1091	37	223
2020	1389	102	144	884	36	298
2021	518	32	100	310	33	151
2022	800	25	87	242	25	92

FIGURES

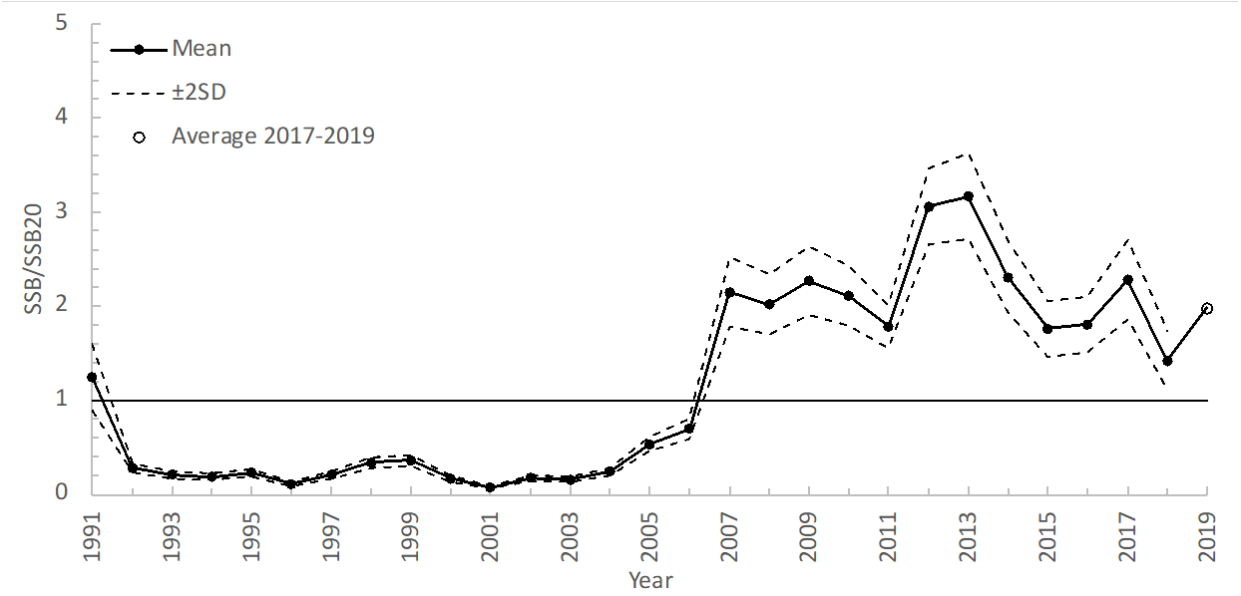

Figure 1. Annual predicted spawning stock biomass (metric tons), relative to the spawning stock biomass threshold ($SSB/SSB_{20\%}$), 1991–2019. 2019 is the terminal year for the most recent spotted seatrout stock assessment (NCDMF 2022). The horizontal black line shows a ratio of one. The terminal-year estimate (open circle) is an average of the most recent three years weighted by the inverse CV values.

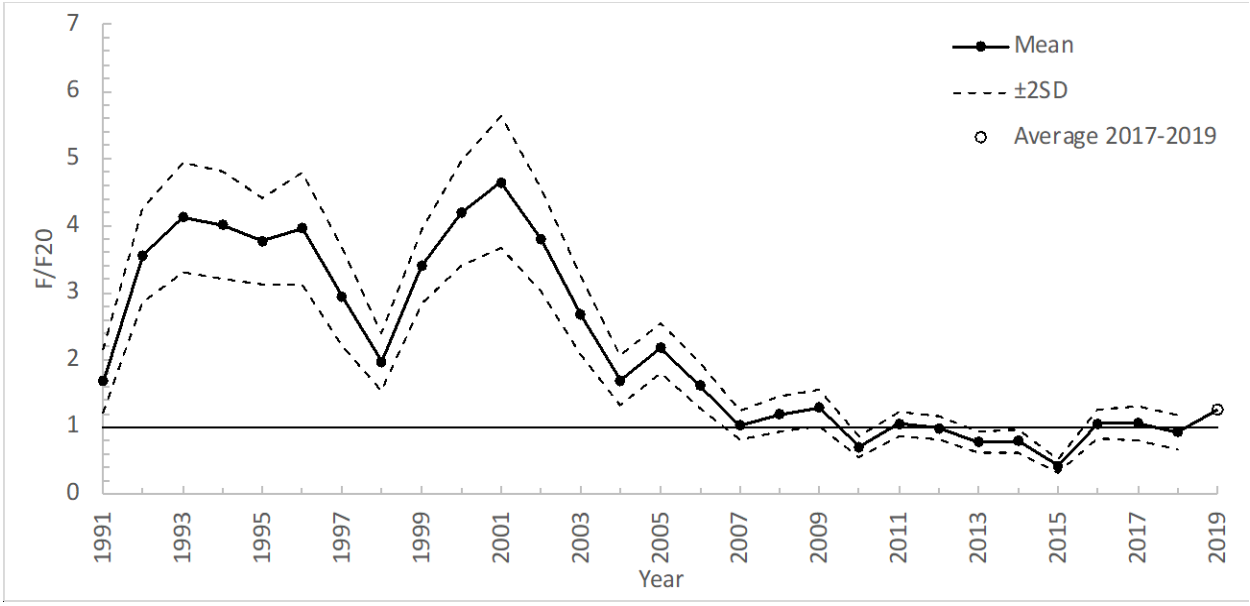

Figure 2. Annual predicted fishing mortality rates relative to the fishing mortality threshold ($F/F_{20\%}$), 1991–2019. 2019 is the terminal year for the most recent spotted seatrout stock assessment (NCDMF 2022). The horizonal black line shows a ratio of one. The terminal-year estimate (open circle) is an average of the most recent three years weighted by the inverse CV values.

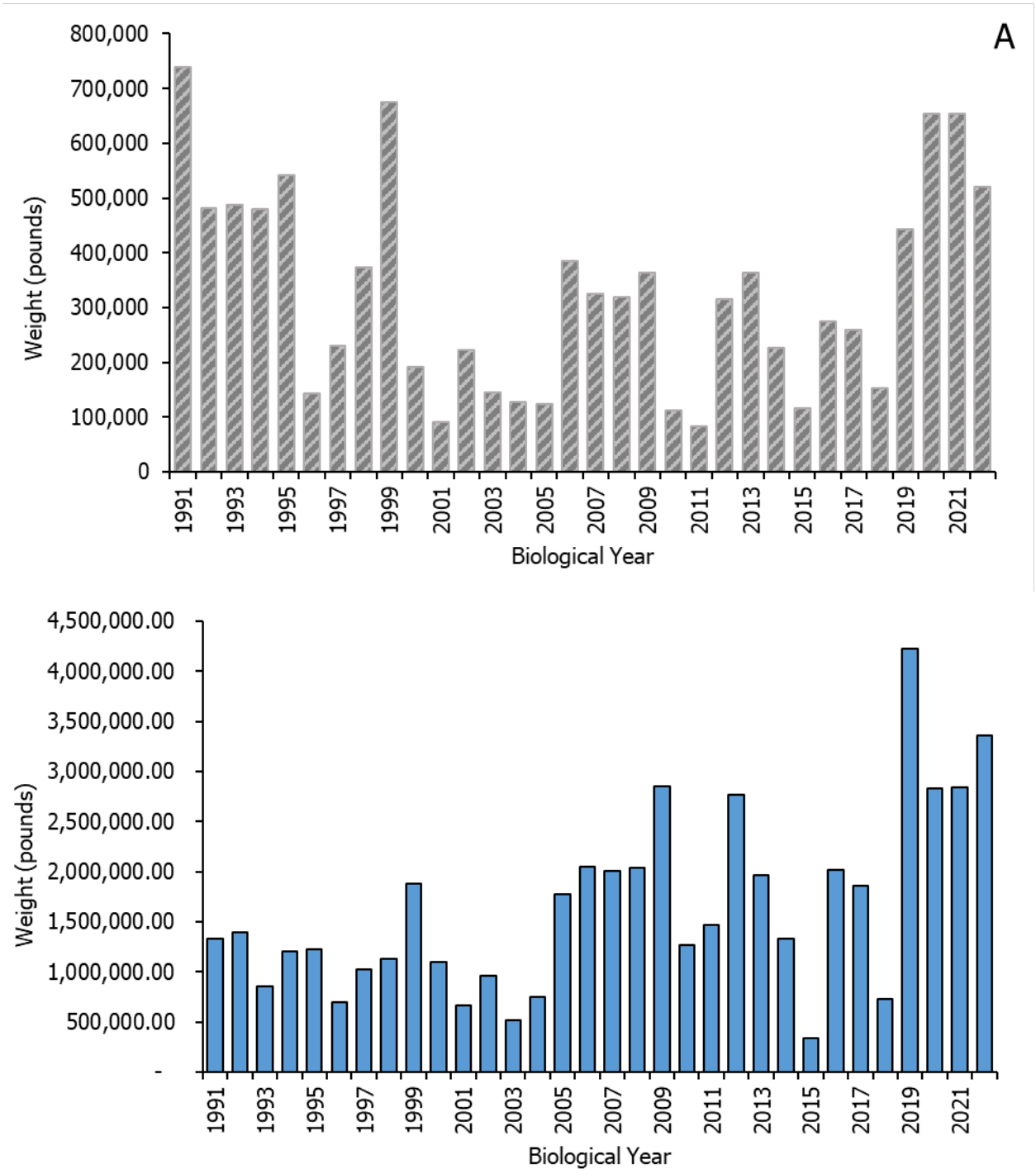

Figure 3. Commercial landings (pounds) reported through the North Carolina Trip Ticket Program (A) and recreational landings (Type A + B1; pounds) estimated from the Marine Recreational Information Program survey (B) for North Carolina, Biological Year 1991–2022. Biological Year is from March through February of the following year (e.g., Biological Year 2022 starts March 2022 and ends February 2023).

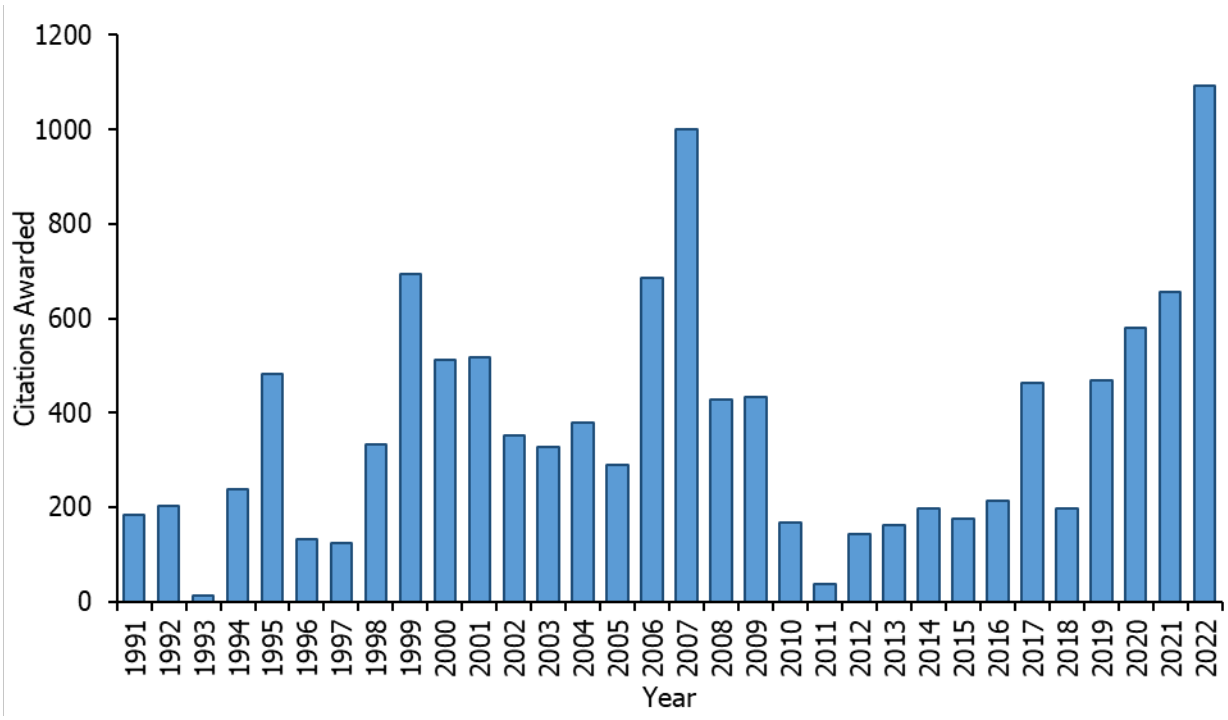

Figure 4. North Carolina Saltwater Fishing Tournament citations awarded for spotted seatrout, calendar years 1991–2022. Citations are awarded for spotted seatrout >24 inches total length for release or >five pounds landed.

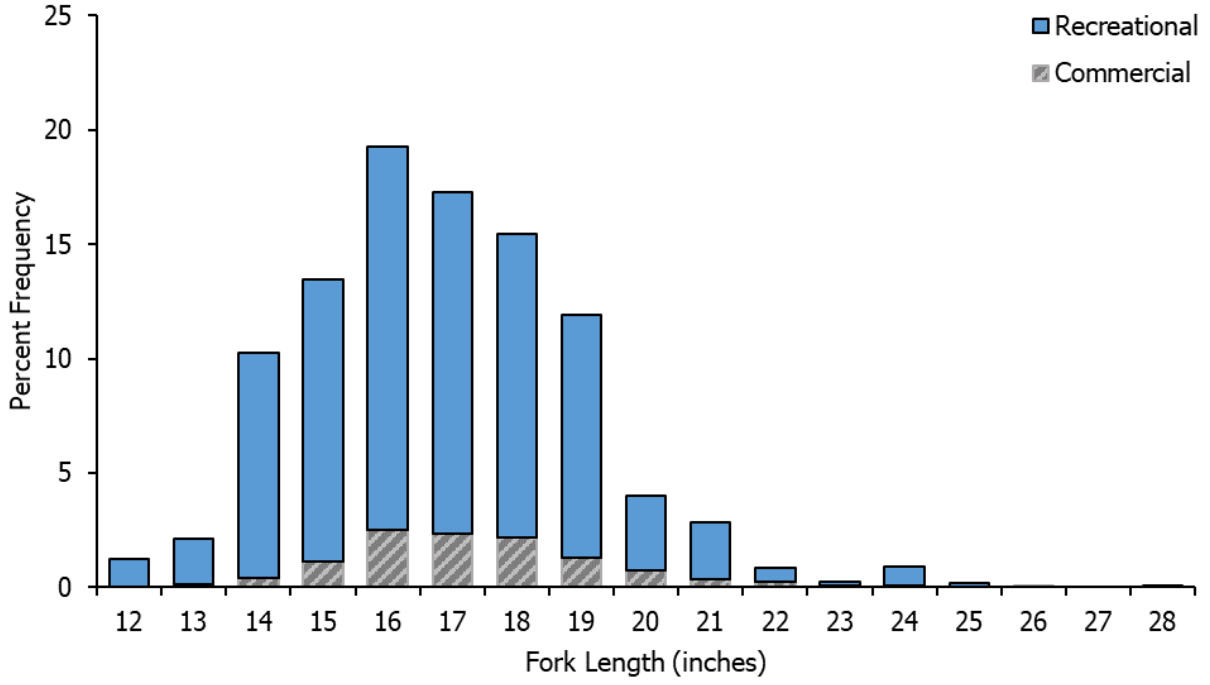

Figure 5. Commercial and recreational length frequency distribution from spotted seatrout harvested in biological year 2022.

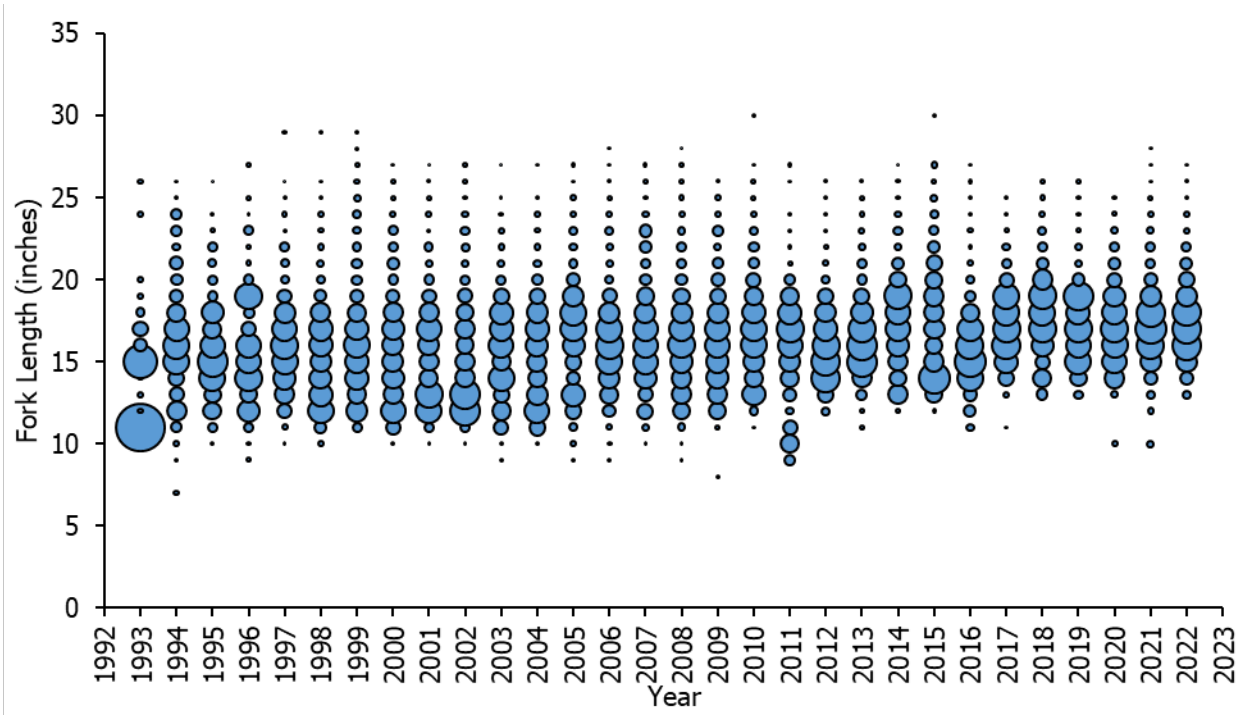

Figure 6. Commercial length frequency (fork length, inches) of spotted seatrout harvested biological year 1993-2022. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

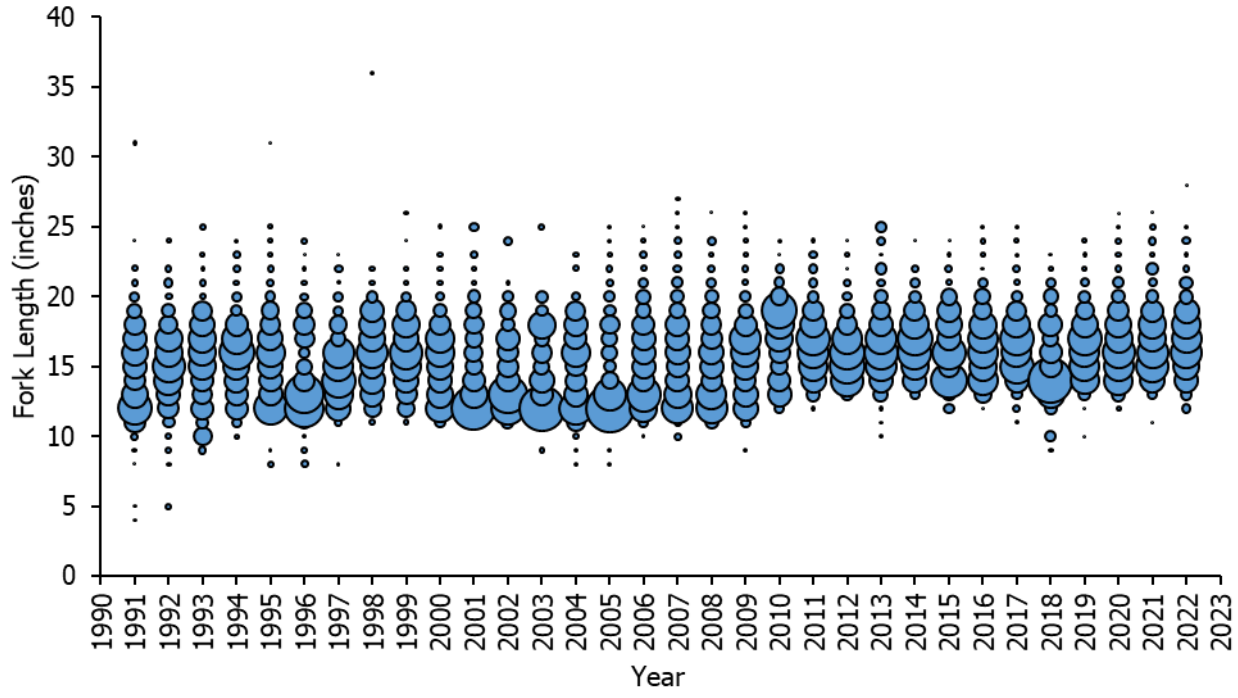

Figure 7. Recreational length frequency (fork length, inches) of spotted seatrout harvested biological year 1991–2022. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

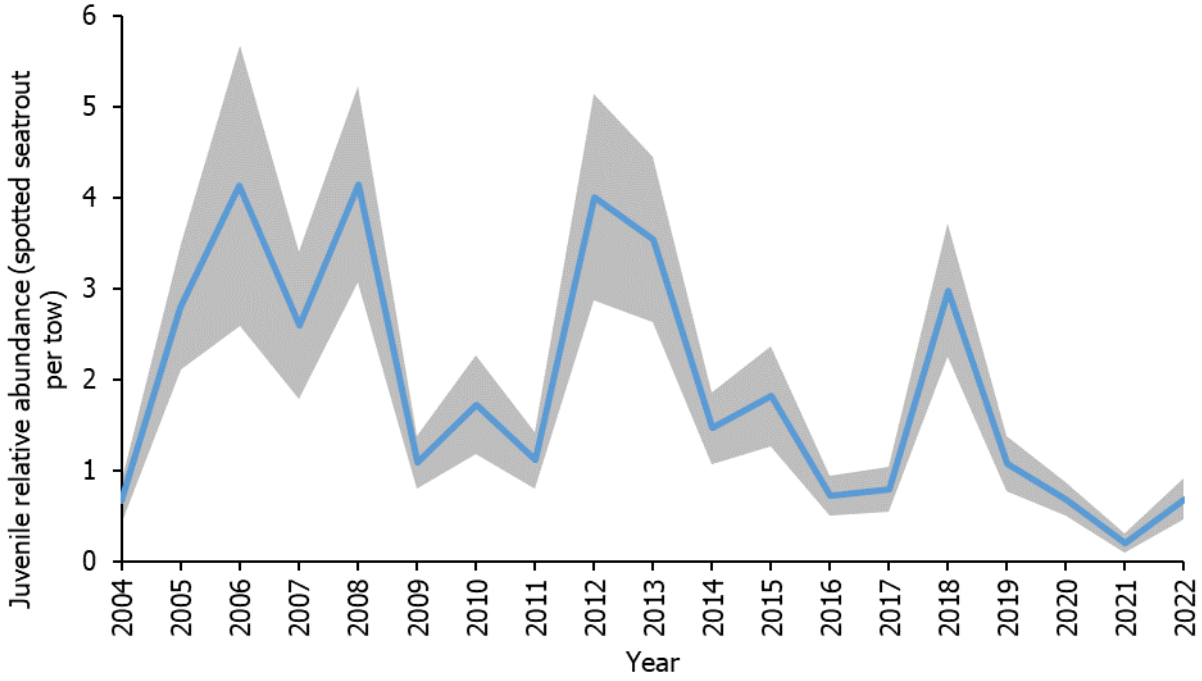

Figure 8. Relative abundance index (fish per tow) from the North Carolina Estuarine Trawl Survey (Program 120) during June and July, 2004–2022. Error bars represent ± 1 standard error.

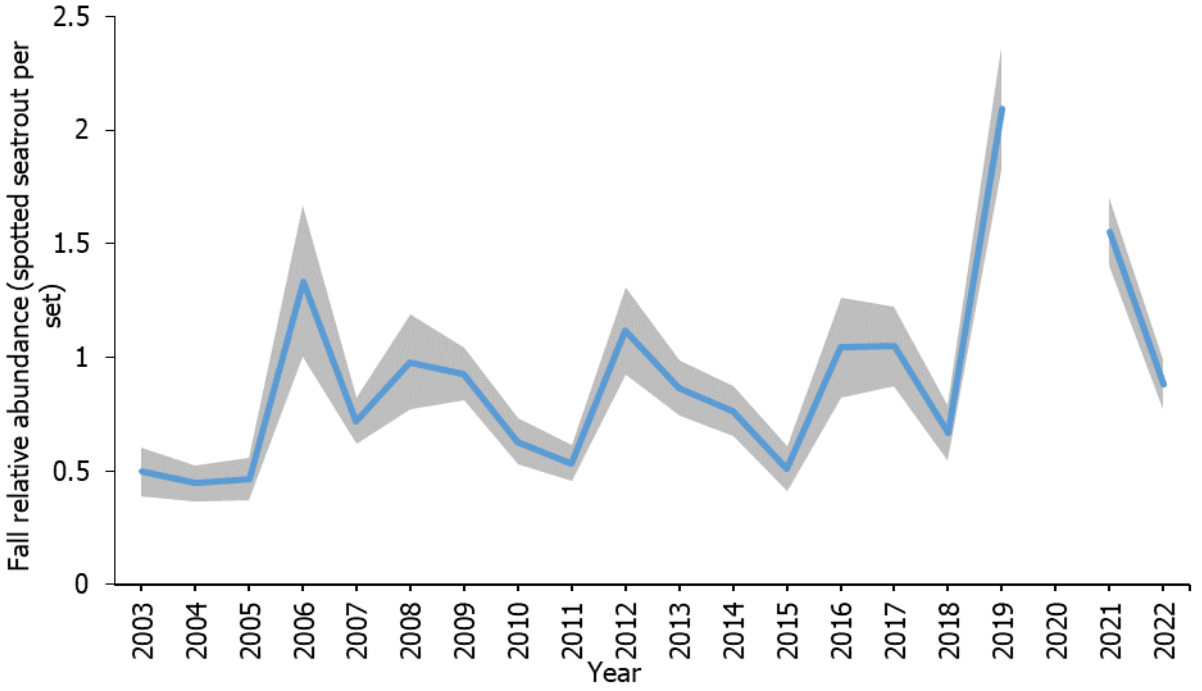

Figure 9. Fall relative abundance index (fish per set) of spotted seatrout collected from Program 915 in Pamlico Sound, Pamlico River, Pungo River, and Neuse River during September, October, and November 2003–2022. Error bars represent ± 1 standard error. Sampling not conducted in 2020 for the Fall Index.

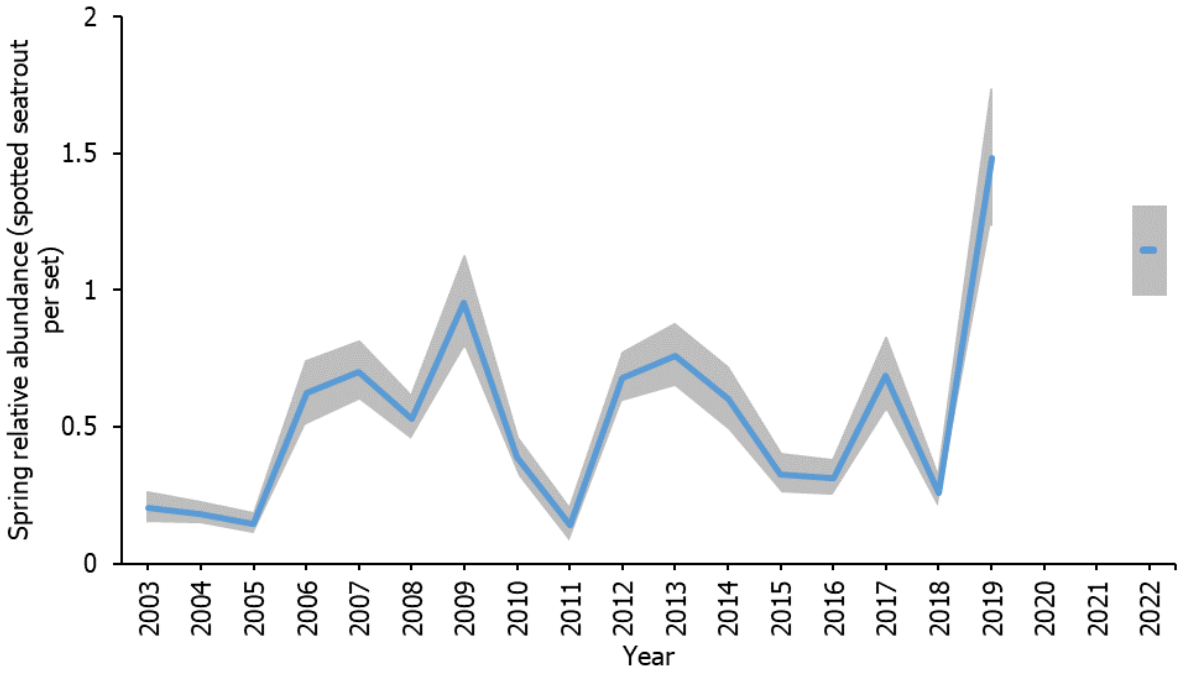

Figure 10. Spring relative abundance index (fish per set) of spotted seatrout collected from Program 915 in Pamlico Sound, Pamlico River, Pungo River, and Neuse River during April, May, and June 2003–2022. Error bars represent ± 1 standard error. *Sampling not conducted in 2020 or April, May, and June of 2021.

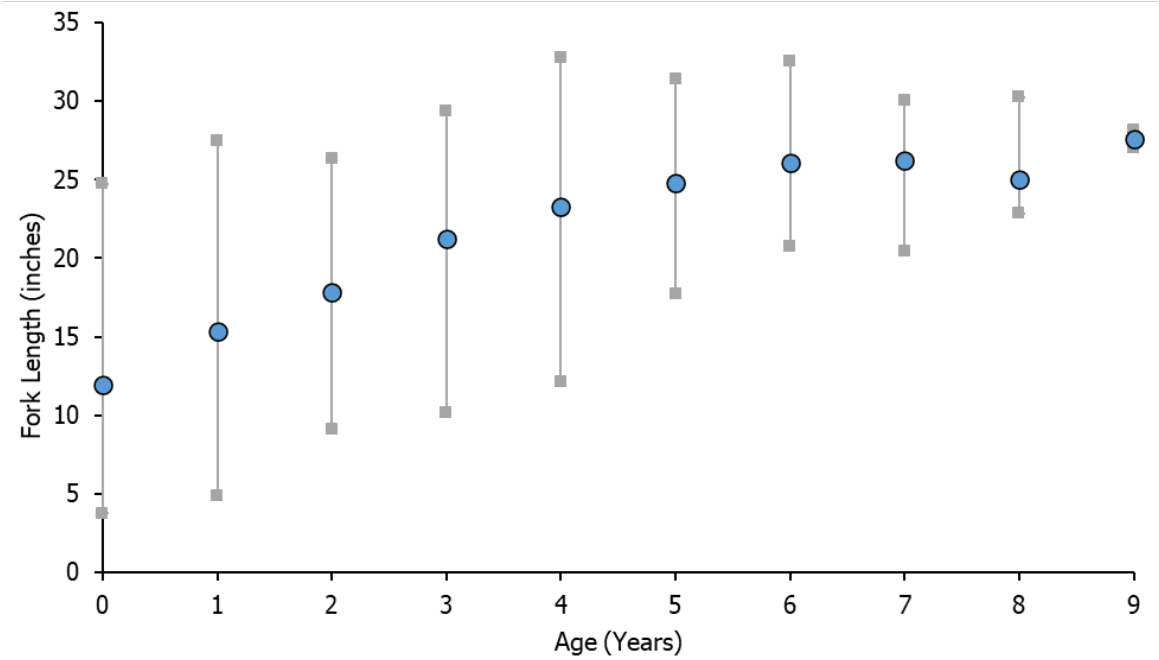

Figure 11. Spotted seatrout length at age based on all age samples collected from calendar year 1991 to 2022. Blue circles represent the mean size at a given age while the grey squares represent the minimum and maximum observed size for each age.

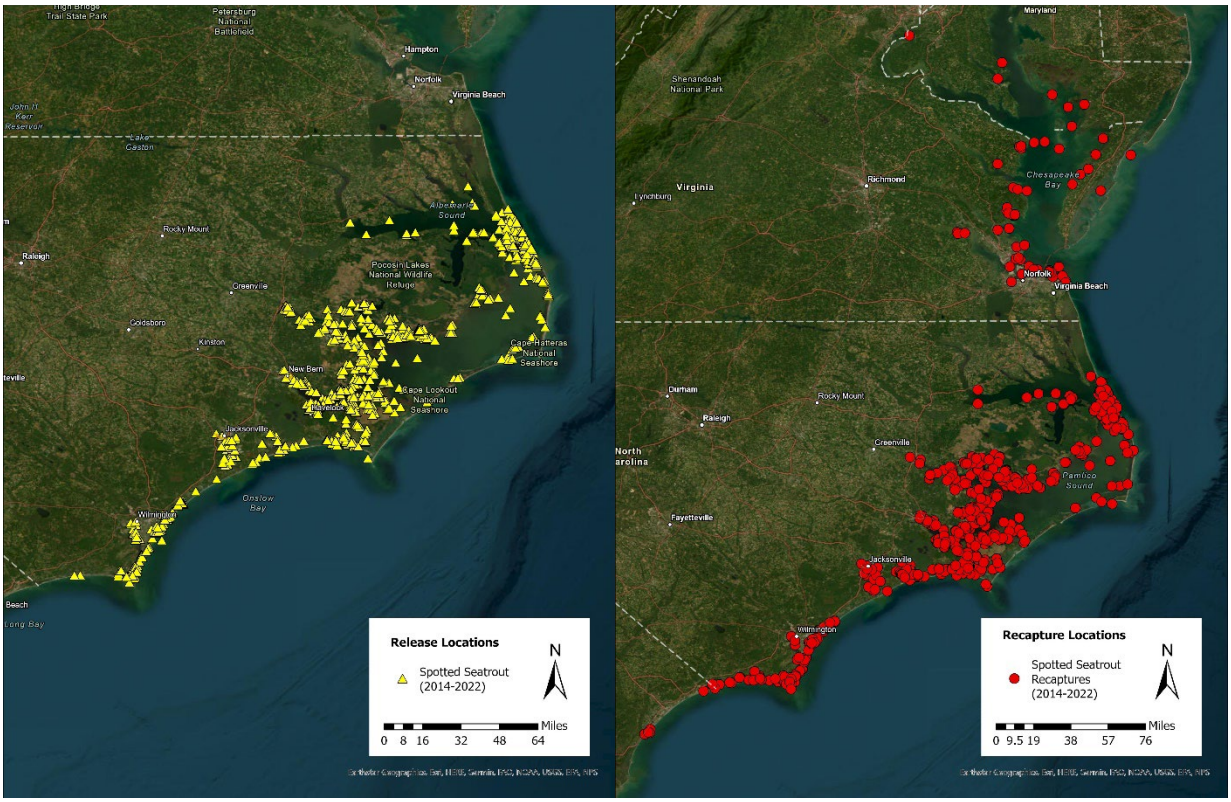

Figure 12. Spotted seatrout release locations (left map, yellow triangles) and recapture locations (right map, red circles) for spotted seatrout tagged in the DMF Multi-Species Tagging Program from calendar year 2014-2022.