FISHERY MANAGEMENT PLAN UPDATE – SCHEDULE CHANGE RECOMMENDED
SPOTTED SEATROUT
AUGUST 2018

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

Original FMP Adoption:	February 2012
Amendments:	None
Revisions:	None
Supplements:	Supplement A to the 2012 FMP – February 2014
Information Updates:	None
Schedule Changes:	N/A
Next Benchmark Review:	Late 2018

Spotted seatrout *(Cynoscion nebulosus)* are managed under the authority of two state and one interstate fishery management plans (FMP). The North Carolina Marine Fisheries Commission (NCMFC) currently manages spotted seatrout under the North Carolina Spotted Seatrout FMP (NCDMF 2012) and Supplement A to the 2012 FMP (NCDMF 2014a). Supplement A 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. This 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 the February 2014 NCMFC meeting the commission 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 an amendment is completed.

As required in the approved 2012 FMP, a stock assessment was completed on schedule (2014-2015), peer reviewed, approved for management, and was presented to the NCMFC at its May 2015 business meeting. A new benchmark stock assessment will begin in late 2018 and incorporate data through the 2017 fishing year. The North Carolina Division of Marine Fisheries (NCDMF) is on schedule to review the current state FMP for spotted seatrout beginning in 2019 and determine if changes to management are needed through the FMP amendment process.

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 state 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).
- Manage the spotted seatrout stock to maintain sufficiently-high 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 (IJ FMP). The goal of the IJ 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 (NCDMF 2015).

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 include all spotted seatrout caught 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:

1. Develop an objective management program that provides conservation of the resource and sustainable harvest in the fishery.
2. Ensure the spawning stock is of sufficient capacity to prevent recruitment-overfishing.
3. Address socio-economic concerns of all user groups.
4. Restore, improve, and protect important habitats that affect growth, survival, and reproduction of the North Carolina spotted seatrout stock.
5. Evaluate, enhance, and initiate studies to increase understanding of spotted seatrout biology and population dynamics in North Carolina.
6. Promote public awareness regarding the status and management of the North Carolina spotted seatrout stock.

STATUS OF THE STOCK

Life history

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. They inhabit shallow coastal and estuarine waters throughout their range and are considered a euryhaline species. In North Carolina, the current state record was recorded at 12.3 pounds in 1961. The maximum reported age of spotted seatrout is 9 years in North Carolina for both male and female fish. Most spotted seatrout in North Carolina are mature by age 1 and 7.9 inches for males and 9.6 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. Spawning occurs within the first few hours after sunset and a single fish is capable of spawning multiple times (batch spawners) throughout the season. In Florida, it has been observed that during peak spawning, spotted seatrout older than 3 years old may spawn every two days while younger fish may spawn as frequently as every four days. Estimates of the number of eggs a female can produce in a year from the Southeast and Gulf Coasts vary, based on size and age and range, from 3 million to 20 million per year.

Stock Status

The 2014 North Carolina spotted seatrout stock assessment (NCDMF 2014b) indicated that the spotted seatrout stock in North Carolina and Virginia is not overfished and overfishing in not occurring. Reference points (SSB and F) for determining stock status were calculated from the assessment using the SPR thresholds (20% SPR) and targets (30%SPR) defined in the spotted seatrout FMP (NCDMF 2012). The model estimated $SSB_{20\%}$ at 394 metric tons and $SSB_{30\%}$ at 623 metric tons with a model terminal year (2012) SSB estimate of 2,513,270 pounds. Based on these results, the stock is not currently overfished ($SSB_{2012} < SSB_{20\%}$) and has not been overfished during the 1991 to 2012 time period (Figure 1). Fishing mortality reference points estimated from the model were $F_{20\%}$ at 0.656 and $F_{30\%}$ at 0.422 with a terminal year estimate of F at 0.401, close to the F target, but still below, suggesting that overfishing is not occurring ($F_{2012} < F_{20\%}$; Figure 2).

Stock Assessment

The 2014 assessment of the spotted seatrout in North Carolina and Virginia was conducted using a Stock Synthesis model that incorporated data collected from commercial and recreational fisheries, two fishery-independent surveys, and a tagging study (NCDMF 2014b). This approach differs from the previous NCDMF assessment of spotted seatrout, which was applied to data available from 1991 through 2008. The previous assessment used the ASAP2 statistical catch-at-age model and data more limited in both area and time. The previous model relied primarily upon fishery-dependent data, one fishery-independent index, and included age data only from the North Carolina portion of the stock.

The Stock Synthesis model has been thoroughly vetted through the stock assessment community and peer reviewed literature. The time period used for the assessment was 1991 through 2012 and relied on expanded fishery-independent data sources, including age data from the Virginia portion of the stock, a juvenile abundance index, and tag-return data from research conducted by North Carolina State University (Ellis 2015). The fishing year was changed from a calendar year to a biological year (defined as March 1 through February 28 or 29) to allow the model to incorporate cold stun mortalities within a single fishing year instead of across two calendar years. The maximum age was decreased from 12 years (previous assessment) to nine as the 12-year maximum was based on scale ages not otoliths. Only ages derived from otoliths were used in the current assessment.

Tagging data from Ellis' (2015) study was included in the model but did not have a significant influence on results. Multiple model configurations were attempted to account for varying natural mortality ranging from direct tagging estimates to estimates based on water temperature correlations: however, no model configuration incorporating varying natural mortality would produce results (converge). Ellis' (2015) data did provide further evidence of the highs and lows associated with spotted seatrout natural mortalities and the need for a custom model that can incorporate these highly variable mortality rates. The NCDMF recognized the need to develop a model that will accept variable natural mortality estimates. Developing a custom model that can incorporate variable natural mortality was added as a research recommendation and the NCDMF will continue to investigate this during the next benchmark assessment.

The results of this assessment suggest the age structure of the spotted seatrout stock has been expanding during the last decade. However, an abrupt decline is evident in the model's estimate of recruitment after 2010, although this is not mirrored in the empirical survey data. Spawning stock biomass (SSB) increased to its maximum in 2007 but has since declined to close to the time series average. In 2012, estimated SSB was 2,513,270 pounds, which is greater than the currently defined threshold for assessing whether the stock is overfished (SSB30%=868,621 pounds; Figure 1). Fishing mortality has varied without apparent trend, but periods of high fishing mortality seem to coincide with the decline in spawning stock biomass and may be attributed to cold stun events. The 2012 estimate of fishing mortality was 0.40, which is less than the fishing mortality threshold (F20%=0.66), indicating that the stock is not experiencing overfishing; however, the 2012 estimate of fishing mortality (0.40) is very near the target fishing mortality of F30%=0.42 (Figure 2).

The current stock assessment will be updated with data through 2017 for the scheduled plan review starting in 2019.

STATUS OF THE FISHERY

Current Regulations

The NCDMF 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 NCDMF has the authority to close the fishery until the following spawning period.

Commercial Landings

Commercial landings from 2017 (299,875 pounds) exceeded the 10-year average for the fishery (Table 1; Figure 3). Annual landings over the last 10-year period have averaged 246,010 pounds but have varied by almost 300,000 pounds (2011 and 2013). During the early to mid-1990s, landings in the ocean and estuarine areas were more similar than in the remainder of the time series (1995-2015) in which estuarine landings have dominated. The primary gear of harvest are estuarine gill nets (set, drift, and run around).

Recreational Landings

Recreational data are collected through an angler based survey program, the Marine Recreational Information Program (MRIP), and are reported in various harvest types with associated sampling error. Estimated recreational harvest (Type A + B1) of spotted seatrout in 2017 was 580,849 pounds (PSE = 12.5%) and 339,523 fish (PSE = 13.1%), similar to the 10 year averages of 609,318 pounds and 359,351 fish (Table 1; Figure 3). Estimated recreational releases in 2017 (1,122,503 fish; PSE = 13.1%) were below the 10 year average of 1,440,047 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. The Division collects information on the date, size, and location of these catches to monitor trends in the recreational fishery. Citations awarded through the North Carolina Saltwater Fishing Tournament for spotted seatrout have varied by year since 2008 and have averaged 242 citations over the period (Table 2). The number of awarded citations in 2017 increased from the previous year to 464, the highest recorded since 2007. The number of release citations (fish over 24 inches that are released) awarded almost doubled the previous year's count and accounted for the largest number of citations issued since the program began issuing release citations in 2008 (Table 2).

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

Commercial fish houses are sampled monthly to provide length, weight, and age data to describe the commercial fisheries. 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 number of fish sampled by division staff at commercial fish houses has varied over time due to annual variability in landings of the fishery, however; mean, minimum, and maximum lengths of spotted seatrout have not varied much between years for the commercial fishery (Table 3). The average sizes of fish landed by the commercial fishery is typically larger than the recreational fishery and is primarily driven by the larger maximum size observed in the commercial landings. The bulk of spotted seatrout landings by the commercial fishery (93%) come from the ocean and estuarine gill net fishery with gigs (5.5%) and all other gears (1.5%) accounting for the rest.

Recreational catch is almost exclusively hook-and-line with few fish being landed by gigs. The average size of fish measured from the recreational fishery has increased over the last 10 years, most likely due to an increase in the minimum size limit from 12-inches (304 mm) to 14-inches (355 mm) in late 2009 (Table 3). The average size of fish caught by the recreational fishery in 2017 was 426 mm, which is similar to the average size of 429 mm over the last eight years since the minimum size was increased. The maximum size of fish in 2017 was 655 mm, an increase of 25 mm over the eight-year average.

Fishery-Independent Monitoring

The NCDMF utilizes numerous independent monitoring programs to provide indices of juvenile (Program 120) and adult (Program 915) 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, June and July. One of the key objectives of this program is to provide a long-term data base 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 are sampled during the months of June and July. Data from the seatrout specific stations is used to generate an index of relative abundance of age zero spotted seatrout. The resulting Catch Per Unit Effort (CPUE) index, which is the average number of fish per tow, for the current 10-year time series remained somewhat constant with no significant trends in CPUE but with peaks in 2008, 2012, and 2013, suggesting relatively higher recruitment in those years (Figure 4). The 2017 Program 120 spotted seatrout CPUE was below the 10-year average. Low juvenile abundance of spotted seatrout typically occurs in years where adult abundance is high and spikes in the juvenile index are often observed in years after severe cold stun events.

The NCDMF 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 sized 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 that encompass 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. Over the last 10 years, CPUE from Pamlico Sound have remained steady with an upward trend over the last two years (Figure 5). Central river stations that include Pamlico, Pungo and Neuse Rivers have had a general declining trend in CPUE (Figure 6). Southern river stations, which include the Cape Fear and New rivers, CPUE varied without trend over the time series (Figure 7).

Spotted seatrout collected during the independent gill net survey are sampled for length frequency and age to generate age length keys useful for assessment and stock monitoring. Since the inception of the program in 2001, 3,672 spotted seatrout have been aged from collections. Because sampling for the independent gill net survey is standardized based on gear, effort, and habitat sampled, ages from the program can be used to track cohorts as they recruit to the fishery. Healthy populations should display a range of ages throughout larger size classes and not exhibit a truncation of age classes. Over the last six years, ages of spotted seatrout collected from the independent gill net survey have been evenly spread across most size classes with above legal size fish (> 14-inches or 354 mm) ranging in age from one to seven years (Figure 8).

Spotted seatrout ages are also collected from numerous NCDMF fishery independent and dependent sources. To date, a total of 17,781 otoliths from spotted seatrout have been aged, the preferred method, since 1991 (Table 4). With the exception of 2003, the minimum age of sampled spotted seatrout has been age zero for every year the NCDMF has recorded this information. Maximum ages have varied every year and has ranged from age five to age nine. Modal ages, which give an indication of the age of the largest cohort in the fishery, has mostly been age one.

MANAGEMENT STRATEGY

Reduce F to maintain a 20% spawning potential ratio which will 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 that would 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. Consider revising reference points after the stock is reassessed in the next plan review based on the response of the population to the management measures selected in the initial FMP. The Director will maintain authority to intervene in the event of a catastrophic cold stun event and do what is necessary in terms of temporary closures by water body (Table 5 and 6).

RESEARCH NEEDS

The following research needs were compiled from those listed in the 2012 North Carolina Spotted Seatrout FMP. Improved management of spotted seatrout is dependent upon research needs being met. Research needs are not listed in order of priority**.**

- Develop a juvenile abundance index to gain a better understanding of a stock recruitment relationship – (ongoing, using program 120 since 2004)
- Research the feasibility of including measures of temperature or salinity into the stock recruitment relationship – (not completed)
- Determine batch fecundity estimates for North Carolina spotted seatrout – (ongoing; CRFL project 2F40-F035)
- Size specific fecundity estimates for North Carolina spotted seatrout – (ongoing; CRFL project 2F40-F035)
- Area specific spawning surveys could help in the delineation of area specific closures to protect females in spawning condition – (not completed)
- Investigation of the relationship of temperature with both adult and juvenile mortality – (started in 2015, monitoring temperatures in over wintering habitat of spotted seatrout: CRFL project 2F40-F024)
- Incorporate cold stun event information into the modeling of the population – (unsuccessfully attempted using stock synthesis model, will be investigated further during next benchmark stock assessment)
- Estimate or develop a model to predict the impact of cold stun events on local and statewide spotted seatrout abundance – (unsuccessfully attempted using stock synthesis model, will be investigated further during next benchmark stock assessment).
- Obtain samples (length, age, weight, quantification) of the cold stun events as they occur – (obtained samples in 2001, 2014, and 2015; length, weight, sex, age; unable to quantify extent of kills)
- Define overwintering habitat requirements of spotted seatrout – (not conducted)
- Determine factors that are most likely to influence the severity of cold stun events in North Carolina, and separate into low and high salinity areas – (Tim Ellis and the spotted seatrout Plan Development Team worked on this but were unable to incorporate into models; Ellis et. al (2017))
- Investigate the distribution of spotted seatrout in nursery and non-nursery areas – (not completed)
- Further research on the possible influences of salinity on release mortality of spotted seatrout – (ongoing; CRFL project 2F40-F017, evaluation of tagging and discard mortality component)
- Survey of fishing effort in creeks with conflict complaints – (not completed)
- Determine targeted species in nursery areas and creeks with conflict complaints – (not completed)
- Microchemistry, genetic, or tagging studies are needed to verify migration patterns, mixing rates, or origins of spotted seatrout between North Carolina and Virginia – (Tim Ellis data (2008-2013); CRFL project 2F40-F017, NC Multi Species Tagging Study 2014 – present; NCSU study CRFL grant 2F40-F022)

- Tagging studies to verify estimates of natural and fishing mortality – (Tim Ellis data (2008-2013); CRFL project 2F40-F017, NC Multi Species Tagging Study 2014 – present)
- Tagging studies to determine if there are localized populations within the state of North Carolina (e.g., a southern and northern stock) – (Tim Ellis data (2008-2013); CRFL project 2F40-F017, NC Multi Species Tagging Study 2014 - present)
- A longer time series and additional sources of fishery-independent information – (longer series available as well as Program 915 survey for rivers and southern portion of state)
- Increased observer coverage in a variety of commercial fisheries over a wider area – (ongoing)
- Expand nursery sampling to include SAV bed sampling in high and low salinity areas during the months of July through September – (not completed)
- Evaluate the role of shell hash and shell bottom in spotted seatrout recruitment and survival, particularly where SAV is absent – (not completed)
- Evaluate the role of SAV in the spawning success of spotted seatrout – (not completed)

FISHERY MANAGEMENT PLAN RECOMMENDATIONS

The Marine Fisheries Commission approved the 2017 FMP schedule in August 2017, including this schedule change for spotted seatrout to begin in 2019, two years later than originally planned. This is due to staff workload for the review of the Southern Flounder Fishery Management Plan, the early review of the Estuarine Striped Bass Fishery Management plan, and the unscheduled review of the Blue Crab and Shrimp Fishery Management Plans. A stock assessment was completed on spotted seatrout in North Carolina and Virginia in 2014 and indicated the stock was in good shape and removals were considered sustainable for the long-term benefit of the stock. Data through 2017 do not indicate anything to the contrary. A new benchmark stock assessment will be completed before the next scheduled plan review.

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TABLES

Table 1. Recreational harvest (number of fish released and weight in pounds) and releases (number of fish) and commercial harvest (weight in pounds) of spotted seatrout from North Carolina for the period 2008 - 2017.

	Recreational			Commercial	
	Number of fish		Weight (lb)		
Year	Released	Harvested	Harvested	Harvested (lb)	Total Weight Harvested (lb)
2008	880,560	654,435	1,005,548	304,430	1,309,978
2009	1,213,526	608,790	954,845	320,247	1,275,092
2010	1,684,872	195,065	407,534	202,647	610,181
2011	1,916,249	215,922	403,517	75,239	478,756
2012	1,646,512	500,522	817,551	265,016	1,082,567
2013	1,427,410	369,265	649,158	367,648	1,016,806
2014	960,570	234,045	433,978	242,245	676,223
2015	1,776,280	87,396	148,926	128,762	277,688
2016	1,771,989	388,544	691,277	253,991	945,268
2017	1,122,503	339,523	580,849	299,875	880,724

Table 2. Total number of awarded citations for spotted seatrout (>24 inches total length for release or > five lb landed) from the North Carolina Saltwater Fishing Tournament for the time period 2008-2017.

Year	Total Citations	Release Citations^{+}	% Release
2008	428	5	1.2
2009	434	14	3.2
2010	168	16	9.5
2011	37	3	8.1
2012	143	5	3.5
2013	162	21	13.0
2014	197	18	9.1
2015	176	16	9.1
2016	214	44	20.1
2017	464	81	17.5

Table 3. Mean, minimum, and maximum lengths (total length, mm) of spotted seatrout measured from the commercial and recreational fisheries for the period 2008-2017.

	Commercial				Recreational			
Year	Mean Length	Minimum Length	Maximum Length	Total Number Measured	Mean Length	Minimum Length	Maximum Length	Total Number Measured
2008	437	43	770	4,893	397	293	674	790
2009	427	71	749	5,534	407	230	661	779
2010	448	290	784	3,372	448	315	630	336
2011	421	223	706	1,082	431	313	615	638
2012	419	187	791	4,216	415	330	612	939
2013	425	46	723	5,661	428	256	598	863
2014	441	139	719	3,184	436	332	660	379
2015	467	225	786	2,485	425	325	634	152
2016	438	240	805	2,873	427	329	639	647
2017	444	193	835	2,768	426	295	655	864

Table 4. Modal age, minimum age, maximum age, and number aged for spotted seatrout collected through NCDMF sampling programs from 1991 through 2016.

Year	Modal Age	Minimum Age	Maximum Age	Number Aged
1991	1	0	7	707
1992	1	0	6	594
1993	1	0	6	698
1994	1	0	9	701
1995	1	0	5	653
1996	1	0	6	1,010
1997	1	0	6	730
1998	1	0	9	781
1999	1	0	6	877
2000	1	0	7	566
2001	1	0	5	426
2002	1	0	7	715
2003	1	1	7	433
2004	1	0	6	600
2005	1	0	5	731
2006	1	0	8	974
2007	2	0	8	706
2008	1	0	7	619
2009	2	0	6	663
2010	1	0	6	646
2011	1	0	6	429
2012	1	0	5	598
2013	2	0	5	641
2014	1	0	7	555
2015	2	0	5	401
2016	1	0	5	457
2017	1	0	7	870

Table 5. Summary of the NCMFC 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 NCDMF 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 NCDMF, Universities, etc.	Ongoing

Table 6. Summary of the NCMFC 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 1 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

FIGURES

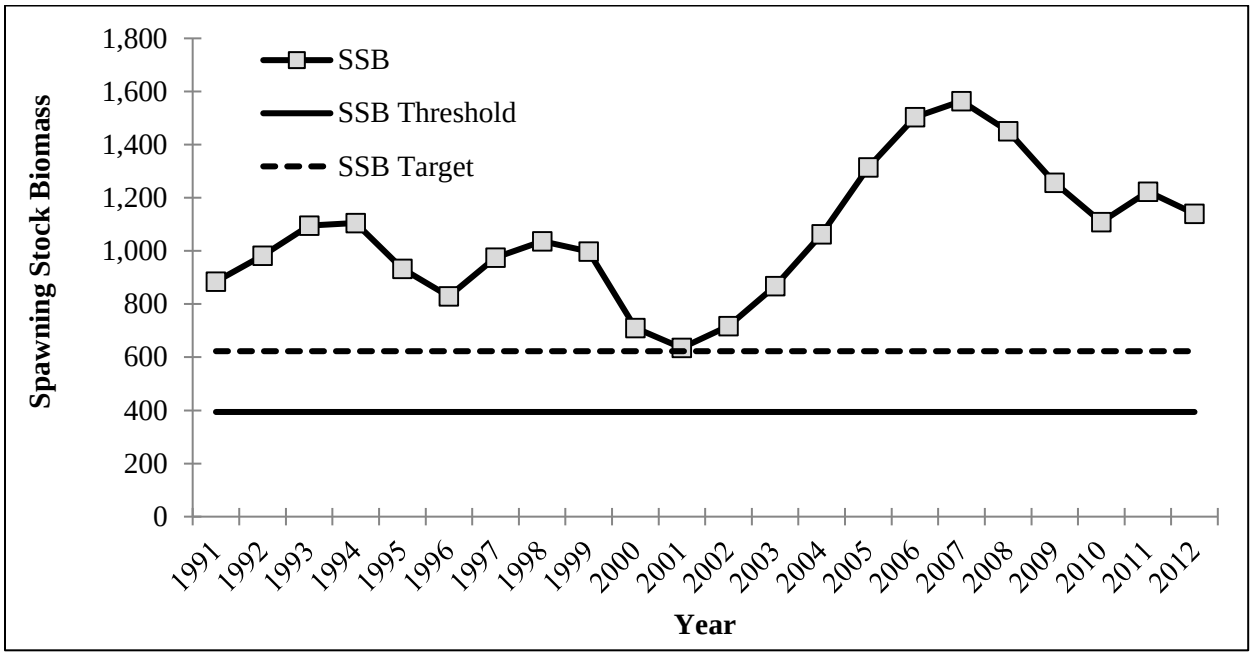

Figure 1. Annual predicted spawning stock biomass compared to estimated $SSB_{Threshold}$ ($SSB_{20\%}$) and SSB_{Target} ($SSB_{30\%}$), 1991-2012. 2012 is the terminal year for the last spotted seatrout stock assessment (NCDMF 2014).

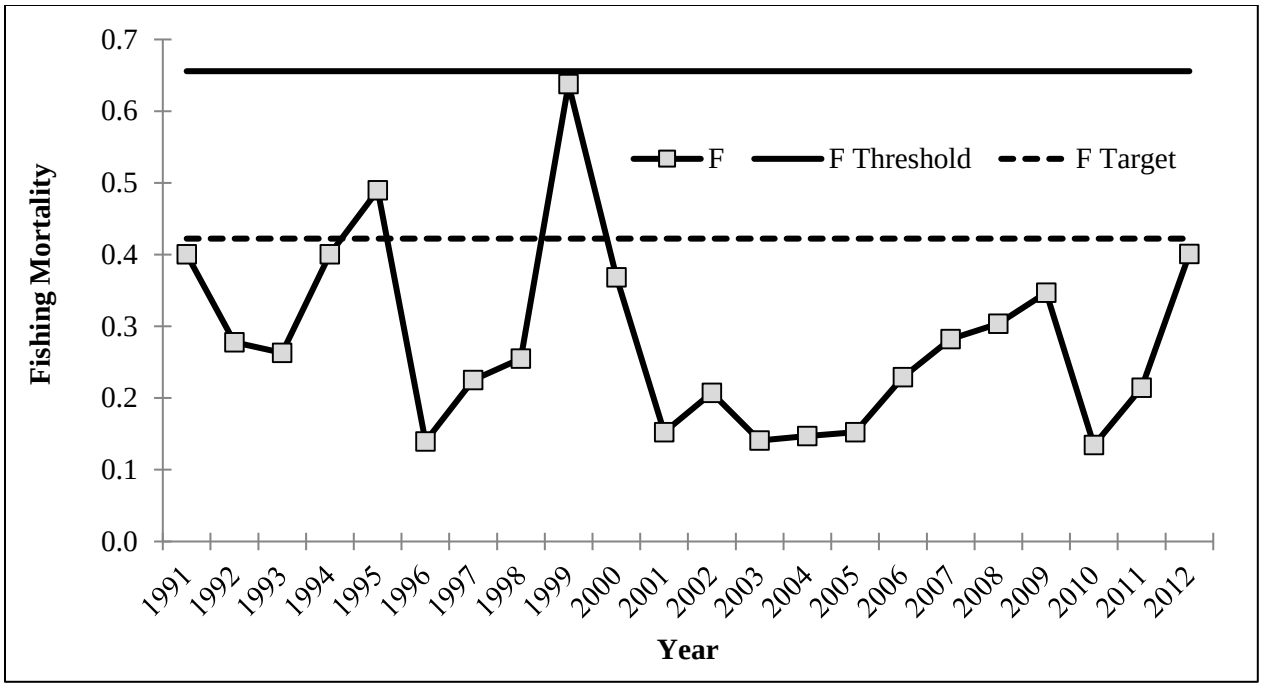

Figure 2. Annual predicted fishing mortality rates (numbers-weighted, ages 1–4) compared to estimated $F_{\text{Threshold}}$ ($F_{20\%}$) and F_{Target} ($F_{30\%}$), 1991-2012. 2012 is the terminal year for the last spotted seatrout stock assessment (NCDMF 2014).

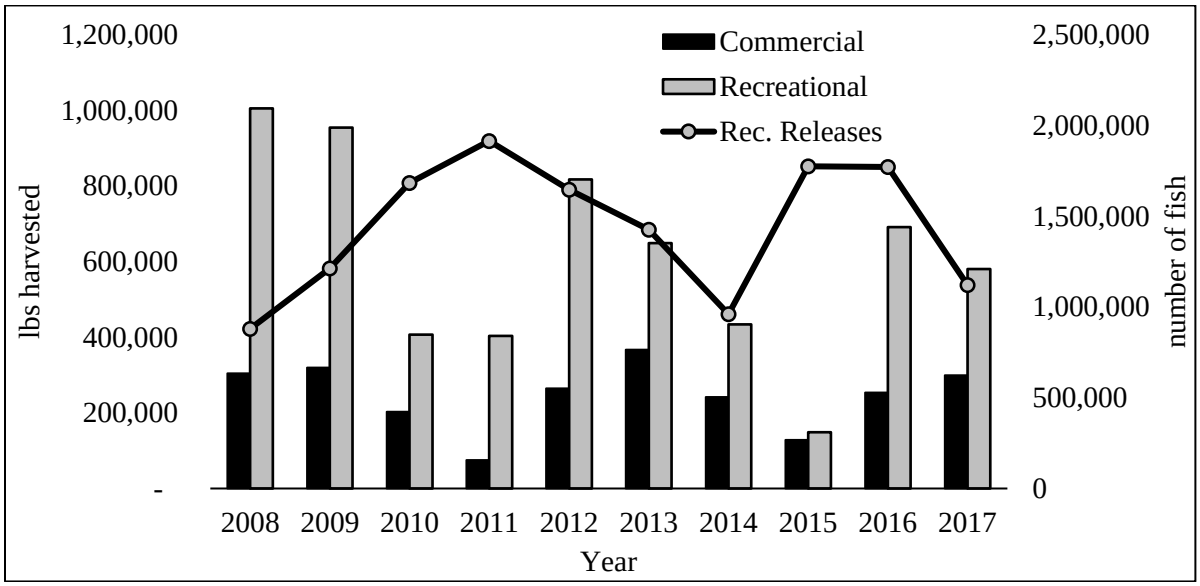

Figure 3. Commercial landings (pounds) reported through the North Carolina Trip Ticket Program and recreational landings (Type A + B1; pounds) and releases (Type B2; number of fish) estimated from the Marine Recreational Information Program survey for North Carolina from 2008 - 2017.

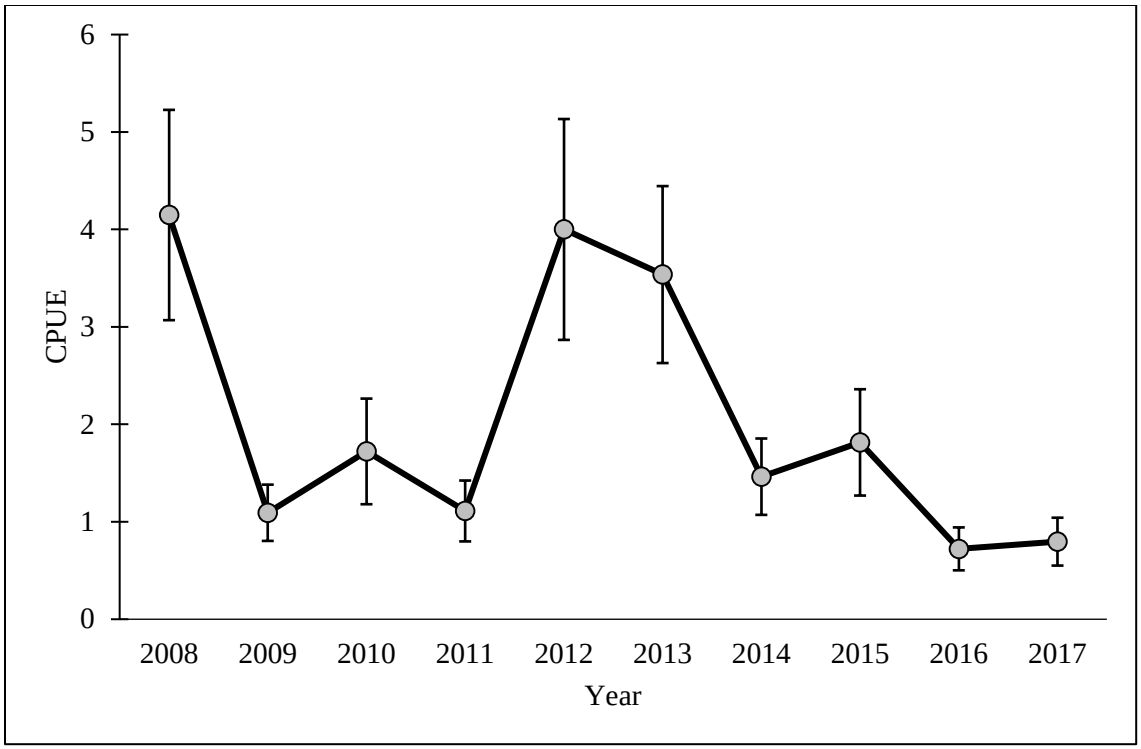

Figure 4. Catch per unit effort (CPUE; fish per-tow) from the North Carolina Estuarine Trawl Survey (Program 120) during June and July, 2008-2017. Error bars represent ± 1 standard error.

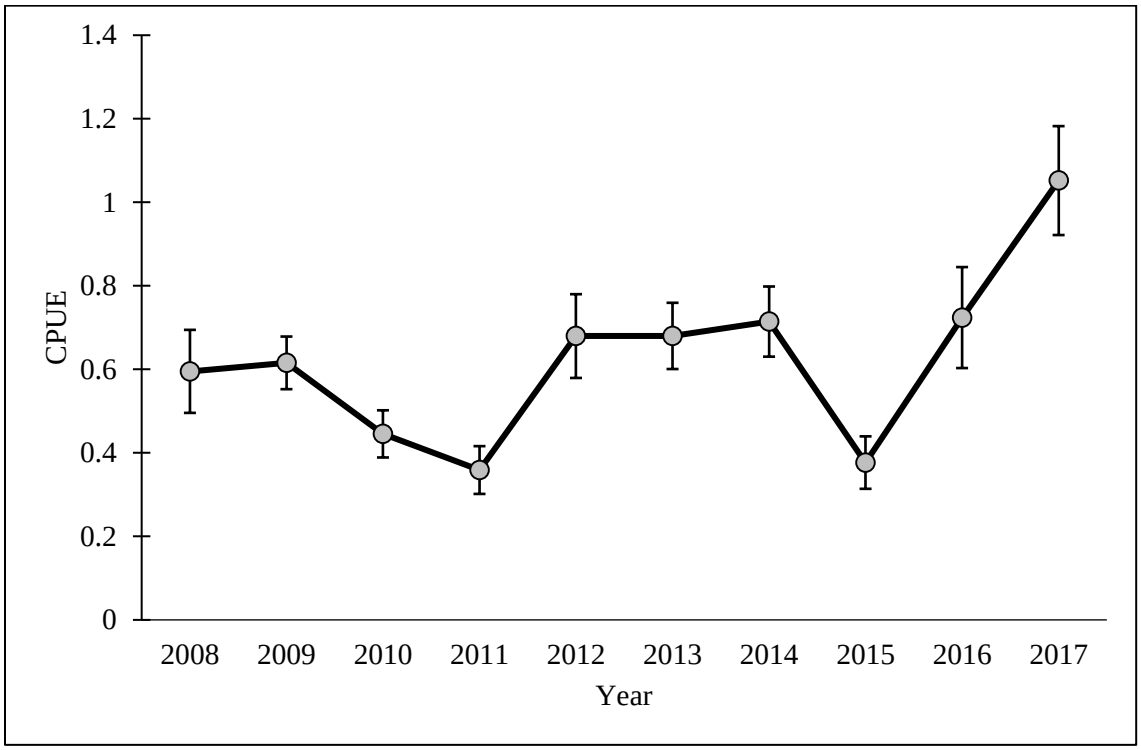

Figure 5. Catch per unit effort (CPUE; fish per station set) of spotted seatrout collected from Program 915 in Pamlico Sound, 2008 - 2017. Error bars represent ± 1 standard error.

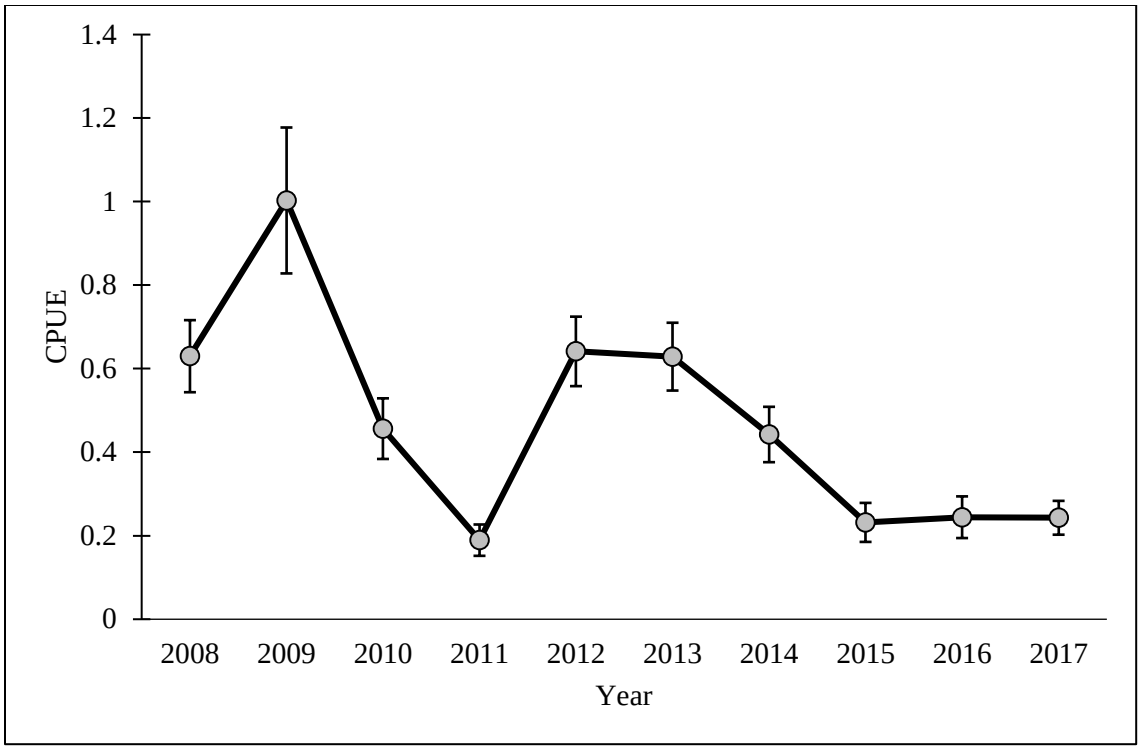

Figure 6. Catch per unit effort (CPUE; fish per station set) of spotted seatrout collected from Program 915 in Pungo, Pamlico, and Neuse Rivers, 2008 - 2017. Error bars represent ± 1 standard error.

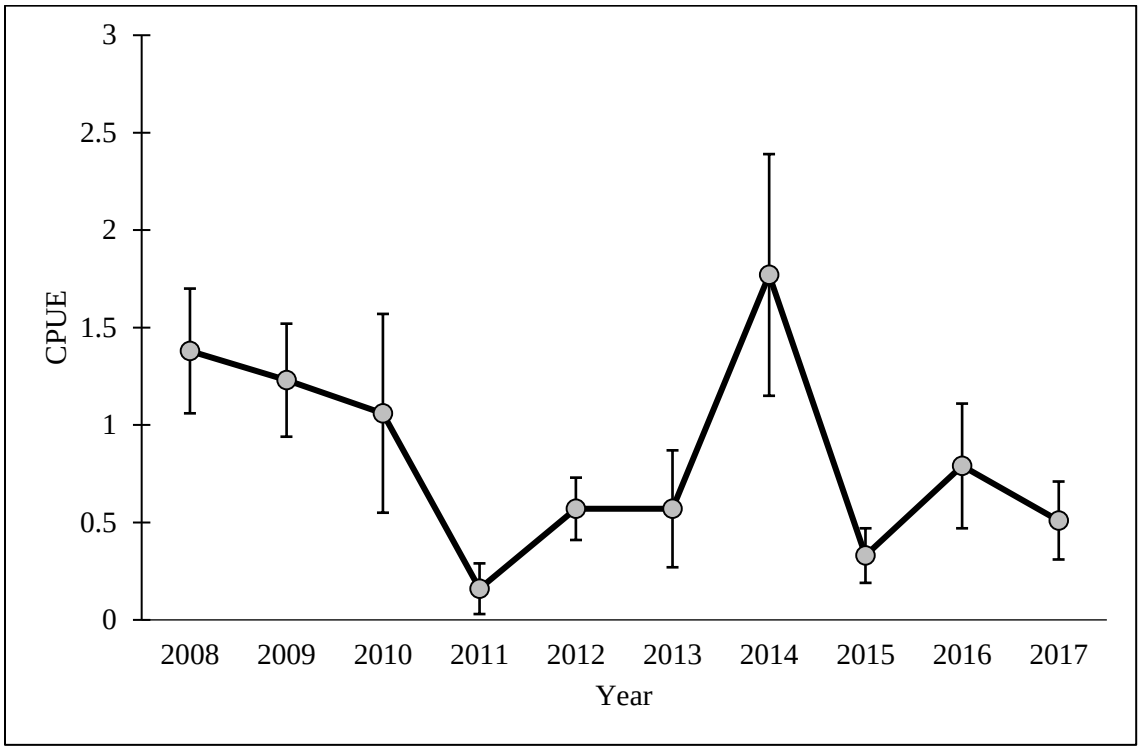

Figure 7. Catch per unit effort (CPUE; fish per station set) of spotted seatrout collected from Program 915 in New and Cape Fear Rivers, 2008 - 2017. Error bars represent ± 1 standard error.

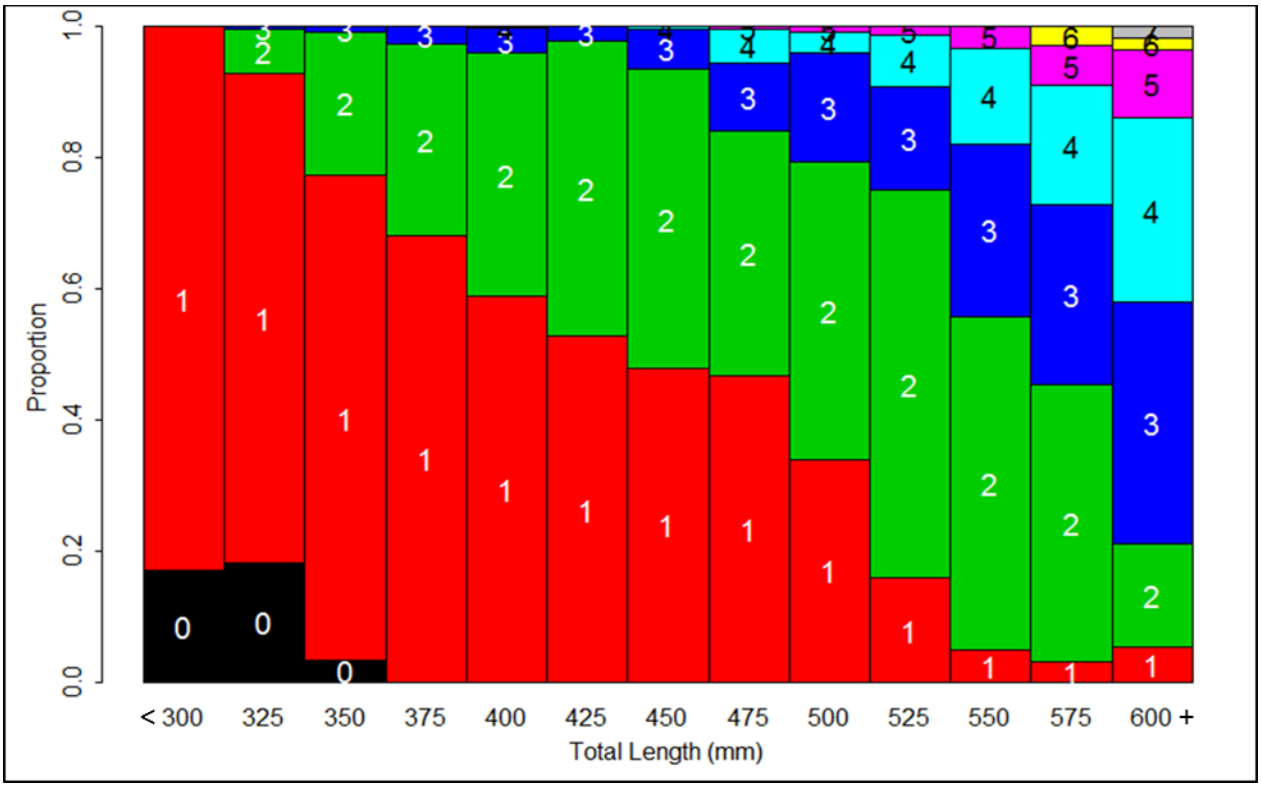

Figure 8. Proportion of ages by size class (25 mm size bins) of all spotted seatrout collected from the Fishery Independent Gill Net Survey (Program 915) and aged by NCDMF, 2012-2017.