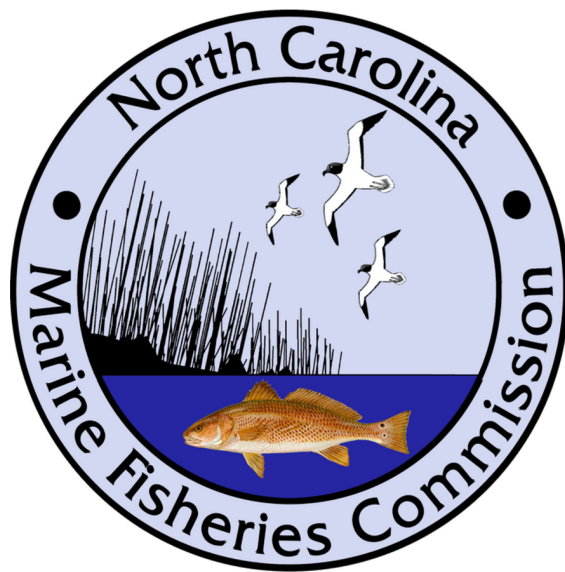


# SOUTHERN REGIONAL ADVISORY COMMITTEE



SEPTEMBER 25, 2024

*Briefing Materials*

Southern Regional Advisory Committee

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**N.C. MFC Southern Regional Advisory Committee  
DEQ Wilmington Regional Office, Wilmington, NC**

**September 25, 2024**

**6 p.m.**

6:00 p.m. Call to Order\*

**Vote on the Approval of the Agenda\*\***

**Vote on the Approval of the Minutes from April 10, 2024 \*\***

6:05 p.m. Presentation on the status of the Blue Crab stock and the Fishery Management Plan Amendment 3 Adaptive Management

*An update on the status of the Blue Crab stock and the framework to implement Adaptive Management through Amendment 3*

6:35 p.m. Public Comment

6:50 p.m. Discussion on Blue Crab FMP Amendment 3 Adaptive Management Potential Options

*Collaborative conversation between the Division and the Advisory Committee on options available under the Adaptive Management framework adopted in Amendment 3.*

7:50 p.m. Issues from AC Members

8:00 p.m. Adjourn

**\* Times indicated are merely for guidance. The committee will proceed through the agenda until completed.**

**\*\*Action Items**



ROY COOPER  
*Governor*

ELIZABETH S. BISER  
*Secretary*

KATHY B. RAWLS  
*Director*

April 11, 2024

**MEMORANDUM**

**TO:** Marine Fisheries Commission  
Southern Regional Advisory Committee

**FROM:** Tina Moore, Southern District Manager  
Chris Stewart, Biologist Supervisor  
Fisheries Management Section

**SUBJECT:** Meeting of the Marine Fisheries Commission's Southern Regional Advisory Committee, Apr. 10, 2024, to provide recommendations for management options for Marine Fisheries Commission consideration on protection of critical seagrass habitat through shrimp trawl area closure

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The Marine Fisheries Commission's (MFC) Southern Regional Advisory Committee (AC) held a meeting on Apr. 10, 2024, at the N.C. Division of Marine Fisheries, Central District Office, Morehead City, North Carolina. Advisory Committee members attended in person, public comment was received in-person and the meeting was streamed to the public not in attendance via YouTube.

The following Advisory Committee members were in attendance: Fred Scharf, Tom Smith, Jason Fowler, Jeremy Skinner, Tim Wilson, Pam Morris, Ken Siegler, Michael Yates (Absent – Sam Boyce, Jeff Harrell, and Truby Proctor).

Division of Marine Fisheries (DMF) Staff: Chris Stewart, Tina Moore, Kathy Rawls, Jeff Dobbs, Jason Rock, Dan Zapf, Garland Yopp, Ashley Bishop, Carter Witten, Debbie Manley, Michelle Brodeur, Brooke Anderson, Chloe Dorian, Lucas Pensinger, Charlie Deaton, and Mike Loeffler

Public: Glenn Skinner, Richard Wade, Thomas Smith, Monica Smith, Robert Buckley, Mike Lewis, Jared Davis, C. R. Frederick, Michael Cowdrey, Chris Elkins, Wesley Potter, Woody Daughetry, Lee Edens, Ivey Edens, Cayla Camm, Ike Edens, Gracie Edens, Brady Hattfield, Shane Griffin, Temple S. Chadwick, Kathy Wilson, Landon Merkley, Camryn Rose, Stephen Smith, Larry Mizelle, Justin Mizelle, Cayton Daniels, Sherri Davis, Stevie Davis, Frances Ann Moran Griffield, John McQuaid, Allyn Powell. Thirty-five viewers watched on YouTube.

The Southern Regional AC had eight members present at the start of the meeting and a quorum was met.

Southern Regional AC Chair Fred Scharf called the meeting to order at 6:03 p.m. The Chair opened the floor for the AC members and DMF staff to provide introductions.

**APPROVAL OF THE AGENDA AND APPROVAL OF THE MINUTES**

**A motion was made to approve the agenda by Tom Smith. Second by Jason Fowler. The motion passed without objection.**

**A motion was made to approve the minutes from the Southern Regional AC meeting held on Jan. 10, 2024. Motion by Jason Fowler to approve the minutes. Second by Tom Smith. The motion passed without objection.**

### **PRESENTATION OF THE PROTECTION OF CRITICAL SEA GRASS HABITAT THROUGH SHRIMP TRAWL AREA CLOSURES**

Steve Poland, Section Chief, Fisheries Management provided introductory remarks for context of this meeting. The MFC instructed DMF to look at current SAV layers on maps and bring the MFC options for shrimp trawls closures to protect SAV as part of the Shrimp FMP Amendment 2 adopted in 2022. Chris Stewart, lead biologist for shrimp, presented the issue paper provide to this AC tonight at the MFC in Feb. 2024 and the MFC passed a motion to bring the issue paper to the MFC regionals and Shellfish Crustacean ACs for further input. Adjustments to the closure options that will be presented tonight but are not shown in the issue paper. This action was directed to DMF by the MFC, and any closures would be implemented by proclamation through adaptive management adopted in Amendment 2 of the Shrimp FMP. The intent is to work collaboratively with stakeholders to balance protection of SAV and limit impacts to the shrimp trawl industry. The DMF is stretching the timeline to bring their recommendations to the MFC later this year from the initial May 2024 meeting. DMF will reach out to more stakeholders for direct input and encourage the public to reach out to participate in these smaller stakeholder group discussions.

Chris Stewart presented information on submerged aquatic vegetation (SAV) overlays also known as the SAV mosaic with the current open and closed areas to trawling and initial DMF lines to extend areas closed to shrimp trawling to protect SAV. He iterated several times in the presentation, this was the first step to allow for stakeholder input and that the proposed closures were intended as a starting point to get discussion going. He noted the adaptive management strategy was directly from the MFC in the Shrimp FMP Amendment 2 and limited to addressing shrimp trawls impacts to SAV. He encouraged the public to reach out to the two other commissions who are responsible for the Coastal Habitat Protection Plan (CHPP) that deal more directly with water quality concerns. Information was provided on the importance of SAV as a critical habitat and impacts to this habitat from bottom-disturbing gears. Aerial imagery with sampling conducted randomly at sites was updated to identify the maximum known extent of SAV in NC from 1981-2021. The original DMF options would close about 9.5% of the current open shrimp trawl areas and he went through the maps of the proposed line changes by region as well as alternative options not shown in the issue paper that would reduce the extent of the closed areas. The MFC Habitat and Water Quality Advisory Committee met in Jan. 2024 and endorsed the current recommendations only after further input from stakeholders and recommended a monitoring program for SAV.

After the presentation questions and comments were brought forwarded from AC members. Tim Willis asked whether other states with similar estuaries have created a similar plan? Stewart responded NC is unique in allowing trawling in inside waters. The closest is Chandlier Bay, LA but they are limited much more than in our inside waters and Florida fines people for anchoring in SAV. Ken Siegler asked who is trawling in 18 inches of water, too shallow, so why make a law where they can't trawl anyways. Stewart added that the turbidity plume is also part of the issue with bottom disturbing gear near SAV. Seigler asked what impact does turbidity from barges going down the IWW have on SAV? Stewart responded navigational channels are outside of the scope of the Shrimp FMP. Seigler indicated that the proposed rules would be detrimental to smaller vessels (18 ft). Stewart explained the variables behind how long sediment plumes stay in the water column. Pam Morris stated that while the SAV mosaic provides the historical extent of SAV, it does not accurately depict where it is today. Morris further noted that she is seeing SAV beds becoming smaller and breaking apart in areas already closed to trawling. There is lack of science to show the trawlers are directly impacting SAV. Core Sound is shallow, and winds cause more turbidity than trawls. Stewart noted that the Albemarle-Pamlico National Estuary Partnership (APNEP) monitoring data has shown a net loss of SAV in NC and pointed to some of their recent publications that document the how

SAV has changed between surveys (2006-2007 vs. 2013). Stewart further noted that mapping data can be viewed for each mapping period but cautioned that the absence of SAV in some of the imagery is due to the area not being monitored as sampling occurs on a rotational schedule. Regarding the loss of SAV and continuous SAV beds, Stewart indicated that this is an indicator that these habitats are stressed and need further protection to aid in their recovery. Morris said there are multiple impacts causing the decline of SAV, including development along the coast, propeller strikes on shallow beds, and dredging channels by the park service. Morris added that creating new shrimp trawl management is not needed since shrimp trawlers don't work in areas where SAV is found and only burden enforcement in other areas. Seigler iterated trawling is not the main problem for the grass beds.

Chair Scharf called a five-minute break before starting public comment.

### **PUBLIC COMMENT**

Glenn Skinner – NC Fisheries Association (NCFA), Executive Director and commercial fisherman. We discussed at the NCFA board and voted to oppose all shrimp trawl closures. None of the closures are necessary because there is nothing to suggest that trawls are impacting SAV. Based on the Rules Review Commission has standards to determine these closures are justified or necessary through the Director's proclamation authority. They must show these closures are reasonably necessary to achieve the goal of saving SAV. When I looked up the definition of necessary the word food came up, the trawl fishermen produce food and essential workers to provide food. Therefore, these closures are arbitrary and ask for the AC to oppose the recommendations by the DMF.

Richard Wade – Commercial Fisherman with a 73-foot trawler. These closures will not affect me because I have a big vessel this will hurt the small boats. Has anyone looked at whether the already closed areas see if SAV has improved or declined? You need to look at areas already closed to trawling to verify if SAV has improved. In 1986 DMF Director Hogarth called fishermen ignorant, when we had a thriving industry. Science based management has ruined the trawling industry and the ecosystem.

Monica Smith – Represents Miss Gina's Seafood, Beaufort. A small group of fishermen and I met with the Director and staff earlier this week and I prepared a presentation I would be happy to share with you. I understand the importance of SAV, but there is a lack of science. We are not here to negotiate, we are here to fight, and I have five points to make. 1.) DMF cannot use scientific data to support closing areas that support SAV. Seventy-seven percent of the SAV mapped is already behind closed lines to trawling. 2.) In 1985 there were over 1,000 shrimpers and now is a fraction of fishermen in the industry. 3.) There is no scientific data to show what buffers should be. 4.) There is no economic analysis to show the impact these proposed closures will do to the industry. 5.) Shrimping in NC has a significant cultural and heritage value that is not considered. I request the AC to vote against these closures. More lines do not protect the SAV and DMF cannot definitively say the closures will improve SAV.

Thomas Smith – Represents Miss Gina's Seafood, Beaufort. I grew up as a kid in Core Sound. I had a skiff that I used to catch seafood and it supported me through college. Closing these areas will directly impact my income. I request the AC to deny the proposed closures until science catches up.

Robert Buckley – Harkers Island. I am not a fisherman, but I have come to this area for over twenty years to visit and bought property in 2019 that looks over Back Sound. When I first came here there were trawlers everywhere, now I rarely see a trawler. I bet the number will be reduced by 60-70%. I see fishermen working their tails off and this economy is killing us. Please recommend no more closures, there is no science and it seems like cherry picking.

Jared Davis – Commercial shrimper. I love being on the water. I love to share my heritage with my kids. You're taking food out of our mouths. These closures will hurt a lot of people. There is no data to support whether trawling affects SAV.

C. R. Fredrick – Commercial fisherman, Swansboro for over 50 years. I worked with NOAA on gear development of TEDs. He asked a few questions: Are props considered bottom disturbing gear? How does DMF survey SAV? Are otter trawls considered the same as skimmer trawls? Do SAV move? Once something is taken away from fishermen it is not given back. Trawlers cannot pull in grass a novice will do it but not for long. There are other issues hurting SAV. Sand encroachment and development for example, changing temperatures and pollution as well. Trawling activity is down at least 85% to what it once was. Need more studies to find out the cause of the degradation of SAV. Other gears are fishing in SAV as well.

Michael Cowdry – Commercial fisherman, Sneads Ferry. I started trawling with a 16-foot skiff in the New River and now have a 30-foot vessel. Fishermen are being impacted by the rulemaking process and plagued by best available data. There is no data to support SAV impacted by trawlers. If anything, there is less dragging done now and our waters are no better. The polluted lines match the trawl closure lines because the bottom goes bad when it is not dragged. Only closing something to say we did something. Even show areas closed where there is no vegetation.

Chris Elkins – Represents the Coastal Conservation Association (CCA), Gloucester. The CCA supports the DMF proposed closures. Habitat is important for shrimp and many other species including food for forage fish such as croaker, spot, weakfish. Bycatch from shrimp trawls is also a major issue and closures will reduce bycatch. From my personal view these areas represent a small amount of shrimp harvested and would eliminate mostly smaller operations. I support subsidies for shrimpers to acknowledge and compensate them for some of their loss.

Wesley Potter – Commercial fisherman. The closures will directly have an impact on me and many other fishermen's livelihood. How much would it cost to pay us off? Need to acknowledge the work it would take to figure out these lines. We are not catching grass we are catching shrimp.

Cayton Daniels – Commercial fisherman, Marshallberg. I fish mostly in Back Sound. These closures will put me out of business. There is no data to support these closures. This will kill all the small boats. Less than 20 fishermen are left in this industry under the age of 40. This hurt high school and college kids trying to fish to get them through school. I encourage the MFC to study if the closure in Bogue Sound has improved SAV. I also ask what do rays do to create turbidity in these areas? You see cownose rays from one end of Core Sound to the other right now and they are stirring up the bottom. Not to mention now Ophelia Inlet. Forty percent of my shrimp came from the Straits last year.

Frances Anne Moran Griffield – I'm from a fishing family, I agree that protection of SAV is needed but these closures go too far. I reached out to Professor Rusty Day, College of Charleston to get his insight on trawling over SAV. He thought it was a good idea to prevent trawling in SAV but noted the proposed areas in the paper were excessive. There was also the absence to measure the positive impacts of closures. There is no mention of specific monitoring programs and need to reach a balance for cultural benefits. There was also the failure to address other stressors to SAV and consideration for how these measures weigh against other activities. It was noted too closure causes more need for enforcement which there isn't enough manpower as it is now. We need real-time information on SAV and not just pointing at trawling as theoretical threats to SAV.

John McQuaid – Recreational fisherman, Raleigh. I support the conservation of SAV, but it may already be too late. I have seen a drastic decline in SAV as well as fish in my years coming to the coast. Inshore

trawling is a destructive gear which damages our fish. Closing areas to trawling will protect juvenile fish. I would err on the side of conservation even with limited data.

Stephen Smith – Recreational fisherman, Morehead City. I have met a lot of people as a local dentist and seen a lot of changes in the years I have lived in this area. Offshore could see the gun mount and now it is underwater. Shrimp used to winter off SC and now they winter off NC. Water temperatures are increasing. My lemon tree in my backyard produced 160 lemons last year and we see Spanish mackerel in our water in February. Do warmer waters cause more issues? More research is needed to see if warming temperatures are causing the decline in SAV. Some people are seeing these closures to reduce bycatch and using SAV as the excuse to limit trawling.

Chair Scharf called a five-minute break before starting Advisory Committee discussion and vote to recommend options to the MFC.

### **SHRIMP FMP AMENDMENT 2 – ADAPTIVE MANAGEMENT – PROTECTION OF CRITICAL SEA GRASS HABITAT THROUGH SHRIMP TRAWL AREA CLOSURES**

Fred Scharf requested Stewart to follow up with any responses to the public comment. Stewart noted there is plenty of evidence that otter trawl doors damage SAV. NOAA and APNEP also survey SAV, which comprises of an aerial high-resolution component as well as ground truthing, completed annually on a rotational basis in areas. DMF staff and others assist with the ground truthing, which requires sampling on the ground to determine SAV presence and other habitat characteristics. When SAV is exposed to extreme high and low temperatures they usually grow back in 1 to 2 years. Scharf added that the grass species composition changes as temperatures increase.

Seigler said trawlers do not drag through grass beds, they don't make money towing through them. He mentioned a study in Buzzards Bay where eelgrass loss was caused by nitrogen loading and suggested getting more water quality samples to see what the nitrogen levels are rather than blaming commercial trawlers. Scharf asked what should we do about unprotected SAV? Stewart noted the direction was provided by the MFC through Amendment 2 of the Shrimp FMP and asked how would others on the AC recommend dealing with this issue? Jeremy Skinner said he would like to see more data on areas already closed to trawling and how the SAV has changed. Skinner further noted that the division should revisit the issue once more data is available.

**A motion was introduced by Jeremy Skinner to not support the proposed closures in the issue paper; Need water quality data in the areas with seagrass loss and healthy seagrass areas and need a link between habitat protection and seagrass recovery. The motion was seconded by Ken Seigler.**

Michael Yates requested clarification whether we are talked about shrimp trawls affecting SAV or other things affecting SAV? Are we asking DMF to address the other issues affecting SAV not only shrimp trawls. Tim Willis said we need to address other things before closing more areas to trawling, as it appears a lot of other things are being ignored that contribute to the loss of SAV. We already do not have enough law enforcement to cover the regulations already in place. Scharf reiterated the discussion to the group what he heard as the intent behind the motion; we want to wait for more data, no support for any trawl closures, and there is not enough manpower to enforce. Ken Seigler added to get the water quality issues resolved before closing more areas to trawling.

Tom Smith stated we should give SAV a chance and exclude all traffic over the SAV. There is a need to protect these core areas. I'll admitted the initial proposed closures are ambitious but let's do what we can to protect SAV habitat and just close the unprotected SAV through this FMP. The CHPP looks at other aspects not under the authority of the MFC like water quality. Why is there such an issue to say no use to



trawls in an area if we already know the trawlers don't go in there? Ken Seigler said if trawls can't be allowed then exclude everyone from SAV. Smith noted we cannot go there through the shrimp FMP. Scharf said we could recommend other protections where current grass exists. Willis said who is going to enforce these laws. Pam Morris wanted to foster a better understanding behind the SAV mosaic. The SAV mosaic is built over time in some areas, not all and layered upon one another. And the mosaic has shown SAV has changed over time, closed areas are disintegrating and the SAV is in broken pieces. There is zero proof that trawling has an affect on these areas. And I can tell you from my own experience running to the Cape with our boat and in the shallowest of water hoping we don't bump. Knowing that our prop is also hitting SAV. SAV occurs in waters 6 feet and less and there is more damage caused by general boating activity through these waters than trawling. Other things to consider is the impact of global warming. Effort and the number of fishermen are declining. The buffers for the closures are too big. I ask DMF to go back and look at how SAV has changed in waters already closed.

Scharf called the motion to vote. **The motion passed 5-2 with one abstention.**

Scharf said the Southern AC motion will go to the MFC for them to make their final decision. Please participate in the process and provide further input before the final recommendation.

#### **ISSUES FROM AC MEMBERS**

No issues were provided by the Advisory Committee.

Jeremy Skinner motioned to adjourn, seconded by Tom Smith. The meeting ended at 8:49 p.m.

# DECISION DOCUMENT

## **Blue Crab Fishery Management Plan Amendment 3 Adaptive Management**



This document was developed to help the MFC track previous activity and prepare for upcoming actions for Blue Crab FMP Amendment 3 Adaptive Management.

September 2024

## Background

The original [North Carolina Blue Crab Fishery Management Plan \(FMP\)](#) was adopted in December 1998, [Amendment 1](#) was adopted in December 2004, and [Amendment 2](#) was adopted in November 2013. The Amendment 2 adaptive management strategy relied on annual updates to the Traffic Light Assessment (TLA) to provide information on relative condition of the stock. Based on results of the TLA update with 2015 data, management action was required by the North Carolina Marine Fisheries Commission (MFC). To improve the condition of the blue crab stock, the MFC adopted management measures documented in the May 2016 [Revision to Amendment 2](#).

Comprehensive review of the Blue Crab FMP was originally scheduled to begin in July 2018, but at its August 2016 business meeting, the MFC voted to begin formal review immediately to assess the status of the blue crab stock and identify more comprehensive management strategies. Consequently, development of Amendment 3 began in August 2016.

## Amendment 3 Background

As part of [Amendment 3 to the North Carolina Blue Crab FMP](#) a benchmark [stock assessment](#) was undertaken using data from 1995-2016. Based on assessment results, the N.C. blue crab stock was classified as overfished in 2016. The probability the stock was overfished was 98% with the average spawner abundance in 2016 estimated at 50 million crabs (below the threshold estimate of 64 million crabs). Overfishing was also occurring in 2016 with a 52% probability. The average fishing mortality in 2016 was estimated at 1.48 (above the fishing mortality threshold of 1.46).

The North Carolina Fishery Reform Act of 1997 requires the State specify a time period not to exceed two years to end overfishing and achieve a sustainable harvest within 10 years of the date of adoption of the plan. To meet the legal requirement, the division determined reductions in commercial harvest were necessary. A harvest reduction of 0.4% (in numbers of crabs) was projected to end overfishing and a harvest reduction of 2.2% was projected to achieve sustainable harvest and rebuild the blue crab spawning stock within 10 years with a 50% probability of success (Table 1).

Table 1. Catch reduction projections for varying levels of fishing mortality ( $F$ ), based on 2016 data from the stock assessment, and the probability of achieving sustainable harvest within the 10-year rebuilding period defined in statute. The bolded row indicates the minimum requirement defined in statute.

$F$ (yr-1)	Catch Reduction (%)	Probability of achieving sustainable harvest within 10 years (%)	Comments
1.48	0.0	31	2016 average $F$ from stock assessment
1.46	0.4	45	Catch reduction to meet $F$ threshold and end overfishing
1.40	1.7	46	Catch reduction to meet spawner abundance threshold and end overfished status
<b>1.38</b>	<b>2.2</b>	<b>50</b>	<b>Catch reduction to meet minimum statutory requirement for achieving sustainable harvest</b>
1.30	3.8	67	
1.22	5.9	90	Catch reduction to meet $F$ target
1.10	9.3	96	
1.00	12.3	100	
0.90	15.7	100	
0.80	19.8	100	Catch reduction to meet spawner abundance target
0.70	24.3	100	

The MFC adopted Amendment 3 to the Blue Crab FMP in February 2020 to rebuild the blue crab stock. Prior to adoption, the division recommended that, at a minimum, the MFC should adopt a commercial harvest reduction of 2.2% (50% probability of success) but encouraged the MFC to consider a further reduction to at least 5.9% (90% probability of success). Further, the division encouraged the MFC to adopt a management strategy that included a prohibition on immature female hard crab harvest, a 5-inch minimum size limit for mature females, and a continuous closure period resulting in a reduction of at least 4.6% to make up the remainder of the preferred reduction. A comprehensive list of Amendment 3 sustainable harvest options can be found in [Table 4.1.12](#) and [Table 4.1.14](#) of Amendment 3.

**The management strategy that the Marine Fisheries Commission ultimately adopted was estimated to result in a harvest reduction lower than the initial recommendation and provided an estimated 2.4% harvest reduction with a 50% probability of success.** This reduction would be just above the statutorily required minimum (2.2%), but below the harvest reduction level needed to reduce  $F$  to the target (5.9%) and the reduction needed to increase spawner abundance to the target (19.8%). Amendment 3 management strategies have been fully in place since January 2021. Amendment 3 also maintained all measures implemented with the May 2016 Revision to the Blue Crab FMP. The management changes adopted in Amendment 3 were:

- Season closures (pot closure periods):
  - January 1-31 north of the Highway 58 bridge
  - March 1-15 south of the Highway 58 bridge
  - Possession of blue crabs is prohibited during the season closure period.
- A 5-inch minimum size limit for mature female crabs statewide.
- Remove all cull ring exempted areas.

- New crab spawning sanctuaries were established in Beaufort, Bogue, Bear, Browns, New River, Topsail, Rich, Mason, Masonboro, Carolina Beach, Cape Fear River, Shallotte, Lockwoods Folly, and Tubbs inlets with a March 1-October 31 closure.
- Crab trawls prohibited in areas where shrimp trawls were already prohibited in the Pamlico, Pungo, and Neuse rivers.
- Crab bycatch allowance in oyster dredges reduced to 10% of the total weight of the combined oyster and crab catch or 100 pounds, whichever is less.
- Criteria were approved for designating Diamondback Terrapin Management Areas where use of approved terrapin excluders will be required.
- The adaptive management framework was revised (more details about this are below).

A summary of all management measures in place through Amendment 3 can be found in the annual [FMP Update](#) or in the [Amendment 3 flyer](#).

## Amendment 3 Adaptive Management

1. Update the stock assessment at least once in between full reviews of the FMP, timing at the discretion of the division
  - a. If the stock is overfished and/or overfishing is occurring or it is not projected to meet the sustainability requirements, then management measures shall be adjusted using the director's proclamation authority
  - b. If the stock is not overfished and overfishing is not occurring, then management measures may be relaxed provided it will not jeopardize the sustainability of the blue crab stock
2. Any quantifiable management measure, including those not explored in this paper, with the ability to achieve sustainable harvest (as defined in the stock assessment), either on its own or in combination, may be considered
3. Use of the director's proclamation authority for adaptive management is contingent on:
  - a. Consultation with the Northern, Southern, and Shellfish/Crustacean advisory committees
  - b. Approval by the Marine Fisheries Commission

Upon evaluation by the division, if a management measure adopted to achieve sustainable harvest (either through Amendment 3 or a subsequent Revision) is not working as intended, then it may be revisited and either: 1) revised or 2) removed and replaced as needed provided it conforms to steps 2 and 3 above.

## Post Amendment 3 Stock Assessment Update

Following full implementation of Amendment 3 management measures in 2021, division monitoring programs continued to observe historically low [commercial landings](#), coupled with continued [low abundance of all blue crab life stages](#) (e.g., male and female juveniles, male and female adults, mature females). In response to stock concerns expressed by commercial crabbers and continued poor trends in abundance since adoption of Amendment 3, the division began updating the stock assessment with data through 2022, adding six years of data to the benchmark assessment. As an assessment update, there were no changes to model parameters and a peer review was not conducted, as the model configuration of the prior peer reviewed model was maintained. Results of the model update indicate the magnitude and trends for estimated recruitment, female spawner abundance, and fishing mortality were similar to the prior benchmark assessment (Figure 1), however, the Maximum Sustainable Yield (MSY)

based reference points used to determine stock status for both female spawner abundance and fishing mortality both drastically changed with the update time series (Figures 2-3). Due to the magnitude of the change in reference points, the division requested an external review of the updated stock assessment.

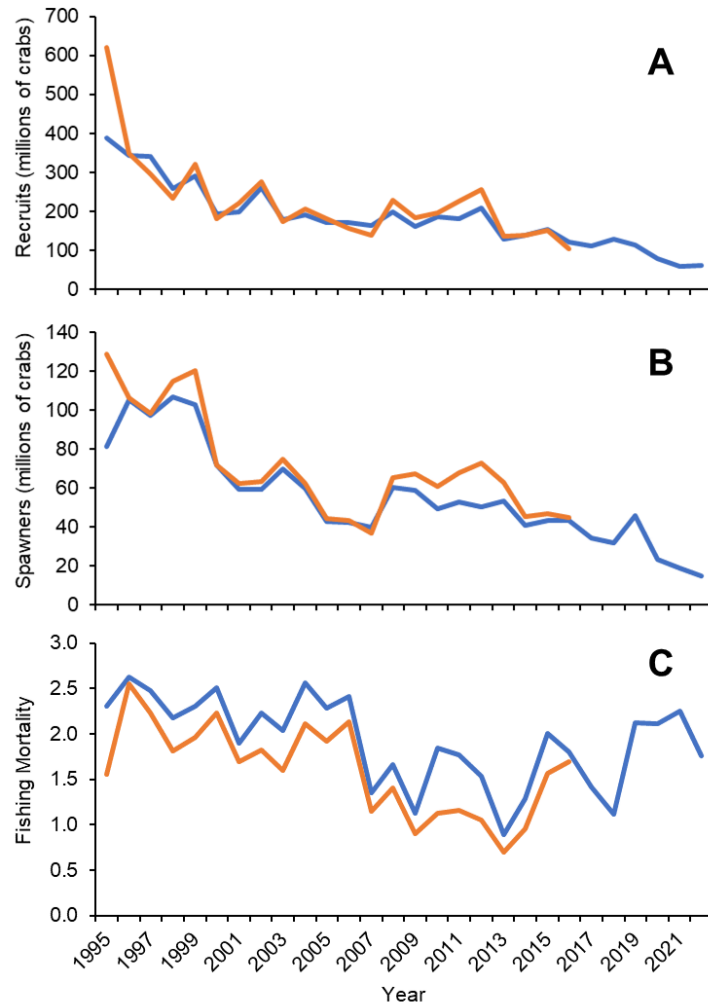


Figure 1. Comparison of estimates of (A) total recruitment, (B) female spawner abundance, and (C) fishing mortality between the 2023 stock assessment update (blue line) and the 2018 benchmark stock assessment (orange line).

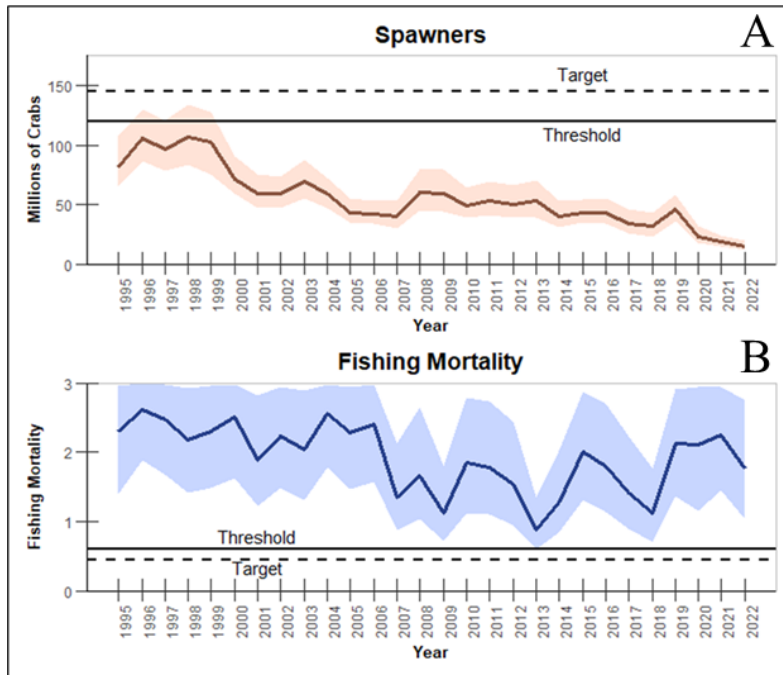


Figure 2. Annual estimates of (A) mature female spawner abundance and (B) fishing mortality relative to associated reference points for hard blue crabs in North Carolina from the 2023 stock assessment update.

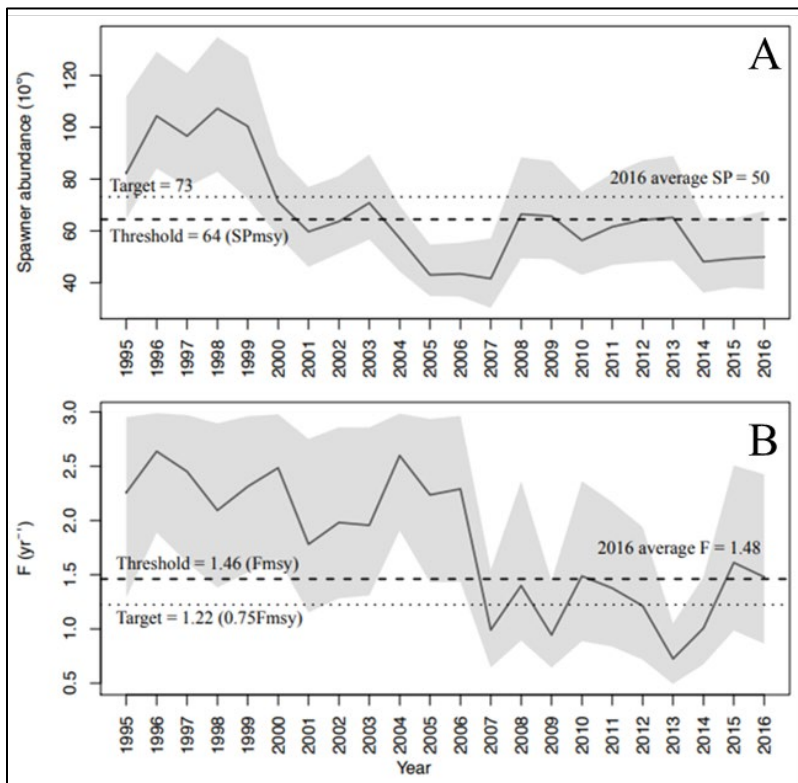


Figure 3. Annual estimates of (A) mature female spawner abundance and (B) fishing mortality relative to associated reference points for hard blue crabs in North Carolina from the 2018 benchmark stock assessment.

This external review was completed in late December 2023. The reviewers identified concerns with model specifications and results and strongly recommended resolving these issues before basing any management decisions solely on the assessment update. Suggestions provided by reviewers can only be incorporated with a new benchmark stock assessment. Given concerns with the assessment update identified by the division and external peer reviewers, **the division does not recommend using results of the 2023 stock assessment update to inform harvest reductions.**

Regardless of the availability of management advice from an updated stock assessment, stock concerns raised by commercial crabbers and trends in available data clearly show Amendment 3 management measures have not worked to reverse declining population trends as intended. Amendment 3 adopted management measures were only projected to result in a 2.4% harvest reduction with a 50% probability of achieving sustainable harvest, the minimum required by statute.

In addition, declines in the North Carolina blue crab stock are not unique, as blue crab stocks in other Atlantic coast states have shown similar declines. In January 2023 the South Carolina Department of Natural Resources released a [status report](#) for the South Carolina blue crab fishery. The report concluded the South Carolina blue crab stock has been in decline for nearly two decades and provided recommendations to prevent overharvesting, gradually reduce fishing pressure, prevent overexploitation, and strengthen enforcement capabilities. Concerns for the [Chesapeake Bay blue crab stock have also persisted](#). While the Chesapeake Bay blue crab stock is not depleted and overfishing is not occurring, juvenile abundance remains low. Precautionary management, focusing on protecting mature females and juveniles, has been recommended for the Chesapeake Bay stock and a benchmark stock assessment has been started to better understand the population.

## Adaptive Management

All available information suggests the blue crab stock has continued to decline since adoption of Amendment 3 management measures in February 2020. The Amendment 3 adaptive management framework will be used to immediately address the overall declining trends in the blue crab stock. This action is appropriate given the Amendment 3 adaptive management framework states: *“upon evaluation by the division, if a management measure adopted to achieve sustainable harvest is not working as intended, then it may be revisited and either 1) revised or 2) removed and replaced as needed...”*.

Because the 2023 stock assessment update cannot be used to inform management, the division will develop recommendations based on results of the 2018 stock assessment. Using 2018 assessment results provides some guidance on appropriate management in lieu of a current stock assessment.

The Amendment 3 adaptive management framework allows any quantifiable management measure, including those not discussed in Amendment 3, with the ability to achieve sustainable harvest either on its own or in combination to be considered. The division has begun reaching out to stakeholders about fishery perceptions and management ideas and has conducted preliminary analysis of potential management measures (Table 2). Prior to implementation, the division will consult with the Northern, Southern, and Shellfish/Crustacean advisory committees and management recommendations will be brought to the MFC for approval.



Table 2. Summary of potential quantifiable management options that can be considered through Amendment 3 adaptive management including pros, cons, and anticipated level of complexity to analyze and implement.

Management Options	Pros	Cons	Complexity
Limit Crab Trawls	<ul style="list-style-type: none"> <li>• Quantifiable</li> <li>• Protects females prior to spawning</li> <li>• Possible habitat protections</li> <li>• Low effort</li> <li>• Low market demand from fishery</li> </ul>	<ul style="list-style-type: none"> <li>• Limits already small segment of fishery</li> <li>• Small harvest reduction</li> </ul>	Low
Extend existing closure period (e.g., statewide closure January 1-March 15)	<ul style="list-style-type: none"> <li>• Quantifiable</li> <li>• Protect females prior to spawning</li> <li>• Low market demand when fishery occurs</li> </ul>	<ul style="list-style-type: none"> <li>• Increased market price due to VA and MD having no harvest</li> <li>• Crabbers active during winter months have close relations with direct markets</li> <li>• Could affect “peeler crab season”</li> <li>• Small harvest reduction</li> </ul>	Moderate
Bushel/Trip Limits, sex specific or life stage specific bushel/trip limits, season specific bushel/trip limits	<ul style="list-style-type: none"> <li>• Quantifiable</li> <li>• Implemented in other states</li> <li>• Limit harvest of vulnerable or important life stages (e.g., mature females)</li> <li>• Limits total harvest</li> <li>• Could reduce effort</li> </ul>	<ul style="list-style-type: none"> <li>• Requires additional culling</li> <li>• Actual reductions may not be realized</li> <li>• Likely longer soak times of pots</li> <li>• Likely to affect some areas more than others</li> </ul>	Very High
Regional Closures	<ul style="list-style-type: none"> <li>• Quantifiable</li> <li>• Current closure periods are split north and south</li> <li>• Accounts for region specific fishery differences</li> </ul>	<ul style="list-style-type: none"> <li>• Creates inequity between regions</li> <li>• Possible effort shifts</li> <li>• Data uncertainties</li> </ul>	Moderate
Size limit changes/Female max size limit/Peelers min size limit	<ul style="list-style-type: none"> <li>• Quantifiable (for max size)</li> <li>• Size limits currently used</li> <li>• Protect biologically important crabs</li> </ul>	<ul style="list-style-type: none"> <li>• Requires additional culling</li> <li>• Loss of market value</li> <li>• Likely to affect some areas more than others</li> </ul>	High
Limit sponge crab harvest or life stage closures	<ul style="list-style-type: none"> <li>• Quantifiable (can estimate reduction with fish house data)</li> <li>• Implemented in other states</li> <li>• Protect biologically important crabs</li> <li>• Some past support from public</li> </ul>	<ul style="list-style-type: none"> <li>• Likely to affect some areas more than others</li> <li>• Unknown success of clutch once potted</li> <li>• Requires additional culling</li> </ul>	Moderate

## Amendment 3 Adaptive Management Timeline (gray indicates a step is complete)

May 2024	Division presents results of stock assessment update and adaptive management plan to MFC
May 2024 – August 2024	Outreach and analysis
August 2024	Division updates the MFC on progress
September 2024	Division updates Northern, Southern, and Shellfish/Crustacean advisory committees
September 2024 – December 2024	Additional outreach and analysis. Division drafts Revision to Amendment 3
February 2025	Update MFC on draft Revision
March 2025	Public and MFC AC (Northern, Southern, Shellfish/Crustacean) review draft
May 2025	MFC approves Revision to Amendment 3

Current step →

### Key Takeaways

- Amendment 3 management strategies have been fully in place since January 2021.
- The Blue Crab Stock Assessment Update was completed in 2023, but given the concerns expressed by the external peer reviewers, the Division does not recommend using the results of that update to inform harvest reductions.
- All available information suggests that the blue crab stock has continued to decline since the adoption of Amendment 3 management measures by the Commission in February 2020.
- The Amendment 3 adaptive management framework will be used to address the overall declining trends in the blue crab stock.
- The division will develop management recommendations that would have resulted in higher harvest reductions with a greater probability of achieving sustainable harvest based on 2018 assessment results and apply them to the current fishery.
- The Amendment 3 adaptive management framework allows any quantifiable management measure, including those not discussed in Amendment 3, that has the ability to achieve sustainable harvest either on its own, or in combination, to be considered.
- Prior to the implementation of any management, management recommendations will be brought to the MFC for approval.